

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: January 7, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 4.4B.R.1.1  
 Sample ID: 387409005  
 Matrix: Soil  
 Collect Date: 25-NOV-15  
 Receive Date: 10-DEC-15  
 Collector: Client  
 Moisture: 26%

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		26.0						percent		LYT1	12/14/15	1204	1530767	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.113	+/-0.291	0.563	0.265	+/-0.296		pCi/g		RXF2	01/06/16	0645	1530779	2
Antimony-125	U	0.0538	+/-0.107	0.187	0.0861	+/-0.110		pCi/g						
Bismuth-212		1.38	+/-0.701	0.841	0.372	+/-0.714		pCi/g						
Bismuth-214		0.936	+/-0.168	0.139	0.063	+/-0.185		pCi/g						
Cesium-137		0.670	+/-0.105	0.0727	0.0328	+/-0.118	0.100	pCi/g						
Cobalt-60	U	-0.00425	+/-0.0405	0.0783	0.0337	+/-0.0405		pCi/g						
Europium-154	UI	0.00	+/-0.126	0.228	0.099	+/-0.139		pCi/g						
Lead-212		1.05	+/-0.123	0.107	0.0502	+/-0.152		pCi/g						
Lead-214		0.987	+/-0.209	0.141	0.0654	+/-0.224		pCi/g						
Potassium-40		13.5	+/-1.52	0.461	0.175	+/-1.92		pCi/g						
Protactinium-231	UI	0.00	+/-0.775	0.896	0.416	+/-0.790		pCi/g						
Radium-226		0.936	+/-0.168	0.139	0.063	+/-0.185		pCi/g						
Radium-228		0.979	+/-0.355	0.269	0.119	+/-0.382		pCi/g						
Thallium-208		0.285	+/-0.0924	0.0686	0.0311	+/-0.0953		pCi/g						
Tin-126	UI	0.00	+/-0.121	0.122	0.0578	+/-0.123		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A-B, solid "Dry Weight Corrected"</i>														
Alpha		14.5	+/-4.11	3.98	1.64	+/-4.95	4.00	pCi/g		KXB2	01/04/16	0902	1532751	3
Beta		21.7	+/-3.14	2.82	1.28	+/-4.35	10.0	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/14/15	1204	1530767

**The following Analytical Methods were performed**

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4.5.2 3/Ga-01-R
3	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Project: Soil Radioisotopes

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Sample ID: 387409005

Project: MJWC00115  
Client ID: MJWC001

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

### Notes:

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

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Report Date: January 8, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

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 Matrix: Soil  
 Collect Date: 25-NOV-15  
 Receive Date: 10-DEC-15  
 Collector: Client  
 Moisture: 26%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		26.0						percent		LYT1	12/14/15	1204	1530767	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammaspac, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.113	+/-0.291	0.563	0.265	+/-0.296		pCi/g		RXF2	01/06/16	0645	1530779	2
Antimony-125	U	0.0538	+/-0.107	0.187	0.0861	+/-0.110		pCi/g						
Bismuth-212		1.38	+/-0.701	0.841	0.372	+/-0.714		pCi/g						
Bismuth-214		0.936	+/-0.168	0.139	0.063	+/-0.185		pCi/g						
Cesium-137		0.670	+/-0.105	0.0727	0.0328	+/-0.118	0.100	pCi/g						
Cobalt-60	U	-0.00425	+/-0.0405	0.0783	0.0337	+/-0.0405		pCi/g						
Europium-154	UI	0.00	+/-0.126	0.228	0.099	+/-0.139		pCi/g						
Lead-212		1.05	+/-0.123	0.107	0.0502	+/-0.152		pCi/g						
Lead-214		0.987	+/-0.209	0.141	0.0654	+/-0.224		pCi/g						
Potassium-40		13.5	+/-1.52	0.461	0.175	+/-1.92		pCi/g						
Protactinium-231	UI	0.00	+/-0.775	0.896	0.416	+/-0.790		pCi/g						
Radium-226		0.936	+/-0.168	0.139	0.063	+/-0.185		pCi/g						
Radium-228		0.979	+/-0.355	0.269	0.119	+/-0.382		pCi/g						
Thallium-208		0.285	+/-0.0924	0.0686	0.0311	+/-0.0953		pCi/g						
Tin-126	UI	0.00	+/-0.121	0.122	0.0578	+/-0.123		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		14.5	+/-4.11	3.98	1.64	+/-4.95	4.00	pCi/g		KXB2	01/04/16	0902	1532751	3
Beta		21.7	+/-3.14	2.82	1.28	+/-4.35	10.0	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/14/15	1204	1530767

