

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: January 5, 2016

Client Sample ID: 4.SC.R.1.1  
 Sample ID: 387031011  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 25.3%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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**Gravimetric Solids**

*ASTM D 2216 % Moisture "As Received"*

Moisture		25.3						percent	DRS1	12/09/15	1310	1529593	1
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**Rad Gamma Spec Analysis**

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

Actinium-227	U	0.15	+/-0.216	0.381	0.182	+/-0.228		pCi/g	RXF2	01/04/16	1203	1529721	2
Antimony-125	U	0.0693	+/-0.084	0.141	0.066	+/-0.0898		pCi/g					
Bismuth-212	UI	0.00	+/-0.703	1.07	0.505	+/-0.949		pCi/g					
Bismuth-214		0.838	+/-0.149	0.106	0.0493	+/-0.165		pCi/g					
Cesium-137		0.811	+/-0.093	0.054	0.025	+/-0.115	0.100	pCi/g					
Cobalt-60	U	6.48E-05	+/-0.030	0.0567	0.0252	+/-0.030		pCi/g					
Europium-154	U	-0.0589	+/-0.108	0.156	0.0692	+/-0.111		pCi/g					
Lead-212		1.03	+/-0.0964	0.0894	0.0428	+/-0.129		pCi/g					
Lead-214		0.965	+/-0.139	0.246	0.120	+/-0.161		pCi/g					
Potassium-40		15.2	+/-1.19	0.418	0.177	+/-1.80		pCi/g					
Protactinium-231	UI	0.00	+/-0.499	0.693	0.328	+/-0.523		pCi/g					
Radium-226		0.838	+/-0.149	0.106	0.0493	+/-0.165		pCi/g					
Radium-228		0.897	+/-0.228	0.200	0.0914	+/-0.264		pCi/g					
Thallium-208		0.344	+/-0.058	0.0589	0.0276	+/-0.065		pCi/g					
Tin-126	UI	0.00	+/-0.0877	0.111	0.0535	+/-0.0892		pCi/g					

**Rad Gas Flow Proportional Counting**

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

Alpha		13.4	+/-4.09	3.85	1.54	+/-4.84	4.00	pCi/g	JXB7	01/04/16	0931	1532748	3
Beta		15.8	+/-3.12	3.41	1.56	+/-3.85	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.1.1  
Sample ID: 387031011

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: 4.5.C.R.1.2  
 Sample ID: 392062009  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 16%

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	0.097	+/-0.299	0.568	0.268	+/-0.303		pCi/g		MXR1	03/07/16	1409	1547923	1
Antimony-125	U	-0.0519	+/-0.116	0.201	0.0926	+/-0.118		pCi/g						
Bismuth-212	UI	0.00	+/-0.820	1.39	0.643	+/-0.901		pCi/g						
Bismuth-214		0.770	+/-0.165	0.154	0.0704	+/-0.176		pCi/g						
Cesium-137		0.486	+/-0.107	0.0825	0.0376	+/-0.114	0.100	pCi/g						
Cobalt-60	U	-0.0253	+/-0.0526	0.0768	0.0327	+/-0.0538		pCi/g						
Europium-154	U	-0.0252	+/-0.140	0.238	0.104	+/-0.140		pCi/g						
Lead-212		0.976	+/-0.128	0.105	0.0491	+/-0.149		pCi/g						
Lead-214		1.02	+/-0.202	0.155	0.0718	+/-0.218		pCi/g						
Potassium-40		14.2	+/-1.51	0.546	0.218	+/-1.99		pCi/g						
Protactinium-231	UI	0.00	+/-0.636	0.867	0.401	+/-0.667		pCi/g						
Radium-226		0.770	+/-0.165	0.154	0.0704	+/-0.176		pCi/g						
Radium-228		0.846	+/-0.293	0.310	0.139	+/-0.315		pCi/g						
Thallium-208		0.312	+/-0.0795	0.0687	0.031	+/-0.0836		pCi/g						
Tin-126	UI	0.00	+/-0.124	0.177	0.0849	+/-0.126		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		18.9	+/-3.77	3.27	1.40	+/-5.26	4.00	pCi/g		JXB7	03/02/16	1637	1548369	2
Beta		26.2	+/-2.74	2.97	1.42	+/-4.55	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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Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5.C.R.1.2  
Sample ID: 392062009

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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Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: 4.5.C.R.2.1  
 Sample ID: 387031012  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 34.1%

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		34.1						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	UI	0.00	+/-0.215	0.400	0.192	+/-0.256		pCi/g		RXF2	01/04/16	1204	1529721	2
Antimony-125	U	0.00553	+/-0.0766	0.136	0.0643	+/-0.0766		pCi/g						
Bismuth-212	UI	0.00	+/-0.722	0.971	0.463	+/-0.925		pCi/g						
Bismuth-214		1.12	+/-0.157	0.105	0.0495	+/-0.182		pCi/g						
Cesium-137		0.174	+/-0.0646	0.0599	0.0283	+/-0.0661	0.100	pCi/g						
Cobalt-60	U	-0.00655	+/-0.0341	0.0607	0.0279	+/-0.0343		pCi/g						
Europium-154	U	0.0598	+/-0.118	0.194	0.0902	+/-0.122		pCi/g						
Lead-212		1.18	+/-0.0949	0.091	0.0438	+/-0.134		pCi/g						
Lead-214		1.45	+/-0.142	0.0994	0.0471	+/-0.185		pCi/g						
Potassium-40		19.4	+/-1.30	0.590	0.271	+/-2.12		pCi/g						
Protactinium-231	UI	0.00	+/-0.505	0.828	0.398	+/-0.618		pCi/g						
Radium-226		1.12	+/-0.157	0.105	0.0495	+/-0.182		pCi/g						
Radium-228		1.45	+/-0.219	0.220	0.103	+/-0.319		pCi/g						
Thallium-208		0.342	+/-0.0683	0.0517	0.0244	+/-0.074		pCi/g						
Tin-126	UI	0.00	+/-0.111	0.116	0.0561	+/-0.114		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		18.1	+/-4.87	3.97	1.55	+/-6.00	4.00	pCi/g		JXB7	01/04/16	0931	1532748	3
Beta		23.5	+/-3.67	3.33	1.50	+/-4.97	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

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Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5.C.R.2.1  
Sample ID: 387031012

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

Client Sample ID: 4.5.C.R.2.5	Project: MJWC00115
Sample ID: 386983006	Client ID: MJWC001
Matrix: Water	
Collect Date: 02-DEC-15 15:30	
Receive Date: 08-DEC-15	
Collector: Client	

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	U	-8.43	46.2		pCi/L		MJH1	12/18/15	0750	1529228	1
Antimony-125	U	-4.99	17.2		pCi/L						
Bismuth-212	U	-13.3	85.0		pCi/L						
Bismuth-214	U	-0.891	15.9		pCi/L						
Cesium-137	U	1.22	7.32	10.0	pCi/L						
Cobalt-60	U	-0.261	7.05		pCi/L						
Europium-154	U	7.61	23.4		pCi/L						
Lead-212	U	-2.19	12.5		pCi/L						
Lead-214	U	-0.327	16.5		pCi/L						
Potassium-40	UI	0.00	81.4		pCi/L						
Protactinium-231	U	-16.1	88.2		pCi/L						
Radium-228	U	0.462	31.0		pCi/L						
Thallium-208	U	0.548	7.13		pCi/L						
Tin-126	U	0.727	15.1		pCi/L						
<b>Rad Gas Flow Proportional Counting</b>											
<b>GFPC, Gross A/B, liquid "As Received"</b>											
Alpha	U	-0.576	4.03	5.00	pCi/L		JXB7	12/21/15	1329	1531188	2
Beta		2.12	4.06	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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Report Date: January 5, 2016

