

Appendix G – Area Certificates of Analysis

Appendix G –
Area 1 – COA

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: December 4, 2015

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

Client Sample ID: 1.1.C1
Sample ID: 385101005
Matrix: Soil
Collect Date: 22-OCT-15 10:05
Receive Date: 05-NOV-15
Collector: Client
Moisture: 32%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Gravimetric Solids

ASTM D 2216 % Moisture "As Received"

Moisture		32.0				percent		LYT1	11/10/15	0955	1521927	1
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	-0.598	+/-0.511	0.703		pCi/g		RXF2	12/03/15	0825	1522386	2
Antimony-125	U	0.143	+/-0.176	0.346		pCi/g						
Cesium-137		3.64	+/-0.256	0.108	0.100	pCi/g						
Cobalt-60	U	0.011	+/-0.0535	0.112		pCi/g						
Europium-154	U	0.0401	+/-0.155	0.316		pCi/g						
Protactinium-231	U	-0.936	+/-0.826	1.27		pCi/g						
Radium-226		0.740	+/-0.216	0.200		pCi/g						
Radium-228		0.777	+/-0.275	0.308		pCi/g						
Tin-126	U	0.0572	+/-0.174	0.191		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		12.6	+/-3.93	3.89	4.00	pCi/g		JXB7	12/02/15	1412	1525768	3
Beta		25.5	+/-3.89	3.57	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	11/10/15	0955	1521927

The following Analytical Methods were performed:

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

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 1.2.C1
Sample ID: 385101006
Matrix: Soil
Collect Date: 22-OCT-15 10:55
Receive Date: 05-NOV-15
Collector: Client
Moisture: 24%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		24.0				percent		LYT1	11/10/15	0955	1521927	1
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	-0.0837	+/-0.370	0.680		pCi/g		RXF2	12/03/15	0826	1522386	2
Antimony-125	U	0.0215	+/-0.151	0.281		pCi/g						
Cesium-137		2.52	+/-0.198	0.102	0.100	pCi/g						
Cobalt-60	U	0.0114	+/-0.0405	0.0856		pCi/g						
Europium-154	U	-0.0436	+/-0.133	0.245		pCi/g						
Protactinium-231	U	0.537	+/-0.730	1.32		pCi/g						
Radium-226		0.909	+/-0.223	0.201		pCi/g						
Radium-228		0.595	+/-0.287	0.350		pCi/g						
Tin-126	U	-0.0136	+/-0.166	0.262		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, solid "Dry Weight Corrected"												
Alpha		7.52	+/-3.29	3.92	4.00	pCi/g		JXB7	12/02/15	1412	1525768	3
Beta		24.5	+/-3.81	3.69	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	11/10/15	0955	1521927

The following Analytical Methods were performed:

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

Notes:

Counting Uncertainty is 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 17, 2015

Client Sample ID: 1.1.C1
Sample ID: 385101005
Matrix: Soil
Collect Date: 22-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 32%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		32.0						percent		LYT1	11/10/15	0955	1521927	1
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.598	+/-0.511	0.703	0.328	+/-0.585		pCi/g		RXF2	12/03/15	0825	1522386	2
Antimony-125	U	0.143	+/-0.176	0.346	0.162	+/-0.188		pCi/g						
Bismuth-212	U	0.236	+/-0.678	1.33	0.592	+/-0.687		pCi/g						
Bismuth-214		0.740	+/-0.216	0.200	0.0906	+/-0.226		pCi/g						
Cesium-137		3.64	+/-0.256	0.108	0.049	+/-0.416	0.100	pCi/g						
Cobalt-60	U	0.011	+/-0.0535	0.112	0.0476	+/-0.0538		pCi/g						
Europium-154	U	0.0401	+/-0.155	0.316	0.135	+/-0.156		pCi/g						
Lead-212		0.615	+/-0.142	0.155	0.0724	+/-0.152		pCi/g						
Lead-214		0.910	+/-0.196	0.403	0.193	+/-0.212		pCi/g						
Potassium-40		10.4	+/-1.92	0.958	0.396	+/-2.12		pCi/g						
Protactinium-231	U	-0.936	+/-0.826	1.27	0.589	+/-0.952		pCi/g						
Radium-226		0.740	+/-0.216	0.200	0.0906	+/-0.226		pCi/g						
Radium-228		0.777	+/-0.275	0.308	0.132	+/-0.300		pCi/g						
Thallium-208		0.121	+/-0.102	0.0968	0.0436	+/-0.102		pCi/g						
Tin-126	U	0.0572	+/-0.174	0.191	0.0904	+/-0.175		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A.B. solid "Dry Weight Corrected"</i>														
Alpha		12.6	+/-3.93	3.89	1.57	+/-4.62	4.00	pCi/g		JXB7	12/02/15	1412	1525768	3
Beta		25.5	+/-3.89	3.57	1.61	+/-5.31	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	11/10/15	0955	1521927

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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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 1.1.C1
Sample ID: 385101005

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	1c	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test													

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
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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: January 20, 2016

Client Sample ID: 1.1.C.2
Sample ID: 388092001
Matrix: Soil
Collect Date: 22-OCT-15
Receive Date: 23-DEC-15
Collector: Client
Moisture: 17.8%

Project: MJWC00115
Client ID: MJWC001

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

ASTM D 2216 % Moisture "As Received"

Moisture		17.8						percent		LYT1	12/24/15	0703	1533555	1
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Rad Gamma Spec Analysis

GammaSpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	0.039	+/-0.193	0.355	0.169	+/-0.194		pCi/g		MJH1	12/29/15	1154	1533562	2
Antimony-125	U	-0.0086	+/-0.072	0.134	0.0626	+/-0.0721		pCi/g						
Bismuth-212	UI	0.00	+/-0.409	0.824	0.385	+/-0.471		pCi/g						
Bismuth-214		0.599	+/-0.112	0.0966	0.0448	+/-0.123		pCi/g						
Cesium-137		0.182	+/-0.0431	0.0264	0.0112	+/-0.0458	0.100	pCi/g						
Cobalt-60	U	-0.00744	+/-0.0317	0.0575	0.0256	+/-0.0319		pCi/g						
Europium-154	U	0.0456	+/-0.0908	0.180	0.0813	+/-0.0932		pCi/g						
Lead-212		0.522	+/-0.104	0.106	0.0513	+/-0.113		pCi/g						
Lead-214		0.878	+/-0.146	0.106	0.0498	+/-0.164		pCi/g						
Potassium-40		9.80	+/-1.00	0.601	0.269	+/-1.30		pCi/g						
Protactinium-231	U	0.00	+/-0.561	0.599	0.281	+/-0.592		pCi/g						
Radium-226		0.599	+/-0.112	0.0966	0.0448	+/-0.123		pCi/g						
Radium-228		0.663	+/-0.230	0.169	0.0759	+/-0.250		pCi/g						
Thallium-208		0.248	+/-0.0628	0.0465	0.0215	+/-0.0663		pCi/g						
Tin-126	U	0.0313	+/-0.0955	0.130	0.063	+/-0.0964		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		9.22	+/-1.49	1.62	0.748	+/-2.31	4.00	pCi/g		JXB7	01/11/16	1859	1534760	3
Beta		14.3	+/-1.24	1.28	0.614	+/-2.34	10.0	pCi/g						

The following Prep Methods were performed

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

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

Report Date: January 20, 2016

Client Sample ID: 1.1.C.2
Sample ID: 388092001

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test													

Notes:

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

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

Report Date: January 20, 2016

Client Sample ID: 1.1.C.2
Sample ID: 388092011
Matrix: Soil
Collect Date: 22-OCT-15
Receive Date: 23-DEC-15
Collector: Client
Moisture: 17.8%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
GammaSpec, Gamma, Solid "Dry Weight Corrected"														
Actinium-227	U	0.189	+/-0.366	0.420	0.196	+/-0.377		pCi/g		MJH	01/18/16	0627	1534020	I
Antimony-125	U	0.00955	+/-0.0883	0.168	0.0769	+/-0.0884		pCi/g						
Bismuth-212	UI	0.00	+/-1.04	1.31	0.607	+/-1.25		pCi/g						
Bismuth-214		0.814	+/-0.159	0.119	0.0536	+/-0.173		pCi/g						
Cesium-137		0.150	+/-0.0613	0.0615	0.0274	+/-0.0625	0.100	pCi/g						
Cobalt-60	U	0.00777	+/-0.0336	0.0701	0.0298	+/-0.0338		pCi/g						
Europium-154	U	-0.00312	+/-0.113	0.220	0.0958	+/-0.113		pCi/g						
Lead-212		0.646	+/-0.119	0.0981	0.0461	+/-0.148		pCi/g						
Lead-214		0.946	+/-0.168	0.296	0.143	+/-0.191		pCi/g						
Potassium-40		9.18	+/-1.34	0.726	0.312	+/-1.57		pCi/g						
Protactinium-231	UI	0.00	+/-0.454	0.626	0.284	+/-0.473		pCi/g						
Radium-226		0.814	+/-0.159	0.119	0.0536	+/-0.173		pCi/g						
Radium-228		0.685	+/-0.271	0.223	0.0972	+/-0.291		pCi/g						
Thallium-208		0.191	+/-0.0609	0.0636	0.0288	+/-0.063		pCi/g						
Tin-126	UI	0.00	+/-0.0805	0.0794	0.0375	+/-0.0823		pCi/g						

The following Prep Methods were performed

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

The following Analytical Methods were performed

Method	Description
I	DOE HASL 300, 4.5.2 3/Ga-01-R

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

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

Report Date: January 20, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: L1.C.2
Sample ID: 388092011

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test													

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 17, 2015

Client Sample ID: 1.2.C1
Sample ID: 385101006
Matrix: Soil
Collect Date: 22-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 24%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
ASTM D 2216 % Moisture "As Received"														
Moisture		24.0						percent		LYT1	11/10/15	0955	1521927	1
Rad Gamma Spec Analysis														
Gammascpec, Gamma, Solid "Dry Weight Corrected"														
Actinium-227	U	-0.0837	+/-0.370	0.680	0.322	+/-0.373		pCi/g		RXF2	12/03/15	0826	1522386	2
Antimony-125	U	0.0215	+/-0.151	0.281	0.131	+/-0.151		pCi/g						
Bismuth-212	U	0.529	+/-0.674	1.36	0.619	+/-0.717		pCi/g						
Bismuth-214		0.909	+/-0.223	0.201	0.0931	+/-0.236		pCi/g						
Cesium-137		2.52	+/-0.198	0.102	0.0465	+/-0.286	0.100	pCi/g						
Cobalt-60	U	0.0114	+/-0.0405	0.0856	0.0363	+/-0.0409		pCi/g						
Europium-154	U	-0.0436	+/-0.133	0.245	0.105	+/-0.134		pCi/g						
Lead-212		0.621	+/-0.130	0.153	0.0727	+/-0.139		pCi/g						
Lead-214		0.926	+/-0.244	0.205	0.0963	+/-0.255		pCi/g						
Potassium-40		11.7	+/-1.50	0.645	0.257	+/-1.82		pCi/g						
Protactinium-231	U	0.537	+/-0.730	1.32	0.621	+/-0.778		pCi/g						
Radium-226		0.909	+/-0.223	0.201	0.0931	+/-0.236		pCi/g						
Radium-228		0.595	+/-0.287	0.350	0.157	+/-0.298		pCi/g						
Thallium-208		0.246	+/-0.090	0.0946	0.0434	+/-0.0924		pCi/g						
Tin-126	U	-0.0136	+/-0.166	0.262	0.126	+/-0.166		pCi/g						
Rad Gas Flow Proportional Counting														
GFPC, Gross A-B, solid "Dry Weight Corrected"														
Alpha		7.52	+/-3.29	3.92	1.59	+/-3.63	4.00	pCi/g		JXB7	12/02/15	1412	1525768	3
Beta		24.5	+/-3.81	3.69	1.68	+/-5.27	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	11/10/15	0955	1521927

