

# 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 19, 2016

Client Sample ID: SN1B18.1  
 Sample ID: 387899001  
 Matrix: Soil  
 Collect Date: 15-DEC-15  
 Receive Date: 21-DEC-15  
 Collector: Client  
 Moisture: 11.4%

Project: MJWC00115  
 Client ID: MJWC001

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

*ASTM D 2216 % Moisture "As Received"*

Moisture		11.4						percent		LYT1	12/22/15	1007	1532997	1
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**Rad Gamma Spec Analysis**

*GammaSpec. Gamma. Solid "Dry Weight Corrected"*

Actinium-227	U	0.117	+/-0.198	0.391	0.186	+/-0.206		pCi/g		RXF2	01/14/16	0906	1533152	2
Antimony-125	U	-0.0164	+/-0.065	0.122	0.0568	+/-0.0654		pCi/g						
Bismuth-212	UI	0.00	+/-0.617	0.879	0.413	+/-0.722		pCi/g						
Bismuth-214		0.731	+/-0.154	0.114	0.0535	+/-0.166		pCi/g						
Cesium-137		0.0884	+/-0.0488	0.0555	0.0258	+/-0.0494	0.100	pCi/g						
Cobalt-60	U	-0.01	+/-0.0313	0.0578	0.026	+/-0.0316		pCi/g						
Europium-154	U	-0.0444	+/-0.106	0.187	0.0853	+/-0.108		pCi/g						
Lead-212		0.818	+/-0.108	0.0889	0.0424	+/-0.125		pCi/g						
Lead-214		0.953	+/-0.148	0.0976	0.0456	+/-0.165		pCi/g						
Potassium-40		12.2	+/-1.06	0.541	0.241	+/-1.49		pCi/g						
Protactinium-231	UI	0.00	+/-0.653	0.662	0.312	+/-0.689		pCi/g						
Radium-226		0.731	+/-0.154	0.114	0.0535	+/-0.166		pCi/g						
Radium-228		0.715	+/-0.195	0.207	0.0949	+/-0.209		pCi/g						
Thallium-208		0.207	+/-0.0593	0.0492	0.0228	+/-0.0619		pCi/g						
Tin-126	U	0.00376	+/-0.109	0.152	0.0737	+/-0.110		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		14.5	+/-2.16	2.45	1.15	+/-3.49	4.00	pCi/g		KXB2	01/11/16	1935	1534757	3
Beta		18.5	+/-1.52	1.78	0.863	+/-2.93	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	12/22/15	1007	1532997

**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

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Buffalo, New York 14228

Report Date: January 19, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B18.1  
Sample ID: 387899001

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  
Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Report Date: February 13, 2016

Client Sample ID: SN1B18.1  
Sample ID: 390909001  
Matrix: Soil  
Collect Date: 15-DEC-15  
Receive Date: 21-DEC-15  
Collector: Client  
Moisture: 11.4%

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	0.0363	+/-0.259	0.506	0.237	+/-0.260		pCi/g		MXR1	02/10/16	0625	1543538	1
Antimony-125	U	0.00336	+/-0.0975	0.165	0.0746	+/-0.0975		pCi/g						
Bismuth-212	UI	0.00	+/-0.780	1.26	0.581	+/-0.906		pCi/g						
Bismuth-214		0.705	+/-0.176	0.139	0.0629	+/-0.186		pCi/g						
Cesium-137		0.128	+/-0.0766	0.0782	0.0354	+/-0.0773	0.100	pCi/g						
Cobalt-60	U	0.0113	+/-0.0363	0.0782	0.0335	+/-0.0367		pCi/g						
Europium-154	U	-0.125	+/-0.114	0.188	0.0787	+/-0.128		pCi/g						
Lead-212		0.754	+/-0.122	0.104	0.0487	+/-0.136		pCi/g						
Lead-214		0.930	+/-0.163	0.133	0.0611	+/-0.178		pCi/g						
Potassium-40		11.1	+/-1.30	0.529	0.209	+/-1.72		pCi/g						
Protactinium-231	UI	0.00	+/-0.566	0.813	0.375	+/-0.612		pCi/g						
Radium-226		0.705	+/-0.176	0.139	0.0629	+/-0.186		pCi/g						
Radium-228		0.626	+/-0.279	0.254	0.111	+/-0.289		pCi/g						
Thallium-208		0.188	+/-0.0641	0.0749	0.0341	+/-0.066		pCi/g						
Tin-126	U	0.0538	+/-0.134	0.183	0.0879	+/-0.134		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	I.YT1	12/22/15	1007	1543525

### The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4 5.2.3/Ga-01-R

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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Report Date: February 13, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B18.1  
Sample ID: 390909001

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  
 Suite 112  
 Buffalo, New York 14228

Report Date: March 9, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: S.N.I.B.18.2  
 Sample ID: 392057020  
 Matrix: Soil  
 Collect Date: 15-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 10.5%

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	0.0254	+/-0.255	0.499	0.233	+/-0.256		pCi/g		MXR1	03/07/16	1209	1547922	1
Antimony-125	U	0.0326	+/-0.102	0.199	0.0913	+/-0.103		pCi/g						
Bismuth-212	UI	0.00	+/-0.826	1.12	0.512	+/-0.863		pCi/g						
Bismuth-214		0.843	+/-0.176	0.144	0.0656	+/-0.192		pCi/g						
Cesium-137		0.155	+/-0.0547	0.0698	0.0312	+/-0.0565	0.100	pCi/g						
Cobalt-60	U	-0.0279	+/-0.0472	0.0828	0.0356	+/-0.0489		pCi/g						
Europium-154	U	0.0669	+/-0.140	0.260	0.115	+/-0.143		pCi/g						
Lead-212		0.914	+/-0.126	0.111	0.0521	+/-0.149		pCi/g						
Lead-214		1.18	+/-0.193	0.138	0.0633	+/-0.219		pCi/g						
Potassium-40		11.5	+/-1.36	0.570	0.228	+/-1.68		pCi/g						
Protactinium-231	UI	0.00	+/-0.606	0.957	0.446	+/-0.665		pCi/g						
Radium-226		0.843	+/-0.176	0.144	0.0656	+/-0.192		pCi/g						
Radium-228		0.808	+/-0.305	0.299	0.134	+/-0.328		pCi/g						
Thallium-208		0.242	+/-0.0714	0.0599	0.0266	+/-0.0746		pCi/g						
Tin-126	U	-0.00105	+/-0.0944	0.181	0.0866	+/-0.0944		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		13.0	+/-3.95	3.83	1.58	+/-4.78	4.00	pCi/g		BXF1	03/05/16	1618	1549866	2
Beta		19.8	+/-3.59	4.41	2.07	+/-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	1436	1547873

**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**

Surrogate/Tracer	Recovery	Acceptable Limits

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Report Date: March 9, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: S.N.1.B.18.2  
Sample ID: 392057020

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 Corporation  
 Address : 15 Hazelwood Drive  
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 Buffalo, New York 14228

Report Date: January 19, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: SN1B18.5  
 Sample ID: 387899002  
 Matrix: Water  
 Collect Date: 15-DEC-15  
 Receive Date: 21-DEC-15  
 Collector: Client