Contact: Ms. Laurie Loscy  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.1  
 Sample ID: 387031013  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 31.4%

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		31.4						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.0134	+/-0.0457	0.0847	0.0231	+/-0.0457	1.00	pCi/g		MXS2	12/28/15	1656	1529806	2
Plutonium-239/240	U	0.020	+/-0.0528	0.095	0.0282	+/-0.0529	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0006	+/-0.0792	0.168	0.0617	+/-0.0793	1.00	pCi/g		MXS2	12/28/15	1548	1529801	3
Uranium-233/234		1.02	+/-0.278	0.0923	0.0173	+/-0.330	1.00	pCi/g						
Uranium-235/236		0.034	+/-0.0668	0.0926	0.0173	+/-0.0671	1.00	pCi/g						
Uranium-238		0.809	+/-0.248	0.0578	0.00	+/-0.286	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0855	+/-0.162	0.500	0.143	+/-0.162	1.00	pCi/g		MXS2	12/28/15	1650	1529805	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.26	+/-0.645	0.548	0.164	+/-0.680	1.00	pCi/g		MXS2	12/28/15	1605	1529799	5
Thorium-229		0.109	+/-0.251	0.398	0.0911	+/-0.251	1.00	pCi/g						
Thorium-230		1.09	+/-0.583	0.438	0.111	+/-0.608	1.00	pCi/g						
Thorium-232		0.680	+/-0.468	0.396	0.0906	+/-0.480	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0123	+/-0.0552	0.108	0.0309	+/-0.0552	1.00	pCi/g		MXS2	12/28/15	1636	1529802	6
Curium-242		0.00	+/-0.0343	0.051	0.00	+/-0.0343	1.00	pCi/g						
Curium-243/244		0.00	+/-0.0307	0.0456	0.00	+/-0.0307	1.00	pCi/g						
Curium-245/246	U	-0.00423	+/-0.0365	0.0845	0.0158	+/-0.0365	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-1.9	+/-5.98	10.4	5.07	+/-5.98	15.0	pCi/g		MXS2	12/31/15	0437	1529807	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.159	+/-0.212	0.340	0.121	+/-0.224	1.00	pCi/g		MJH1	12/30/15	1902	1533084	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.035	+/-0.205	0.364	0.173	+/-0.206		pCi/g		RXF2	01/04/16	1204	1529721	9
Antimony-125	U	0.0285	+/-0.0743	0.135	0.0634	+/-0.0754		pCi/g						
Bismuth-212	UI	0.00	+/-0.591	0.980	0.464	+/-0.816		pCi/g						
Bismuth-214		0.825	+/-0.120	0.0816	0.0375	+/-0.139		pCi/g						
Cesium-137		0.773	+/-0.0729	0.0528	0.0245	+/-0.0976	0.100	pCi/g						
Cobalt-60	U	0.00943	+/-0.0294	0.0577	0.0259	+/-0.0297		pCi/g						
Europium-154	U	-0.0312	+/-0.0874	0.158	0.0707	+/-0.0886		pCi/g						
Lead-212		1.15	+/-0.0933	0.0789	0.0377	+/-0.145		pCi/g						
Lead-214		1.17	+/-0.136	0.110	0.052	+/-0.171		pCi/g						

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 Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes  
 Client Sample ID: 4.5C.R.3.1  
 Sample ID: 387031013

Report Date: January 5, 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>Gammasec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		15.2	+/-1.17	0.505	0.223	+/-1.79		pCi/g						
Protactinium-231	U	0.390	+/-0.501	0.818	0.392	+/-0.539		pCi/g						
Radium-226		0.825	+/-0.120	0.0816	0.0375	+/-0.139		pCi/g						
Radium-228		0.900	+/-0.216	0.211	0.0974	+/-0.253		pCi/g						
Thallium-208		0.294	+/-0.0691	0.0491	0.0229	+/-0.0734		pCi/g						
Tin-126	UI	0.00	+/-0.0834	0.094	0.0455	+/-0.0862		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		17.8	+/-3.98	3.90	1.70	+/-5.27	4.00	pCi/g		JXB7	01/04/16	0928	1532748	10
Beta		27.5	+/-2.77	2.22	1.03	+/-4.68	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.665	+/-0.666	1.49	0.651	+/-0.666	2.00	pCi/g		KSD1	12/29/15	1422	1532743	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	-0.18	+/-2.85	5.01	2.40	+/-2.85	6.00	pCi/g		TXJ1	12/28/15	1526	1531105	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.0419	+/-0.938	1.60	0.788	+/-0.938	2.00	pCi/g		TXJ1	12/24/15	1624	1531115	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99		2.11	+/-1.81	3.00	1.44	+/-1.83	5.00	pCi/g		MYM	01/02/16	1501	1532556	14

**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	1310	1529593

**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 EERF C-01 Modified

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.1  
Sample ID: 387031013

Project: MJWC00115  
Client ID: MJWC001

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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1529806	86.5	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1529801	75.8	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1529801	84.7	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1529805	97.1	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1529799	95	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1529802	97.2	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1529807	86.5	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1532743	81.4	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1532556	89.9	(15%-125%)

### Notes:

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

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: January 7, 2016

Client Sample ID: 4.5C.R.3.2  
 Sample ID: 387409001  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 10-DEC-15  
 Collector: Client  
 Moisture: 20%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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### Gravimetric Solids

*ASTM D 2216 % Moisture "As Received"*

Moisture		20.0						percent		LYT1	12/14/15	1204	1530767	1
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### Rad Gamma Spec Analysis

*Gammaspac, Gamma, Solid "Dry Weight Corrected"*

Actinium-227	U	-0.126	+/-0.248	0.462	0.216	+/-0.256		pCi/g		RXF2	01/06/16	0631	1530779	2
Antimony-125	U	0.0096	+/-0.097	0.184	0.0853	+/-0.0971		pCi/g						
Bismuth-212	UI	0.00	+/-1.02	1.46	0.686	+/-1.23		pCi/g						
Bismuth-214		0.888	+/-0.161	0.123	0.056	+/-0.179		pCi/g						
Cesium-137		0.688	+/-0.086	0.0585	0.0261	+/-0.104	0.100	pCi/g						
Cobalt-60	U	0.0099	+/-0.0402	0.0797	0.035	+/-0.0405		pCi/g						
Europium-154	U	0.0648	+/-0.112	0.232	0.103	+/-0.116		pCi/g						
Lead-212		1.15	+/-0.125	0.111	0.0525	+/-0.167		pCi/g						
Lead-214		1.04	+/-0.197	0.145	0.0677	+/-0.217		pCi/g						
Potassium-40		14.6	+/-1.40	0.398	0.150	+/-1.89		pCi/g						
Protactinium-231	U	0.406	+/-0.536	1.04	0.490	+/-0.574		pCi/g						
Radium-226		0.888	+/-0.161	0.123	0.056	+/-0.179		pCi/g						
Radium-228		0.935	+/-0.328	0.243	0.108	+/-0.357		pCi/g						
Thallium-208		0.288	+/-0.0906	0.0626	0.0284	+/-0.094		pCi/g						
Tin-126	UI	0.00	+/-0.131	0.132	0.0632	+/-0.133		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha		9.76	+/-3.49	3.94	1.66	+/-4.03	4.00	pCi/g		KXB2	01/04/16	0902	1532751	3
Beta		23.8	+/-3.49	3.91	1.84	+/-4.84	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	LYT1	12/14/15	1204	1530767

### The following Analytical Methods were performed

Method	Description
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

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 7, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.2  
Sample ID: 387409001

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

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

## Certificate of Analysis

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

Report Date: January 8, 2016

Client Sample ID: 4.5C.R.3.2  
 Sample ID: 387409001  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 10-DEC-15  
 Collector: Client  
 Moisture: 20%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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**Gravimetric Solids**