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

Certificate of Analysis

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

Report Date: December 17, 2015

Client Sample ID: 1.2.C1
Sample ID: 385101006

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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: January 20, 2016

Client Sample ID: 1.2.C.2
Sample ID: 388092002
Matrix: Soil
Collect Date: 22-OCT-15
Receive Date: 23-DEC-15
Collector: Client
Moisture: 15.8%

Project: MJWC00115
Client ID: MJWC001

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

ASTM D 2216 % Moisture "As Received"

Moisture		15.8						percent		LYT1	12/24/15	0703	1533555	1
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	0.035	+/-0.176	0.343	0.163	+/-0.177		pCi/g		MJH1	12/29/15	1154	1533562	2
Antimony-125	U	0.033	+/-0.0658	0.128	0.0601	+/-0.0675		pCi/g						
Bismuth-212	U	0.00	+/-0.523	0.852	0.400	+/-0.843		pCi/g						
Bismuth-214		0.605	+/-0.126	0.0912	0.0422	+/-0.136		pCi/g						
Cesium-137		0.139	+/-0.0437	0.051	0.0236	+/-0.0452	0.100	pCi/g						
Cobalt-60	U	0.0124	+/-0.030	0.0606	0.0273	+/-0.0305		pCi/g						
Europium-154	U	0.0494	+/-0.128	0.180	0.0818	+/-0.130		pCi/g						
Lead-212		0.715	+/-0.132	0.0806	0.0385	+/-0.146		pCi/g						
Lead-214		0.812	+/-0.114	0.200	0.0972	+/-0.133		pCi/g						
Potassium-40		13.0	+/-1.06	0.348	0.144	+/-1.53		pCi/g						
Protactinium-231	U	0.00	+/-0.388	0.530	0.248	+/-0.431		pCi/g						
Radium-226		0.605	+/-0.126	0.0912	0.0422	+/-0.136		pCi/g						
Radium-228		0.456	+/-0.233	0.159	0.0711	+/-0.240		pCi/g						
Thallium-208		0.226	+/-0.0531	0.0445	0.0205	+/-0.0563		pCi/g						
Tin-126	UI	0.00	+/-0.107	0.129	0.0625	+/-0.107		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		6.53	+/-1.68	2.29	1.08	+/-2.09	4.00	pCi/g		JXB7	01/11/16	1859	1534760	3
Beta		17.0	+/-1.45	1.69	0.818	+/-2.77	10.0	pCi/g						

The following Prep Methods were performed

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

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4.5.2 3/Ga-01-R
3	EPA 900 0/SW846 9310/SM 7110B Modified

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

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

Certificate of Analysis

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

Report Date: January 20, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: I.2.C.2
Sample ID: 388092002

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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: January 20, 2016

Client Sample ID: 1.2.C.2
Sample ID: 388092012
Matrix: Soil
Collect Date: 22-OCT-15
Receive Date: 23-DEC-15
Collector: Client
Moisture: 15.8%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.017	+/-0.253	0.495	0.231	+/-0.253		pCi/g		MJH	01/18/16	0627	1534020	1
Antimony-125	U	0.00	+/-0.0944	0.200	0.092	+/-0.106		pCi/g						
Bismuth-212	U	0.557	+/-0.587	1.22	0.562	+/-0.641		pCi/g						
Bismuth-214		0.730	+/-0.170	0.131	0.059	+/-0.183		pCi/g						
Cesium-137		0.143	+/-0.0636	0.0815	0.0372	+/-0.0649	0.100	pCi/g						
Cobalt-60	U	-0.00831	+/-0.0387	0.0741	0.0313	+/-0.0389		pCi/g						
Europium-154	U	-0.0202	+/-0.147	0.276	0.123	+/-0.147		pCi/g						
Lead-212		0.892	+/-0.126	0.117	0.0554	+/-0.148		pCi/g						
Lead-214		1.03	+/-0.209	0.131	0.060	+/-0.228		pCi/g						
Potassium-40		14.7	+/-1.52	0.670	0.279	+/-1.97		pCi/g						
Protactinium-231	U	-0.189	+/-0.521	0.843	0.389	+/-0.529		pCi/g						
Radium-226		0.730	+/-0.170	0.131	0.059	+/-0.183		pCi/g						
Radium-228		0.932	+/-0.262	0.295	0.132	+/-0.298		pCi/g						
Thallium-208		0.185	+/-0.080	0.0679	0.0307	+/-0.0817		pCi/g						
Th-126	U	0.0471	+/-0.140	0.161	0.0768	+/-0.141		pCi/g						

The following Prep Methods were performed

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

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4 S 2 3/Ga-01-R

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

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

Report Date: January 20, 2016

Client Sample ID: 1.2.C.2
Sample ID: 388092012

Project: MJWC00115
Client ID: MJWC001

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

Notes:

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

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Certificate of Analysis

Report Date: December 4, 2015

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

Client Sample ID: 1.3.C1
Sample ID: 385101007
Matrix: Soil
Collect Date: 21-OCT-15 09:35
Receive Date: 05-NOV-15
Collector: Client
Moisture: 39.2%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Gravimetric Solids

ASTM D 2216 % Moisture "As Received"

Moisture		39.2				percent		LYT1	11/10/15	0955	1521927	1
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Rad Gamma Spec Analysis

GammaSpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	-0.0109	+/-0.316	0.586		pCi/g		RXF2	12/03/15	0826	1522386	2
Antimony-125	U	0.156	+/-0.152	0.314		pCi/g						
Cesium-137		0.406	+/-0.144	0.109	0.100	pCi/g						
Cobalt-60	U	0.0075	+/-0.0663	0.136		pCi/g						
Europium-154	U	0.165	+/-0.187	0.429		pCi/g						
Protactinium-231	U	0.635	+/-0.752	1.33		pCi/g						
Radium-226		0.802	+/-0.242	0.194		pCi/g						
Radium-228		1.03	+/-0.402	0.434		pCi/g						
Tin-126	U1	0.00	+/-0.0942	0.106		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		7.84	+/-3.45	3.97	4.00	pCi/g		JXB7	12/02/15	1420	1525768	3
Beta		25.6	+/-3.77	3.05	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	11/10/15	0955	1521927

The following Analytical Methods were performed:

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

Notes:

Counting Uncertainty is 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 17, 2015

Client Sample ID: 1.3.C1
Sample ID: 385101007
Matrix: Soil
Collect Date: 21-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 39.2%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		39.2						percent		LYT1	11/10/15	0955	1521927	1
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0109	+/-0.316	0.586	0.270	+/-0.316		pCi/g		RXF2	12/03/15	0826	1522386	2
Antimony-125	UI	0.00	+/-0.152	0.314	0.145	+/-0.168		pCi/g						
Bismuth-212	UI	0.00	+/-1.08	2.21	1.01	+/-1.24		pCi/g						
Bismuth-214		0.802	+/-0.242	0.194	0.0856	+/-0.251		pCi/g						
Cesium-137		0.406	+/-0.144	0.109	0.0478	+/-0.148	0.100	pCi/g						
Cobalt-60	U	0.0075	+/-0.0663	0.136	0.0569	+/-0.0664		pCi/g						
Europium-154	U	0.165	+/-0.187	0.429	0.184	+/-0.202		pCi/g						
Lead-210		3.71	+/-0.987	0.993	0.467	+/-1.04	4.00	pCi/g						
Lead-212		0.879	+/-0.137	0.156	0.0733	+/-0.168		pCi/g						
Lead-214		0.930	+/-0.237	0.222	0.103	+/-0.251		pCi/g						
Potassium-40		14.3	+/-2.24	0.904	0.340	+/-2.58		pCi/g						
Protactinium-231	UI	0.00	+/-0.752	1.33	0.620	+/-0.817		pCi/g						
Radium-226		0.802	+/-0.242	0.194	0.0856	+/-0.251		pCi/g						
Radium-228		1.03	+/-0.402	0.434	0.187	+/-0.423		pCi/g						
Thallium-208		0.369	+/-0.107	0.104	0.0465	+/-0.111		pCi/g						
Tin-126	UI	0.00	+/-0.0942	0.106	0.0501	+/-0.0958		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		7.84	+/-3.45	3.97	1.60	+/-3.81	4.00	pCi/g		JXB7	12/02/15	1420	1525768	3
Beta		25.6	+/-3.77	3.05	1.35	+/-5.21	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	11/10/15	0955	1521927

The following Analytical Methods were performed

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

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

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

Report Date: December 17, 2015

Client Sample ID: 13.C1
Sample ID: 385101007

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: January 20, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 13.C.2
Sample ID: 388092013
Matrix: Soil
Collect Date: 21-OCT-15
Receive Date: 23-DEC-15
Collector: Client
Moisture: 21.6%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	1c	TPC	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.166	+/-0.311	0.595	0.280	+/-0.321		pCi/g						
Antimony-125	U	-0.0396	+/-0.116	0.203	0.0928	+/-0.118		pCi/g						
Bismuth-212	UI	0.00	+/-1.07	1.59	0.742	+/-1.68		pCi/g						
Bismuth-214		1.08	+/-0.170	0.152	0.0689	+/-0.192		pCi/g						
Cesium-137		0.482	+/-0.0947	0.0637	0.0279	+/-0.102	0.100	pCi/g						
Cobalt-60	U	0.0129	+/-0.0444	0.0907	0.0393	+/-0.0448		pCi/g						
Europium-154	U	0.0122	+/-0.138	0.268	0.118	+/-0.138		pCi/g						
Lead-212		1.07	+/-0.138	0.126	0.0594	+/-0.162		pCi/g						
Lead-214		1.31	+/-0.211	0.388	0.188	+/-0.234		pCi/g						
Potassium-40		14.2	+/-1.72	0.877	0.379	+/-2.15		pCi/g						
Protactinium-231	UI	0.00	+/-0.623	1.05	0.490	+/-0.632		pCi/g						
Radium-226		1.08	+/-0.170	0.152	0.0689	+/-0.192		pCi/g						
Radium-228		1.02	+/-0.272	0.309	0.138	+/-0.306		pCi/g						
Thallium-208		0.360	+/-0.0938	0.0771	0.035	+/-0.0985		pCi/g						
Tin-126	UI	0.00	+/-0.130	0.209	0.101	+/-0.131		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	LYTI	12/24/15	0703	1533924

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

GEL LABORATORIES LLC

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Certificate of Analysis

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

Report Date: January 20, 2016

Client Sample ID: 1.3.C.2
Sample ID: 388092013

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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: January 20, 2016

Client Sample ID: 13.C.2
Sample ID: 388092003
Matrix: Soil
Collect Date: 21-OCT-15
Receive Date: 23-DEC-15
Collector: Client
Moisture: 21.6%

Project: MJWC00115
Client ID: MJWC001

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

ASTM D 2216 % Moisture "As Received"

Moisture		21.6						percent		LYT1	12/24/15	0703	1533555	1
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Rad Gamma Spec Analysis

GammaSpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	-0.0784	+/-0.231	0.413	0.196	+/-0.234		pCi/g		MJH1	12/29/15	1154	1533562	2
Antimony-125	U	0.0254	+/-0.0997	0.166	0.0782	+/-0.100		pCi/g						
Bismuth-212		1.39	+/-0.700	0.852	0.394	+/-0.713		pCi/g						
Bismuth-214		0.678	+/-0.122	0.114	0.0531	+/-0.134		pCi/g						
Cesium-137		0.405	+/-0.0678	0.0658	0.0306	+/-0.0752	0.100	pCi/g						
Cobalt-60	U	0.0136	+/-0.0426	0.0739	0.0332	+/-0.043		pCi/g						
Europium-154	U	-0.0175	+/-0.121	0.217	0.0982	+/-0.121		pCi/g						
Lead-212		-1.06	+/-0.104	0.0882	0.042	+/-0.140		pCi/g						
Lead-214		0.776	+/-0.142	0.129	0.0612	+/-0.157		pCi/g						
Potassium-40		15.2	+/-1.34	0.547	0.236	+/-1.87		pCi/g						
Protactinium-231	U	0.00	+/-0.728	0.769	0.364	+/-0.762		pCi/g						
Radium-226		0.678	+/-0.122	0.114	0.0531	+/-0.134		pCi/g						
Radium-228		1.03	+/-0.216	0.215	0.0974	+/-0.260		pCi/g						
Thallium-208		0.286	+/-0.0695	0.0568	0.0263	+/-0.0735		pCi/g						
Tin-126	U	0.00	+/-0.113	0.111	0.0534	+/-0.115		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		11.1	+/-2.15	2.78	1.31	+/-3.06	4.00	pCi/g		JXB7	01/11/16	1859	1534760	3
Beta		21.2	+/-1.80	2.19	1.06	+/-3.53	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	12/24/15	0703	1533555

The following Analytical Methods were performed

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

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

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

Report Date: January 20, 2016

Client Sample ID: 13.C.2
Sample ID: 388092003

Project: MJWC00115
Client ID: MJWC001

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

Notes:

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

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Certificate of Analysis

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 1.3.C5
Sample ID: 385101008
Matrix: Soil
Collect Date: 21-OCT-15 09:40
Receive Date: 05-NOV-15
Collector: Client
Moisture: 39.7%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		39.7				percent		LYT1	11/10/15	0955	1521927	1
Rad Alpha Spec Analysis												
ASP Plutonium Isotopic, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0042	+/-0.0363	0.084	1.00	pCi/g		HAKB	11/23/15	1502	1522577	2
Plutonium-239/240	U	0.0147	+/-0.0734	0.147	1.00	pCi/g						
ASP Uranium Isotopic, Solid "Dry Weight Corrected"												
Uranium-232	U	0.0644	+/-0.127	0.225	1.00	pci/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.656	+/-0.320	0.261	1.00	pci/g						
Uranium-235/236	U	0.0709	+/-0.121	0.106	1.00	pci/g						
Uranium-238		0.954	+/-0.367	0.106	1.00	pci/g						
Alphaspec Np237, Solid "Dry Weight Corrected"												
Neptunium-237	U	-0.146	+/-0.252	0.714	1.00	pCi/g		HAKB	11/23/15	1711	1522576	4
Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"												
Thorium-228		1.40	+/-0.595	0.449	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229	U	-0.0406	+/-0.122	0.344	1.00	pCi/g						
Thorium-230		0.803	+/-0.444	0.343	1.00	pCi/g						
Thorium-232		0.616	+/-0.381	0.168	1.00	pCi/g						
Am241, Cm Solid "Dry Weight Corrected"												
Americium-241	U	0.0173	+/-0.0393	0.110	1.00	pCi/g		HAKB	11/24/15	1039	1522571	6
Curium-242	U	-0.00457	+/-0.0394	0.0913	1.00	pCi/g						
Curium-243/244	U	-0.0119	+/-0.0359	0.101	1.00	pCi/g						
Curium-245/246	U	0.0382	+/-0.0654	0.0573	1.00	pCi/g						
Liquid Scint Pu241, Solid "Dry Weight Corrected"												
Plutonium-241	U	-1.82	+/-5.80	10.1	15.0	pCi/g		HAKB	11/25/15	1739	1522578	7
Rad Gamma Spec Analysis												
Gamma 1129, Solid "Dry Weight Corrected"												
Iodine-129	U	0.130	+/-0.576	0.928	1.00	pCi/g		MJH1	12/02/15	1805	1522374	8
Gamma spec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	0.181	+/-0.293	0.568		pCi/g		RXF2	12/03/15	0827	1522386	9
Antimony-125	U	0.0603	+/-0.109	0.213		pCi/g						
Cesium-137		0.481	+/-0.110	0.0796	0.100	pCi/g						
Cobalt-60	U	-0.00427	+/-0.0412	0.0788		pCi/g						
Europium-154	U	-0.0118	+/-0.149	0.277		pCi/g						
Protactinium-231	U	0.0888	+/-0.620	1.03		pCi/g						

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Certificate of Analysis

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 1.3.C5
Sample ID: 385101008

Project: MJWC00115
Client ID: MJWC001

Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Radium-226	0.803	+/-0.169	0.156	pCi/g
Radium-228	0.665	+/-0.382	0.300	pCi/g
Tin-126	0.00	+/-0.163	0.130	pCi/g

Rad Gas Flow Proportional Counting

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

Alpha	9.43	+/-3.61	3.99	4.00	pCi/g	JXB7	12/02/15	1422	1525768	10
Beta	27.0	+/-3.46	2.52	10.0	pCi/g					

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.321	+/-0.889	1.76	2.00	pCi/g	KSD1	12/02/15	1710	1525755	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U	2.71	+/-2.71	4.45	6.00	pCi/g	TXJ1	12/02/15	1944	1522724	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U	-0.459	+/-0.768	1.32	2.00	pCi/g	TXJ1	12/04/15	0357	1522716	13
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Liquid Scint Te99, Solid "Dry Weight Corrected"

Technetium-99	U	1.57	+/-2.00	3.38	5.00	pCi/g	MYM1	11/29/15	1349	1522715	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	LYT1	11/10/15	0955	1521927

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Company : MJW Corporation
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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 1.3.C5

Sample ID: 385101008

Project: MJWC00115

Client ID: MJWC001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 2216 (Modified)	
2	DOE EML HASL-300, Pu-11-RC Modified	
3	DOE EML HASL-300, U-02-RC Modified	
4	ASTM C 1476-00 Modified	
5	DOE EML HASL-300, Th-01-RC Modified	
6	DOE EML HASL-300, Am-05-RC Modified	
7	DOE EML HASL-300, Pu-11-RC Modified	
8	DOE EML HASL-300, I-01 Modified	
9	DOE HASL 300, 4 5 2.3/Ga-01-R	
10	EPA 900 0/SW846 9310/SM 7110B Modified	
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified	
12	EPA 906.0 Modified	
13	EPA EERF C-01 Modified	
14	DOE EML HASL-300, Te-02-RC Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			84.5	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			42	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			64.9	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			86.2	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			89.2	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			88.3	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			84.5	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			86.7	(25%-125%)
Technetium-99m Tracer	Liquid Scint Te99, Solid "Dry Weight Corrected"			94.5	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Corporation
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Report Date: December 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 1.3.C5
Sample ID: 385101008
Matrix: Soil
Collect Date: 21-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 39.7%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		39.7						percent		LYT1	11/10/15	0955	1521927	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	-0.0042	+/-0.0363	0.084	0.0157	+/-0.0363	1.00	pCi/g		HAKB	11/23/15	1502	1522577	2
Plutonium-239/240	U	0.0147	+/-0.0734	0.147	0.0471	+/-0.0734	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0644	+/-0.127	0.225	0.0853	+/-0.128	1.00	pci/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.656	+/-0.320	0.261	0.0777	+/-0.355	1.00	pci/g						
Uranium-235/236		0.0709	+/-0.121	0.106	0.00	+/-0.123	1.00	pci/g						
Uranium-238		0.954	+/-0.367	0.106	0.00	+/-0.429	1.00	pci/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.146	+/-0.252	0.714	0.241	+/-0.252	1.00	pCi/g		HAKB	11/23/15	1711	1522576	4
<i>Alphaspec Th229 + 228.230.232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.40	+/-0.595	0.449	0.138	+/-0.631	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229	U	-0.0406	+/-0.122	0.344	0.0876	+/-0.123	1.00	pCi/g						
Thorium-230		0.803	+/-0.444	0.343	0.0874	+/-0.459	1.00	pCi/g						
Thorium-232		0.616	+/-0.381	0.168	0.00	+/-0.392	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0173	+/-0.0593	0.110	0.0299	+/-0.0593	1.00	pCi/g		HAKB	11/24/15	1039	1522571	6
Curium-242	U	-0.00457	+/-0.0394	0.0913	0.0171	+/-0.0395	1.00	pCi/g						
Curium-243/244	U	-0.0119	+/-0.0359	0.101	0.0256	+/-0.0359	1.00	pCi/g						
Curium-245/246		0.0382	+/-0.0654	0.0573	0.00	+/-0.0656	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-1.82	+/-5.80	10.1	4.92	+/-5.80	15.0	pCi/g		HAKB	11/25/15	1739	1522578	7
Rad Gamma Spec Analysis														
<i>Gamma 1129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.130	+/-0.576	0.928	0.428	+/-0.576	1.00	pCi/g		MJH1	12/02/15	1805	1522374	8
<i>Gamma spec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.181	+/-0.293	0.568	0.265	+/-0.305		pCi/g		RXF2	12/03/15	0827	1522386	9
Antimony-125	U	0.0603	+/-0.109	0.213	0.0971	+/-0.112		pCi/g						
Bismuth-212		1.39	+/-0.906	1.12	0.499	+/-0.916		pCi/g						
Bismuth-214		0.803	+/-0.169	0.156	0.0704	+/-0.181		pCi/g						
Cesium-137		0.481	+/-0.110	0.0796	0.0354	+/-0.117	0.100	pCi/g						
Cobalt-60	U	-0.00427	+/-0.0412	0.0788	0.0327	+/-0.0412		pCi/g						
Europium-154	U	-0.0118	+/-0.149	0.277	0.120	+/-0.149		pCi/g						
Lead-212		0.928	+/-0.127	0.112	0.0522	+/-0.148		pCi/g						
Lead-214		1.08	+/-0.188	0.384	0.185	+/-0.206		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

Report Date: December 17, 2015

Client Sample ID: 1.3.C5
Sample ID: 385101008

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		14.2	+/-1.66	0.807	0.336	+/-2.10		pCi/g						
Protactinium-231	U	0.0888	+/-0.620	1.03	0.475	+/-0.621		pCi/g						
Radium-226		0.803	+/-0.169	0.156	0.0704	+/-0.181		pCi/g						
Radium-228		0.665	+/-0.382	0.300	0.132	+/-0.393		pCi/g						
Thallium-208		0.354	+/-0.0817	0.0704	0.0312	+/-0.0867		pCi/g						
Tin-126	UI	0.00	+/-0.163	0.130	0.0612	+/-0.165		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		9.43	+/-3.61	3.99	1.61	+/-4.06	4.00	pCi/g		JXB7	12/02/15	1422	1525768	10
Beta		27.0	+/-3.46	2.52	1.12	+/-5.28	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.321	+/-0.889	1.76	0.783	+/-0.889	2.00	pCi/g		KSD1	12/02/15	1710	1525755	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium		2.71	+/-2.71	4.45	1.93	+/-2.71	6.00	pCi/g		TXJ1	12/02/15	1944	1522724	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.459	+/-0.768	1.32	0.651	+/-0.768	2.00	pCi/g		TXJ1	12/04/15	0357	1522716	13
<i>Liquid Scint Te99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	1.57	+/-2.00	3.38	1.63	+/-2.01	5.00	pCi/g		MYM	11/29/15	1349	1522715	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	11/10/15	0955	1521927

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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Report Date: December 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 1.3.C5
Sample ID: 385101008

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.
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14 DOF 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"	1522577	84.5	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	42	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	64.9	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1522576	86.2	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1522579	89.2	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1522571	88.3	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1522578	84.5	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1525755	86.7	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1522715	94.5	(15%-125%)

Notes:

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

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Certificate of Analysis

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 13.C6
Sample ID: 385101009
Matrix: Soil
Collect Date: 21-OCT-15 09:55
Receive Date: 05-NOV-15
Collector: Client
Moisture: 23.6%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		23.6				percent		LYT1	11/10/15	0955	1521927	1
Rad Alpha Spec Analysis												
ASP Plutonium Isotopic, Solid "Dry Weight Corrected"												
Plutonium-238	U	0.00979	+/-0.0544	0.104	1.00	pCi/g		HAKB	11/23/15	1502	1522577	2
Plutonium-239/240	U	0.00677	+/-0.0799	0.168	1.00	pCi/g						
ASP Uranium Isotopic, Solid "Dry Weight Corrected"												
Uranium-232	U	0.0473	+/-0.121	0.222	1.00	pCi/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.799	+/-0.301	0.214	1.00	pCi/g						
Uranium-235/236	U	0.0469	+/-0.0921	0.128	1.00	pCi/g						
Uranium-238		1.14	+/-0.345	0.0796	1.00	pCi/g						
Alphaspec Np237, Solid "Dry Weight Corrected"												
Neptunium-237	U	-0.0342	+/-0.236	0.575	1.00	pCi/g		HAKB	11/23/15	1711	1522576	4
Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"												
Thorium-228		0.984	+/-0.482	0.395	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229	U	0.131	+/-0.207	0.287	1.00	pCi/g						
Thorium-230		1.16	+/-0.498	0.286	1.00	pCi/g						
Thorium-232		0.979	+/-0.452	0.155	1.00	pCi/g						
Am241, Cm Solid "Dry Weight Corrected"												
Americium-241	U	0.0315	+/-0.062	0.0859	1.00	pCi/g		HAKB	11/24/15	1039	1522571	6
Curium-242	U	0.00	+/-0.0412	0.0613	1.00	pCi/g						
Curium-243/244	U	0.00921	+/-0.0512	0.0981	1.00	pCi/g						
Curium-245/246	U	0.0361	+/-0.0709	0.0983	1.00	pCi/g						
Liquid Scint Pu241, Solid "Dry Weight Corrected"												
Plutonium-241	U	-2.07	+/-6.40	11.2	15.0	pCi/g		HAKB	11/25/15	1840	1522578	7
Rad Gamma Spec Analysis												
Gamma 129, Solid "Dry Weight Corrected"												
Iodine-129	U	0.214	+/-0.383	0.769	1.00	pCi/g		MJH1	12/02/15	1806	1522374	8
Gamma spec, Gamma. Solid "Dry Weight Corrected"												
Actinium-227	U	-0.478	+/-0.464	0.775		pCi/g		RXF2	12/03/15	0828	1522386	9
Antimony-125	U	0.0263	+/-0.202	0.369		pCi/g						
Cesium-137		0.357	+/-0.122	0.178	0.100	pCi/g						
Cobalt-60	U	-0.0195	+/-0.0816	0.153		pCi/g						
Europium-154	U	-0.00356	+/-0.241	0.468		pCi/g						
Protactinium-231	U	0.801	+/-0.980	1.81		pCi/g						

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Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 13.C6
Sample ID: 385101009

Project: MJWC00115
Client ID: MJWC001

Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Radium-226	1.08	+/-0.289	0.255	pCi/g	
Radium-228	0.892	+/-0.403	0.526	pCi/g	
Tin-126	U	0.143	+/-0.185	0.177	pCi/g

Rad Gas Flow Proportional Counting

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

Alpha	7.80	+/-3.22	3.91	4.00	pCi/g	JXB7	12/03/15	1234	1525768	10
Beta	18.3	+/-2.99	2.69	10.0	pCi/g					

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.122	+/-0.659	1.34	2.00	pCi/g	KSD1	12/02/15	1712	1525755	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U	1.95	+/-2.00	3.30	6.00	pCi/g	TXJ1	12/02/15	2031	1522724	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U	-0.833	+/-0.891	1.55	2.00	pCi/g	TXJ1	12/04/15	0520	1522716	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	U	1.60	+/-1.76	2.95	5.00	pCi/g	MYM1	11/29/15	1416	1522715	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	LYTI	11/10/15	0955	1521927

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 1.3.C6
Sample ID: 385101009

Project: MJWC00115
Client ID: MJWC001

The following Analytical Methods were performed:

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

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			76.6	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			55.9	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			65.4	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			74.8	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			88.6	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			86.4	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			76.6	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.9	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"			98.4	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Company : MIW Corporation
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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 1.3.C6
Sample ID: 385101009
Matrix: Soil
Collect Date: 21-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 23.6%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		23.6						percent		LYT1	11/10/15	0955	1521927	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.00979	+/-0.0544	0.104	0.0239	+/-0.0545	1.00	pCi/g		HAKB	11/23/15	1502	1522577	2
Plutonium-239/240	U	0.00677	+/-0.0799	0.168	0.056	+/-0.0799	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0473	+/-0.121	0.222	0.0821	+/-0.121	1.00	pCi/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.799	+/-0.301	0.214	0.0674	+/-0.347	1.00	pCi/g						
Uranium-235/236		0.0469	+/-0.0921	0.128	0.0239	+/-0.0927	1.00	pCi/g						
Uranium-238		1.14	+/-0.345	0.0796	0.00	+/-0.424	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0342	+/-0.236	0.575	0.171	+/-0.236	1.00	pCi/g		HAKB	11/23/15	1711	1522576	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.984	+/-0.482	0.395	0.117	+/-0.505	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229		0.131	+/-0.207	0.287	0.0657	+/-0.208	1.00	pCi/g						
Thorium-230		1.16	+/-0.498	0.286	0.0656	+/-0.527	1.00	pCi/g						
Thorium-232		0.979	+/-0.452	0.155	0.00	+/-0.475	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0315	+/-0.062	0.0859	0.0161	+/-0.0621	1.00	pCi/g		HAKB	11/24/15	1039	1522571	6
Curium-242		0.00	+/-0.0412	0.0613	0.00	+/-0.0413	1.00	pCi/g						
Curium-243/244	U	0.00921	+/-0.0512	0.0981	0.0225	+/-0.0512	1.00	pCi/g						
Curium-245/246		0.0361	+/-0.0709	0.0983	0.0184	+/-0.0711	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-2.07	+/-6.40	11.2	5.43	+/-6.40	15.0	pCi/g		HAKB	11/25/15	1840	1522578	7
Rad Gamma Spec Analysis														
<i>Gamma 1129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.214	+/-0.383	0.769	0.345	+/-0.396	1.00	pCi/g		MJH1	12/02/15	1806	1522374	8
<i>Gamma spec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.478	+/-0.464	0.775	0.355	+/-0.517		pCi/g		RXF2	12/03/15	0828	1522386	9
Antimony-125	U	0.0263	+/-0.202	0.369	0.169	+/-0.202		pCi/g						
Bismuth-212	U	0.725	+/-1.19	2.35	1.07	+/-1.23		pCi/g						
Bismuth-214		1.08	+/-0.289	0.255	0.114	+/-0.303		pCi/g						
Cesium-137		0.357	+/-0.122	0.178	0.0812	+/-0.126	0.100	pCi/g						
Cobalt-60	U	-0.0195	+/-0.0816	0.153	0.064	+/-0.0821		pCi/g						
Europium-154	U	-0.00356	+/-0.241	0.468	0.200	+/-0.241		pCi/g						
Lead-212		1.34	+/-0.197	0.181	0.0839	+/-0.236		pCi/g						
Lead-214		1.09	+/-0.363	0.580	0.279	+/-0.374		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

Report Date: December 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 1.3.C6
Sample ID: 385101009

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		13.9	+/-2.27	1.05	0.402	+/-2.56		pCi/g						
Protactinium-231	U	0.801	+/-0.980	1.81	0.841	+/-1.06		pCi/g						
Radium-226		1.08	+/-0.289	0.255	0.114	+/-0.303		pCi/g						
Radium-228		0.892	+/-0.403	0.526	0.229	+/-0.415		pCi/g						
Thallium-208		0.381	+/-0.168	0.131	0.0584	+/-0.171		pCi/g						
Tin-126	UI	0.00	+/-0.185	0.177	0.0839	+/-0.185		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A-B, solid "Dry Weight Corrected"</i>														
Alpha		7.80	+/-3.22	3.91	1.63	+/-3.56	4.00	pCi/g		JXB7	12/03/15	1234	1525768	10
Beta		18.3	+/-2.99	2.69	1.20	+/-3.93	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.122	+/-0.659	1.34	0.573	+/-0.660	2.00	pCi/g		RSD1	12/02/15	1712	1525755	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium		1.95	+/-2.00	3.30	1.44	+/-2.00	6.00	pCi/g		TXJ1	12/02/15	2031	1522724	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.833	+/-0.891	1.55	0.762	+/-0.891	2.00	pCi/g		TXJ1	12/04/15	0520	1522716	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99		1.60	+/-1.76	2.95	1.42	+/-1.77	5.00	pCi/g		MYM	11/29/15	1416	1522715	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	11/10/15	0955	1521927

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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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"	1522577	76.6	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	55.9	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	65.4	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1522576	74.8	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228.230,232 Solid "Dry Weight Corrected"	1522579	88.6	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1522571	86.4	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1522578	76.6	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1525755	88.9	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1522715	98.4	(15%-125%)

Notes:

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