**The following Analytical Methods were performed**

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4 5 2 3/Ga-01-R
3	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

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Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 4.4B.R.1.1  
Sample ID: 387409005

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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 Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes  
 Client Sample ID: 4.4B.R.1.2  
 Sample ID: 387409006  
 Matrix: Soil  
 Collect Date: 25-NOV-15  
 Receive Date: 10-DEC-15  
 Collector: Client  
 Moisture: 19.9%

Report Date: January 7, 2016

Project: MJWC00115  
 Client ID: MJWC001

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

*ASTM D 2216 % Moisture "As Received"*

Moisture		19.9						percent		LYT1	12/14/15	1204	1530767	1
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**Rad Gamma Spec Analysis**

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

Actinium-227	U	-0.0724	+/-0.259	0.467	0.220	+/-0.262		pCi/g		RXF2	01/06/16	0646	1530779	2
Antimony-125	U	-0.0223	+/-0.0908	0.170	0.0784	+/-0.0914		pCi/g						
Bismuth-212	UI	0.00	+/-0.888	1.25	0.583	+/-1.09		pCi/g						
Bismuth-214		0.781	+/-0.142	0.148	0.0687	+/-0.155		pCi/g						
Cesium-137		0.426	+/-0.0898	0.0593	0.0265	+/-0.096	0.100	pCi/g						
Cobalt-60	U	0.000632	+/-0.0362	0.0708	0.0307	+/-0.0362		pCi/g						
Europium-154	U	-0.0188	+/-0.114	0.214	0.0941	+/-0.114		pCi/g						
Lead-212		1.01	+/-0.124	0.109	0.0517	+/-0.153		pCi/g						
Lead-214		1.09	+/-0.189	0.122	0.0566	+/-0.209		pCi/g						
Potassium-40		12.9	+/-1.37	0.686	0.296	+/-1.78		pCi/g						
Protactinium-231	UI	0.00	+/-0.695	0.846	0.396	+/-0.736		pCi/g						
Radium-226		0.781	+/-0.142	0.148	0.0687	+/-0.155		pCi/g						
Radium-228		0.969	+/-0.281	0.293	0.133	+/-0.311		pCi/g						
Thallium-208		0.295	+/-0.0759	0.0596	0.027	+/-0.0796		pCi/g						
Tin-126	UI	0.00	+/-0.112	0.117	0.0557	+/-0.115		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		8.75	+/-3.36	4.00	1.67	+/-3.77	4.00	pCi/g		KXB2	01/04/16	0903	1532751	3
Beta		21.3	+/-3.05	2.44	1.08	+/-4.28	10.0	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/14/15	1204	1530767

**The following Analytical Methods were performed**

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300.4.5.2.3/Ga-01-R
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Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Client Sample ID: 4.4B.R.1.2  
Sample ID: 387409006

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				

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<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		19.9						percent		LY11	12/14/15	1204	1530767	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0724	+/-0.259	0.467	0.220	+/-0.262		pCi/g		RXF2	01/06/16	0646	1530779	2
Antimony-125	U	-0.0223	+/-0.0908	0.170	0.0784	+/-0.0914		pCi/g						
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Lead-212		1.01	+/-0.124	0.109	0.0517	+/-0.153		pCi/g						
Lead-214		1.09	+/-0.189	0.122	0.0566	+/-0.209		pCi/g						
Potassium-40		12.9	+/-1.37	0.686	0.296	+/-1.78		pCi/g						
Protactinium-231	UI	0.00	+/-0.695	0.846	0.396	+/-0.736		pCi/g						
Radium-226		0.781	+/-0.142	0.148	0.0687	+/-0.155		pCi/g						
Radium-228		0.969	+/-0.281	0.293	0.133	+/-0.311		pCi/g						
Thallium-208		0.295	+/-0.0759	0.0596	0.027	+/-0.0796		pCi/g						
Tin-126	UI	0.00	+/-0.112	0.117	0.0557	+/-0.115		pCi/g						
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<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
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2	DOE HASL 300, 4 5 2 3/Ga-01-R
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Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

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