*ASTM D 2216 % Moisture "As Received"*

Moisture		20.0						percent		LYT1	12/14/15	1204	1530767	1
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**Rad Gamma Spec Analysis**

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

Actinium-227	U	-0.126	+/-0.248	0.462	0.216	+/-0.256		pCi/g		RXF2	01/06/16	0631	1530779	2
Antimony-125	U	0.0096	+/-0.097	0.184	0.0853	+/-0.0971		pCi/g						
Bismuth-212	UI	0.00	+/-1.02	1.46	0.686	+/-1.23		pCi/g						
Bismuth-214		0.888	+/-0.161	0.123	0.056	+/-0.179		pCi/g						
Cesium-137		0.688	+/-0.086	0.0585	0.0261	+/-0.104	0.100	pCi/g						
Cobalt-60	U	0.0099	+/-0.0402	0.0797	0.035	+/-0.0405		pCi/g						
Europium-154	U	0.0648	+/-0.112	0.232	0.103	+/-0.116		pCi/g						
Lead-212		1.15	+/-0.125	0.111	0.0525	+/-0.167		pCi/g						
Lead-214		1.04	+/-0.197	0.145	0.0677	+/-0.217		pCi/g						
Potassium-40		14.6	+/-1.40	0.398	0.150	+/-1.89		pCi/g						
Protactinium-231	U	0.406	+/-0.536	1.04	0.490	+/-0.574		pCi/g						
Radium-226		0.888	+/-0.161	0.123	0.056	+/-0.179		pCi/g						
Radium-228		0.935	+/-0.328	0.243	0.108	+/-0.357		pCi/g						
Thallium-208		0.288	+/-0.0906	0.0626	0.0284	+/-0.094		pCi/g						
Tin-126	UI	0.00	+/-0.131	0.132	0.0632	+/-0.133		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		9.76	+/-3.49	3.94	1.66	+/-4.03	4.00	pCi/g		KXB2	01/04/16	0902	1532751	3
Beta		23.8	+/-3.49	3.91	1.84	+/-4.84	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	LYT1	12/14/15	1204	1530767

**The following Analytical Methods were performed**

Method	Description
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

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 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.2  
Sample ID: 387409001

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

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: 4.5C.R.3.5  
 Sample ID: 387031014  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 29%

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		29.0						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.00835	+/-0.0539	0.110	0.0328	+/-0.0539	1.00	pCi/g		MXS2	12/28/15	1656	1529806	2
Plutonium-239/240	U	-0.00298	+/-0.0447	0.104	0.0299	+/-0.0448	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0469	+/-0.096	0.171	0.0637	+/-0.0964	1.00	pCi/g		MXS2	12/28/15	1548	1529801	3
Uranium-233/234		0.772	+/-0.256	0.117	0.0268	+/-0.292	1.00	pCi/g						
Uranium-235/236		0.0849	+/-0.0935	0.0636	0.00	+/-0.0948	1.00	pCi/g						
Uranium-238		0.730	+/-0.249	0.117	0.0268	+/-0.282	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0555	+/-0.168	0.471	0.120	+/-0.168	1.00	pCi/g		MXS2	12/28/15	1650	1529805	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.374	+/-0.459	0.679	0.217	+/-0.466	1.00	pCi/g		MXS2	12/28/15	1605	1529799	5
Thorium-229	U	0.0223	+/-0.233	0.487	0.124	+/-0.234	1.00	pCi/g						
Thorium-230		0.820	+/-0.572	0.616	0.189	+/-0.587	1.00	pCi/g						
Thorium-232		0.932	+/-0.562	0.380	0.0711	+/-0.582	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0256	+/-0.0503	0.0697	0.0131	+/-0.0504	1.00	pCi/g		MXS2	12/28/15	1636	1529802	6
Curium-242		0.00	+/-0.0324	0.0482	0.00	+/-0.0324	1.00	pCi/g						
Curium-243/244	U	-0.0069	+/-0.0305	0.0796	0.0182	+/-0.0306	1.00	pCi/g						
Curium-245/246		0.0459	+/-0.0662	0.0798	0.0149	+/-0.0665	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-2.91	+/-6.60	11.6	5.62	+/-6.60	15.0	pCi/g		MXS2	12/31/15	0528	1529807	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma 1129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0831	+/-0.306	0.541	0.253	+/-0.309	1.00	pCi/g		MJH1	12/31/15	1209	1533084	8
<i>Gammiaspec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0557	+/-0.224	0.422	0.200	+/-0.225		pCi/g		RXF2	01/04/16	1204	1529721	9
Antimony-125	U	0.0385	+/-0.0989	0.182	0.0857	+/-0.100		pCi/g						
Bismuth-212	UI	0.00	+/-0.484	0.991	0.461	+/-0.571		pCi/g						
Bismuth-214		1.04	+/-0.140	0.115	0.0529	+/-0.166		pCi/g						
Cesium-137		0.856	+/-0.101	0.0784	0.0367	+/-0.123	0.100	pCi/g						
Cobalt-60	U	-0.00798	+/-0.0396	0.0715	0.0318	+/-0.0398		pCi/g						
Europtm-154	U	-0.0647	+/-0.115	0.197	0.0877	+/-0.119		pCi/g						
Lead-212		1.17	+/-0.104	0.0986	0.0471	+/-0.142		pCi/g						
Lead-214		1.10	+/-0.163	0.281	0.137	+/-0.189		pCi/g						



# GEL LABORATORIES LLC

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

## 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: 4.5C.R.3.5  
 Sample ID: 387031014

Report Date: January 5, 2016

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPI	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		15.1	+/-1.36	0.578	0.249	+/-1.88		pCi/g						
Protactinium-231	U	0.00	+/-0.567	0.764	0.360	+/-0.592		pCi/g						
Radium-226		1.04	+/-0.140	0.115	0.0529	+/-0.166		pCi/g						
Radium-228		1.13	+/-0.265	0.246	0.112	+/-0.306		pCi/g						
Thallium-208		0.239	+/-0.0942	0.0657	0.0306	+/-0.0965		pCi/g						
Tin-126	U	0.00	+/-0.107	0.115	0.0549	+/-0.108		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		12.0	+/-3.44	3.92	1.71	+/-4.12	4.00	pCi/g		JXB7	01/04/16	0928	1532748	10
Beta		28.3	+/-3.03	3.18	1.51	+/-5.02	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	0.255	+/-0.916	1.69	0.735	+/-0.917	2.00	pCi/g		KSD1	12/29/15	1422	1532743	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	-0.281	+/-2.85	5.02	2.40	+/-2.85	6.00	pCi/g		TXJ1	12/28/15	1657	1531105	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.539	+/-0.907	1.57	0.770	+/-0.907	2.00	pCi/g		TXJ1	12/24/15	1748	1531115	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	0.597	+/-1.43	2.46	1.18	+/-1.43	5.00	pCi/g		MYM	01/02/16	1517	1532556	14

**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	1310	1529593

**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 EERF C-01 Modified

# GEL LABORATORIES LLC

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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: 4.5C.R.3.5  
Sample ID: 387031014

Report Date: January 5, 2016

Project: MJWC00115  
Client ID: MJWC001

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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1529806	77.8	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1529801	76.9	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1529801	82.9	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1529805	87.4	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1529799	95.4	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1529802	99.6	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1529807	77.8	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1532743	81.4	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1532556	90	(15%-125%)

### Notes:

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

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

## Certificate of Analysis

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

Report Date: January 7, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.6  
 Sample ID: 387409002  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 10-DEC-15  
 Collector: Client  
 Moisture: 19.1%

