



# GEL LABORATORIES LLC

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

## Certificate of Analysis

Company : MJW Technical Services  
 Address : 15 Hazelwood Drive  
 Suite 112  
 Buffalo, New York 14228  
 Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes  
 Client Sample ID: 4.2.B.R.10.2  
 Sample ID: 392057022  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 21.6%

Report Date: March 9, 2016

Project: MJWC00115  
 Client ID: MJWC001

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

*Gamma with Ingrowth "Dry Weight Corrected"*

Actinium-227	U	0.199	+/-0.350	0.592	0.280	+/-0.363		pCi/g		MXR1	03/07/16	1039	1547792	1
Antimony-125	U	-0.0262	+/-0.116	0.216	0.100	+/-0.117		pCi/g						
Bismuth-212	UI	0.00	+/-0.592	1.24	0.570	+/-0.678		pCi/g						
Bismuth-214		0.815	+/-0.170	0.159	0.0731	+/-0.183		pCi/g						
Cesium-137		0.239	+/-0.0876	0.0853	0.039	+/-0.0897	0.100	pCi/g						
Cobalt-60	U	-0.0303	+/-0.0483	0.0828	0.0358	+/-0.0503		pCi/g						
Europium-154	U	-0.0321	+/-0.134	0.246	0.108	+/-0.135		pCi/g						
Lead-212		1.29	+/-0.141	0.122	0.0574	+/-0.176		pCi/g						
Lead-214		1.10	+/-0.218	0.335	0.162	+/-0.235		pCi/g						
Potassium-40		16.0	+/-1.59	0.731	0.311	+/-2.09		pCi/g						
Protactinium-231	UI	0.00	+/-0.862	1.02	0.479	+/-0.880		pCi/g						
Radium-226		0.815	+/-0.170	0.159	0.0731	+/-0.183		pCi/g						
Radium-228		0.792	+/-0.348	0.293	0.131	+/-0.364		pCi/g						
Thallium-208		0.302	+/-0.0952	0.0682	0.0308	+/-0.0984		pCi/g						
Tin-126	UI	0.00	+/-0.119	0.144	0.0685	+/-0.121		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha		15.1	+/-4.23	3.96	1.61	+/-5.14	4.00	pCi/g		JXB7	03/03/16	1458	1548366	2
Beta		25.9	+/-3.75	3.84	1.77	+/-5.24	10.0	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/25/16	1513	1547785

### The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5 2 3/Ga-01-R
2	EPA 900 0/SW846 9310/SM 7110B Modified

### Surrogate/Tracer Recovery Test

Surrogate/Tracer	Recovery	Batch ID	Recovery%	Acceptable Limits
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Company : MJW Technical Services  
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Buffalo, New York 14228

Report Date: March 9, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.10.2  
Sample ID: 392057022

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 5, 2016

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

Client Sample ID: 4.2B.R.11.1	Project: MJWC00115
Sample ID: 386983010	Client ID: MJWC001
Matrix: Soil	
Collect Date: 02-DEC-15 10:36	
Receive Date: 08-DEC-15	
Collector: Client	
Moisture: 32.8%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Gravimetric Solids</b>											
ASTM D 2216 % Moisture "As Received"											
Moisture		32.8			percent	DRS1	12/09/15	1255	1529378		1
<b>Rad Gamma Spec Analysis</b>											
Gammaspec, Gamma, Solid "Dry Weight Corrected"											
Actinium-227	U	-0.0353	0.506		pCi/g	RXF2	01/04/16	0830	1529716		2
Antimony-125	U	0.00672	0.203		pCi/g						
Bismuth-212		0.994	1.03		pCi/g						
Bismuth-214		0.885	0.149		pCi/g						
Cesium-137		0.219	0.0794	0.100	pCi/g						
Cobalt-60	UI	0.00	0.0821		pCi/g						
Europium-154	U	-0.0574	0.221		pCi/g						
Lead-212		0.995	0.144		pCi/g						
Lead-214		0.856	0.160		pCi/g						
Potassium-40		15.5	0.601		pCi/g						
Protactinium-231	U	-0.104	1.06		pCi/g						
Radium-226		0.885	0.149		pCi/g						
Radium-228		1.23	0.254		pCi/g						
Thallium-208		0.386	0.0719		pCi/g						
Tin-126	UI	0.00	0.152		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>											
GFPC, Gross A/B, solid "Dry Weight Corrected"											
Alpha		16.5	3.79	4.00	pCi/g	KXB2	01/04/16	1239	1532749		3
Beta		24.7	3.87	10.0	pCi/g						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	12/09/15	1255	1529378

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE HASL 300, 4.5.2.3/Ga-01-R	
3	EPA 900.0/SW846 9310/SM 7110B Modified	

Notes:

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2040 Savage Road Charleston SC 29407 - (843) 558-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 5, 2016

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

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.12.1  
 Sample ID: 386983011  
 Matrix: Soil  
 Collect Date: 02-DEC-15 11:11  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 30.3%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Gravimetric Solids</b>											
ASTM D 2216 % Moisture "As Received"											
Moisture		30.3			percent		DRS1	12/09/15	1255	1529378	1
<b>Rad Gamma Spec Analysis</b>											
Gammascpec, Gamma, Solid "Dry Weight Corrected"											
Actinium-227	U	0.0471	0.744		pCi/g		RXF2	01/04/16	0831	1529716	2
Antimony-125	U	-0.0612	0.290		pCi/g						
Bismuth-212	U	0.640	1.91		pCi/g						
Bismuth-214		1.12	0.147		pCi/g						
Cesium-137		0.577	0.122	0.100	pCi/g						
Cobalt-60	U	-0.000172	0.110		pCi/g						
Europium-154	U	-0.0213	0.427		pCi/g						
Lead-212		1.04	0.175		pCi/g						
Lead-214		1.31	0.211		pCi/g						
Potassium-40		15.4	1.21		pCi/g						
Protactinium-231	UI	0.00	1.67		pCi/g						
Radium-226		1.12	0.147		pCi/g						
Radium-228		0.721	0.437		pCi/g						
Thallium-208		0.314	0.110		pCi/g						
Tm-126	UI	0.00	0.139		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>											
GFPC, Gross A/B, solid "Dry Weight Corrected"											
Alpha		20.7	3.92	4.00	pCi/g		KXB2	01/04/16	1239	1532749	3
Beta		22.8	3.36	10.0	pCi/g						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	12/09/15	1255	1529378

