

# 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 15, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 5.1B.R.1.1  
 Sample ID: 387769015  
 Matrix: Soil  
 Collect Date: 14-DEC-15  
 Receive Date: 17-DEC-15  
 Collector: Client  
 Moisture: 22.8%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		22.8						percent	1.YT1		12/18/15	1142	1532297	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.130	+/-0.227	0.457	0.214	+/-0.235		pCi/g		RXF2	01/12/16	0907	1532304	2
Antimony-125	U	-0.061	+/-0.0827	0.145	0.0659	+/-0.0873		pCi/g						
Bismuth-212	UI	0.00	+/-0.661	1.02	0.469	+/-0.801		pCi/g						
Bismuth-214		0.761	+/-0.157	0.116	0.0526	+/-0.170		pCi/g						
Cesium-137		0.465	+/-0.0788	0.071	0.0323	+/-0.0883	0.100	pCi/g						
Cobalt-60	U	-0.0208	+/-0.0362	0.0626	0.0265	+/-0.0374		pCi/g						
Europium-154	U	-0.0501	+/-0.103	0.182	0.0779	+/-0.106		pCi/g						
Lead-212		0.583	+/-0.127	0.128	0.0609	+/-0.138		pCi/g						
Lead-214		1.01	+/-0.186	0.143	0.0664	+/-0.206		pCi/g						
Potassium-40		10.5	+/-1.24	0.558	0.231	+/-1.54		pCi/g						
Protactinium-231	U	0.348	+/-0.477	0.935	0.438	+/-0.508		pCi/g						
Radium-226		0.761	+/-0.157	0.116	0.0526	+/-0.170		pCi/g						
Radium-228		0.629	+/-0.303	0.234	0.104	+/-0.318		pCi/g						
Thallium-208		0.207	+/-0.0602	0.0504	0.0223	+/-0.0628		pCi/g						
Tin-126	U	0.0685	+/-0.125	0.143	0.0686	+/-0.129		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A.B. solid "Dry Weight Corrected"</i>														
Alpha		10.5	+/-3.89	3.62	1.34	+/-4.37	4.00	pCi/g		JXB7	01/07/16	1509	1534688	3
Beta		18.3	+/-3.37	3.32	1.48	+/-4.19	10.0	pCi/g						

**Solid Preparation**

*Laboratory Composite "As Received"*

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYTI	12/18/15	1142	1532297

**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
4	GEL Prep Method

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Project: Soil Radioisotopes  
Client Sample ID: 5.1B.R.1.1  
Sample ID: 387769015

Report Date: January 15, 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).

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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: S.I.B.R.1.2  
 Sample ID: 392062021  
 Matrix: Soil  
 Collect Date: 14-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 16.8%

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	0.145	+/-0.229	0.455	0.214	+/-0.239		pCi/g		MXR1	03/07/16	1040	1547792	1
Antimony-125	U	-0.0077	+/-0.0871	0.160	0.0736	+/-0.0871		pCi/g						
Bismuth-212	UI	0.00	+/-0.498	0.993	0.456	+/-0.734		pCi/g						
Bismuth-214		0.739	+/-0.132	0.108	0.0486	+/-0.146		pCi/g						
Cesium-137		0.0646	+/-0.0487	0.0602	0.0272	+/-0.049	0.100	pCi/g						
Cobalt-60	UI	0.00	+/-0.0463	0.0897	0.0402	+/-0.050		pCi/g						
Europium-154	U	-0.0502	+/-0.109	0.198	0.0865	+/-0.111		pCi/g						
Lead-212		0.640	+/-0.126	0.104	0.0493	+/-0.141		pCi/g						
Lead-214		0.886	+/-0.180	0.134	0.0626	+/-0.196		pCi/g						
Potassium-40		10.3	+/-1.15	0.504	0.206	+/-1.47		pCi/g						
Protactinium-231	UI	0.00	+/-0.647	0.684	0.315	+/-0.675		pCi/g						
Radium-226		0.739	+/-0.132	0.108	0.0486	+/-0.146		pCi/g						
Radium-228		0.701	+/-0.228	0.151	0.0631	+/-0.250		pCi/g						
Thallium-208		0.181	+/-0.0705	0.0547	0.0247	+/-0.0721		pCi/g						
Tin-126	UI	0.00	+/-0.0878	0.0962	0.0456	+/-0.0899		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		8.15	+/-3.17	3.88	1.64	+/-3.55	4.00	pCi/g		JXB7	03/03/16	1504	1548366	2
Beta		14.1	+/-2.81	3.34	1.56	+/-3.55	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	02/25/16	1513	1547785

**The following Analytical Methods were performed**

Method	Description
1	DOE HASL 300, 4.5 2 3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

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Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 5.1.B.R.1.2

Sample ID: 392062021

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:

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Report Date: January 15, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Project: MJWC00115  
 Client ID: MJWC001

Client Sample ID: 5.1B.R.2.1  
 Sample ID: 387769016  
 Matrix: Soil  
 Collect Date: 14-DEC-15  
 Receive Date: 17-DEC-15  
 Collector: Client  
 Moisture: 20.2%

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		20.2						percent		LYT1	12/18/15	1142	1532297	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0404	+/-0.216	0.424	0.198	+/-0.216		pCi/g		RNF2	01/12/16	0907	1532304	2
Antimony-125	U	-0.0207	+/-0.0826	0.153	0.0699	+/-0.0832		pCi/g						
Bismuth-212	UI	0.00	+/-0.712	0.989	0.452	+/-0.842		pCi/g						
Bismuth-214		0.764	+/-0.176	0.115	0.0522	+/-0.187		pCi/g						
Cesium-137		0.290	+/-0.0989	0.0549	0.0243	+/-0.102	0.100	pCi/g						
Cobalt-60	U	0.00959	+/-0.0366	0.0703	0.0304	+/-0.0369		pCi/g						
Europtium-154	U	-0.0853	+/-0.117	0.178	0.0758	+/-0.123		pCi/g						
Lead-212		0.789	+/-0.105	0.0855	0.0399	+/-0.123		pCi/g						
Lead-214		0.971	+/-0.168	0.115	0.0527	+/-0.185		pCi/g						
Potassium-40		9.12	+/-1.19	0.684	0.294	+/-1.45		pCi/g						
Protactinium-231	UI	0.00	+/-0.591	0.686	0.315	+/-0.614		pCi/g						
Radium-226		0.764	+/-0.176	0.115	0.0522	+/-0.187		pCi/g						
Radium-228		0.572	+/-0.245	0.215	0.0942	+/-0.257		pCi/g						
Thallium-208		0.207	+/-0.0672	0.0624	0.0283	+/-0.0693		pCi/g						
Tin-126	UI	0.00	+/-0.126	0.112	0.0532	+/-0.128		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		12.1	+/-3.98	3.52	1.33	+/-4.59	4.00	pCi/g		JXB7	01/07/16	1509	1534688	3
Beta		15.5	+/-3.03	3.04	1.36	+/-3.67	10.0	pCi/g						

**Solid Preparation**

*Laboratory Composite "As Received"*

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/18/15	1142	1532297

**The following Analytical Methods were performed**

Method	Description
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Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 5.1B.R.2.1  
Sample ID: 387769016

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).