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		19.1						percent		LYT1	12/14/15	1204	1530767	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.0463	+/-0.174	0.292	0.0546	+/-0.174	1.00	pCi/g		JXE2	12/29/15	1301	1531421	2
Plutonium-239/240	U	0.0462	+/-0.173	0.292	0.0546	+/-0.174	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.146	+/-0.335	0.604	0.211	+/-0.336	1.00	pCi/g		JXE2	12/30/15	0846	1531417	3
Uranium-233/234		1.12	+/-0.589	0.401	0.092	+/-0.617	1.00	pCi/g						
Uranium-235/236	U	0.093	+/-0.256	0.444	0.113	+/-0.257	1.00	pCi/g						
Uranium-238		0.600	+/-0.454	0.443	0.113	+/-0.465	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	0.0343	+/-0.221	0.453	0.135	+/-0.221	1.00	pCi/g		JXE2	12/31/15	0855	1531420	4
<i>Alphaspec Th229, 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.897	+/-0.432	0.330	0.0933	+/-0.450	1.00	pCi/g		JXE2	01/06/16	1525	1534801	5
Thorium-229		0.187	+/-0.228	0.305	0.0831	+/-0.229	1.00	pCi/g						
Thorium-230		0.625	+/-0.353	0.256	0.0586	+/-0.363	1.00	pCi/g						
Thorium-232		0.278	+/-0.260	0.304	0.0827	+/-0.263	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0181	+/-0.189	0.395	0.101	+/-0.190	1.00	pCi/g		JXE2	12/30/15	1440	1531419	6
Curium-242	U	-0.0174	+/-0.150	0.347	0.0649	+/-0.150	1.00	pCi/g						
Curium-243/244	U	-0.123	+/-0.154	0.516	0.162	+/-0.155	1.00	pCi/g						
Curium-245/246		0.278	+/-0.328	0.355	0.0664	+/-0.330	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-6.41	+/-12.8	22.2	10.9	+/-12.8	15.0	pCi/g		JXE2	01/06/16	1754	1531413	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0187	+/-0.179	0.306	0.139	+/-0.180	1.00	pCi/g		MJH1	12/31/15	1209	1533084	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.218	+/-0.279	0.495	0.231	+/-0.298		pCi/g		RXF2	01/06/16	0631	1530779	9
Antimony-125	U	0.000101	+/-0.109	0.202	0.093	+/-0.109		pCi/g						
Bismuth-212	U	0.00	+/-0.652	1.23	0.565	+/-0.713		pCi/g						
Bismuth-214		0.759	+/-0.193	0.151	0.0688	+/-0.202		pCi/g						
Cesium-137		0.754	+/-0.102	0.086	0.0393	+/-0.118	0.100	pCi/g						
Cobalt-60	U	0.0318	+/-0.047	0.0977	0.0432	+/-0.0492		pCi/g						
Europium-154	U	-0.0491	+/-0.122	0.215	0.0921	+/-0.124		pCi/g						
Lead-212		1.13	+/-0.132	0.110	0.0518	+/-0.162		pCi/g						
Lead-214		1.24	+/-0.186	0.360	0.175	+/-0.211		pCi/g						

# GEL LABORATORIES LLC

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

## 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: 4.5C.R.3.6  
 Sample ID: 387409002

Report Date: January 7, 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>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		13.7	+/-1.57	0.709	0.298	+/-2.00		pCi/g						
Protactinium-231	U	0.00312	+/-0.591	1.02	0.479	+/-0.591		pCi/g						
Radium-226		0.759	+/-0.193	0.151	0.0688	+/-0.202		pCi/g						
Radium-228	UI	0.00	+/-0.328	0.598	0.284	+/-0.549		pCi/g						
Thallium-208		0.355	+/-0.0938	0.0744	0.0338	+/-0.0983		pCi/g						
Tin-126	UI	0.00	+/-0.137	0.120	0.0567	+/-0.138		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		14.5	+/-4.42	3.93	1.54	+/-5.26	4.00	pCi/g		KXB2	01/04/16	0902	1532751	10
Beta		25.8	+/-3.84	3.02	1.33	+/-5.27	10.0	pCi/g						
<i>GFPC, Sr-90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.842	+/-0.592	1.50	0.642	+/-0.592	2.00	pCi/g		KSD1	12/29/15	1422	1532743	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist. Solid "Dry Weight Corrected"</i>														
Tritium	U	0.0922	+/-2.31	4.03	1.93	+/-2.31	6.00	pCi/g		TXJ1	12/28/15	1828	1531105	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.597	+/-0.804	1.39	0.684	+/-0.804	2.00	pCi/g		TXJ1	12/24/15	1910	1531115	13
<i>Liquid Scint Te99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	0.630	+/-1.30	2.22	1.06	+/-1.30	5.00	pCi/g		MYM	01/02/16	1534	1532556	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	12/14/15	1204	1530767

**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 EERF C-01 Modified

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## Certificate of Analysis

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

Report Date: January 7, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.6  
Sample ID: 387409002

Project: MJWC00115  
Client ID: MJWC001

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

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1531421	88.5	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1531417	76.5	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1531417	87	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1531420	103	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1534801	111	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1531419	78.5	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1531413	88.5	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1532743	78.2	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"	1532556	91.7	(15%-125%)

### 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

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

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.6  
 Sample ID: 387409002  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 10-DEC-15  
 Collector: Client  
 Moisture: 19.1%

Report Date: January 8, 2016

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		19.1						percent		LYT1	12/14/15	1204	1530767	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.0463	+/-0.174	0.292	0.0546	+/-0.174	1.00	pCi/g		JXE2	12/29/15	1301	1531421	2
Plutonium-239/240	U	0.0462	+/-0.173	0.292	0.0546	+/-0.174	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.146	+/-0.335	0.604	0.211	+/-0.336	1.00	pCi/g		JXE2	12/30/15	0846	1531417	3
Uranium-233/234		1.12	+/-0.589	0.401	0.092	+/-0.617	1.00	pCi/g						
Uranium-235/236	U	0.093	+/-0.256	0.444	0.113	+/-0.257	1.00	pCi/g						
Uranium-238		0.600	+/-0.454	0.443	0.113	+/-0.465	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	0.0343	+/-0.221	0.453	0.135	+/-0.221	1.00	pCi/g		JXE2	12/31/15	0855	1531420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.897	+/-0.432	0.330	0.0933	+/-0.450	1.00	pCi/g		JXE2	01/06/16	1525	1534801	5
Thorium-229		0.187	+/-0.228	0.305	0.0831	+/-0.229	1.00	pCi/g						
Thorium-230		0.625	+/-0.353	0.256	0.0586	+/-0.363	1.00	pCi/g						
Thorium-232		0.278	+/-0.260	0.304	0.0827	+/-0.263	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0181	+/-0.189	0.395	0.101	+/-0.190	1.00	pCi/g		JXE2	12/30/15	1440	1531419	6
Curium-242	U	-0.0174	+/-0.150	0.347	0.0649	+/-0.150	1.00	pCi/g						
Curium-243/244	U	-0.123	+/-0.154	0.516	0.162	+/-0.155	1.00	pCi/g						
Curium-245/246		0.278	+/-0.328	0.355	0.0664	+/-0.330	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-6.41	+/-12.8	22.2	10.9	+/-12.8	15.0	pCi/g		JXE2	01/06/16	1754	1531413	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma 1129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0187	+/-0.179	0.306	0.139	+/-0.180	1.00	pCi/g		MJH1	12/31/15	1209	1533084	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.218	+/-0.279	0.495	0.231	+/-0.298		pCi/g		RXF2	01/06/16	0631	1530779	9
Antimony-125	U	0.000101	+/-0.109	0.202	0.093	+/-0.109		pCi/g						
Bismuth-212	UI	0.00	+/-0.652	1.23	0.565	+/-0.713		pCi/g						
Bismuth-214		0.759	+/-0.193	0.151	0.0688	+/-0.202		pCi/g						
Cesium-137		0.754	+/-0.102	0.086	0.0393	+/-0.118	0.100	pCi/g						
Cobalt-60	U	0.0318	+/-0.047	0.0977	0.0432	+/-0.0492		pCi/g						
Europium-154	U	-0.0491	+/-0.122	0.215	0.0921	+/-0.124		pCi/g						
Lead-212		1.13	+/-0.132	0.110	0.0518	+/-0.162		pCi/g						
Lead-214		1.24	+/-0.186	0.360	0.175	+/-0.211		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: 4.5C.R.3.6  
 Sample ID: 387409002