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE HASL 300.4 5 2 3/Ga-01-R	
3	EPA 900 0/SW846 9310/SM 7110B Modified	

Notes:

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## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.12.2  
 Sample ID: 392062016  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 20.9%

Project: MJWC00115  
 Client ID: MJWC001

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

*Gamma with Ingrowth "Dry Weight Corrected"*

Actinium-227	U	-0.0123	+/-0.379	0.701	0.331	+/-0.379		pCi/g		MXR1	03/07/16	1415	1547923	1
Antimony-125	U	0.034	+/-0.184	0.348	0.165	+/-0.184		pCi/g						
Bismuth-212	UI	0.00	+/-0.927	1.62	0.751	+/-1.18		pCi/g						
Bismuth-214		0.978	+/-0.197	0.172	0.0784	+/-0.216		pCi/g						
Cesium-137		5.03	+/-0.269	0.103	0.0472	+/-0.528	0.100	pCi/g						
Cobalt-60	U	0.0321	+/-0.0422	0.0971	0.0418	+/-0.0447		pCi/g						
Europium-154	U	-0.108	+/-0.180	0.308	0.136	+/-0.187		pCi/g						
Lead-212		1.13	+/-0.168	0.166	0.0791	+/-0.197		pCi/g						
Lead-214		0.952	+/-0.264	0.234	0.111	+/-0.278		pCi/g						
Potassium-40		13.0	+/-1.60	0.427	0.147	+/-1.95		pCi/g						
Protactinium-231	U	0.174	+/-0.820	1.41	0.668	+/-0.825		pCi/g						
Radium-226		0.978	+/-0.197	0.172	0.0784	+/-0.216		pCi/g						
Radium-228		0.753	+/-0.390	0.346	0.155	+/-0.407		pCi/g						
Thallium-208		0.245	+/-0.121	0.0916	0.042	+/-0.123		pCi/g						
Tin-126	UI	0.00	+/-0.154	0.203	0.0975	+/-0.156		pCi/g						

### Rad Gas Flow Proportional Counting

*GFPC, Grass A-B, solid "Dry Weight Corrected"*

Alpha		14.7	+/-3.83	3.36	1.36	+/-4.80	4.00	pCi/g		JXB7	03/02/16	1646	1548369	2
Beta		27.7	+/-3.55	3.83	1.80	+/-5.27	10.0	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/26/16	1449	1547874

### The following Analytical Methods were performed

Method	Description
1	DOE HASL 300.4 5 2 3/Ga-01-R
2	EPA 900 0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.12.2  
Sample ID: 392062016

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).



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Company : MJW Technical Services  
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Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.13.2  
 Sample ID: 392043019  
 Matrix: Soil  
 Collect Date: 03-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 22.8%

Project: MJWC00115  
 Client ID: MJWC001

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

*Gamma with Ingrowth "Dry Weight Corrected"*

Actinium-227	U	-0.0545	+/-0.297	0.562	0.265	+/-0.298		pCi/g		MXR1	03/07/16	0918	1547791	1
Antimony-125	U	0.0396	+/-0.162	0.290	0.136	+/-0.163		pCi/g						
Bismuth-212	UI	0.00	+/-0.942	1.70	0.784	+/-1.09		pCi/g						
Bismuth-214		0.816	+/-0.197	0.163	0.0734	+/-0.209		pCi/g						
Cesium-137		3.11	+/-0.216	0.093	0.0418	+/-0.332	0.100	pCi/g						
Cobalt-60	U	-0.0108	+/-0.0607	0.119	0.0513	+/-0.061		pCi/g						
Europium-154	U	0.0218	+/-0.180	0.315	0.136	+/-0.180		pCi/g						
Lead-212		1.03	+/-0.150	0.146	0.0694	+/-0.188		pCi/g						
Lead-214		0.954	+/-0.205	0.184	0.0861	+/-0.222		pCi/g						
Potassium-40		14.7	+/-1.78	0.677	0.259	+/-2.22		pCi/g						
Protactinium-231	UI	0.00	+/-0.882	1.06	0.496	+/-0.908		pCi/g						
Radium-226		0.816	+/-0.197	0.163	0.0734	+/-0.209		pCi/g						
Radium-228		0.871	+/-0.385	0.388	0.173	+/-0.401		pCi/g						
Thallium-208		0.288	+/-0.111	0.087	0.0394	+/-0.114		pCi/g						
Tin-126	UI	0.00	+/-0.0945	0.105	0.0502	+/-0.0965		pCi/g						

### Rad Gas Flow Proportional Counting

*GFPC, Gross A.B. solid "Dry Weight Corrected"*

Alpha		13.6	+/-4.21	3.81	1.49	+/-4.97	4.00	pCi/g		BXF1	03/04/16	0754	1547857	2
Beta		27.2	+/-4.04	4.03	1.86	+/-5.64	10.0	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/25/16	1523	1547783

### The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

### Surrogate/Tracer Recovery Test

Batch ID Recovery% Acceptable Limits

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.13.2  
Sample ID: 392043019