Project: MJWC00115  
 Client ID: MJWC001

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

*Gammasp. Gamma, Liquid (Standard List) "As Received"*

Actinium-227	U	1.94	+/-31.7	55.8	26.5	+/-31.7		pCi/L		MJH1	01/08/16	1547	1532831	1
Antimony-125	U	0.223	+/-10.3	19.0	8.84	+/-10.3		pCi/L						
Bismuth-212	U	-17.1	+/-60.7	106	48.5	+/-61.3		pCi/L						
Bismuth-214	U	0.714	+/-10.2	17.6	8.28	+/-10.2		pCi/L						
Cesium-137	U	-1.43	+/-6.42	8.27	3.83	+/-6.45	10.0	pCi/L						
Cobalt-60	U	3.53	+/-4.25	8.89	3.97	+/-4.54		pCi/L						
Europium-154	U	-7.06	+/-10.9	18.3	7.85	+/-11.4		pCi/L						
Lead-212	U	4.86	+/-11.2	12.5	5.97	+/-11.2		pCi/L						
Lead-214	U	4.41	+/-16.4	17.3	8.18	+/-16.5		pCi/L						
Potassium-40	U	-33	+/-63.2	102	45.9	+/-65.0		pCi/L						
Protactinium-231	U	3.73	+/-59.8	105	49.6	+/-59.8		pCi/L						
Radium-228	U	10.4	+/-21.8	32.8	15.1	+/-22.3		pCi/L						
Thallium-208	U	-3.42	+/-6.21	9.34	4.38	+/-6.41		pCi/L						
Tin-126	U	-9.02	+/-9.82	15.9	7.58	+/-10.7		pCi/L						

### Rad Gas Flow Proportional Counting

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

Alpha	U	-1.12	+/-1.24	3.25	1.31	+/-1.24	5.00	pCi/L		JXB7	01/05/16	1144	1533798	2
Beta	U	-1.07	+/-2.36	4.50	2.06	+/-2.36	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:

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## Certificate of Analysis

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

Report Date: January 5, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: SN1B19.1  
 Sample ID: 387031007  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 20.6%

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

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

Actinium-227	U	-0.0808	+/-0.300	0.550	0.257	+/-0.302		pCi/g		RXF2	01/04/16	1012	1529721	2
Antimony-125	UI	0.00	+/-0.118	0.236	0.110	+/-0.131		pCi/g						
Bismuth-212	UI	0.00	+/-0.973	1.43	0.659	+/-1.14		pCi/g						
Bismuth-214		0.863	+/-0.159	0.165	0.0758	+/-0.175		pCi/g						
Cesium-137		0.124	+/-0.073	0.0955	0.0438	+/-0.0737	0.100	pCi/g						
Cobalt-60	U	0.0137	+/-0.0448	0.0919	0.0398	+/-0.0453		pCi/g						
Europium-154	U	0.0574	+/-0.134	0.276	0.121	+/-0.137		pCi/g						
Lead-212		1.21	+/-0.168	0.164	0.0781	+/-0.195		pCi/g						
Lead-214		0.885	+/-0.219	0.337	0.163	+/-0.232		pCi/g						
Potassium-40		15.5	+/-1.81	0.843	0.360	+/-2.27		pCi/g						
Protactinium-231	U	0.329	+/-0.638	1.18	0.557	+/-0.659		pCi/g						
Radium-226		0.863	+/-0.159	0.165	0.0758	+/-0.175		pCi/g						
Radium-228		0.908	+/-0.279	0.308	0.137	+/-0.310		pCi/g						
Thallium-208		0.328	+/-0.107	0.0762	0.0345	+/-0.111		pCi/g						
Tin-126	UI	0.00	+/-0.131	0.187	0.0898	+/-0.133		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		16.5	+/-4.34	3.97	1.63	+/-5.38	4.00	pCi/g		JXB7	01/04/16	0929	1532748	3
Beta		25.0	+/-3.28	2.84	1.30	+/-4.87	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	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: SN1B19.1  
Sample ID: 387031007

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: February 13, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: SN1B19.1  
 Sample ID: 390909002  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 20.6%

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	0.0859	+/-0.255	0.495	0.231	+/-0.259		pCi/g		MXR1	02/10/16	0625	1543538	1
Antimony-125	U	-0.00835	+/-0.101	0.184	0.0842	+/-0.101		pCi/g						
Bismuth-212		1.60	+/-0.863	1.07	0.480	+/-0.878		pCi/g						
Bismuth-214		0.891	+/-0.159	0.136	0.0613	+/-0.175		pCi/g						
Cesium-137		0.138	+/-0.0695	0.0876	0.040	+/-0.0704	0.100	pCi/g						
Cobalt-60	U	-0.00743	+/-0.0516	0.0833	0.0357	+/-0.0517		pCi/g						
Europium-154	U	0.00832	+/-0.152	0.291	0.129	+/-0.152		pCi/g						
Lead-212		1.19	+/-0.123	0.091	0.0421	+/-0.202		pCi/g						
Lead-214		1.17	+/-0.199	0.356	0.173	+/-0.229		pCi/g						
Potassium-40		17.5	+/-1.73	0.534	0.208	+/-2.32		pCi/g						
Protactinium-231	UI	0.00	+/-0.570	1.10	0.517	+/-0.630		pCi/g						
Radium-226		0.891	+/-0.159	0.136	0.0613	+/-0.175		pCi/g						
Radium-228	UI	0.00	+/-0.296	0.662	0.315	+/-0.605		pCi/g						
Thallium-208		0.363	+/-0.0798	0.0798	0.0365	+/-0.0856		pCi/g						
Tin-126	UI	0.00	+/-0.0832	0.0951	0.0451	+/-0.0868		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	1543525

**The following Analytical Methods were performed**

Method	Description
1	DOE HASL 300.4 5.2.3/Ga-01-R

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

Company : MJW Technical Services  
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Report Date: February 13, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B19.1  
Sample ID: 390909002

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  
 Suite 112  
 Buffalo, New York 14228

Report Date: March 9, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: S.N.I.B.19.3  
 Sample ID: 392057018  
 Matrix: Soil  
 Collect Date: 02-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 15.5%

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	-0.0911	+/-0.290	0.530	0.249	+/-0.293		pCi/g		MXR1	03/07/16	1208	1547922	1
Antimony-125	U	0.0635	+/-0.215	0.195	0.0896	+/-0.217		pCi/g						
Bismuth-212	UI	0.00	+/-0.976	1.15	0.528	+/-1.11		pCi/g						
Bismuth-214		0.800	+/-0.151	0.124	0.056	+/-0.167		pCi/g						
Cesium-137	U	0.00434	+/-0.0419	0.0807	0.0368	+/-0.0419	0.100	pCi/g						
Cobalt-60	U	-0.0436	+/-0.0406	0.0619	0.0252	+/-0.0452		pCi/g						
Europium-154	U	0.00496	+/-0.134	0.262	0.116	+/-0.134		pCi/g						
Lead-212		1.18	+/-0.136	0.116	0.0543	+/-0.175		pCi/g						
Lead-214		1.09	+/-0.198	0.336	0.162	+/-0.221		pCi/g						
Potassium-40		15.7	+/-1.61	0.807	0.347	+/-2.09		pCi/g						
Protactinium-231	UI	0.00	+/-0.536	0.898	0.416	+/-0.567		pCi/g						
Radium-226		0.800	+/-0.151	0.124	0.056	+/-0.167		pCi/g						
Radium-228		1.05	+/-0.290	0.305	0.137	+/-0.334		pCi/g						
Thallium-208		0.277	+/-0.0941	0.0765	0.035	+/-0.0973		pCi/g						
Tin-126	UI	0.00	+/-0.122	0.185	0.0886	+/-0.124		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		15.2	+/-3.72	3.88	1.69	+/-4.73	4.00	pCi/g		BXF1	03/05/16	1624	1549866	2
Beta		19.2	+/-3.03	3.55	1.68	+/-4.19	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	1436	1547873

**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

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: S.N.I.B.19.3

Sample ID: 392057018

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.	
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: December 28, 2015