Report Date: January 8, 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		13.7	+/-1.57	0.709	0.298	+/-2.00		pCi/g						
Protactinium-231	U	0.00312	+/-0.591	1.02	0.479	+/-0.591		pCi/g						
Radium-226		0.759	+/-0.193	0.151	0.0688	+/-0.202		pCi/g						
Radium-228	UI	0.00	+/-0.328	0.598	0.284	+/-0.549		pCi/g						
Thallium-208		0.355	+/-0.0938	0.0744	0.0338	+/-0.0983		pCi/g						
Tin-126	UI	0.00	+/-0.137	0.120	0.0567	+/-0.138		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		14.5	+/-4.42	3.93	1.54	+/-5.26	4.00	pCi/g		KXB2	01/04/16	0902	1532751	10
Beta		25.8	+/-3.84	3.02	1.33	+/-5.27	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.842	+/-0.592	1.50	0.642	+/-0.592	2.00	pCi/g		KSD1	12/29/15	1422	1532743	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	0.0922	+/-2.31	4.03	1.93	+/-2.31	6.00	pCi/g		TXJ1	12/28/15	1828	1531105	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.597	+/-0.804	1.39	0.684	+/-0.804	2.00	pCi/g		TXJ1	12/24/15	1910	1531115	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	0.630	+/-1.30	2.22	1.06	+/-1.30	5.00	pCi/g		MYM	01/02/16	1534	1532556	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	12/14/15	1204	1530767

**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 EERF C-01 Modified

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## Certificate of Analysis

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

Report Date: January 8, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.3.6  
Sample ID: 387409002

Project: MJWC00115  
Client ID: MJWC001

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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1531421	88.5	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1531417	76.5	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1531417	87	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1531420	103	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1534801	111	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1531419	78.5	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1531413	88.5	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1532743	78.2	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1532556	91.7	(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 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.4.1  
 Sample ID: 387031015  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 28.2%

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		28.2						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.032	+/-0.201	0.361	0.173	+/-0.202		pCi/g		RXF2	01/04/16	1205	1529721	2
Antimony-125	U	-0.0369	+/-0.0781	0.133	0.0628	+/-0.0799		pCi/g						
Bismuth-212	UI	0.00	+/-0.566	0.951	0.452	+/-0.720		pCi/g						
Bismuth-214		0.824	+/-0.124	0.0989	0.0464	+/-0.141		pCi/g						
Cesium-137		0.706	+/-0.0838	0.0549	0.0257	+/-0.101	0.100	pCi/g						
Cobalt-60	U	0.00461	+/-0.0255	0.0493	0.022	+/-0.0256		pCi/g						
Europium-154	U	-0.112	+/-0.091	0.145	0.0649	+/-0.105		pCi/g						
Lead-212		1.07	+/-0.0894	0.0795	0.0381	+/-0.133		pCi/g						
Lead-214		0.970	+/-0.139	0.106	0.0503	+/-0.161		pCi/g						
Potassium-40		14.0	+/-1.17	0.476	0.211	+/-1.69		pCi/g						
Protactinium-231	UI	0.00	+/-0.470	0.803	0.386	+/-0.560		pCi/g						
Radium-226		0.824	+/-0.124	0.0989	0.0464	+/-0.141		pCi/g						
Radium-228		0.906	+/-0.203	0.188	0.0867	+/-0.240		pCi/g						
Thallium-208		0.258	+/-0.0588	0.0506	0.0237	+/-0.0625		pCi/g						
Tm-126	UI	0.00	+/-0.070	0.0871	0.0421	+/-0.072		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		10.8	+/-3.30	3.95	1.74	+/-3.92	4.00	pCi/g		JXB7	01/04/16	0931	1532748	3
Beta		24.2	+/-2.97	2.96	1.39	+/-4.67	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
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

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

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.4.1  
Sample ID: 387031015

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

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: 4.5.C.R.4.2  
 Sample ID: 392062010  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 21.4%

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	0.169	+/-0.259	0.517	0.243	+/-0.271		pCi/g		MXR1	03/07/16	1409	1547923	1
Antimony-125	UI	0.00	+/-0.0953	0.197	0.0912	+/-0.106		pCi/g						
Bismuth-212	UI	0.00	+/-0.638	1.24	0.573	+/-0.782		pCi/g						
Bismuth-214		0.736	+/-0.162	0.109	0.0486	+/-0.175		pCi/g						
Cesium-137		0.311	+/-0.0808	0.070	0.0317	+/-0.085	0.100	pCi/g						
Cobalt-60	U	0.00515	+/-0.0445	0.091	0.0403	+/-0.0446		pCi/g						
Europium-154	U	0.0786	+/-0.128	0.262	0.117	+/-0.133		pCi/g						
Lead-212		1.03	+/-0.125	0.101	0.0471	+/-0.159		pCi/g						
Lead-214		1.01	+/-0.165	0.317	0.154	+/-0.188		pCi/g						
Potassium-40		16.2	+/-1.51	0.584	0.241	+/-2.07		pCi/g						
Protactinium-231	U	0.402	+/-0.508	1.02	0.478	+/-0.547		pCi/g						
Radium-226		0.736	+/-0.162	0.109	0.0486	+/-0.175		pCi/g						
Radium-228		0.836	+/-0.293	0.255	0.113	+/-0.320		pCi/g						
Thallium-208		0.266	+/-0.0835	0.0674	0.0307	+/-0.0866		pCi/g						
Tin-126	UI	0.00	+/-0.105	0.106	0.0496	+/-0.107		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha		18.5	+/-4.59	3.81	1.54	+/-5.83	4.00	pCi/g		JXB7	03/03/16	1246	1548369	2
Beta		24.3	+/-3.35	3.05	1.39	+/-4.79	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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# 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: 4.5.C.R.4.2  
Sample ID: 392062010

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

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

Report Date: January 5, 2016

Client Sample ID: 4.5C.R.5.1  
 Sample ID: 387031016  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 34.4%

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		34.4						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.225	+/-0.260	0.480	0.230	+/-0.281		pCi/g		RXF2	01/04/16	1205	1529721	2
Antimony-125	UI	0.00	+/-0.106	0.176	0.0832	+/-0.115		pCi/g						
Bismuth-212	UI	0.00	+/-0.882	1.22	0.576	+/-1.15		pCi/g						
Bismuth-214		1.03	+/-0.146	0.111	0.0513	+/-0.169		pCi/g						
Cesium-137		0.228	+/-0.086	0.0665	0.0309	+/-0.0879	0.100	pCi/g						
Cobalt-60	UI	0.00	+/-0.0501	0.0754	0.0341	+/-0.0534		pCi/g						
Europium-154	UI	0.00	+/-0.113	0.222	0.102	+/-0.134		pCi/g						
Lead-212		1.23	+/-0.107	0.0993	0.0475	+/-0.143		pCi/g						
Lead-214		1.12	+/-0.157	0.289	0.141	+/-0.180		pCi/g						
Potassium-40		18.4	+/-1.40	0.563	0.246	+/-2.18		pCi/g						
Protactinium-231	UI	0.00	+/-0.520	0.828	0.393	+/-0.551		pCi/g						
Radium-226		1.03	+/-0.146	0.111	0.0513	+/-0.169		pCi/g						
Radium-228		1.13	+/-0.306	0.215	0.0975	+/-0.342		pCi/g						
Thallium-208		0.314	+/-0.0753	0.0657	0.0307	+/-0.0796		pCi/g						
Tin-126	UI	0.00	+/-0.106	0.122	0.0586	+/-0.109		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A-B, solid "Dry Weight Corrected"</i>														
Alpha		18.1	+/-5.25	3.71	1.31	+/-6.21	4.00	pCi/g		JXB7	01/04/16	1207	1532748	3
Beta		22.2	+/-4.03	3.67	1.63	+/-4.97	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
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

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 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.5.1  
Sample ID: 387031016

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	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

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.6.1  
 Sample ID: 387031017  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 27.9%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	FPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		27.9						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.00579	+/-0.187	0.350	0.167	+/-0.187		pCi/g		RXF2	01/04/16	1205	1529721	2
Antimony-125	U	-0.0118	+/-0.0679	0.123	0.0579	+/-0.0681		pCi/g						
Bismuth-212	UI	0.00	+/-0.537	0.927	0.441	+/-0.838		pCi/g						
Bismuth-214		0.893	+/-0.118	0.0845	0.0393	+/-0.141		pCi/g						
Cesium-137		0.761	+/-0.0803	0.0506	0.0236	+/-0.103	0.100	pCi/g						
Cobalt-60	U	0.0183	+/-0.0262	0.0531	0.024	+/-0.0275		pCi/g						
Europium-154	UI	0.00	+/-0.0874	0.169	0.0776	+/-0.0948		pCi/g						
Lead-212		0.907	+/-0.105	0.0972	0.047	+/-0.137		pCi/g						
Lead-214		0.983	+/-0.128	0.105	0.0498	+/-0.155		pCi/g						
Potassium-40		15.9	+/-1.09	0.448	0.198	+/-1.75		pCi/g						
Protactinium-231	UI	0.00	+/-0.509	0.637	0.303	+/-0.524		pCi/g						
Radium-226		0.893	+/-0.118	0.0845	0.0393	+/-0.141		pCi/g						
Radium-228		0.646	+/-0.222	0.182	0.0837	+/-0.243		pCi/g						
Thallium-208		0.257	+/-0.0541	0.0457	0.0213	+/-0.0585		pCi/g						
Tin-126	UI	0.00	+/-0.0896	0.103	0.0497	+/-0.0911		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A B, solid "Dry Weight Corrected"</i>														
Alpha		9.32	+/-3.77	3.83	1.44	+/-4.20	4.00	pCi/g		JXB7	01/04/16	1207	1532748	3
Beta		23.4	+/-3.46	2.57	1.12	+/-4.91	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

# 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 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.6.1  
Sample ID: 387031017

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).



# GEL LABORATORIES LLC

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## 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: 4.5.C.R.6.2  
 Sample ID: 392062011  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 20.4%

Report Date: March 8, 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	UI	0.00	+/-0.374	0.776	0.363	+/-0.423		pCi/g		MXR1	03/07/16	1410	1547923	1
Antimony-125	U	-0.0397	+/-0.169	0.265	0.120	+/-0.170		pCi/g						
Bismuth-212	UI	0.00	+/-1.46	1.89	0.863	+/-1.67		pCi/g						
Bismuth-214		0.803	+/-0.224	0.199	0.0891	+/-0.234		pCi/g						
Cesium-137		0.199	+/-0.0986	0.127	0.0573	+/-0.100	0.100	pCi/g						
Cobalt-60	U	0.0307	+/-0.0515	0.118	0.0496	+/-0.0534		pCi/g						
Europium-154	U	0.0187	+/-0.183	0.365	0.158	+/-0.183		pCi/g						
Lead-212		0.977	+/-0.155	0.150	0.0701	+/-0.182		pCi/g						
Lead-214		0.898	+/-0.236	0.208	0.0958	+/-0.248		pCi/g						
Potassium-40		13.1	+/-1.90	0.909	0.364	+/-2.20		pCi/g						
Protactinium-231	U	0.337	+/-0.785	1.38	0.639	+/-0.803		pCi/g						
Radium-226		0.803	+/-0.224	0.199	0.0891	+/-0.234		pCi/g						
Radium-228		1.26	+/-0.443	0.405	0.177	+/-0.464		pCi/g						
Thallium-208		0.355	+/-0.106	0.100	0.0448	+/-0.110		pCi/g						
Tin-126	UI	0.00	+/-0.147	0.137	0.0652	+/-0.149		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		15.7	+/-3.57	3.36	1.44	+/-4.68	4.00	pCi/g		JXB7	03/02/16	1637	1548369	2
Beta		24.7	+/-2.96	2.87	1.34	+/-4.55	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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# GEL LABORATORIES LLC

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## 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: 4.5.C.R.6.2  
Sample ID: 392062011

Report Date: March 8, 2016

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

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: 4.5.C.R.7.1  
 Sample ID: 387031018  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 32%

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		32.0						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec. Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0268	+/-0.200	0.363	0.173	+/-0.200		pCi/g		RXF2	01/04/16	1206	1529721	2
Antimony-125	UI	0.00	+/-0.0784	0.151	0.0715	+/-0.0875		pCi/g						
Bismuth-212	UI	0.00	+/-0.524	1.01	0.477	+/-0.782		pCi/g						
Bismuth-214		0.840	+/-0.132	0.0958	0.0444	+/-0.149		pCi/g						
Cesium-137		0.964	+/-0.0872	0.0512	0.0236	+/-0.116	0.100	pCi/g						
Cobalt-60	U	-0.00799	+/-0.0315	0.0556	0.0247	+/-0.0317		pCi/g						
Europium-154	UI	0.00	+/-0.111	0.200	0.0917	+/-0.121		pCi/g						
Lead-212		1.06	+/-0.0926	0.079	0.0377	+/-0.127		pCi/g						
Lead-214		0.952	+/-0.127	0.244	0.119	+/-0.148		pCi/g						
Potassium-40		14.0	+/-1.14	0.473	0.206	+/-1.71		pCi/g						
Protactinium-231	UI	0.00	+/-0.536	0.654	0.310	+/-0.550		pCi/g						
Radium-226		0.840	+/-0.132	0.0958	0.0444	+/-0.149		pCi/g						
Radium-228		1.11	+/-0.236	0.161	0.0718	+/-0.280		pCi/g						
Thallium-208		0.315	+/-0.0637	0.0538	0.0251	+/-0.0687		pCi/g						
Tin-126	UI	0.00	+/-0.0877	0.0889	0.0426	+/-0.0899		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		15.7	+/-4.24	3.95	1.62	+/-5.12	4.00	pCi/g		JXB7	01/04/16	1207	1532748	3
Beta		22.1	+/-3.78	4.24	1.97	+/-4.77	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
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

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5.C.R.7.1  
Sample ID: 387031018

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

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: 4.5.C.R.7.2  
 Sample ID: 392062012  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 23.1%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma with Ingrowth "Dry Weight Corrected"</i>														
Actinium-227	U	0.149	+/-0.341	0.656	0.309	+/-0.348		pCi/g		MXR1	03/07/16	1410	1547923	1
Antimony-125	U	-0.146	+/-0.131	0.209	0.095	+/-0.147		pCi/g						
Bismuth-212	U	0.555	+/-1.02	1.43	0.653	+/-1.05		pCi/g						
Bismuth-214		0.687	+/-0.181	0.190	0.0877	+/-0.191		pCi/g						
Cesium-137		0.570	+/-0.0989	0.0952	0.0433	+/-0.111	0.100	pCi/g						
Cobalt-60	U	-0.0304	+/-0.0562	0.101	0.0433	+/-0.0579		pCi/g						
Europium-154	U	-0.0679	+/-0.200	0.310	0.136	+/-0.203		pCi/g						
Lead-212		1.16	+/-0.140	0.135	0.0635	+/-0.175		pCi/g						
Lead-214		0.944	+/-0.184	0.351	0.169	+/-0.202		pCi/g						
Potassium-40		15.0	+/-1.70	0.730	0.294	+/-2.13		pCi/g						
Protactinium-231	U	0.379	+/-0.780	1.05	0.487	+/-0.785		pCi/g						
Radium-226		0.687	+/-0.181	0.190	0.0877	+/-0.191		pCi/g						
Radium-228		1.07	+/-0.299	0.369	0.166	+/-0.344		pCi/g						
Thallium-208		0.223	+/-0.0899	0.0844	0.0383	+/-0.092		pCi/g						
Tin-126	UI	0.00	+/-0.169	0.142	0.0666	+/-0.170		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha	16.1	+/-3.68	3.49	1.49	+/-4.81	4.00	pCi/g	JXB7	03/02/16	1637	1548369	2
Beta	24.9	+/-2.97	2.95	1.38	+/-4.56	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	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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# 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: 4.5.C.R.7.2  
Sample ID: 392062012

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

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

## Certificate of Analysis

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.8.1  
 Sample ID: 387031019  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 26.6%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		26.6						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0617	+/-0.244	0.433	0.207	+/-0.246		pCi/g		RXF2	01/04/16	1206	1529721	2
Antimony-125	U	0.0363	+/-0.0881	0.160	0.0756	+/-0.0897		pCi/g						
Bismuth-212		1.58	+/-0.710	0.741	0.342	+/-0.730		pCi/g						
Bismuth-214		1.02	+/-0.139	0.107	0.0501	+/-0.167		pCi/g						
Cesium-137		0.703	+/-0.0778	0.0614	0.0286	+/-0.101	0.100	pCi/g						
Cobalt-60	U	-0.0146	+/-0.0303	0.0541	0.0237	+/-0.031		pCi/g						
Europium-154	U	0.0273	+/-0.0985	0.191	0.0867	+/-0.0993		pCi/g						
Lead-212		1.13	+/-0.102	0.0935	0.0447	+/-0.146		pCi/g						
Lead-214		0.986	+/-0.152	0.117	0.0554	+/-0.176		pCi/g						
Potassium-40		15.7	+/-1.26	0.508	0.221	+/-1.84		pCi/g						
Protactinium-231	UI	0.00	+/-0.700	0.707	0.334	+/-0.721		pCi/g						
Radium-226		1.02	+/-0.139	0.107	0.0501	+/-0.167		pCi/g						
Radium-228		1.10	+/-0.278	0.192	0.0868	+/-0.327		pCi/g						
Thallium-208		0.319	+/-0.0638	0.0526	0.0244	+/-0.0699		pCi/g						
Tin-126	UI	0.00	+/-0.119	0.126	0.0608	+/-0.122		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A-B, solid "Dry Weight Corrected"</i>														
Alpha		13.1	+/-4.43	3.89	1.45	+/-5.11	4.00	pCi/g		JXB7	01/04/16	1208	1532748	3
Beta		22.8	+/-3.59	2.96	1.31	+/-4.92	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4 S 2.3/Ga-01-R
3	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 Corporation  
Address : 15 Hazelwood Drive  
Suite 112  
Buffalo, New York 14228

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.8.1  
Sample ID: 387031019

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

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: 4.5.C.R.8.2  
 Sample ID: 392062013  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 21.4%

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	-0.0688	+/-0.314	0.583	0.272	+/-0.316		pCi/g		MXR1	03/07/16	1410	1547923	1
Antimony-125	U	0.0539	+/-0.120	0.232	0.107	+/-0.123		pCi/g						
Bismuth-212	UI	0.00	+/-0.605	1.41	0.644	+/-0.760		pCi/g						
Bismuth-214		0.819	+/-0.178	0.171	0.0782	+/-0.193		pCi/g						
Cesium-137		0.265	+/-0.0872	0.0853	0.0384	+/-0.0903	0.100	pCi/g						
Cobalt-60	U	-0.036	+/-0.0498	0.0844	0.0354	+/-0.0525		pCi/g						
Europium-154	U	0.0855	+/-0.134	0.267	0.115	+/-0.140		pCi/g						
Lead-212		1.25	+/-0.149	0.127	0.0595	+/-0.184		pCi/g						
Lead-214		1.23	+/-0.194	0.376	0.182	+/-0.222		pCi/g						
Potassium-40		14.4	+/-1.79	0.949	0.408	+/-2.18		pCi/g						
Protactinium-231	UI	0.00	+/-0.978	1.05	0.487	+/-1.01		pCi/g						
Radium-226		0.819	+/-0.178	0.171	0.0782	+/-0.193		pCi/g						
Radium-228		1.01	+/-0.385	0.252	0.108	+/-0.414		pCi/g						
Thallium-208		0.334	+/-0.0906	0.086	0.0392	+/-0.0954		pCi/g						
Tin-126	U	0.0835	+/-0.137	0.205	0.098	+/-0.138		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		18.2	+/-3.99	3.55	1.50	+/-5.34	4.00	pCi/g		JXB7	03/02/16	1638	1548369	2
Beta		28.7	+/-3.36	3.53	1.67	+/-5.34	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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# 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: 4.5.C.R.8.2  
Sample ID: 392062013

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

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

## Certificate of Analysis

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

Report Date: January 8, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.8.5  
 Sample ID: 387409007  
 Matrix: Water  
 Collect Date: 01-DEC-15  
 Receive Date: 10-DEC-15  
 Collector: Client

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

*Gammascpec, Gamma, Liquid (Standard List) "As Received"*

Actinium-227	U	-0.658	+/-24.6	44.8	21.0	+/-24.6		pCi/L		MJH1	12/18/15	0734	1529228	1
Antimony-125	U	7.13	+/-9.40	18.1	8.39	+/-9.95		pCi/L						
Bismuth-212	U	-2.71	+/-51.8	96.0	43.6	+/-51.9		pCi/L						
Bismuth-214	U	2.12	+/-9.74	16.0	7.44	+/-9.79		pCi/L						
Cesium-137	U	1.31	+/-3.49	6.18	2.77	+/-3.54	10.0	pCi/L						
Cobalt-60	U	-0.969	+/-3.80	6.77	2.90	+/-3.83		pCi/L						
Europium-154	U	-0.337	+/-10.7	20.7	9.03	+/-10.7		pCi/L						
Lead-212	U	2.40	+/-10.8	12.7	6.05	+/-10.9		pCi/L						
Lead-214	U	-0.299	+/-9.30	15.8	7.45	+/-9.30		pCi/L						
Potassium-40	U	25.9	+/-49.5	67.3	28.8	+/-49.6		pCi/L						
Protactinium-231	UI	0.00	+/-49.7	95.9	45.2	+/-55.6		pCi/L						
Radium-228	U	-9.76	+/-19.6	28.3	12.8	+/-20.1		pCi/L						
Thallium-208	U	0.963	+/-6.75	6.48	2.95	+/-6.75		pCi/L						
Tin-126	U	0.105	+/-7.87	13.8	6.58	+/-7.87		pCi/L						

### Rad Gas Flow Proportional Counting

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

Alpha		1.20	+/-1.77	3.11	1.15	+/-1.78	5.00	pCi/L		JXB7	01/05/16	1610	1533798	2
Beta	U	-0.43	+/-2.51	4.83	2.15	+/-2.51	5.00	pCi/L						

### The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 900.0/SW846.9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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### Notes:

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

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: January 7, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.8.5  
 Sample ID: 387409007  
 Matrix: Water  
 Collect Date: 01-DEC-15  
 Receive Date: 10-DEC-15  
 Collector: Client

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>Gammasec, Gamma, Liquid (Standard List) "As Received"</i>														
Actinium-227	U	-0.658	+/-24.6	44.8	21.0	+/-24.6		pCi/L		MJH1	12/18/15	0734	1529228	1
Antimony-125	U	7.13	+/-9.40	18.1	8.39	+/-9.95		pCi/L						
Bismuth-212	U	-2.71	+/-51.8	96.0	43.6	+/-51.9		pCi/L						
Bismuth-214	U	2.12	+/-9.74	16.0	7.44	+/-9.79		pCi/L						
Cesium-137	U	1.31	+/-3.49	6.18	2.77	+/-3.54	10.0	pCi/L						
Cobalt-60	U	-0.969	+/-3.80	6.77	2.90	+/-3.83		pCi/L						
Europium-154	U	-0.337	+/-10.7	20.7	9.03	+/-10.7		pCi/L						
Lead-212	U	2.40	+/-10.8	12.7	6.05	+/-10.9		pCi/L						
Lead-214	U	-0.299	+/-9.30	15.8	7.45	+/-9.30		pCi/L						
Potassium-40	U	25.9	+/-49.5	67.3	28.8	+/-49.6		pCi/L						
Protactinium-231	UI	0.00	+/-49.7	95.9	45.2	+/-55.6		pCi/L						
Radium-228	U	-9.76	+/-19.6	28.3	12.8	+/-20.1		pCi/L						
Thallium-208	U	0.963	+/-6.75	6.48	2.95	+/-6.75		pCi/L						
Tin-126	U	0.105	+/-7.87	13.8	6.58	+/-7.87		pCi/L						

**Rad Gas Flow Proportional Counting**  
*GFPC, Gross A/B, liquid "As Received"*

Alpha		1.20	+/-1.77	3.11	1.15	+/-1.78	5.00	pCi/L		JXB7	01/05/16	1610	1533798	2
Beta	U	-0.43	+/-2.51	4.83	2.15	+/-2.51	5.00	pCi/L						

**The following Analytical Methods were performed**

Method	Description
1	EPA 901.1
2	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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**Notes:**

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

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.9.1  
 Sample ID: 387031020  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 31.4%

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		31.4						percent		DRS1	12/09/15	1310	1529593	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec. Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.134	+/-0.281	0.465	0.222	+/-0.289		pCi/g		RXF2	01/04/16	1207	1529721	2
Antimony-125	UI	0.00	+/-0.105	0.195	0.0927	+/-0.114		pCi/g						
Bismuth-212	UI	0.00	+/-0.824	1.08	0.510	+/-0.941		pCi/g						
Bismuth-214		0.774	+/-0.154	0.132	0.0621	+/-0.169		pCi/g						
Cesium-137		2.17	+/-0.140	0.0605	0.0279	+/-0.240	0.100	pCi/g						
Cobalt-60	U	-0.0122	+/-0.0342	0.0627	0.0275	+/-0.0347		pCi/g						
Europium-154	U	-0.0156	+/-0.125	0.231	0.105	+/-0.125		pCi/g						
Lead-212		1.06	+/-0.106	0.103	0.0494	+/-0.143		pCi/g						
Lead-214		1.03	+/-0.164	0.136	0.0646	+/-0.188		pCi/g						
Potassium-40		13.6	+/-1.29	0.648	0.285	+/-1.74		pCi/g						
Protactinium-231	UI	0.00	+/-0.749	0.807	0.383	+/-0.789		pCi/g						
Radium-226		0.774	+/-0.154	0.132	0.0621	+/-0.169		pCi/g						
Radium-228		1.06	+/-0.270	0.229	0.105	+/-0.318		pCi/g						
Thallium-208		0.347	+/-0.0595	0.0595	0.0277	+/-0.0671		pCi/g						
Tin-126	UI	0.00	+/-0.0869	0.134	0.0646	+/-0.0894		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC. Gross A B. solid "Dry Weight Corrected"</i>														
Alpha		14.2	+/-3.86	3.89	1.64	+/-4.68	4.00	pCi/g		JXB7	01/04/16	1208	1532748	3
Beta		27.4	+/-3.59	3.67	1.72	+/-5.11	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	1310	1529593

**The following Analytical Methods were performed**

Method	Description
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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.9.1  
Sample ID: 387031020

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

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: 4.5.C.R.9.2  
 Sample ID: 392062014  
 Matrix: Soil  
 Collect Date: 01-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 22.6%

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 with Ingrowth "Dry Weight Corrected"</i>														
Actinium-227	U	-0.103	+/-0.365	0.644	0.302	+/-0.368		pCi/g		MXR1	03/07/16	1411	1547923	1
Antimony-125	U	-0.0712	+/-0.149	0.267	0.123	+/-0.152		pCi/g						
Bismuth-212		1.83	+/-0.971	1.36	0.613	+/-0.986		pCi/g						
Bismuth-214		0.867	+/-0.221	0.164	0.0736	+/-0.233		pCi/g						
Cesium-137		2.05	+/-0.195	0.109	0.0494	+/-0.257	0.100	pCi/g						
Cobalt-60	U	-0.0509	+/-0.0489	0.0727	0.0283	+/-0.0541		pCi/g						
Europium-154	U	0.105	+/-0.161	0.345	0.151	+/-0.168		pCi/g						
Lead-212		1.08	+/-0.135	0.143	0.0673	+/-0.169		pCi/g						
Lead-214		0.976	+/-0.211	0.384	0.185	+/-0.227		pCi/g						
Potassium-40		15.7	+/-1.91	0.853	0.347	+/-2.33		pCi/g						
Protactinium-231	UI	0.00	+/-0.819	1.46	0.690	+/-0.904		pCi/g						
Radium-226		0.867	+/-0.221	0.164	0.0736	+/-0.233		pCi/g						
Radium-228		1.00	+/-0.276	0.234	0.0955	+/-0.300		pCi/g						
Thallium-208		0.377	+/-0.0957	0.104	0.0474	+/-0.101		pCi/g						
Tin-126	UI	0.00	+/-0.115	0.133	0.0635	+/-0.118		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		13.2	+/-3.65	3.81	1.62	+/-4.47	4.00	pCi/g		JXB7	03/02/16	1638	1548369	2
Beta		24.1	+/-3.30	3.89	1.85	+/-4.76	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**

# 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: 4.5.C.R.9.2  
Sample ID: 392062014

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

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: 4.5.C.R.9.5	Project: MJWC00115
Sample ID: 386983004	Client ID: MJWC001
Matrix: Water	
Collect Date: 01-DEC-15 15:30	
Receive Date: 08-DEC-15	
Collector: Client	

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	U	-0.826	51.1		pCi/L		MJH1	12/18/15	0721	1529228	1
Antimony-125	U	-5.14	17.2		pCi/L						
Bismuth-212	U	36.0	96.1		pCi/L						
Bismuth-214	U	2.82	14.4		pCi/L						
Cesium-137	U	-2.15	6.17	10.0	pCi/L						
Cobalt-60	U	0.100	6.36		pCi/L						
Europium-154	U	0.924	19.0		pCi/L						
Lead-212	U	-2.12	13.4		pCi/L						
Lead-214	U	3.75	16.8		pCi/L						
Potassium-40	U	-14.1	93.7		pCi/L						
Protactinium-231	U	-11.9	90.9		pCi/L						
Radium-228	U	1.14	28.7		pCi/L						
Thallium-208	U	-0.168	7.24		pCi/L						
Tin-126	U	-1.78	13.5		pCi/L						
<b>Rad Gas Flow Proportional Counting</b>											
<b>GFPC, Gross A/B, liquid "As Received"</b>											
Alpha	U	0.254	3.47	5.00	pCi/L		JXB7	12/21/15	1330	1531188	2
Beta		1.45	3.11	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:**