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lo	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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## Certificate of Analysis

Report Date: January 5, 2016

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

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.14.1	Project: MJWC00115
Sample ID: 386983013	Client ID: MJWC001
Matrix: Soil	
Collect Date: 03-DEC-15 10:16	
Receive Date: 08-DEC-15	
Collector: Client	
Moisture: 33.9%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Gravimetric Solids</b>											
ASTM D 2216 % Moisture "As Received"											
Moisture		33.9			percent	DRS1	12/09/15	1255	1529378		1
<b>Rad Gamma Spec Analysis</b>											
Gammaspec, Gamma, Solid "Dry Weight Corrected"											
Actinium-227	U	-0.0384	0.689		pCi/g	RXF2	01/04/16	0832	1529716		2
Antimony-125	U	0.0212	0.275		pCi/g						
Bismuth-212		1.41	0.931		pCi/g						
Bismuth-214		0.732	0.205		pCi/g						
Cesium-137		0.967	0.0914	0.100	pCi/g						
Cobalt-60	U	-0.00277	0.107		pCi/g						
Europium-154	U	-0.0889	0.274		pCi/g						
Lead-212		1.37	0.142		pCi/g						
Lead-214		1.05	0.209		pCi/g						
Potassium-40		15.1	0.883		pCi/g						
Protactinium-231	UI	0.00	1.33		pCi/g						
Radium-226		0.732	0.205		pCi/g						
Radium-228		0.901	0.379		pCi/g						
Thallium-208		0.369	0.0889		pCi/g						
Tin-126	UI	0.00	0.203		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>											
GFPC, Gross A/B, solid "Dry Weight Corrected"											
Alpha		18.8	3.99	4.00	pCi/g	KXB2	01/04/16	1239	1532749		3
Beta		26.3	3.86	10.0	pCi/g						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	12/09/15	1255	1529378

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE HASL 300, 4.5.2.3/Ga-01-R	
3	EPA 900 0/SW846 9310/SM 7110B Modified	

Notes:

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.14.2  
 Sample ID: 392043020  
 Matrix: Soil  
 Collect Date: 03-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 21.5%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma with Ingrowth "Dry Weight Corrected"</i>														
Actinium-227	U	0.0618	+/-0.275	0.523	0.248	+/-0.277		pCi/g		MXR1	03/07/16	0923	1547791	1
Antimony-125	U	0.0284	+/-0.117	0.217	0.102	+/-0.118		pCi/g						
Bismuth-212	UI	0.00	+/-0.555	1.16	0.541	+/-0.652		pCi/g						
Bismuth-214		0.630	+/-0.157	0.127	0.058	+/-0.166		pCi/g						
Cesium-137		2.66	+/-0.171	0.075	0.0345	+/-0.282	0.100	pCi/g						
Cobalt-60	U	0.0365	+/-0.0379	0.0842	0.0374	+/-0.0414		pCi/g						
Europium-154	U	-0.0684	+/-0.116	0.206	0.0904	+/-0.120		pCi/g						
Lead-212		1.04	+/-0.179	0.123	0.0585	+/-0.205		pCi/g						
Lead-214		0.760	+/-0.223	0.155	0.073	+/-0.233		pCi/g						
Potassium-40		14.2	+/-1.39	0.509	0.208	+/-1.88		pCi/g						
Protactinium-231	U	-0.0243	+/-0.565	1.01	0.476	+/-0.565		pCi/g						
Radium-226		0.630	+/-0.157	0.127	0.058	+/-0.166		pCi/g						
Radium-228		0.825	+/-0.296	0.237	0.106	+/-0.320		pCi/g						
Thallium-208		0.280	+/-0.0692	0.0716	0.0331	+/-0.0731		pCi/g						
Tin-126	UI	0.00	+/-0.123	0.112	0.0533	+/-0.125		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha		19.7	+/-5.17	3.73	1.39	+/-6.43	4.00	pCi/g		BXF1	03/04/16	0755	1547857	2
Beta		21.9	+/-3.68	3.41	1.54	+/-4.96	10.0	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/25/16	1523	1547783

### The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846.9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.14.2  
Sample ID: 392043020

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer	Recovery	Test											Batch ID	Recovery%	Acceptable Limits

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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## Certificate of Analysis

Report Date: January 5, 2016

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

Client Sample ID: 4.2B.R.15.1	Project: MJWC00115
Sample ID: 386983014	Client ID: MJWC001
Matrix: Soil	
Collect Date: 03-DEC-15 09:43	
Receive Date: 08-DEC-15	
Collector: Client	
Moisture: 31%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Gravimetric Solids</b>											
ASTM D 2216 % Moisture "As Received"											
Moisture		31.0			percent	DRS1	12/09/15	1255	1529378		1
<b>Rad Gamma Spec Analysis</b>											
Gammaspec, Gamma, Solid "Dry Weight Corrected"											
Actinium-227	U	0.0427	0.525		pCi/g	RXF2	01/04/16	0832	1529716		2
Antimony-125	U	0.0503	0.197		pCi/g						
Bismuth-212	UI	0.00	1.21		pCi/g						
Bismuth-214		0.863	0.142		pCi/g						
Cesium-137		0.719	0.0757	0.100	pCi/g						
Cobalt-60	U	0.0207	0.0856		pCi/g						
Europium-154	U	0.106	0.258		pCi/g						
Lead-212		1.18	0.112		pCi/g						
Lead-214		1.24	0.148		pCi/g						
Potassium-40		15.4	0.556		pCi/g						
Protactinium-231	UI	0.00	0.920		pCi/g						
Radium-226		0.863	0.142		pCi/g						
Radium-228		0.759	0.246		pCi/g						
Thallium-208		0.315	0.067		pCi/g						
Tin-126	U	0.052	0.138		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>											
GFPC, Gross A/B, solid "Dry Weight Corrected"											
Alpha		9.92	3.87	4.00	pCi/g	KXB2	01/04/16	1241	1532749		3
Beta		22.4	2.56	10.0	pCi/g						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	12/09/15	1255	1529378