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: SNIB20.1  
 Sample ID: 386431007  
 Matrix: Soil  
 Collect Date: 24-NOV-15  
 Receive Date: 30-NOV-15  
 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>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		21.5						percent		CXC1	12/03/15	1517	1528032	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammasec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.114	+/-0.197	0.367	0.175	+/-0.204		pCi/g		RXF2	12/28/15	0843	1528767	2
Antimony-125	U	0.0129	+/-0.0691	0.133	0.0628	+/-0.0693		pCi/g						
Bismuth-212	UI	0.00	+/-0.657	0.945	0.448	+/-0.909		pCi/g						
Bismuth-214		0.764	+/-0.112	0.101	0.0474	+/-0.130		pCi/g						
Cesium-137	UI	0.00	+/-0.0328	0.0622	0.0293	+/-0.0355	0.100	pCi/g						
Cobalt-60	UI	0.00	+/-0.0296	0.0621	0.0281	+/-0.0324		pCi/g						
Europium-154	U	-0.0327	+/-0.0998	0.178	0.0809	+/-0.101		pCi/g						
Lead-212		0.898	+/-0.0913	0.0799	0.0382	+/-0.125		pCi/g						
Lead-214		0.988	+/-0.136	0.0966	0.0455	+/-0.164		pCi/g						
Potassium-40		14.6	+/-1.23	0.539	0.240	+/-1.76		pCi/g						
Protactinium-231	UI	0.00	+/-0.525	0.650	0.308	+/-0.552		pCi/g						
Radium-226		0.764	+/-0.112	0.101	0.0474	+/-0.130		pCi/g						
Radium-228		0.838	+/-0.194	0.208	0.096	+/-0.228		pCi/g						
Thallium-208		0.211	+/-0.0655	0.0483	0.0225	+/-0.068		pCi/g						
Tin-126	UI	0.00	+/-0.0879	0.102	0.0491	+/-0.0896		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		12.7	+/-3.75	3.93	1.66	+/-4.49	4.00	pCi/g		JXB7	12/17/15	1527	1531243	3
Beta		23.6	+/-3.38	3.60	1.68	+/-4.74	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	12/03/15	1517	1528032

**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  
Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes  
Client Sample ID: SNIB20.1  
Sample ID: 386431007

Report Date: December 28, 2015

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: February 13, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: SN1B20.1  
 Sample ID: 390909003  
 Matrix: Soil  
 Collect Date: 24-NOV-15  
 Receive Date: 30-NOV-15  
 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	-0.0857	+/-0.206	0.373	0.175	+/-0.210		pCi/g		MXR1	02/10/16	0626	1543538	1
Antimony-125	U	0.0117	+/-0.0737	0.141	0.0655	+/-0.0739		pCi/g						
Bismuth-212	UI	0.00	+/-0.635	0.969	0.455	+/-0.690		pCi/g						
Bismuth-214		0.783	+/-0.134	0.109	0.0508	+/-0.149		pCi/g						
Cesium-137	UI	0.00	+/-0.0344	0.063	0.0293	+/-0.0379	0.100	pCi/g						
Cobalt-60	U	-0.0257	+/-0.0324	0.0551	0.0243	+/-0.0344		pCi/g						
Europium-154	U	-0.0414	+/-0.102	0.184	0.083	+/-0.104		pCi/g						
Lead-212		0.882	+/-0.111	0.0905	0.0429	+/-0.132		pCi/g						
Lead-214		0.900	+/-0.164	0.116	0.0545	+/-0.180		pCi/g						
Potassium-40		14.5	+/-1.27	0.482	0.209	+/-1.78		pCi/g						
Protactinium-231	UI	0.00	+/-0.485	0.679	0.318	+/-0.533		pCi/g						
Radium-226		0.783	+/-0.134	0.109	0.0508	+/-0.149		pCi/g						
Radium-228		0.751	+/-0.246	0.205	0.0936	+/-0.274		pCi/g						
Thallium-208		0.200	+/-0.0589	0.0594	0.0277	+/-0.0612		pCi/g						
Tm-126	UI	0.00	+/-0.103	0.118	0.0562	+/-0.106		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	12/03/15	1517	1543525

**The following Analytical Methods were performed**

Method	Description
1	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 Technical Services  
Address : 15 Hazelwood Drive  
Suite 112  
Buffalo, New York 14228

Report Date: February 13, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B20.1  
Sample ID: 390909003

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: December 28, 2015

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: SN1B20.5  
 Sample ID: 386431005  
 Matrix: Water  
 Collect Date: 24-NOV-15  
 Receive Date: 30-NOV-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

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

Actinium-227	U	5.84	+/-29.7	53.2	25.1	+/-29.8		pCi/L		MJH1	12/18/15	0710	1529228	1
Antimony-125	UI	0.00	+/-10.0	19.4	9.04	+/-11.2		pCi/L						
Bismuth-212	UI	0.00	+/-53.9	89.0	40.2	+/-68.2		pCi/L						
Bismuth-214	U	-1.57	+/-9.71	15.7	7.32	+/-9.74		pCi/L						
Cesium-137	U	2.05	+/-3.38	6.74	3.06	+/-3.51	10.0	pCi/L						
Cobalt-60	U	-1.05	+/-4.72	7.47	3.25	+/-4.75		pCi/L						
Europium-154	U	-7.04	+/-10.5	18.4	7.86	+/-11.0		pCi/L						
Lead-212	U	3.67	+/-12.2	13.8	6.58	+/-12.3		pCi/L						
Lead-214	U	-7.09	+/-10.2	15.4	7.24	+/-10.7		pCi/L						
Potassium-40	U	23.5	+/-57.9	78.4	34.4	+/-57.9		pCi/L						
Protactinium-231	U	-14.6	+/-58.6	101	47.7	+/-59.0		pCi/L						
Radium-228	U	4.59	+/-22.5	31.3	14.3	+/-22.6		pCi/L						
Thallium-208	U	1.00	+/-4.25	7.02	3.23	+/-4.25		pCi/L						
Tin-126	U	3.87	+/-10.3	17.0	8.11	+/-10.5		pCi/L						

### Rad Gas Flow Proportional Counting

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

Alpha	U	0.492	+/-1.65	2.96	1.27	+/-1.66	5.00	pCi/L		JXB7	12/21/15	1329	1531188	2
Beta	U	-0.0258	+/-2.74	4.88	2.30	+/-2.74	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) 558-8171 - www.gel.com

## Certificate of Analysis

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

Report Date: December 28, 2015

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: SN1B21.1  
 Sample ID: 386431002  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 30-NOV-15  
 Collector: Client  
 Moisture: 19.2%

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		19.2						percent		CXC1	12/01/15	1158	1527021	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.133	+/-0.239	0.478	0.224	+/-0.247		pCi/g		RXF2	12/24/15	0603	1528387	2
Antimony-125	U	-0.0499	+/-0.0921	0.163	0.0748	+/-0.0949		pCi/g						
Bismuth-212		1.66	+/-0.781	0.761	0.336	+/-0.798		pCi/g						
Bismuth-214		0.987	+/-0.172	0.116	0.0522	+/-0.190		pCi/g						
Cesium-137		0.125	+/-0.0562	0.0804	0.037	+/-0.0571	0.100	pCi/g						
Cobalt-60	U	0.0221	+/-0.0348	0.0707	0.0304	+/-0.0362		pCi/g						
Europium-154	U	-0.043	+/-0.118	0.218	0.0956	+/-0.120		pCi/g						
Lead-212		1.22	+/-0.124	0.108	0.0509	+/-0.161		pCi/g						
Lead-214		1.09	+/-0.184	0.140	0.0651	+/-0.205		pCi/g						
Potassium-40		15.7	+/-1.47	0.485	0.193	+/-2.00		pCi/g						
Protactinium-231	UI	0.00	+/-0.553	0.845	0.394	+/-0.562		pCi/g						
Radium-226		0.987	+/-0.172	0.116	0.0522	+/-0.190		pCi/g						
Radium-228		1.11	+/-0.330	0.232	0.102	+/-0.367		pCi/g						
Thallium-208		0.366	+/-0.0709	0.0573	0.0257	+/-0.0769		pCi/g						
Tin-126	UI	0.00	+/-0.118	0.119	0.0565	+/-0.121		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		13.9	+/-4.02	3.99	1.65	+/-4.84	4.00	pCi/g		JXB7	12/17/15	1528	1531243	3
Beta		24.2	+/-3.26	2.65	1.19	+/-4.71	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	12/01/15	1158	1527021

**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: December 28, 2015

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B21.1  
Sample ID: 386431002

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: February 13, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: SN1B21.1  
 Sample ID: 390909004  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 30-NOV-15  
 Collector: Client  
 Moisture: 17.3%

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	-0.11	+/-0.201	0.352	0.167	+/-0.208		pCi/g		MXR1	02/11/16	1413	1543886	1
Antimony-125	U	-0.0384	+/-0.0757	0.137	0.0638	+/-0.0778		pCi/g						
Bismuth-212	UI	0.00	+/-0.665	1.09	0.514	+/-0.997		pCi/g						
Bismuth-214		0.657	+/-0.135	0.119	0.0555	+/-0.146		pCi/g						
Cesium-137		0.0904	+/-0.0789	0.0622	0.0289	+/-0.0792	0.100	pCi/g						
Cobalt-60	U	-0.0121	+/-0.0394	0.0686	0.0307	+/-0.0398		pCi/g						
Europium-154	U	-0.0448	+/-0.111	0.196	0.0883	+/-0.113		pCi/g						
Lead-212		1.12	+/-0.094	0.0809	0.0386	+/-0.142		pCi/g						
Lead-214		0.851	+/-0.132	0.111	0.0525	+/-0.151		pCi/g						
Potassium-40		16.4	+/-1.29	0.513	0.221	+/-1.91		pCi/g						
Protactinium-231	UI	0.00	+/-0.487	0.645	0.305	+/-0.512		pCi/g						
Radium-226		0.657	+/-0.135	0.119	0.0555	+/-0.146		pCi/g						
Radium-228		1.18	+/-0.249	0.240	0.110	+/-0.286		pCi/g						
Thallium-208		0.340	+/-0.0652	0.0574	0.0267	+/-0.0714		pCi/g						
Tin-126	UI	0.00	+/-0.0775	0.0684	0.0329	+/-0.0797		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	KYW2	02/10/16	1449	1543636

**The following Analytical Methods were performed**

Method	Description
1	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

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: February 13, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: SN1B21.1  
Sample ID: 390909004

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 Loscy  
 Project: Soil Radioisotopes

Client Sample ID: SN1B21.2  
 Sample ID: 387031008  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 08-DEC-15  
 Collector: Client  
 Moisture: 17.3%

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		17.3						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	-0.00698	+/-0.0309	0.0806	0.0185	+/-0.0309	1.00	pCi/g		MXS2	12/28/15	1656	1529806	2
Plutonium-239/240	U	-0.0279	+/-0.0351	0.117	0.0369	+/-0.0352	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232		0.0981	+/-0.0947	0.140	0.0524	+/-0.0962	1.00	pCi/g		MXS2	12/28/15	1548	1529801	3
Uranium-233/234		1.03	+/-0.283	0.128	0.0349	+/-0.335	1.00	pCi/g						
Uranium-235/236		0.0927	+/-0.0944	0.0934	0.0175	+/-0.0958	1.00	pCi/g						
Uranium-238		0.962	+/-0.272	0.108	0.0246	+/-0.319	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.113	+/-0.182	0.580	0.172	+/-0.182	1.00	pCi/g		MXS2	12/28/15	1650	1529805	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.35	+/-0.695	0.611	0.187	+/-0.733	1.00	pCi/g		MXS2	12/28/15	1606	1529799	5
Thorium-229	U	-0.0732	+/-0.170	0.503	0.137	+/-0.170	1.00	pCi/g						
Thorium-230		1.28	+/-0.635	0.365	0.0683	+/-0.667	1.00	pCi/g						
Thorium-232		1.01	+/-0.580	0.463	0.118	+/-0.602	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0403	+/-0.0712	0.108	0.0275	+/-0.0715	1.00	pCi/g		MXS2	12/28/15	1636	1529802	6
Curium-242		0.0206	+/-0.058	0.0619	0.00	+/-0.058	1.00	pCi/g						
Curium-243/244	U	-0.0168	+/-0.0389	0.115	0.0314	+/-0.039	1.00	pCi/g						
Curium-245/246	X	0.121	+/-0.105	0.0607	0.00	+/-0.107	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-2.13	+/-6.02	10.5	5.11	+/-6.02	15.0	pCi/g		MXS2	12/31/15	0346	1529807	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.137	+/-0.181	0.295	0.125	+/-0.192	1.00	pCi/g		MJH1	12/30/15	1902	1533084	8
<i>Gammaspac, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0749	+/-0.281	0.555	0.259	+/-0.283		pCi/g		RXF2	01/04/16	1012	1529721	9
Antimony-125	U	0.00335	+/-0.123	0.213	0.0977	+/-0.123		pCi/g						
Bismuth-212		1.10	+/-0.985	1.22	0.550	+/-0.991		pCi/g						
Bismuth-214		1.02	+/-0.191	0.157	0.0711	+/-0.210		pCi/g						
Cesium-137		0.154	+/-0.0686	0.101	0.0464	+/-0.0697	0.100	pCi/g						
Cobalt-60	U	-0.0126	+/-0.0617	0.104	0.0455	+/-0.062		pCi/g						
Europium-154	U	0.106	+/-0.160	0.333	0.148	+/-0.167		pCi/g						
Lead-212		1.26	+/-0.147	0.122	0.0573	+/-0.180		pCi/g						
Lead-214		1.15	+/-0.205	0.159	0.0732	+/-0.228		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: SN1B21.2  
 Sample ID: 387031008

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>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		15.9	+/-1.82	0.800	0.333	+/-2.28		pCi/g						
Protactinium-231	UI	0.00	+/-0.945	0.859	0.393	+/-0.997		pCi/g						
Radium-226		1.02	+/-0.191	0.157	0.0711	+/-0.210		pCi/g						
Radium-228		1.30	+/-0.385	0.329	0.146	+/-0.423		pCi/g						
Thallium-208		0.318	+/-0.0854	0.0783	0.0353	+/-0.0898		pCi/g						
Tin-126	UI	0.00	+/-0.141	0.156	0.0737	+/-0.142		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha		9.71	+/-3.11	3.90	1.73	+/-3.63	4.00	pCi/g		JXB7	01/04/16	0932	1532748	10
Beta		7.04	+/-1.94	2.60	1.22	+/-2.24	10.0	pCi/g						

*GFPC, Sr-90, solid "Dry Weight Corrected"*

Strontium-90	U	0.111	+/-0.869	1.64	0.714	+/-0.869	2.00	pCi/g		KSD1	12/29/15	1420	1532743	11
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### Rad Liquid Scintillation Analysis

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

Tritium	U	-0.0964	+/-2.26	3.97	1.90	+/-2.26	6.00	pCi/g		TXJ1	12/28/15	1355	1531105	12
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*Liquid Scint C14, Solid "Dry Weight Corrected"*

Carbon-14	U	0.387	+/-0.803	1.36	0.668	+/-0.803	2.00	pCi/g		TXJ1	12/24/15	1501	1531115	13
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*Liquid Scint Te99, Solid "Dry Weight Corrected"*

Technetium-99	U	0.696	+/-1.26	2.15	1.03	+/-1.26	5.00	pCi/g		MYM	01/02/16	1444	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	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



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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: SN1B21.2  
Sample ID: 387031008

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.
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14 DOE EML HASL-300, Te-02-RC Modified

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1529806	85	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1529801	74.2	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1529801	93.3	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1529805	95.2	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1529799	94.8	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1529802	79.8	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1529807	85	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1532743	80.3	(25%-125%)
Technetium-99m Tracer		Liquid Scint Te99, Solid "Dry Weight Corrected"	1532556	91.9	(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 Technical Services  
Address : 15 Hazelwood Drive  
Suite 112  
Buffalo, New York 14228  
Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Report Date: February 13, 2016

Client Sample ID: SN1B21.2  
Sample ID: 390909005  
Matrix: Soil  
Collect Date: 19-NOV-15  
Receive Date: 08-DEC-15  
Collector: Client  
Moisture: 17.3%

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	0.0417	+/-0.331	0.608	0.287	+/-0.331		pCi/g		MXR1	02/10/16	0626	1543538	1
Antimony-125	U	-0.0134	+/-0.115	0.216	0.100	+/-0.115		pCi/g						
Bismuth-212	UI	0.00	+/-0.741	1.44	0.670	+/-0.951		pCi/g						
Bismuth-214		0.794	+/-0.192	0.164	0.0756	+/-0.202		pCi/g						
Cesium-137		0.131	+/-0.0609	0.0975	0.0451	+/-0.0618	0.100	pCi/g						
Cobalt-60	U	0.00375	+/-0.0456	0.0887	0.0387	+/-0.0456		pCi/g						
Europium-154	U	0.0285	+/-0.152	0.293	0.131	+/-0.153		pCi/g						
Lead-212		1.18	+/-0.143	0.131	0.0623	+/-0.172		pCi/g						
Lead-214		1.18	+/-0.211	0.367	0.178	+/-0.232		pCi/g						
Potassium-40		17.7	+/-1.71	0.743	0.316	+/-2.28		pCi/g						
Protactinium-231	U	0.388	+/-0.917	1.08	0.509	+/-0.921		pCi/g						
Radium-226		0.794	+/-0.192	0.164	0.0756	+/-0.202		pCi/g						
Radium-228		1.28	+/-0.333	0.281	0.125	+/-0.375		pCi/g						
Thallium-208		0.311	+/-0.097	0.0792	0.0363	+/-0.100		pCi/g						
Tin-126	UI	0.00	+/-0.135	0.150	0.0713	+/-0.138		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	1543525

### 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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## Certificate of Analysis

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

Report Date: February 13, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B21.2  
Sample ID: 390909005

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  
 Suite 112  
 Buffalo, New York 14228

Report Date: March 9, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: S.N.I.B.21.3  
 Sample ID: 392057019  
 Matrix: Soil  
 Collect Date: 19-NOV-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.
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma with Ingrowth "Dry Weight Corrected"</i>														
Actinium-227	U	0.0478	+/-0.266	0.519	0.243	+/-0.267		pCi/g		MXR1	03/07/16	1208	1547922	1
Antimony-125	U	0.00883	+/-0.105	0.197	0.0904	+/-0.105		pCi/g						
Bismuth-212		1.32	+/-0.857	0.795	0.347	+/-0.869		pCi/g						
Bismuth-214		0.866	+/-0.164	0.137	0.0621	+/-0.182		pCi/g						
Cesium-137	U	-0.0128	+/-0.0499	0.0782	0.0354	+/-0.0502	0.100	pCi/g						
Cobalt-60	U	0.00901	+/-0.0461	0.0944	0.0411	+/-0.0463		pCi/g						
Europium-154	U	-0.0573	+/-0.175	0.274	0.121	+/-0.177		pCi/g						
Lead-212		1.03	+/-0.132	0.106	0.0493	+/-0.162		pCi/g						
Lead-214		0.985	+/-0.190	0.317	0.153	+/-0.209		pCi/g						
Potassium-40		16.2	+/-1.72	0.617	0.249	+/-2.21		pCi/g						
Protactinium-231	UI	0.00	+/-0.562	1.06	0.498	+/-0.657		pCi/g						
Radium-226		0.866	+/-0.164	0.137	0.0621	+/-0.182		pCi/g						
Radium-228		0.754	+/-0.298	0.295	0.132	+/-0.321		pCi/g						
Thallium-208		0.315	+/-0.083	0.0774	0.0354	+/-0.0876		pCi/g						
Tin-126	UI	0.00	+/-0.154	0.163	0.0775	+/-0.155		pCi/g						

### Rad Gas Flow Proportional Counting

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

Alpha		14.0	+/-4.45	4.00	1.57	+/-5.27	4.00	pCi/g		BXF1	03/05/16	1618	1549866	2
Beta		23.0	+/-3.80	3.94	1.81	+/-4.98	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	1436	1547873

### 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 9, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: S.N.I.B.21.3  
Sample ID: 392057019

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

Report Date: December 28, 2015

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: SNIB21.4  
 Sample ID: 386431003  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 30-NOV-15  
 Collector: Client  
 Moisture: 15.2%

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		15.2						percent		CXC1	12/01/15	1158	1527021	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.00	+/-0.0275	0.041	0.00	+/-0.0276	1.00	pCi/g		JXR1	12/21/15	0933	1527520	2
Plutonium-239/240	U	0.0251	+/-0.0632	0.114	0.0368	+/-0.0633	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0175	+/-0.0783	0.153	0.0438	+/-0.0784	1.00	pci/g		JXR1	12/21/15	0932	1527510	3
Uranium-233/234		0.600	+/-0.185	0.0689	0.0129	+/-0.212	1.00	pci/g						
Uranium-235/236		0.0865	+/-0.075	0.0432	0.00	+/-0.0765	1.00	pci/g						
Uranium-238		0.701	+/-0.199	0.0689	0.0129	+/-0.233	1.00	pci/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.103	+/-0.166	0.528	0.157	+/-0.166	1.00	pCi/g		JXR1	12/18/15	0923	1527516	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.481	+/-0.384	0.498	0.172	+/-0.391	1.00	pCi/g		JXR1	12/19/15	1025	1527505	5
Thorium-229		0.140	+/-0.226	0.350	0.100	+/-0.227	1.00	pCi/g						
Thorium-230		0.313	+/-0.280	0.304	0.0774	+/-0.283	1.00	pCi/g						
Thorium-232		0.411	+/-0.311	0.303	0.0771	+/-0.316	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	-0.0175	+/-0.0528	0.148	0.0377	+/-0.0529	1.00	pCi/g		JXR1	12/21/15	1250	1527513	6
Curium-242		0.0275	+/-0.0772	0.0824	0.00	+/-0.0774	1.00	pCi/g						
Curium-243/244	U	0.0182	+/-0.0684	0.115	0.0215	+/-0.0685	1.00	pCi/g						
Curium-245/246		0.00	+/-0.056	0.0833	0.00	+/-0.0562	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	4.93	+/-6.58	11.1	5.37	+/-6.66	15.0	pCi/g		JXR1	12/24/15	1507	1527521	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0531	+/-0.146	0.630	0.173	+/-0.148	1.00	pCi/g		MJH1	12/22/15	0633	1528513	8
<i>Gammasp. Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.129	+/-0.252	0.476	0.224	+/-0.259		pCi/g		RXF2	12/24/15	0603	1528387	9
Antimony-125	U	0.0738	+/-0.108	0.176	0.0813	+/-0.113		pCi/g						
Bismuth-212	UJ	0.00	+/-0.484	1.06	0.487	+/-0.571		pCi/g						
Bismuth-214		0.615	+/-0.151	0.114	0.0515	+/-0.160		pCi/g						
Cesium-137	U	0.0329	+/-0.0325	0.0682	0.0309	+/-0.0341	0.100	pCi/g						
Cobalt-60	U	-0.00564	+/-0.0321	0.0624	0.0265	+/-0.0322		pCi/g						
Europium-154	U	-0.0297	+/-0.115	0.216	0.0947	+/-0.116		pCi/g						
Lead-212		0.767	+/-0.119	0.102	0.0481	+/-0.134		pCi/g						
Lead-214		0.748	+/-0.184	0.128	0.0592	+/-0.193		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: SNIB21.4  
 Sample ID: 386431003

Report Date: December 28, 2015

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>Gammaspac, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		12.6	+/-1.34	0.471	0.188	+/-1.74		pCi/g						
Protactinium-231	U	0.0183	+/-0.493	0.884	0.414	+/-0.493		pCi/g						
Radium-226		0.615	+/-0.151	0.114	0.0515	+/-0.160		pCi/g						
Radium-228		0.858	+/-0.229	0.246	0.110	+/-0.254		pCi/g						
Thallium-208		0.267	+/-0.0908	0.0599	0.0271	+/-0.0935		pCi/g						
Tin-126	U	0.018	+/-0.148	0.201	0.0968	+/-0.148		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A-B, solid "Dry Weight Corrected"</i>														
Alpha		14.7	+/-3.91	3.99	1.70	+/-4.82	4.00	pCi/g		JXB7	12/17/15	1528	1531243	10
Beta		22.0	+/-3.08	3.02	1.40	+/-4.40	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	0.457	+/-1.12	1.95	0.912	+/-1.12	2.00	pCi/g		KSD1	12/18/15	1647	1531246	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	1.72	+/-2.25	3.79	1.83	+/-2.25	6.00	pCi/g		TXJ1	12/19/15	1327	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	0.393	+/-0.918	1.56	0.764	+/-0.918	2.00	pCi/g		TXJ1	12/19/15	1001	1529501	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-0.603	+/-1.12	2.16	0.989	+/-1.12	5.00	pCi/g		MYM	12/24/15	1031	1529498	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1158	1527021

**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  
Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes  
Client Sample ID: SN1B21.4  
Sample ID: 386431003

Report Date: December 28, 2015

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"	1527520	82	(15%-125%)										
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	72.2	(15%-125%)										
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	64.2	(15%-125%)										
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1527516	98.9	(15%-125%)										
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1527505	99.3	(15%-125%)										
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1527513	60.1	(15%-125%)										
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1527521	82	(15%-125%)										
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1531246	79.2	(25%-125%)										
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1529498	95.3	(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 Technical Services  
 Address : 15 Hazelwood Drive  
 Suite 112  
 Buffalo, New York 14228

Report Date: February 13, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: SN1B21.4  
 Sample ID: 390909006  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 30-NOV-15  
 Collector: Client  
 Moisture: 16.2%

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	-0.141	+/-0.339	0.536	0.248	+/-0.345		pCi/g		MXR1	02/12/16	0707	1543886	1
Antimony-125	U	-0.0498	+/-0.101	0.188	0.0836	+/-0.103		pCi/g						
Bismuth-212	UI	0.00	+/-0.836	1.49	0.676	+/-1.06		pCi/g						
Bismuth-214	UI	0.00	+/-0.160	0.345	0.164	+/-0.373		pCi/g						
Cesium-137	U	-0.00271	+/-0.0401	0.0776	0.0337	+/-0.0401	0.100	pCi/g						
Cobalt-60	U	0.0256	+/-0.0402	0.0977	0.0405	+/-0.0419		pCi/g						
Europium-154	U	0.0108	+/-0.178	0.359	0.157	+/-0.178		pCi/g						
Lead-212		0.862	+/-0.150	0.130	0.061	+/-0.167		pCi/g						
Lead-214		0.754	+/-0.185	0.332	0.159	+/-0.196		pCi/g						
Potassium-40		13.2	+/-1.77	0.788	0.312	+/-2.11		pCi/g						
Protactinium-231	U	-0.176	+/-0.518	0.934	0.427	+/-0.526		pCi/g						
Radium-226	UI	0.00	+/-0.160	0.345	0.164	+/-0.373		pCi/g						
Radium-228		0.720	+/-0.303	0.354	0.155	+/-0.315		pCi/g						
Thallium-208		0.214	+/-0.102	0.0756	0.0333	+/-0.104		pCi/g						
Tin-126	UI	0.00	+/-0.121	0.156	0.0739	+/-0.122		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	KYW2	02/10/16	1449	1543636

**The following Analytical Methods were performed**

Method	Description
1	DOE HASL 300, 4.5 2.3/Ga-01-R

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: February 13, 2016

Contact: Ms. Laurie Loscy

Project: Soil Radioisotopes

Client Sample ID: SN1B21.4  
Sample ID: 390909006

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

Report Date: December 28, 2015

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: SN1B21.5  
 Sample ID: 386431004  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 30-NOV-15  
 Collector: Client  
 Moisture: 19.4%

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		19.4						percent		CXC1	12/01/15	1158	1527021	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.0105	+/-0.0392	0.066	0.0123	+/-0.0393	1.00	pCi/g		JXR1	12/21/15	0933	1527520	2
Plutonium-239/240	U	-0.00935	+/-0.0423	0.107	0.0326	+/-0.0423	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0118	+/-0.0694	0.165	0.0549	+/-0.0695	1.00	pci/g		JXR1	12/21/15	0932	1527510	3
Uranium-233/234		0.992	+/-0.251	0.0893	0.0205	+/-0.305	1.00	pci/g						
Uranium-235/236	U	0.0123	+/-0.0461	0.0776	0.0145	+/-0.0462	1.00	pci/g						
Uranium-238		1.03	+/-0.258	0.113	0.0324	+/-0.313	1.00	pci/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237		0.00	+/-0.166	0.248	0.00	+/-0.167	1.00	pCi/g		JXR1	12/18/15	0923	1527516	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.609	+/-0.532	0.683	0.221	+/-0.544	1.00	pCi/g		JXR1	12/19/15	1025	1527505	5
Thorium-229	U	0.00313	+/-0.232	0.515	0.140	+/-0.232	1.00	pCi/g						
Thorium-230		0.705	+/-0.514	0.514	0.140	+/-0.527	1.00	pCi/g						
Thorium-232		1.32	+/-0.648	0.233	0.00	+/-0.686	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0713	+/-0.0814	0.101	0.0257	+/-0.082	1.00	pCi/g		JXR1	12/22/15	1039	1527513	6
Curium-242	U	-0.0045	+/-0.0391	0.0905	0.0169	+/-0.0392	1.00	pCi/g						
Curium-243/244		0.0337	+/-0.0667	0.108	0.0294	+/-0.0669	1.00	pCi/g						
Curium-245/246	X	0.0571	+/-0.0752	0.0571	0.00	+/-0.0756	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241		9.40	+/-7.40	12.3	5.93	+/-7.65	15.0	pCi/g		JXR1	12/24/15	1553	1527521	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.325	+/-0.695	1.31	0.596	+/-0.710	1.00	pCi/g		MJH1	12/22/15	0645	1528513	8
<i>Gammaspect, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.00754	+/-0.289	0.489	0.229	+/-0.289		pCi/g		RXF2	12/24/15	0603	1528387	9
Antimony-125	U	-0.0519	+/-0.0991	0.175	0.0802	+/-0.102		pCi/g						
Bismuth-212	UI	0.00	+/-0.977	0.925	0.416	+/-0.979		pCi/g						
Bismuth-214		0.781	+/-0.177	0.155	0.0715	+/-0.189		pCi/g						
Cesium-137		0.0748	+/-0.0657	0.068	0.0306	+/-0.066	0.100	pCi/g						
Cobalt-60	U	-0.0444	+/-0.0365	0.0553	0.0223	+/-0.0418		pCi/g						
Europium-154	U	-0.0701	+/-0.157	0.235	0.103	+/-0.161		pCi/g						
Lead-212		1.10	+/-0.127	0.112	0.0528	+/-0.157		pCi/g						
Lead-214		1.17	+/-0.186	0.336	0.163	+/-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: SN1B21.5  
 Sample ID: 386431004

Report Date: December 28, 2015

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		16.2	+/-1.58	0.722	0.308	+/-2.13		pCi/g						
Protactinium-231	U	0.00	+/-0.728	0.919	0.429	+/-0.756		pCi/g						
Radium-226		0.781	+/-0.177	0.155	0.0715	+/-0.189		pCi/g						
Radium-228		0.985	+/-0.278	0.236	0.103	+/-0.314		pCi/g						
Thallium-208		0.334	+/-0.0852	0.0685	0.0311	+/-0.0898		pCi/g						
Tin-126	U	0.00	+/-0.106	0.142	0.0676	+/-0.109		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		22.0	+/-4.85	3.91	1.63	+/-6.80	4.00	pCi/g		JXB7	12/17/15	1526	1531243	10
Beta		26.0	+/-3.13	2.34	1.05	+/-4.82	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	0.013	+/-0.910	1.74	0.762	+/-0.910	2.00	pCi/g		KSD1	12/18/15	1648	1531246	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium		2.84	+/-2.35	3.89	1.88	+/-2.35	6.00	pCi/g		TXJ1	12/19/15	1500	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	0.632	+/-0.935	1.58	0.774	+/-0.936	2.00	pCi/g		TXJ1	12/19/15	1104	1529501	13
<i>Liquid Scint Te99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-1.06	+/-1.65	3.16	1.46	+/-1.65	5.00	pCi/g		MYM	12/24/15	1049	1529498	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1158	1527021

**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: December 28, 2015

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B21.5  
Sample ID: 386431004

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	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"	1527520	75.8	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	70.7	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	80.1	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1527516	83.1	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1527505	62.1	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1527513	65.2	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1527521	75.8	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1531246	78.2	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1529498	93.6	(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 Technical Services  
 Address : 15 Hazelwood Drive  
 Suite 112  
 Buffalo, New York 14228

Report Date: February 13, 2016

Contact: Ms. Lauric Losey  
 Project: Soil Radioisotopes

Client Sample ID: SN1B21.5  
 Sample ID: 390909007  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 30-NOV-15  
 Collector: Client  
 Moisture: 17.2%

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	0.117	+/-0.307	0.586	0.275	+/-0.312		pCi/g		MXR1	02/12/16	0710	1543886	1
Antimony-125	U	-0.0542	+/-0.110	0.191	0.0868	+/-0.113		pCi/g						
Bismuth-212	UI	0.00	+/-0.781	1.29	0.593	+/-0.869		pCi/g						
Bismuth-214		0.749	+/-0.172	0.158	0.0722	+/-0.185		pCi/g						
Cesium-137	UI	0.00	+/-0.0525	0.110	0.0513	+/-0.0735	0.100	pCi/g						
Cobalt-60	U	-0.0238	+/-0.0591	0.0899	0.0387	+/-0.0601		pCi/g						
Europium-154	U	0.0208	+/-0.141	0.280	0.123	+/-0.141		pCi/g						
Lead-212		1.00	+/-0.134	0.128	0.0604	+/-0.163		pCi/g						
Lead-214		0.768	+/-0.179	0.156	0.072	+/-0.192		pCi/g						
Potassium-40		16.8	+/-1.68	0.753	0.315	+/-2.21		pCi/g						
Protactinium-231	UI	0.00	+/-1.10	1.03	0.477	+/-1.11		pCi/g						
Radium-226		0.749	+/-0.172	0.158	0.0722	+/-0.185		pCi/g						
Radium-228		1.15	+/-0.296	0.275	0.121	+/-0.346		pCi/g						
Thallium-208		0.278	+/-0.0742	0.0682	0.0306	+/-0.0783		pCi/g						
Tin-126	UI	0.00	+/-0.161	0.169	0.0803	+/-0.163		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	KYW2	02/10/16	1449	1543636

**The following Analytical Methods were performed**

Method	Description
1	DOE HASL 300, 4 5.2.3/Ga-01-R

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: February 13, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B21.5  
Sample ID: 390909007

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mid.	
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 Corporation  
 Address : 15 Hazelwood Drive  
 Suite 112  
 Buffalo, New York 14228  
 Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Report Date: December 29, 2015

Client Sample ID: SN1B21.6  
 Sample ID: 386555001  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 02-DEC-15  
 Collector: Client  
 Moisture: 16.2%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lo	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		16.2						percent		CXC1	12/02/15	1419	1527878	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	-0.0322	+/-0.0405	0.135	0.0425	+/-0.0405	1.00	pCi/g		JXR1	12/21/15	0933	1527520	2
Plutonium-239/240	U	0.00536	+/-0.061	0.130	0.0398	+/-0.0611	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.00522	+/-0.0595	0.126	0.0387	+/-0.0596	1.00	pCi/g		JXR1	12/21/15	0932	1527510	3
Uranium-233/234		0.880	+/-0.243	0.103	0.0262	+/-0.286	1.00	pCi/g						
Uranium-235/236		0.182	+/-0.115	0.081	0.0152	+/-0.119	1.00	pCi/g						
Uranium-238		0.830	+/-0.236	0.103	0.0262	+/-0.276	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237		0.0755	+/-0.212	0.226	0.00	+/-0.212	1.00	pCi/g		JXR1	12/18/15	0923	1527516	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.39	+/-0.600	0.482	0.153	+/-0.636	1.00	pCi/g		JXR1	12/19/15	1025	1527505	5
Thorium-229	U	-0.0274	+/-0.121	0.316	0.0724	+/-0.121	1.00	pCi/g						
Thorium-230		0.899	+/-0.478	0.399	0.114	+/-0.495	1.00	pCi/g						
Thorium-232		0.837	+/-0.446	0.272	0.0509	+/-0.463	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.050	+/-0.0994	0.161	0.044	+/-0.0998	1.00	pCi/g		JXR1	12/21/15	1251	1527513	6
Curium-242		0.00	+/-0.0559	0.0832	0.00	+/-0.0561	1.00	pCi/g						
Curium-243/244	U	0.0184	+/-0.069	0.116	0.0217	+/-0.0691	1.00	pCi/g						
Curium-245/246		0.00	+/-0.0565	0.0841	0.00	+/-0.0567	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	1.64	+/-7.48	12.9	6.22	+/-7.48	15.0	pCi/g		JXR1	12/24/15	1811	1527521	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma 1129, Solid "Dry Weight Corrected"</i>														
Iodine-129	UI	0.00	+/-0.452	1.02	0.449	+/-0.504	1.00	pCi/g		MJH1	12/22/15	0646	1528513	8
<i>Gammaspect, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0873	+/-0.241	0.446	0.210	+/-0.244		pCi/g		RXF2	12/24/15	0605	1528387	9
Antimony-125	U	0.0471	+/-0.0868	0.169	0.0785	+/-0.0894		pCi/g						
Bismuth-212	UI	0.00	+/-0.594	1.11	0.516	+/-0.657		pCi/g						
Bismuth-214		0.810	+/-0.138	0.120	0.0551	+/-0.153		pCi/g						
Cesium-137		0.0732	+/-0.0361	0.0643	0.0293	+/-0.0366	0.100	pCi/g						
Cobalt-60	UI	0.00	+/-0.0357	0.0788	0.0351	+/-0.0394		pCi/g						
Europium-154	U	-0.0159	+/-0.0995	0.162	0.0694	+/-0.0997		pCi/g						
Lead-212		1.13	+/-0.122	0.0902	0.0424	+/-0.161		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: SN1B21.6  
 Sample ID: 386555001

Report Date: December 29, 2015

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Lead-214		1.02	+/-0.142	0.291	0.141	+/-0.166		pCi/g						
Potassium-40		14.3	+/-1.33	0.386	0.150	+/-1.83		pCi/g						
Protactinium-231	U	0.00	+/-1.29	0.774	0.361	+/-1.32		pCi/g						
Radium-226		0.810	+/-0.138	0.120	0.0551	+/-0.153		pCi/g						
Radium-228		0.947	+/-0.248	0.259	0.117	+/-0.282		pCi/g						
Thallium-208		0.301	+/-0.0652	0.0651	0.030	+/-0.0697		pCi/g						
Tin-126	U	0.00	+/-0.127	0.109	0.052	+/-0.129		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A B, solid "Dry Weight Corrected"</i>														
Alpha		18.5	+/-4.60	3.92	1.59	+/-5.82	4.00	pCi/g		JXB7	12/17/15	1527	1531243	10
Beta		22.4	+/-3.10	2.81	1.28	+/-4.44	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.822	+/-0.805	1.75	0.777	+/-0.805	2.00	pCi/g		KSD1	12/18/15	1648	1531246	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	1.32	+/-2.30	3.92	1.89	+/-2.30	6.00	pCi/g		TXJ1	12/22/15	1044	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14		0.908	+/-0.937	1.57	0.771	+/-0.939	2.00	pCi/g		TXJ1	12/19/15	1412	1529501	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	0.260	+/-1.60	2.88	1.32	+/-1.60	5.00	pCi/g		MYM	12/24/15	1141	1529498	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/02/15	1419	1527878

**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

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## Certificate of Analysis

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

Report Date: December 29, 2015

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B21.6  
Sample ID: 386555001

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
13	EPA EERF C-01 Modified													
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"	1527520	71.3	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	74.1	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	92.4	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1527516	89.6	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1527505	93.8	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1527513	58.2	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1527521	71.3	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1531246	77.1	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1529498	95.3	(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  
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 Buffalo, New York 14228  
 Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Report Date: December 29, 2015

Client Sample ID: SN1B21.6  
 Sample ID: 386555001  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 02-DEC-15  
 Collector: Client  
 Moisture: 16.2%

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		16.2						percent	CXC1		12/02/15	1419	1527878	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	-0.0322	+/-0.0405	0.135	0.0425	+/-0.0405	1.00	pCi/g	JXR1		12/21/15	0933	1527520	2
Plutonium-239/240	U	0.00536	+/-0.061	0.130	0.0398	+/-0.0611	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.00522	+/-0.0595	0.126	0.0387	+/-0.0596	1.00	pCi/g	JXR1		12/21/15	0932	1527510	3
Uranium-233/234		0.880	+/-0.243	0.103	0.0262	+/-0.286	1.00	pCi/g						
Uranium-235/236		0.182	+/-0.115	0.081	0.0152	+/-0.119	1.00	pCi/g						
Uranium-238		0.830	+/-0.236	0.103	0.0262	+/-0.276	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237		0.0755	+/-0.212	0.226	0.00	+/-0.212	1.00	pCi/g	JXR1		12/18/15	0923	1527516	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.39	+/-0.600	0.482	0.153	+/-0.636	1.00	pCi/g	JXR1		12/19/15	1025	1527505	5
Thorium-229	U	-0.0274	+/-0.121	0.316	0.0724	+/-0.121	1.00	pCi/g						
Thorium-230		0.899	+/-0.478	0.399	0.114	+/-0.495	1.00	pCi/g						
Thorium-232		0.837	+/-0.446	0.272	0.0509	+/-0.463	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.050	+/-0.0994	0.161	0.044	+/-0.0998	1.00	pCi/g	JXR1		12/21/15	1251	1527513	6
Curium-242		0.00	+/-0.0559	0.0832	0.00	+/-0.0561	1.00	pCi/g						
Curium-243/244	U	0.0184	+/-0.069	0.116	0.0217	+/-0.0691	1.00	pCi/g						
Curium-245/246		0.00	+/-0.0565	0.0841	0.00	+/-0.0567	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	1.64	+/-7.48	12.9	6.22	+/-7.48	15.0	pCi/g	JXR1		12/24/15	1811	1527521	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	UI	0.00	+/-0.452	1.02	0.449	+/-0.504	1.00	pCi/g	MJB1		12/22/15	0646	1528513	8
<i>Gamma spec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0873	+/-0.241	0.446	0.210	+/-0.244		pCi/g	RXF2		12/24/15	0605	1528387	9
Antimony-125	U	0.0471	+/-0.0868	0.169	0.0785	+/-0.0894		pCi/g						
Bismuth-212	UI	0.00	+/-0.594	1.11	0.516	+/-0.657		pCi/g						
Bismuth-214		0.810	+/-0.138	0.120	0.0551	+/-0.153		pCi/g						
Cesium-137		0.0732	+/-0.0361	0.0643	0.0293	+/-0.0366	0.100	pCi/g						
Cobalt-60	UI	0.00	+/-0.0357	0.0788	0.0351	+/-0.0394		pCi/g						
Europium-154	U	-0.0159	+/-0.0995	0.162	0.0694	+/-0.0997		pCi/g						
Lead-212		1.13	+/-0.122	0.0902	0.0424	+/-0.161		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: SN1B21.6  
 Sample ID: 386555001

Report Date: December 29, 2015

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>														
Lead-214		1.02	+/-0.142	0.291	0.141	+/-0.166		pCi/g						
Potassium-40		14.3	+/-1.33	0.386	0.150	+/-1.83		pCi/g						
Protactinium-231	U1	0.00	+/-1.29	0.774	0.361	+/-1.32		pCi/g						
Radium-226		0.810	+/-0.138	0.120	0.0551	+/-0.153		pCi/g						
Radium-228		0.947	+/-0.248	0.259	0.117	+/-0.282		pCi/g						
Thallium-208		0.301	+/-0.0652	0.0651	0.030	+/-0.0697		pCi/g						
Tm-126	U1	0.00	+/-0.127	0.109	0.052	+/-0.129		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		18.5	+/-4.60	3.92	1.59	+/-5.82	4.00	pCi/g		JXB7	12/17/15	1527	1531243	10
Beta		22.4	+/-3.10	2.81	1.28	+/-4.44	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Sr-90	U	-0.822	+/-0.805	1.75	0.777	+/-0.805	2.00	pCi/g		KSD1	12/18/15	1648	1531246	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	1.32	+/-2.30	3.92	1.89	+/-2.30	6.00	pCi/g		TXJ1	12/22/15	1044	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14		0.908	+/-0.937	1.57	0.771	+/-0.939	2.00	pCi/g		TXJ1	12/19/15	1412	1529501	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	0.260	+/-1.60	2.88	1.32	+/-1.60	5.00	pCi/g		MYM	12/24/15	1141	1529498	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXCI	12/02/15	1419	1527878

**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

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## Certificate of Analysis

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

Report Date: December 29, 2015

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B21.6  
Sample ID: 386555001

Project: MJWC00115  
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
13	EPA EERF C-01 Modified													
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"	1527520	71.3	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	74.1	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	92.4	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1527516	89.6	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1527505	93.8	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1527513	58.2	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1527521	71.3	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1531246	77.1	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"	1529498	95.3	(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 Technical Services  
 Address : 15 Hazelwood Drive  
 Suite 112  
 Buffalo, New York 14228

Report Date: February 13, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: SN1B21.6  
 Sample ID: 390909008  
 Matrix: Soil  
 Collect Date: 19-NOV-15  
 Receive Date: 02-DEC-15  
 Collector: Client  
 Moisture: 16.4%

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	0.025	+/-0.218	0.426	0.199	+/-0.218		pCi/g		MXR1	02/12/16	0750	1543886	1
Antimony-125	U	0.0122	+/-0.088	0.168	0.0771	+/-0.0882		pCi/g						
Bismuth-212	UI	0.00	+/-0.789	1.40	0.656	+/-1.17		pCi/g						
Bismuth-214		0.752	+/-0.158	0.130	0.0591	+/-0.170		pCi/g						
Cesium-137		0.0973	+/-0.0546	0.0698	0.0316	+/-0.0552	0.100	pCi/g						
Cobalt-60	U	-0.00753	+/-0.0345	0.066	0.0279	+/-0.0347		pCi/g						
Europium-154	U	0.0407	+/-0.112	0.208	0.090	+/-0.113		pCi/g						
Lead-212		1.12	+/-0.122	0.098	0.0461	+/-0.194		pCi/g						
Lead-214		1.01	+/-0.179	0.126	0.058	+/-0.204		pCi/g						
Potassium-40		15.7	+/-1.48	0.408	0.153	+/-2.04		pCi/g						
Protactinium-231	UI	0.00	+/-0.654	0.756	0.350	+/-0.699		pCi/g						
Radium-226		0.752	+/-0.158	0.130	0.0591	+/-0.170		pCi/g						
Radium-228		1.13	+/-0.290	0.254	0.113	+/-0.339		pCi/g						
Thallium-208		0.232	+/-0.0898	0.0658	0.0299	+/-0.0919		pCi/g						
Tin-126	UI	0.00	+/-0.0921	0.105	0.0502	+/-0.0941		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	KYW2	02/10/16	1449	1543636

**The following Analytical Methods were performed**

Method	Description
1	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 Technical Services  
Address : 15 Hazelwood Drive  
Suite 112  
Buffalo, New York 14228

Report Date: February 13, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: SN1B21.6  
Sample ID: 390909008

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).