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE HASL 300, 4.5.2.3/Ga-01-R	
3	EPA 900.0/SW846 9310/SM 7110B Modified	

Notes:

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## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Lauric Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.15.2  
 Sample ID: 392043021  
 Matrix: Soil  
 Collect Date: 03-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 22.1%

Project: MJWC00115  
 Client ID: MJWC001

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

*Gamma with Ingrowth "Dry Weight Corrected"*

Actinium-227	U	-0.0802	+/-0.308	0.550	0.258	+/-0.310		pCi/g		MXR1	03/07/16	1036	1547792	1
Antimony-125	UI	0.00	+/-0.210	0.263	0.123	+/-0.242		pCi/g						
Bismuth-212	UI	0.00	+/-0.771	1.29	0.597	+/-1.01		pCi/g						
Bismuth-214		0.843	+/-0.176	0.141	0.064	+/-0.189		pCi/g						
Cesium-137		2.85	+/-0.185	0.0828	0.0377	+/-0.300	0.100	pCi/g						
Cobalt-60	U	-0.00159	+/-0.0381	0.0752	0.0317	+/-0.0381		pCi/g						
Europium-154	U	-0.0304	+/-0.120	0.230	0.099	+/-0.121		pCi/g						
Lead-212		1.22	+/-0.140	0.123	0.0582	+/-0.176		pCi/g						
Lead-214		1.11	+/-0.214	0.160	0.0745	+/-0.234		pCi/g						
Potassium-40		14.2	+/-1.54	0.631	0.258	+/-1.96		pCi/g						
Protactinium-231	U	0.402	+/-0.644	1.10	0.518	+/-0.675		pCi/g						
Radium-226		0.843	+/-0.176	0.141	0.064	+/-0.189		pCi/g						
Radium-228		1.08	+/-0.286	0.277	0.123	+/-0.327		pCi/g						
Thallium-208		0.364	+/-0.0862	0.0704	0.0319	+/-0.0915		pCi/g						
Tin-126	UI	0.00	+/-0.175	0.169	0.0806	+/-0.176		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		8.24	+/-3.22	3.91	1.66	+/-3.63	4.00	pCi/g		JXB7	03/03/16	1600	1547853	2
Beta		26.1	+/-3.87	4.55	2.15	+/-5.44	10.0	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/25/16	1513	1547785

**The following Analytical Methods were performed**

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846.9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.15.2  
Sample ID: 392043021

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).



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## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.16.2  
 Sample ID: 392043022  
 Matrix: Soil  
 Collect Date: 03-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 25%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mid.
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma with Ingrowth "Dry Weight Corrected"</i>														
Actinium-227	U	0.0144	+/-0.316	0.530	0.249	+/-0.316		pCi/g		MXR1	03/07/16	1037	1547792	1
Antimony-125	U	-0.0635	+/-0.135	0.205	0.0948	+/-0.138		pCi/g						
Bismuth-212	UI	0.00	+/-1.03	0.914	0.410	+/-1.03		pCi/g						
Bismuth-214		0.930	+/-0.156	0.142	0.065	+/-0.174		pCi/g						
Cesium-137		1.89	+/-0.158	0.0813	0.0372	+/-0.217	0.100	pCi/g						
Cobalt-60	U	-0.0236	+/-0.0375	0.0659	0.0276	+/-0.039		pCi/g						
Europium-154	U	0.0199	+/-0.127	0.251	0.111	+/-0.127		pCi/g						
Lead-212		1.09	+/-0.129	0.126	0.0597	+/-0.158		pCi/g						
Lead-214		1.18	+/-0.184	0.345	0.167	+/-0.208		pCi/g						
Potassium-40		14.2	+/-1.47	0.590	0.242	+/-1.92		pCi/g						
Protactinium-231	U	0.247	+/-0.597	1.07	0.506	+/-0.610		pCi/g						
Radium-226		0.930	+/-0.156	0.142	0.065	+/-0.174		pCi/g						
Radium-228		1.04	+/-0.332	0.260	0.115	+/-0.364		pCi/g						
Thallium-208		0.297	+/-0.0853	0.0723	0.033	+/-0.0886		pCi/g						
Tin-126	UI	0.00	+/-0.132	0.122	0.0577	+/-0.134		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha		18.7	+/-4.92	3.96	1.55	+/-6.11	4.00	pCi/g		JXB7	03/03/16	1602	1547853	2
Beta		24.8	+/-4.39	5.01	2.33	+/-5.70	10.0	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/25/16	1513	1547785

### The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4 5.2 3/Ga-01-R
2	EPA 900 0/SW846 9310/SM 7110B Modified

### Surrogate/Tracer Recovery Test

Batch ID Recovery% Acceptable Limits

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## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2.B.R.16.2  
Sample ID: 392043022

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test													
								Batch ID	Recovery%	Acceptable Limits				

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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## Certificate of Analysis

Report Date: January 5, 2016

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

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.17.1	Project: MJWC00115
Sample ID: 386983016	Client ID: MJWC001
Matrix: Soil	
Collect Date: 03-DEC-15 10:53	
Receive Date: 08-DEC-15	
Collector: Client	
Moisture: 31.6%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Gravimetric Solids</b>											
ASTM D 2216 % Moisture "As Received"											
Moisture		31.6			percent		DRS1	12/09/15	1255	1529378	1
<b>Rad Alpha Spec Analysis</b>											
ASP Plutonium Isotopic, Solid "Dry Weight Corrected"											
Plutonium-238	U	-0.0326	0.126	1.00	pCi/g		MXS2	12/28/15	1656	1529806	2
Plutonium-239/240	U	0.0193	0.0921	1.00	pCi/g						
ASP Uranium Isotopic, Solid "Dry Weight Corrected"											
Uranium-232		0.0439	0.118	1.00	pCi/g		MXS2	12/28/15	1552	1529801	3
Uranium-233/234		0.743	0.105	1.00	pCi/g						
Uranium-235/236		0.0449	0.0449	1.00	pCi/g						
Uranium-238		0.903	0.0826	1.00	pCi/g						
Alphaspec Np237, Solid "Dry Weight Corrected"											
Neptunium-237	U	-0.101	0.628	1.00	pCi/g		MXS2	12/28/15	1604	1529805	4
Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"											
Thorium-228		1.27	0.428	1.00	pCi/g		MXS2	12/28/15	1037	1529799	5
Thorium-229		0.107	0.345	1.00	pCi/g						
Thorium-230		0.719	0.251	1.00	pCi/g						
Thorium-232		0.782	0.156	1.00	pCi/g						
Am241, Cm Solid "Dry Weight Corrected"											
Americium-241	U	-0.0029	0.058	1.00	pCi/g		MXS2	12/28/15	1656	1529802	6
Curium-242	U	-0.00319	0.0637	1.00	pCi/g						
Curium-243/244	U	-0.0086	0.073	1.00	pCi/g						
Curium-245/246	X	0.0415	0.0415	1.00	pCi/g						
Liquid Scint Pu241, Solid "Dry Weight Corrected"											
Plutonium-241	U	-3.92	11.5	15.0	pCi/g		MXS2	12/30/15	1255	1529807	7
<b>Rad Gamma Spec Analysis</b>											
Gamma 1129, Solid "Dry Weight Corrected"											
Iodine-129	U	0.204	0.568	1.00	pCi/g		MJH1	12/30/15	1431	1533084	8
Gammaspect, Gamma, Solid "Dry Weight Corrected"											
Actinium-227	U	-0.157	0.581		pCi/g		RXF2	01/04/16	0833	1529716	9
Antimony-125	U	-0.0381	0.223		pCi/g						
Bismuth-212	UI	0.00	1.37		pCi/g						
Bismuth-214		1.07	0.157		pCi/g						
Cesium-137		2.44	0.0742	0.100	pCi/g						
Cobalt-60	U	-0.00165	0.0842		pCi/g						

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Suite 112  
Buffalo, New York 14228  
Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.17.1  
Sample ID: 386983016

Project: MJWC00115  
Client ID: MJWC001

### Rad Gamma Spec Analysis

#### Gammascpec, Gamma, Solid "Dry Weight Corrected"

Europium-154	U	-0.00211	0.256	pCi/g
Lead-212		1.14	0.124	pCi/g
Lead-214		1.10	0.364	pCi/g
Potassium-40		14.7	0.755	pCi/g
Protactinium-231	UI	0.00	1.10	pCi/g
Radium-226		1.07	0.157	pCi/g
Radium-228		1.04	0.331	pCi/g
Thallium-208		0.390	0.0825	pCi/g
Tin-126	UI	0.00	0.197	pCi/g

### Rad Gas Flow Proportional Counting

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

Alpha	17.0	3.82	4.00	pCi/g	KXB2	01/04/16	1239	1532749	10
Beta	26.6	2.98	10.0	pCi/g					

#### GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.478	1.55	2.00	pCi/g	KSD1	12/29/15	1703	1532743	11
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### Rad Liquid Scintillation Analysis

#### LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U	0.978	4.57	6.00	pCi/g	TXJ1	12/27/15	1222	1531105	12
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#### Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U	-0.69	1.62	2.00	pCi/g	TXJ1	12/23/15	1544	1531115	13
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#### Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	U	0.728	2.72	5.00	pCi/g	MYM1	01/02/16	1020	1532556	14
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### The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	12/09/15	1255	1529378

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## Certificate of Analysis

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

Client Sample ID: 4.2B.R.17.1  
Sample ID: 386983016

Project: MJWC00115  
Client ID: MJWC001

### The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE EML HASL-300, Pu-11-RC Modified	
3	DOE EML HASL-300, U-02-RC Modified	
4	ASTM C 1476-00 Modified	
5	DOE EML HASL-300, Th-01-RC Modified	
6	DOE EML HASL-300, Am-05-RC Modified	
7	DOE EML HASL-300, Pu-11-RC Modified	
8	DOE EML HASL-300, I-01 Modified	
9	DOE HASL 300, 4.5 2 3/Ga-01-R	
10	EPA 900 0/SW846 9310/SM 7110B Modified	
11	EPA 905 0 Modified/DOE RPS01 Rev 1 Modified	
12	EPA 906 0 Modified	
13	EPA EERF C-01 Modified	
14	DOE EML HASL-300, Te-02-RC Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			77.4	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			71.5	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			76.9	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			91.3	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228.230.232 Solid "Dry Weight Corrected"			96.7	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			91.9	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			77.4	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			69.6	(25%-125%)
Technetium-99m Tracer	Liquid Scint Te99, Solid "Dry Weight Corrected"			92.4	(15%-125%)

### Notes:



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Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.17.2  
Sample ID: 386983020

Project: MJWC00115  
Client ID: MJWC001

### Rad Gamma Spec Analysis

#### Gammascpec, Gamma, Solid "Dry Weight Corrected"

Europium-154	U	0.114	0.317	pCi/g
Lead-212		0.967	0.152	pCi/g
Lead-214		1.19	0.376	pCi/g
Potassium-40		13.9	0.826	pCi/g
Protactinium-231	UI	0.00	1.30	pCi/g
Radium-226		0.754	0.183	pCi/g
Radium-228		0.989	0.328	pCi/g
Thallium-208		0.220	0.0897	pCi/g
Tin-126	U	0.0169	0.183	pCi/g

### Rad Gas Flow Proportional Counting

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

Alpha	14.4	3.84	4.00	pCi/g	KXB2	01/04/16	1240	1532749	10
Beta	19.0	2.15	10.0	pCi/g					

#### GFPC, Sr90, solid "Dry Weight Corrected"

Sr90	U	-0.375	1.61	2.00	pCi/g	KSD1	12/29/15	1422	1532743	11
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### Rad Liquid Scintillation Analysis

#### LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U	0.442	3.91	6.00	pCi/g	TXJ1	12/27/15	1656	1531105	12
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#### Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U	-0.919	1.42	2.00	pCi/g	TXJ1	12/23/15	1953	1531115	13
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#### Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	U	0.868	2.02	5.00	pCi/g	MYM1	01/02/16	1110	1532556	14
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### The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	12/09/15	1255	1529378

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## Certificate of Analysis

Report Date: January 5, 2016

Company : MJW Corporation  
Address : 15 Hazelwood Drive  
Suite 112  
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Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.17.2  
Sample ID: 386983020

Project: MJWC00115  
Client ID: MJWC001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE EML HASL-300, Pu-11-RC Modified	
3	DOE EML HASL-300, U-02-RC Modified	
4	ASTM C 1476-00 Modified	
5	DOE EML HASL-300, Th-01-RC Modified	
6	DOE EML HASL-300, Am-05-RC Modified	
7	DOE EML HASL-300, Pu-11-RC Modified	
8	DOE EML HASL-300.1-01 Modified	
9	DOE HASL 300, 4.5.2 3/Ga-01-R	
10	EPA 900.0/SW846 9310/SM 7110B Modified	
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified	
12	EPA 906.0 Modified	
13	EPA EERF C-01 Modified	
14	DOE EML HASL-300, Tc-02-RC Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			80.8	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			77.3	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			76.5	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			92.5	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			88.8	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			102	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			80.8	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			71.7	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"			89.7	(15%-125%)

Notes:

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## Certificate of Analysis

Report Date: January 5, 2016

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

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.17.5  
 Sample ID: 386983007  
 Matrix: Water  
 Collect Date: 03-DEC-15 11:20  
 Receive Date: 08-DEC-15  
 Collector: Client

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Rad Gamma Spec Analysis</b>											
<b>Gammascpec, Gamma, Liquid (Standard List) "As Received"</b>											
Actinium-227	UI	0.00	48.7		pCi/L		MJH1	12/18/15	0723	1529228	1
Antimony-125	U	-7.86	17.4		pCi/L						
Bismuth-212	U	21.8	105		pCi/L						
Bismuth-214	U	3.84	18.6		pCi/L						
Cesium-137	U	-0.0332	6.40	10.0	pCi/L						
Cobalt-60	U	-1.43	7.54		pCi/L						
Europium-154	U	7.63	24.2		pCi/L						
Lead-212	UI	0.00	11.9		pCi/L						
Lead-214	U	3.72	18.4		pCi/L						
Potassium-40	U	2.34	69.3		pCi/L						
Protactinium-231	U	18.8	102		pCi/L						
Radium-228	UI	0.00	30.8		pCi/L						
Thallium-208	U	0.764	8.78		pCi/L						
Tin-126	U	-6.28	16.8		pCi/L						

**Rad Gas Flow Proportional Counting**

**GFPC, Gross A/B, liquid "As Received"**

Alpha	U	-0.615	3.79	5.00	pCi/L		JXB7	12/21/15	1329	1531188	2
Beta	U	-1.17	4.16	5.00	pCi/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 901.1	
2	EPA 900.0/SW846 9310	

**Notes:**



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## Certificate of Analysis

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

Report Date: January 20, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.18.2  
 Sample ID: 388092009  
 Matrix: Soil  
 Collect Date: 03-DEC-15  
 Receive Date: 23-DEC-15  
 Collector: Client  
 Moisture: 23.6%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		23.6						percent		LYT1	12/24/15	0703	1533555	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.00422	+/-0.0441	0.092	0.0234	+/-0.0441	1.00	pCi/g		MXS2	01/12/16	1021	1534070	2
Plutonium-239/240		0.0644	+/-0.0736	0.0919	0.0234	+/-0.0741	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0106	+/-0.0467	0.122	0.0279	+/-0.0469	1.00	pCi/g		MXS2	01/12/16	1015	1534063	3
Uranium-233/234		0.654	+/-0.211	0.122	0.0364	+/-0.241	1.00	pCi/g						
Uranium-235/236		0.0292	+/-0.0574	0.0795	0.0149	+/-0.0576	1.00	pCi/g						
Uranium-238		0.769	+/-0.225	0.0916	0.021	+/-0.263	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0904	+/-0.245	0.653	0.210	+/-0.245	1.00	pCi/g		MXS2	01/12/16	1032	1534069	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.10	+/-0.594	0.468	0.124	+/-0.639	1.00	pCi/g		MXS2	01/12/16	1031	1534062	5
Thorium-229		0.141	+/-0.242	0.212	0.00	+/-0.244	1.00	pCi/g						
Thorium-230		1.04	+/-0.554	0.337	0.0632	+/-0.594	1.00	pCi/g						
Thorium-232		0.966	+/-0.535	0.336	0.063	+/-0.571	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0292	+/-0.0517	0.0783	0.0199	+/-0.0518	1.00	pCi/g		MXS2	01/12/16	1103	1534067	6
Curium-242	U	-0.0072	+/-0.0318	0.0831	0.019	+/-0.0319	1.00	pCi/g						
Curium-243/244		0.032	+/-0.0508	0.0702	0.0161	+/-0.0509	1.00	pCi/g						
Curium-245/246		0.0698	+/-0.0711	0.0703	0.0132	+/-0.0716	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-0.279	+/-7.11	12.3	5.97	+/-7.11	15.0	pCi/g		MXS2	01/14/16	1931	1534073	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.591	+/-0.484	0.628	0.221	+/-0.556	1.00	pCi/g		MJH1	01/15/16	1023	1535059	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0148	+/-0.203	0.372	0.178	+/-0.203		pCi/g		MJH1	12/29/15	1157	1533562	9
Antimony-125	UI	0.00	+/-0.0795	0.152	0.0724	+/-0.0915		pCi/g						
Bismuth-212	U	0.00	+/-0.470	0.844	0.400	+/-0.628		pCi/g						
Bismuth-214		0.674	+/-0.112	0.0963	0.0454	+/-0.126		pCi/g						
Cesium-137		1.81	+/-0.102	0.0489	0.0229	+/-0.183	0.100	pCi/g						
Cobalt-60	U	0.00433	+/-0.028	0.0537	0.0243	+/-0.028		pCi/g						
Europium-154	U	-0.00456	+/-0.0738	0.139	0.0626	+/-0.0739		pCi/g						
Lead-212		1.19	+/-0.0909	0.0771	0.037	+/-0.146		pCi/g						
Lead-214		1.01	+/-0.131	0.221	0.108	+/-0.158		pCi/g						

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## Certificate of Analysis

Company : MJW Corporation  
 Address : 15 Hazelwood Drive  
 Suite 112  
 Buffalo, New York 14228  
 Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes  
 Client Sample ID: 4.2B.R.18.2  
 Sample ID: 388092009

Report Date: January 20, 2016

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		14.0	+/-1.03	0.428	0.189	+/-1.62		pCi/g						
Protactinium-231	U1	0.00	+/-0.607	0.676	0.324	+/-0.613		pCi/g						
Radium-226		0.674	+/-0.112	0.0963	0.0454	+/-0.126		pCi/g						
Radium-228		1.01	+/-0.217	0.165	0.0754	+/-0.264		pCi/g						
Thallium-208		0.325	+/-0.057	0.0433	0.0202	+/-0.0632		pCi/g						
Tin-126	U	0.00	+/-0.0691	0.0877	0.0425	+/-0.072		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		21.7	+/-3.12	3.14	1.45	+/-5.19	4.00	pCi/g		JXB7	01/11/16	1900	1534760	10
Beta		25.0	+/-1.86	1.85	0.894	+/-4.29	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.262	+/-0.843	1.73	0.746	+/-0.843	2.00	pCi/g		KSD1	01/06/16	1656	1534788	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	1.20	+/-2.53	4.32	2.09	+/-2.53	6.00	pCi/g		TXJ1	01/11/16	0000	1534918	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.431	+/-0.809	1.39	0.686	+/-0.809	2.00	pCi/g		TXJ1	01/16/16	1539	1534935	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	1.31	+/-2.01	3.41	1.64	+/-2.01	5.00	pCi/g		MYM	01/19/16	0715	1534638	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/24/15	0703	1533555

**The following Analytical Methods were performed**

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1476-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300, I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified
12	EPA 906.0 Modified
13	EPA FERR C-01 Modified

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## Certificate of Analysis

Company : MJW Corporation  
Address : 15 Hazelwood Drive  
Suite 112  
Buffalo, New York 14228  
Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes  
Client Sample ID: 4.2B.R.18.2  
Sample ID: 388092009

Report Date: January 20, 2016

Project: MJWC00115  
Client ID: MJWC001

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

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1534070	74.6	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1534063	71.4	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1534063	64.6	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1534069	95.9	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1534062	89	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1534067	80.7	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1534073	74.6	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1534788	72.8	(25%-125%)
Technetium-99m Tracer		Liquid Scint Te99, Solid "Dry Weight Corrected"	1534638	96.2	(15%-125%)

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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## Certificate of Analysis

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

Report Date: January 20, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.18.2  
 Sample ID: 388092019  
 Matrix: Soil  
 Collect Date: 03-DEC-15  
 Receive Date: 23-DEC-15  
 Collector: Client  
 Moisture: 23.6%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma spec. Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0409	+/-0.325	0.607	0.286	+/-0.326		pCi/g		MJH1	01/18/16	0723	1534020	I
Antimony-125	U	0.0378	+/-0.128	0.238	0.111	+/-0.129		pCi/g						
Bismuth-212	UI	0.00	+/-0.736	1.37	0.631	+/-0.879		pCi/g						
Bismuth-214		0.954	+/-0.213	0.150	0.0683	+/-0.230		pCi/g						
Cesium-137		1.89	+/-0.153	0.0829	0.0377	+/-0.231	0.100	pCi/g						
Cobalt-60	U	0.00359	+/-0.0465	0.0922	0.0401	+/-0.0465		pCi/g						
Europium-154	U	0.0802	+/-0.122	0.265	0.116	+/-0.128		pCi/g						
Lead-212		1.09	+/-0.145	0.133	0.0627	+/-0.177		pCi/g						
Lead-214		1.30	+/-0.190	0.157	0.0726	+/-0.223		pCi/g						
Potassium-40		14.4	+/-1.57	0.695	0.288	+/-2.00		pCi/g						
Protactinium-231	UI	0.00	+/-0.653	1.18	0.557	+/-0.753		pCi/g						
Radium-226		0.954	+/-0.213	0.150	0.0683	+/-0.230		pCi/g						
Radium-228		0.842	+/-0.383	0.280	0.124	+/-0.405		pCi/g						
Thallium-208		0.356	+/-0.0764	0.0714	0.0323	+/-0.0828		pCi/g						
Tin-126	UI	0.00	+/-0.174	0.152	0.0722	+/-0.175		pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/24/15	0703	1533924

**The following Analytical Methods were performed**

Method	Description
I	DOE HASL 300, 4.5 2 3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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# GEL LABORATORIES LLC

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## Certificate of Analysis

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

Report Date: January 20, 2016

Contact: Ms. Laurie Loscy  
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.18.2  
Sample ID: 388092019

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				

### Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).



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## Certificate of Analysis

Report Date: January 5, 2016

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

Client Sample ID: 4.2B.R.18.5  
Sample ID: 386983018

Project: MJWC00115  
Client ID: MJWC001

### Rad Gamma Spec Analysis

#### Gammascpec, Gamma, Solid "Dry Weight Corrected"

Europium-154	U	-0.0274	0.295	pCi/g
Lead-212		1.36	0.132	pCi/g
Lead-214		1.19	0.403	pCi/g
Potassium-40		17.3	1.05	pCi/g
Protactinium-231	UI	0.00	1.03	pCi/g
Radium-226		0.816	0.190	pCi/g
Radium-228		1.25	0.429	pCi/g
Thallium-208		0.325	0.0914	pCi/g
Tin-126	UI	0.00	0.164	pCi/g

### Rad Gas Flow Proportional Counting

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

Alpha	10.2	3.85	4.00	pCi/g	KXB2	01/04/16	1241	1532749	10
Beta	21.4	3.77	10.0	pCi/g					

#### GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.698	1.60	2.00	pCi/g	KSD1	12/29/15	1703	1532743	11
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### Rad Liquid Scintillation Analysis

#### LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U	-0.131	4.66	6.00	pCi/g	TXJ1	12/27/15	1353	1531105	12
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#### Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U	-0.0901	1.60	2.00	pCi/g	TXJ1	12/23/15	1707	1531115	13
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#### Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	U	0.442	2.53	5.00	pCi/g	MYM1	01/02/16	1036	1532556	14
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### The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	12/09/15	1255	1529378

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 5, 2016

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

Client Sample ID: 4.2B.R.18.5  
Sample ID: 386983018

Project: MJWC00115  
Client ID: MJWC001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE EML HASL-300, Pu-11-RC Modified	
3	DOE EML HASL-300, U-02-RC Modified	
4	ASTM C 1476-00 Modified	
5	DOE EML HASL-300, Th-01-RC Modified	
6	DOE EML HASL-300, Am-05-RC Modified	
7	DOE EML HASL-300, Pu-11-RC Modified	
8	DOE EML HASL-300,1-01 Modified	
9	DOE HASL 300, 4 5 2 3/Ga-01-R	
10	EPA 900.0/SW846 9310/SM 7110B Modified	
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified	
12	EPA 906.0 Modified	
13	EPA EERF C-01 Modified	
14	DOE EML HASL-300, Tc-02-RC Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			75	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			79	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			75.3	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			89.8	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			98.6	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			84.4	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			75	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			76	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"			94.4	(15%-125%)

Notes:



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## Certificate of Analysis

Report Date: January 5, 2016

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

Client Sample ID: 4.2B.R.18.6  
Sample ID: 386983019

Project: MJWC00115  
Client ID: MJWC001

### Rad Gamma Spec Analysis

#### Gammaspec, Gamma, Solid "Dry Weight Corrected"

Europium-154	U	-0.0139	0.280	pCi/g
Lead-212		1.24	0.130	pCi/g
Lead-214		1.10	0.179	pCi/g
Potassium-40		15.6	0.936	pCi/g
Protactinium-231	UI	0.00	1.13	pCi/g
Radium-226		0.913	0.176	pCi/g
Radium-228		1.38	0.384	pCi/g
Thallium-208		0.329	0.0934	pCi/g
Tin-126	UII	0.00	0.170	pCi/g

### Rad Gas Flow Proportional Counting

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

Alpha	10.7	3.91	4.00	pCi/g	KXB2	01/04/16	1240	1532749	10
Beta	16.9	2.57	10.0	pCi/g					

#### GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.255	1.26	2.00	pCi/g	KSD1	12/29/15	1703	1532743	11
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### Rad Liquid Scintillation Analysis

#### LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U	-1.05	4.15	6.00	pCi/g	TXJ1	12/27/15	1525	1531105	12
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#### Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U	-0.691	1.47	2.00	pCi/g	TXJ1	12/23/15	1830	1531115	13
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#### Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	U	0.464	2.68	5.00	pCi/g	MYM1	01/02/16	1053	1532556	14
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### The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRSI	12/09/15	1255	1529378

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: January 5, 2016

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

Client Sample ID: 4.2B.R.18.6  
 Sample ID: 386983019

Project: MJWC00115  
 Client ID: MJWC001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE EML HASL-300, Pu-11-RC Modified	
3	DOE EML HASL-300, U-02-RC Modified	
4	ASTM C 1476-00 Modified	
5	DOE EML HASL-300, Th-01-RC Modified	
6	DOE EML HASL-300, Am-05-RC Modified	
7	DOE EML HASL-300, Pu-11-RC Modified	
8	DOE EML HASL-300, I-01 Modified	
9	DOE HASL 300, 4.5.2.3/Ga-01-R	
10	EPA 900.0/SW846 9310/SM 7110B Modified	
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified	
12	EPA 906.0 Modified	
13	EPA EERF C-01 Modified	
14	DOE EML HASL-300, Te-02-RC Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			67.2	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			70.5	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			76.6	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			84.5	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			84.6	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			81.1	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			67.2	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			76	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"			93.7	(15%-125%)

Notes: