

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 19, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2BR.1.1
 Sample ID: 387899014
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 21-DEC-15
 Collector: Client
 Moisture: 21.8%

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		21.8						percent		LYT1	12/22/15	1007	1532997	1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.131	+/-0.252	0.463	0.214	+/-0.260		pCi/g		RXF2	01/14/16	1046	1533152	2
Antimony-125	U	-0.0379	+/-0.128	0.208	0.0946	+/-0.129		pCi/g						
Bismuth-212	U	0.178	+/-0.836	1.40	0.630	+/-0.840		pCi/g						
Bismuth-214	UI	0.00	+/-0.218	0.412	0.198	+/-0.529		pCi/g						
Cesium-137		0.821	+/-0.126	0.079	0.0345	+/-0.142	0.100	pCi/g						
Cobalt-60	U	-0.0058	+/-0.0625	0.121	0.052	+/-0.0625		pCi/g						
Europium-154	UI	0.00	+/-0.184	0.413	0.184	+/-0.206		pCi/g						
Lead-212		0.811	+/-0.117	0.0992	0.046	+/-0.148		pCi/g						
Lead-214		1.18	+/-0.223	0.160	0.0734	+/-0.246		pCi/g						
Potassium-40		10.5	+/-1.75	0.956	0.393	+/-1.98		pCi/g						
Protactinium-231	U	0.187	+/-0.568	1.07	0.497	+/-0.576		pCi/g						
Radium-226	UI	0.00	+/-0.218	0.412	0.198	+/-0.529		pCi/g						
Radium-228		0.574	+/-0.333	0.247	0.101	+/-0.341		pCi/g						
Thallium-208		0.313	+/-0.0888	0.0775	0.0343	+/-0.0926		pCi/g						
Tin-126	UI	0.00	+/-0.0895	0.0926	0.044	+/-0.0922		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A.B. solid "Dry Weight Corrected"</i>														
Alpha		6.92	+/-2.18	3.18	1.50	+/-2.59	4.00	pCi/g		KXB2	01/11/16	1936	1534757	3
Beta		20.4	+/-2.05	2.72	1.33	+/-3.59	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	DOF 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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Sample ID: 387899014

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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Company : MJW Technical Services
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Report Date: March 8, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.1.2
 Sample ID: 392062017
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 18.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gamma with Ingrowth "Dry Weight Corrected"

Actinium-227	U	-0.0239	+/-0.314	0.575	0.272	+/-0.314		pCi/g		MXR1	03/07/16	1415	1547923	1
Antimony-125	U	-0.0266	+/-0.108	0.203	0.0939	+/-0.109		pCi/g						
Bismuth-212	U	0.386	+/-0.578	1.15	0.528	+/-0.604		pCi/g						
Bismuth-214		0.893	+/-0.181	0.153	0.0707	+/-0.196		pCi/g						
Cesium-137		0.143	+/-0.0658	0.0756	0.0344	+/-0.0668	0.100	pCi/g						
Cobalt-60	U	0.00601	+/-0.0397	0.0792	0.0343	+/-0.0398		pCi/g						
Europium-154	U	0.0724	+/-0.128	0.264	0.118	+/-0.132		pCi/g						
Lead-212		0.884	+/-0.123	0.115	0.0544	+/-0.143		pCi/g						
Lead-214		0.760	+/-0.224	0.308	0.149	+/-0.232		pCi/g						
Potassium-40		11.3	+/-1.34	0.559	0.228	+/-1.65		pCi/g						
Protactinium-231	UI	0.00	+/-1.15	0.854	0.396	+/-1.16		pCi/g						
Radium-226		0.893	+/-0.181	0.153	0.0707	+/-0.196		pCi/g						
Radium-228		1.05	+/-0.301	0.272	0.122	+/-0.333		pCi/g						
Thallium-208		0.273	+/-0.0717	0.0696	0.0317	+/-0.0752		pCi/g						
Tin-126	UI	0.00	+/-0.127	0.162	0.0777	+/-0.128		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		11.8	+/-3.08	3.65	1.64	+/-3.84	4.00	pCi/g		JXB7	03/02/16	1637	1548369	2
Beta		19.3	+/-2.50	2.98	1.42	+/-3.66	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/26/16	1449	1547874

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4 5 2 3/Ga-01-R
2	EPA 900 0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Report Date: March 8, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.1.2
Sample ID: 392062017

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 19, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.1.3
 Sample ID: 387899015
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 21-DEC-15
 Collector: Client
 Moisture: 17.2%

Project: MJWC00115
 Client ID: MJWC001

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

ASTM D 2216 % Moisture "As Received"

Moisture		17.2						percent		LYT1	12/22/15	1007	1532997	1
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Rad Gamma Spec Analysis

Gammaspac, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	0.174	+/-0.229	0.448	0.213	+/-0.243		pCi/g		RXF2	01/14/16	1046	1533152	2
Antimony-125	U	0.0514	+/-0.0851	0.148	0.0694	+/-0.0883		pCi/g						
Bismuth-212	UI	0.00	+/-0.668	1.03	0.485	+/-0.850		pCi/g						
Bismuth-214		0.833	+/-0.138	0.118	0.0552	+/-0.156		pCi/g						
Cesium-137		0.0617	+/-0.0673	0.0685	0.0321	+/-0.0675	0.100	pCi/g						
Cobalt-60	U	0.0227	+/-0.037	0.0668	0.0302	+/-0.0384		pCi/g						
Europium-154	U	-0.077	+/-0.100	0.168	0.0754	+/-0.106		pCi/g						
Lead-212		0.848	+/-0.119	0.0928	0.0441	+/-0.136		pCi/g						
Lead-214		0.952	+/-0.183	0.113	0.0532	+/-0.198		pCi/g						
Potassium-40		12.1	+/-1.11	0.351	0.144	+/-1.52		pCi/g						
Protactinium-231	UI	0.00	+/-0.488	0.733	0.346	+/-0.513		pCi/g						
Radium-226		0.833	+/-0.138	0.118	0.0552	+/-0.156		pCi/g						
Radium-228		0.651	+/-0.287	0.243	0.112	+/-0.295		pCi/g						
Thallium-208		0.164	+/-0.0716	0.0537	0.0249	+/-0.073		pCi/g						
Tin-126	U	0.0655	+/-0.127	0.154	0.0744	+/-0.128		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		8.27	+/-1.99	2.75	1.30	+/-2.58	4.00	pCi/g		KXB2	01/11/16	1936	1534757	3
Beta		18.1	+/-1.69	2.16	1.05	+/-3.07	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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Client Sample ID: 5.2B.R.1.3
Sample ID: 387899015

Project: MJWC00115
Client ID: MJWC001

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

Notes:

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

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Report Date: January 19, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.1
 Sample ID: 387899016
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 21-DEC-15
 Collector: Client
 Moisture: 20.9%

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		20.9						percent		LYT1	12/22/15	1007	1532997	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.0106	+/-0.0587	0.113	0.0258	+/-0.0588	1.00	pCi/g		HAKB	01/11/16	0940	1533905	2
Plutonium-239/240		0.0723	+/-0.101	0.150	0.0446	+/-0.101	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232		0.0468	+/-0.0694	0.101	0.0276	+/-0.070	1.00	pCi/g		HAKB	01/11/16	1029	1533902	3
Uranium-233/234		0.601	+/-0.270	0.0901	0.00	+/-0.297	1.00	pCi/g						
Uranium-235/236		0.053	+/-0.104	0.145	0.027	+/-0.105	1.00	pCi/g						
Uranium-238		0.774	+/-0.307	0.144	0.027	+/-0.345	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.258	+/-0.294	1.00	0.322	+/-0.294	1.00	pCi/g		HAKB	01/08/16	0854	1533904	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.31	+/-0.796	0.733	0.210	+/-0.837	1.00	pCi/g		HAKB	01/11/16	1350	1533901	5
Thorium-229		0.155	+/-0.356	0.564	0.129	+/-0.357	1.00	pCi/g						
Thorium-230		0.817	+/-0.639	0.670	0.182	+/-0.657	1.00	pCi/g						
Thorium-232		1.09	+/-0.691	0.486	0.0909	+/-0.720	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	-0.00288	+/-0.0432	0.101	0.0289	+/-0.0432	1.00	pCi/g		HAKB	01/11/16	1543	1533903	6
Curium-242		0.00	+/-0.0321	0.0478	0.00	+/-0.0322	1.00	pCi/g						
Curium-243/244	U	-0.00341	+/-0.0294	0.0681	0.0127	+/-0.0295	1.00	pCi/g						
Curium-245/246		0.029	+/-0.0569	0.0789	0.0148	+/-0.057	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	1.11	+/-4.97	8.61	4.13	+/-4.97	15.0	pCi/g		HAKB	01/13/16	1014	1533906	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0884	+/-0.272	0.528	0.236	+/-0.275	1.00	pCi/g		MJH1	01/12/16	1708	1533089	8
<i>Gammaspect, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.103	+/-0.296	0.571	0.268	+/-0.300		pCi/g		RXF2	01/14/16	1046	1533152	9
Antimony-125	U	0.0825	+/-0.148	0.205	0.0945	+/-0.153		pCi/g						
Bismuth-212	UI	0.00	+/-1.07	1.50	0.697	+/-1.16		pCi/g						
Bismuth-214		0.926	+/-0.173	0.160	0.0735	+/-0.191		pCi/g						
Cesium-137		0.412	+/-0.0905	0.0836	0.038	+/-0.0973	0.100	pCi/g						
Cobalt-60	U	0.0265	+/-0.0359	0.0826	0.0352	+/-0.0379		pCi/g						
Europium-154	U	-0.0788	+/-0.130	0.226	0.0961	+/-0.135		pCi/g						
Lead-212		0.757	+/-0.120	0.115	0.0541	+/-0.140		pCi/g						
Lead-214		1.09	+/-0.233	0.168	0.0782	+/-0.254		pCi/g						

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 Project: Soil Radioisotopes
 Client Sample ID: 5.2.B.R.2.1
 Sample ID: 387899016

Report Date: January 19, 2016

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>														
Potassium-40		11.2	+/-1.73	0.768	0.322	+/-1.98		pCi/g						
Protactinium-231	U	0.00	+/-0.630	1.13	0.532	+/-0.696		pCi/g						
Radium-226		0.926	+/-0.173	0.160	0.0735	+/-0.191		pCi/g						
Radium-228		0.724	+/-0.300	0.294	0.130	+/-0.317		pCi/g						
Thallium-208		0.263	+/-0.101	0.0757	0.0343	+/-0.104		pCi/g						
Tin-126	U	0.00	+/-0.122	0.183	0.0876	+/-0.125		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		9.88	+/-1.75	2.04	0.951	+/-2.60	4.00	pCi/g		KXB2	01/11/16	1939	1534757	10
Beta		16.9	+/-1.71	2.24	1.09	+/-2.97	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	0.0142	+/-0.515	0.985	0.431	+/-0.515	2.00	pCi/g		KSD1	01/11/16	0853	1534758	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist. Solid "Dry Weight Corrected"</i>														
Tritium	U	-3.36	+/-2.70	4.99	2.40	+/-2.70	6.00	pCi/g		TXJ1	01/08/16	0542	1534917	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.492	+/-0.778	1.36	0.664	+/-0.778	2.00	pCi/g		TXJ1	01/14/16	1947	1534934	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-0.658	+/-1.87	3.32	1.60	+/-1.87	5.00	pCi/g		MYM	01/12/16	0730	1534637	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/22/15	1007	1532997

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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Contact: Ms. Laurie Loscy
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.1
Sample ID: 387899016

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"	1533905	69.8	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	47.9	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	76.8	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1533904	61.2	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1533901	64.4	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1533903	100	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1533906	69.8	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1534758	73.9	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1534637	96.2	(15%-125%)

Notes:

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

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Report Date: March 8, 2016

Contact: Ms. Laurie Loscy
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.2
 Sample ID: 392062018
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 17.1%

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>Gamma with Ingrowth "Dry Weight Corrected"</i>														
Actinium-227	UI	0.00	+/-0.173	0.384	0.178	+/-0.193		pCi/g		MXR1	03/07/16	1415	1547923	1
Antimony-125	U	-0.0144	+/-0.0846	0.154	0.0703	+/-0.0849		pCi/g						
Bismuth-212	UI	0.00	+/-0.482	1.05	0.483	+/-0.581		pCi/g						
Bismuth-214		0.733	+/-0.141	0.124	0.0565	+/-0.154		pCi/g						
Cesium-137	UI	0.00	+/-0.0383	0.0816	0.0377	+/-0.0447	0.100	pCi/g						
Cobalt-60	U	0.00183	+/-0.0323	0.0656	0.0279	+/-0.0323		pCi/g						
Europium-154	U	-0.006	+/-0.093	0.184	0.0787	+/-0.093		pCi/g						
Lead-212		0.918	+/-0.121	0.103	0.0486	+/-0.150		pCi/g						
Lead-214		1.08	+/-0.182	0.306	0.148	+/-0.206		pCi/g						
Potassium-40		11.2	+/-1.26	0.533	0.218	+/-1.60		pCi/g						
Protactinium-231	UI	0.00	+/-0.701	0.810	0.377	+/-0.725		pCi/g						
Radium-226		0.733	+/-0.141	0.124	0.0565	+/-0.154		pCi/g						
Radium-228		0.796	+/-0.207	0.252	0.113	+/-0.238		pCi/g						
Thallium-208		0.268	+/-0.0699	0.0545	0.0244	+/-0.0735		pCi/g						
Tin-126	U	0.0592	+/-0.103	0.127	0.061	+/-0.104		pCi/g						

Rad Gas Flow Proportional Counting
GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha		12.5	+/-3.71	3.98	1.69	+/-4.45	4.00	pCi/g		JXB7	03/02/16	1646	1548369	2
Beta		22.9	+/-3.24	3.61	1.70	+/-4.56	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/26/16	1449	1547874

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

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Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.2
Sample ID: 392062018

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 19, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.3
 Sample ID: 387899017
 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.
Gravimetric Solids													
<i>ASTM D 2216 % Moisture "As Received"</i>													
Moisture		11.4						percent		LYT1	12/22/15 1007	1532997	1
Rad Alpha Spec Analysis													
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>													
Plutonium-238		0.0548	+/-0.0968	0.147	0.0373	+/-0.0972	1.00	pCi/g		HAKB	01/11/16 0941	1533905	2
Plutonium-239/240	U	-0.0461	+/-0.058	0.194	0.0609	+/-0.0581	1.00	pCi/g					
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>													
Uranium-232	U	-0.00181	+/-0.0646	0.142	0.0487	+/-0.0647	1.00	pCi/g		HAKB	01/11/16 1029	1533902	3
Uranium-233/234		0.877	+/-0.259	0.125	0.0342	+/-0.302	1.00	pCi/g					
Uranium-235/236		0.0527	+/-0.0759	0.0916	0.0171	+/-0.0765	1.00	pCi/g					
Uranium-238		0.590	+/-0.211	0.0571	0.00	+/-0.235	1.00	pCi/g					
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>													
Neptunium-237	U	-0.0383	+/-0.169	0.442	0.101	+/-0.170	1.00	pCi/g		HAKB	01/08/16 0854	1533904	4
<i>Alphaspec Th229, 228,230,232 Solid "Dry Weight Corrected"</i>													
Thorium-228		0.900	+/-0.520	0.565	0.195	+/-0.541	1.00	pCi/g		HAKB	01/11/16 1350	1533901	5
Thorium-229		0.00	+/-0.115	0.171	0.00	+/-0.115	1.00	pCi/g					
Thorium-230		0.700	+/-0.421	0.348	0.0886	+/-0.435	1.00	pCi/g					
Thorium-232		1.08	+/-0.499	0.170	0.00	+/-0.525	1.00	pCi/g					
<i>Am241, Cm Solid "Dry Weight Corrected"</i>													
Americium-241		0.036	+/-0.0637	0.0965	0.0246	+/-0.0639	1.00	pCi/g		HAKB	01/11/16 1543	1533903	6
Curium-242		0.00	+/-0.0353	0.0525	0.00	+/-0.0354	1.00	pCi/g					
Curium-243/244	U	0.00812	+/-0.0451	0.0865	0.0198	+/-0.0452	1.00	pCi/g					
Curium-245/246	U	0.0137	+/-0.0515	0.0867	0.0162	+/-0.0516	1.00	pCi/g					
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>													
Plutonium-241	U	1.60	+/-5.75	9.94	4.76	+/-5.76	15.0	pCi/g		HAKB	01/13/16 1100	1533906	7
Rad Gamma Spec Analysis													
<i>Gamma I129, Solid "Dry Weight Corrected"</i>													
Iodine-129	UI	0.00	+/-0.294	0.334	0.136	+/-0.296	1.00	pCi/g		MJH1	01/12/16 1708	1533089	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>													
Actinium-227	U	0.148	+/-0.245	0.503	0.234	+/-0.255		pCi/g		RXF2	01/14/16 1047	1533152	9
Antimony-125	UI	0.00	+/-0.162	0.232	0.108	+/-0.169		pCi/g					
Bismuth-212	UI	0.00	+/-1.03	1.44	0.667	+/-1.22		pCi/g					
Bismuth-214		0.933	+/-0.186	0.136	0.061	+/-0.201		pCi/g					
Cesium-137		0.109	+/-0.0489	0.0699	0.031	+/-0.0497	0.100	pCi/g					
Cobalt-60	U	-0.00952	+/-0.0384	0.0749	0.0312	+/-0.0387		pCi/g					
Europium-154	U	-0.0018	+/-0.155	0.301	0.134	+/-0.155		pCi/g					
Lead-212		1.03	+/-0.135	0.0998	0.0462	+/-0.162		pCi/g					
Lead-214		1.22	+/-0.211	0.146	0.0672	+/-0.235		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: 5.2.B.R.2.3
 Sample ID: 387899017

Report Date: January 19, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		12.2	+/-1.46	0.691	0.283	+/-1.79		pCi/g						
Protactinium-231	U	0.00	+/-0.895	0.945	0.437	+/-0.906		pCi/g						
Radium-226		0.933	+/-0.186	0.136	0.061	+/-0.201		pCi/g						
Radium-228		0.703	+/-0.278	0.280	0.123	+/-0.292		pCi/g						
Thallium-208		0.256	+/-0.075	0.0708	0.0318	+/-0.0779		pCi/g						
Tin-126	U	0.00	+/-0.156	0.163	0.0768	+/-0.158		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A B, solid "Dry Weight Corrected"</i>														
Alpha		10.1	+/-1.74	1.71	0.769	+/-2.64	4.00	pCi/g		KXB2	01/11/16	1939	1534757	10
Beta		15.9	+/-1.67	2.19	1.07	+/-2.81	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.602	+/-0.737	1.44	0.665	+/-0.737	2.00	pCi/g		KSD1	01/11/16	1208	1534758	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist. Solid "Dry Weight Corrected"</i>														
Tritium	U	-0.257	+/-2.52	4.41	2.12	+/-2.52	6.00	pCi/g		TXJ1	01/08/16	0807	1534917	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.0589	+/-0.698	1.20	0.587	+/-0.698	2.00	pCi/g		TXJ1	01/14/16	2048	1534934	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-1.28	+/-1.51	2.73	1.31	+/-1.51	5.00	pCi/g		MYM	01/12/16	0747	1534637	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/22/15	1007	1532997

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1476-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300, I-01 Modified
9	DOE HASL 300, 4.5 2 3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified

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Certificate of Analysis

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

Report Date: January 19, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.3
Sample ID: 387899017

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"	1533905	61.8	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	76	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	77.9	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1533904	81.1	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1533901	86.2	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1533903	91.5	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1533906	61.8	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1534758	78.2	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"	1534637	95.6	(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 Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: January 19, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.5
 Sample ID: 387899018
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 21-DEC-15
 Collector: Client
 Moisture: 22.2%

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		22.2						percent		LYT1	12/22/15	1007	1532997	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.00	+/-0.0428	0.0637	0.00	+/-0.0429	1.00	pCi/g		HAKB	01/11/16	0941	1533905	2
Plutonium-239/240	U	0.0551	+/-0.107	0.184	0.0602	+/-0.107	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0307	+/-0.0738	0.134	0.045	+/-0.074	1.00	pCi/g		HAKB	01/11/16	1029	1533902	3
Uranium-233/234		0.675	+/-0.255	0.131	0.030	+/-0.284	1.00	pCi/g						
Uranium-235/236		0.0361	+/-0.0829	0.131	0.0301	+/-0.0831	1.00	pCi/g						
Uranium-238		0.486	+/-0.218	0.131	0.030	+/-0.237	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0753	+/-0.175	0.517	0.141	+/-0.175	1.00	pCi/g		HAKB	01/08/16	0854	1533904	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.963	+/-0.471	0.404	0.126	+/-0.494	1.00	pCi/g		HAKB	01/11/16	1350	1533901	5
Thorium-229	U	0.0279	+/-0.180	0.369	0.110	+/-0.180	1.00	pCi/g						
Thorium-230		0.388	+/-0.314	0.349	0.0999	+/-0.319	1.00	pCi/g						
Thorium-232		1.03	+/-0.457	0.238	0.0445	+/-0.481	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	-0.00326	+/-0.049	0.114	0.0327	+/-0.049	1.00	pCi/g		HAKB	01/11/16	1543	1533903	6
Curium-242		0.00	+/-0.0364	0.0542	0.00	+/-0.0365	1.00	pCi/g						
Curium-243/244		0.0284	+/-0.0557	0.0773	0.0145	+/-0.0559	1.00	pCi/g						
Curium-245/246		0.0515	+/-0.0742	0.0895	0.0167	+/-0.0745	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	2.19	+/-5.27	9.05	4.34	+/-5.29	15.0	pCi/g		HAKB	01/13/16	1147	1533906	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.0144	+/-0.458	0.743	0.326	+/-0.458	1.00	pCi/g		MJH1	01/12/16	1709	1533089	8
<i>Gammaspect, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.00188	+/-0.329	0.545	0.254	+/-0.329		pCi/g		RXF2	01/14/16	1047	1533152	9
Antimony-125	U	-0.00297	+/-0.113	0.217	0.100	+/-0.113		pCi/g						
Bismuth-212	UI	0.00	+/-0.743	1.40	0.646	+/-1.09		pCi/g						
Bismuth-214		0.796	+/-0.167	0.150	0.0676	+/-0.182		pCi/g						
Cesium-137		0.422	+/-0.0818	0.0776	0.0347	+/-0.0902	0.100	pCi/g						
Cobalt-60	U	-0.0197	+/-0.0381	0.0707	0.029	+/-0.0392		pCi/g						
Europium-154	U	-0.0926	+/-0.143	0.243	0.104	+/-0.149		pCi/g						
Lead-212		0.830	+/-0.133	0.123	0.0575	+/-0.153		pCi/g						
Lead-214		1.13	+/-0.223	0.170	0.0787	+/-0.245		pCi/g						

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: 5.2.B.R.2.5
 Sample ID: 387899018

Report Date: January 19, 2016

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>Gammasec. Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		8.56	+/-1.51	0.414	0.143	+/-1.68		pCi/g						
Protactinium-231	U	0.00	+/-0.773	1.01	0.469	+/-0.781		pCi/g						
Radium-226		0.796	+/-0.167	0.150	0.0676	+/-0.182		pCi/g						
Radium-228		0.875	+/-0.265	0.256	0.111	+/-0.297		pCi/g						
Thallium-208		0.255	+/-0.101	0.0794	0.036	+/-0.103		pCi/g						
Tin-126	U	0.00	+/-0.137	0.168	0.080	+/-0.138		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		9.99	+/-1.67	1.52	0.678	+/-2.54	4.00	pCi/g		KXB2	01/11/16	1939	1534757	10
Beta		16.9	+/-1.73	2.29	1.11	+/-2.97	10.0	pCi/g						
<i>GFPC, Sr-90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.203	+/-0.527	1.06	0.467	+/-0.527	2.00	pCi/g		KSD1	01/11/16	0853	1534758	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	-0.936	+/-3.00	5.31	2.55	+/-3.00	6.00	pCi/g		TXJ1	01/08/16	0919	1534917	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	0.340	+/-0.791	1.35	0.657	+/-0.792	2.00	pCi/g		TXJ1	01/14/16	2149	1534934	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-1.57	+/-1.57	2.86	1.38	+/-1.57	5.00	pCi/g		MYM	01/12/16	0804	1534637	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/22/15	1007	1532997

The following Analytical Methods were performed

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

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Certificate of Analysis

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

Report Date: January 19, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.5
Sample ID: 387899018

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"	1533905	68.7	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	67.7	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	74.1	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1533904	84.6	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1533901	99.4	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1533903	92.6	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1533906	68.7	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1534758	80.3	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"	1534637	96.6	(15%-125%)

Notes:

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

GEL LABORATORIES LLC

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

Certificate of Analysis

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

Report Date: January 19, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.6
 Sample ID: 387899019
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 21-DEC-15
 Collector: Client
 Moisture: 10.9%

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		10.9						percent		LYT1	12/22/15	1007	1532997	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.0383	+/-0.0608	0.0841	0.0193	+/-0.061	1.00	pCi/g		HAKB	01/11/16	1903	1533905	2
Plutonium-239/240	U	0.00486	+/-0.0553	0.118	0.036	+/-0.0554	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0234	+/-0.0497	0.129	0.0457	+/-0.0498	1.00	pCi/g		HAKB	01/12/16	1526	1533902	3
Uranium-233/234		0.676	+/-0.202	0.084	0.0193	+/-0.230	1.00	pCi/g						
Uranium-235/236	U	-0.00731	+/-0.0323	0.0843	0.0193	+/-0.0324	1.00	pCi/g						
Uranium-238		0.414	+/-0.161	0.0927	0.0236	+/-0.174	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237		0.0999	+/-0.229	0.364	0.0834	+/-0.230	1.00	pCi/g		HAKB	01/08/16	0854	1533904	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.47	+/-0.651	0.627	0.223	+/-0.691	1.00	pCi/g		HAKB	01/11/16	1350	1533901	5
Thorium-229	U	-0.124	+/-0.192	0.555	0.190	+/-0.193	1.00	pCi/g						
Thorium-230		0.606	+/-0.439	0.523	0.174	+/-0.448	1.00	pCi/g						
Thorium-232		0.804	+/-0.462	0.409	0.117	+/-0.477	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0318	+/-0.0625	0.0866	0.0162	+/-0.0626	1.00	pCi/g		HAKB	01/11/16	1545	1533903	6
Curium-242		0.00	+/-0.0404	0.0601	0.00	+/-0.0405	1.00	pCi/g						
Curium-243/244	U	-0.00856	+/-0.0379	0.0988	0.0226	+/-0.038	1.00	pCi/g						
Curium-245/246	X	0.140	+/-0.115	0.0991	0.0185	+/-0.117	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-2.76	+/-4.25	7.67	3.67	+/-4.25	15.0	pCi/g		HAKB	01/13/16	1233	1533906	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.0141	+/-0.192	0.386	0.153	+/-0.192	1.00	pCi/g		MJH1	01/12/16	1709	1533089	8
<i>Gammaspect, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.105	+/-0.237	0.428	0.199	+/-0.242		pCi/g		RXF2	01/14/16	1048	1533152	9
Antimony-125	U	0.0161	+/-0.0712	0.145	0.0654	+/-0.0716		pCi/g						
Bismuth-212		0.911	+/-0.727	0.804	0.358	+/-0.733		pCi/g						
Bismuth-214		0.840	+/-0.148	0.115	0.0518	+/-0.164		pCi/g						
Cesium-137	U	0.0051	+/-0.039	0.0739	0.0337	+/-0.039	0.100	pCi/g						
Cobalt-60	U	0.0213	+/-0.0338	0.0754	0.0327	+/-0.0352		pCi/g						
Europium-154	U	-0.04	+/-0.0727	0.136	0.0541	+/-0.075		pCi/g						
Lead-212		0.955	+/-0.121	0.0969	0.0454	+/-0.147		pCi/g						
Lead-214		1.21	+/-0.187	0.119	0.0546	+/-0.213		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 Loscy
 Project: Soil Radioisotopes
 Client Sample ID: 5.2.B.R.2.6
 Sample ID: 387899019

Report Date: January 19, 2016

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>Gammasec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		11.9	+/-1.28	0.417	0.158	+/-1.64		pCi/g						
Protactinium-231	U	0.305	+/-0.464	0.910	0.425	+/-0.489		pCi/g						
Radium-226		0.840	+/-0.148	0.115	0.0518	+/-0.164		pCi/g						
Radium-228		0.728	+/-0.283	0.239	0.106	+/-0.303		pCi/g						
Thallium-208		0.245	+/-0.0659	0.0571	0.0256	+/-0.0691		pCi/g						
Tin-126	U	0.0457	+/-0.138	0.154	0.0736	+/-0.139		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A.B, solid "Dry Weight Corrected"</i>														
Alpha		13.4	+/-2.38	2.89	1.36	+/-3.58	4.00	pCi/g		KXB2	01/11/16	1939	1534757	10
Beta		17.5	+/-1.52	1.89	0.918	+/-2.85	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Sr-90	U	-0.498	+/-0.482	1.07	0.471	+/-0.482	2.00	pCi/g		KSD1	01/11/16	0855	1534758	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	-0.70	+/-2.52	4.45	2.14	+/-2.52	6.00	pCi/g		TXJ1	01/08/16	1032	1534917	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.709	+/-0.683	1.21	0.589	+/-0.683	2.00	pCi/g		TXJ1	01/14/16	2251	1534934	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-0.0625	+/-1.84	3.21	1.54	+/-1.84	5.00	pCi/g		MYM	01/12/16	0820	1534637	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXT1	12/22/15	1007	1532997

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 RPS01 Rev 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified

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Certificate of Analysis

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

Report Date: January 19, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.6
Sample ID: 387899019

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"	1533905	80.5	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	93.3	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	89.1	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1533904	99.4	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228.230.232 Solid "Dry Weight Corrected"	1533901	96.7	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1533903	84.1	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1533906	80.5	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1534758	81.4	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1534637	99.1	(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: March 9, 2016

Client Sample ID: 5.2.B.R.3.1
 Sample ID: 391281001
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 12-FEB-16
 Collector: Client
 Moisture: 23.5%

Project: MJWC00115
 Client ID: MJWC001

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

ASTM D 2216 % Moisture "As Received"

Moisture		23.5						percent		JX01	02/12/16	1332	1544774	1
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Rad Gamma Spec Analysis

Gamma with Ingrowth "Dry Weight Corrected"

Actinium-227	U	0.0248	+/-0.289	0.545	0.255	+/-0.289		pCi/g		MXR1	03/08/16	0627	1545191	2
Antimony-125	U	0.0778	+/-0.111	0.229	0.106	+/-0.117		pCi/g						
Bismuth-212		0.839	+/-0.758	0.829	0.361	+/-0.763		pCi/g						
Bismuth-214		0.881	+/-0.189	0.134	0.0603	+/-0.204		pCi/g						
Cesium-137		0.333	+/-0.0788	0.0681	0.0302	+/-0.0837	0.100	pCi/g						
Cobalt-60	U	-0.0348	+/-0.0456	0.0777	0.0326	+/-0.0483		pCi/g						
Europium-154	U	-0.104	+/-0.129	0.220	0.0931	+/-0.138		pCi/g						
Lead-212		0.751	+/-0.143	0.148	0.0704	+/-0.157		pCi/g						
Lead-214		0.977	+/-0.193	0.161	0.0747	+/-0.210		pCi/g						
Potassium-40		10.6	+/-1.40	0.725	0.301	+/-1.67		pCi/g						
Protactinium-231	U	0.291	+/-0.647	0.967	0.448	+/-0.663		pCi/g						
Radium-226		0.881	+/-0.189	0.134	0.0603	+/-0.204		pCi/g						
Radium-228		0.692	+/-0.228	0.300	0.133	+/-0.249		pCi/g						
Thallium-208		0.247	+/-0.069	0.0692	0.0311	+/-0.0721		pCi/g						
Tin-126	U	0.074	+/-0.181	0.196	0.0939	+/-0.182		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		8.54	+/-3.22	3.49	1.40	+/-3.61	4.00	pCi/g		JXB7	02/29/16	1501	1547068	3
Beta		18.7	+/-3.33	3.77	1.74	+/-4.24	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	JX01	02/12/16	1332	1544774

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 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: 5.2.B.R.3.1
Sample ID: 391281001

Project: MJWC00115
Client ID: MJWC001

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

Notes:

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

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Certificate of Analysis

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

Report Date: January 18, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.4.1
 Sample ID: 387853011
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 18-DEC-15
 Collector: Client
 Moisture: 22.4%

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		22.4						percent		CXC1	12/21/15	1516	1532672	1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0388	+/-0.238	0.468	0.217	+/-0.238		pCi/g		RXF2	01/13/16	0744	1532995	2
Antimony-125	U	-0.0185	+/-0.0918	0.179	0.0804	+/-0.0922		pCi/g						
Bismuth-212	UI	0.00	+/-0.996	1.59	0.728	+/-1.26		pCi/g						
Bismuth-214		0.848	+/-0.201	0.165	0.0742	+/-0.213		pCi/g						
Cesium-137		0.292	+/-0.110	0.0936	0.0421	+/-0.113	0.100	pCi/g						
Cobalt-60	U	-0.0178	+/-0.0491	0.0921	0.0382	+/-0.0498		pCi/g						
Europium-154	U	0.0509	+/-0.147	0.311	0.134	+/-0.148		pCi/g						
Lead-212		0.764	+/-0.114	0.106	0.0495	+/-0.142		pCi/g						
Lead-214		1.04	+/-0.167	0.135	0.0617	+/-0.190		pCi/g						
Potassium-40		9.14	+/-1.65	0.901	0.370	+/-1.84		pCi/g						
Protactinium-231	UI	0.00	+/-0.541	0.826	0.378	+/-0.552		pCi/g						
Radium-226		0.848	+/-0.201	0.165	0.0742	+/-0.213		pCi/g						
Radium-228		0.614	+/-0.265	0.352	0.155	+/-0.276		pCi/g						
Thallium-208		0.183	+/-0.0811	0.0716	0.0316	+/-0.0826		pCi/g						
Tin-126	UI	0.00	+/-0.0857	0.0886	0.0421	+/-0.0884		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		11.3	+/-3.65	3.78	1.55	+/-4.25	4.00	pCi/g		JXB7	01/11/16	1332	1534754	3
Beta		19.4	+/-3.08	3.61	1.70	+/-4.06	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	12/21/15	1516	1532672

The following Analytical Methods were performed

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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

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Certificate of Analysis

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

Report Date: January 18, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.4.1
Sample ID: 387853011

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 18, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.5.1
 Sample ID: 387853012
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 18-DEC-15
 Collector: Client
 Moisture: 27.5%

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		27.5						percent		CXC1	12/21/15	1516	1532672	1
Rad Gamma Spec Analysis														
<i>Gammascpec. Gamma. Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0713	+/-0.267	0.493	0.231	+/-0.270		pCi/g		RXF2	01/13/16	0745	1532995	2
Antimony-125	U	0.0766	+/-0.124	0.193	0.0893	+/-0.129		pCi/g						
Bismuth-212	UI	0.00	+/-0.743	1.29	0.600	+/-0.981		pCi/g						
Bismuth-214		0.728	+/-0.181	0.145	0.0665	+/-0.190		pCi/g						
Cesium-137		0.682	+/-0.111	0.0779	0.0356	+/-0.124	0.100	pCi/g						
Cobalt-60	U	0.000334	+/-0.0353	0.0698	0.0297	+/-0.0353		pCi/g						
Europium-154	U	-0.101	+/-0.101	0.160	0.0657	+/-0.111		pCi/g						
Lead-212		0.784	+/-0.123	0.115	0.0542	+/-0.141		pCi/g						
Lead-214		1.17	+/-0.214	0.330	0.160	+/-0.235		pCi/g						
Potassium-40		9.72	+/-1.23	0.615	0.256	+/-1.50		pCi/g						
Protactinium-231	UI	0.00	+/-0.744	0.979	0.459	+/-0.755		pCi/g						
Radium-226		0.728	+/-0.181	0.145	0.0665	+/-0.190		pCi/g						
Radium-228		0.785	+/-0.212	0.219	0.0952	+/-0.238		pCi/g						
Thallium-208		0.266	+/-0.0681	0.0633	0.0286	+/-0.0715		pCi/g						
Tin-126	UI	0.00	+/-0.0728	0.151	0.0725	+/-0.105		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC. Gross A.B. solid "Dry Weight Corrected"</i>														
Alpha		7.98	+/-3.22	3.91	1.63	+/-3.57	4.00	pCi/g		JXB7	01/11/16	1331	1534754	3
Beta		20.4	+/-3.27	3.38	1.55	+/-4.32	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	12/21/15	1516	1532672

The following Analytical Methods were performed

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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

GEL LABORATORIES LLC

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Certificate of Analysis

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

Report Date: January 18, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.5.1
Sample ID: 387853012

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 8, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.5.2
 Sample ID: 392043009
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 16.2%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPC	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>Gamma with Ingrowth "Dry Weight Corrected"</i>														
Actinium-227	U	0.0554	+/-0.221	0.429	0.200	+/-0.223		pCi/g		MXR1	03/07/16	0901	1547791	1
Antimony-125	U	-0.00786	+/-0.0921	0.158	0.0719	+/-0.0921		pCi/g						
Bismuth-212	UI	0.00	+/-0.753	0.940	0.428	+/-0.856		pCi/g						
Bismuth-214		0.617	+/-0.152	0.116	0.0523	+/-0.161		pCi/g						
Cesium-137		0.0653	+/-0.0728	0.0565	0.0252	+/-0.073	0.100	pCi/g						
Cobalt-60	U	0.0044	+/-0.0292	0.0622	0.0262	+/-0.0293		pCi/g						
Europium-154	U	-0.0622	+/-0.105	0.191	0.0822	+/-0.109		pCi/g						
Lead-212		0.740	+/-0.103	0.0936	0.0438	+/-0.121		pCi/g						
Lead-214		0.971	+/-0.163	0.120	0.0551	+/-0.183		pCi/g						
Potassium-40		11.4	+/-1.38	0.727	0.315	+/-1.69		pCi/g						
Protactinium-231	U	0.0107	+/-0.442	0.827	0.385	+/-0.442		pCi/g						
Radium-226		0.617	+/-0.152	0.116	0.0523	+/-0.161		pCi/g						
Radium-228		0.727	+/-0.254	0.195	0.0843	+/-0.276		pCi/g						
Thallium-208		0.207	+/-0.0631	0.0492	0.0218	+/-0.0654		pCi/g						
Tin-126	UI	0.00	+/-0.132	0.137	0.0652	+/-0.133		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		9.40	+/-3.35	3.86	1.62	+/-3.82	4.00	pCi/g		BXF1	03/04/16	0744	1547857	2
Beta		14.6	+/-3.08	4.08	1.93	+/-3.72	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	1523	1547783

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4 5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery Test

Batch ID Recovery% Acceptable Limits

GEL LABORATORIES LLC

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

Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.5.2
Sample ID: 392043009

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 18, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.6.1
 Sample ID: 387853013
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 18-DEC-15
 Collector: Client
 Moisture: 20.7%

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		20.7						percent		CXC1	12/21/15	1516	1532672	1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0482	+/-0.212	0.420	0.196	+/-0.213		pCi/g		RXF2	01/13/16	0752	1532995	2
Antimony-125	U	-0.00426	+/-0.0948	0.157	0.0721	+/-0.0949		pCi/g						
Bismuth-212	UI	0.00	+/-0.614	1.06	0.486	+/-0.720		pCi/g						
Bismuth-214		0.921	+/-0.145	0.144	0.0668	+/-0.163		pCi/g						
Cesium-137		0.529	+/-0.0904	0.0606	0.0272	+/-0.0997	0.100	pCi/g						
Cobalt-60	U	-0.00284	+/-0.0314	0.0602	0.0255	+/-0.0314		pCi/g						
Europium-154	U	0.0963	+/-0.105	0.227	0.101	+/-0.114		pCi/g						
Lead-212		0.725	+/-0.106	0.0922	0.0432	+/-0.121		pCi/g						
Lead-214		1.11	+/-0.156	0.300	0.145	+/-0.179		pCi/g						
Potassium-40		9.52	+/-1.20	0.607	0.257	+/-1.48		pCi/g						
Protactinium-231	U	0.370	+/-0.430	0.879	0.412	+/-0.468		pCi/g						
Radium-226		0.921	+/-0.145	0.144	0.0668	+/-0.163		pCi/g						
Radium-228		0.625	+/-0.277	0.160	0.0668	+/-0.290		pCi/g						
Thallium-208		0.242	+/-0.0833	0.0496	0.022	+/-0.0857		pCi/g						
Tin-126	UI	0.00	+/-0.0713	0.148	0.0712	+/-0.0943		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		10.2	+/-3.51	4.00	1.68	+/-4.07	4.00	pCi/g		JXB7	01/11/16	1338	1534754	3
Beta		17.6	+/-3.23	3.99	1.88	+/-4.06	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	12/21/15	1516	1532672

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**

Surrogate/Tracer	Recovery	Acceptable Limits

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

Report Date: January 18, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.6.1
Sample ID: 387853013

Project: MJWC00115
Client ID: MJWC001

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

Notes:

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

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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: 5.2.B.R.6.2
 Sample ID: 392043010
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 18.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gamma with Ingrowth "Dry Weight Corrected"

Actinium-227	UI	0.00	+/-0.393	0.555	0.262	+/-0.425		pCi/g		MXR1	03/07/16	0910	1547791	1
Antimony-125	U	0.0375	+/-0.104	0.209	0.097	+/-0.105		pCi/g						
Bismuth-212	UI	0.00	+/-0.907	1.36	0.630	+/-1.31		pCi/g						
Bismuth-214		0.816	+/-0.174	0.136	0.0619	+/-0.188		pCi/g						
Cesium-137		0.196	+/-0.0722	0.072	0.0325	+/-0.0741	0.100	pCi/g						
Cobalt-60	U	0.00591	+/-0.0361	0.0717	0.0302	+/-0.0362		pCi/g						
Europium-154	U	-0.0733	+/-0.133	0.233	0.101	+/-0.137		pCi/g						
Lead-212		0.571	+/-0.162	0.118	0.0554	+/-0.171		pCi/g						
Lead-214		0.849	+/-0.203	0.314	0.152	+/-0.217		pCi/g						
Potassium-40		9.69	+/-1.24	0.557	0.223	+/-1.49		pCi/g						
Protactinium-231	U	0.0951	+/-0.573	0.968	0.453	+/-0.575		pCi/g						
Radium-226		0.816	+/-0.174	0.136	0.0619	+/-0.188		pCi/g						
Radium-228		0.866	+/-0.289	0.305	0.138	+/-0.314		pCi/g						
Thallium-208		0.229	+/-0.0581	0.0691	0.0314	+/-0.0614		pCi/g						
Tin-126	U	0.0293	+/-0.130	0.163	0.0779	+/-0.131		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		9.73	+/-3.23	3.54	1.48	+/-3.75	4.00	pCi/g		BNF1	03/04/16	0744	1547857	2
Beta		19.0	+/-3.18	3.79	1.78	+/-4.20	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	1523	1547783

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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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: 5.2.B.R.6.2
Sample ID: 392043010

Project: MJWC00115
Client ID: MJWC001

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

Notes:

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

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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 18, 2016

Client Sample ID: 5.2B.R.7.1
 Sample ID: 387853014
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 18-DEC-15
 Collector: Client
 Moisture: 38.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lo	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		38.3						percent		CXC1	12/21/15	1516	1532672	1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.348	+/-0.355	0.590	0.269	+/-0.391		pCi/g		RXF2	01/13/16	0753	1532995	2
Antimony-125	U	0.025	+/-0.134	0.251	0.113	+/-0.135		pCi/g						
Bismuth-212	U	0.0155	+/-0.824	1.55	0.694	+/-0.824		pCi/g						
Bismuth-214		0.701	+/-0.215	0.205	0.0923	+/-0.224		pCi/g						
Cesium-137		0.863	+/-0.124	0.111	0.0495	+/-0.145	0.100	pCi/g						
Cobalt-60	U	0.00924	+/-0.0454	0.0999	0.0404	+/-0.0456		pCi/g						
Europium-154	U	0.0682	+/-0.170	0.362	0.155	+/-0.173		pCi/g						
Lead-212		0.493	+/-0.126	0.112	0.0507	+/-0.132		pCi/g						
Lead-214		0.705	+/-0.221	0.217	0.0997	+/-0.229		pCi/g						
Potassium-40		8.09	+/-1.55	1.15	0.478	+/-1.69		pCi/g						
Protactinium-231	U	0.133	+/-0.833	1.36	0.627	+/-0.836		pCi/g						
Radium-226		0.701	+/-0.215	0.205	0.0923	+/-0.224		pCi/g						
Radium-228		0.602	+/-0.278	0.335	0.141	+/-0.292		pCi/g						
Thallium-208		0.180	+/-0.0828	0.0845	0.0369	+/-0.0843		pCi/g						
Tin-126	U	0.0767	+/-0.129	0.233	0.110	+/-0.134		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A.B. solid "Dry Weight Corrected"</i>														
Alpha		9.88	+/-3.17	3.31	1.36	+/-3.72	4.00	pCi/g		JXB7	01/11/16	1338	1534754	3
Beta		19.0	+/-3.27	3.83	1.79	+/-4.22	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	12/21/15	1516	1532672

The following Analytical Methods were performed

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

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

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Certificate of Analysis

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

Report Date: January 18, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.7.1
Sample ID: 387853014

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 18, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.8.1
 Sample ID: 387853015
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 18-DEC-15
 Collector: Client
 Moisture: 21.4%

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		21.4						percent		CXC1	12/21/15	1516	1532672	1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0123	+/-0.199	0.387	0.180	+/-0.199		pCi/g		RXF2	01/13/16	0805	1532995	2
Antimony-125	U	-0.00635	+/-0.0722	0.137	0.0618	+/-0.0722		pCi/g						
Bismuth-212	UI	0.00	+/-0.729	1.15	0.530	+/-0.797		pCi/g						
Bismuth-214		0.913	+/-0.146	0.115	0.0518	+/-0.165		pCi/g						
Cesium-137		0.274	+/-0.0685	0.0685	0.0311	+/-0.0719	0.100	pCi/g						
Cobalt-60	U	-0.00454	+/-0.0303	0.0594	0.0248	+/-0.0304		pCi/g						
Europium-154	U	-0.0131	+/-0.0976	0.189	0.0811	+/-0.0978		pCi/g						
Lead-212		0.873	+/-0.108	0.0874	0.0409	+/-0.160		pCi/g						
Lead-214		1.09	+/-0.159	0.301	0.146	+/-0.190		pCi/g						
Potassium-40		10.6	+/-1.23	0.552	0.227	+/-1.55		pCi/g						
Protactinium-231	UI	0.00	+/-0.543	0.742	0.343	+/-0.551		pCi/g						
Radium-226		0.913	+/-0.146	0.115	0.0518	+/-0.165		pCi/g						
Radium-228		1.00	+/-0.233	0.225	0.0988	+/-0.280		pCi/g						
Thallium-208		0.213	+/-0.0729	0.0566	0.0254	+/-0.0751		pCi/g						
Tin-126	UI	0.00	+/-0.129	0.104	0.050	+/-0.131		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		9.88	+/-2.91	2.88	1.18	+/-3.48	4.00	pCi/g		JXB7	01/11/16	1331	1534754	3
Beta		14.4	+/-2.92	3.71	1.74	+/-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	12/21/15	1516	1532672

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4 5 2 3/Ga-01-R
3	EPA 900 0/SW846 9310/SM 7110B Modified

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

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

Report Date: January 18, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2B.R.8.1
Sample ID: 387853015

Project: MJWC00115
Client ID: MJWC001

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

Notes:

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

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Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.7.2
 Sample ID: 392043011
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 16.7%

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	0.0245	+/-0.221	0.431	0.201	+/-0.222		pCi/g		MXR1	03/07/16	0910	1547791	1
Antimony-125	U	-0.0547	+/-0.0843	0.148	0.067	+/-0.0879		pCi/g						
Bismuth-212	UI	0.00	+/-0.664	1.04	0.473	+/-0.722		pCi/g						
Bismuth-214		0.918	+/-0.144	0.0976	0.0431	+/-0.163		pCi/g						
Cesium-137		0.105	+/-0.0519	0.0629	0.0282	+/-0.0526	0.100	pCi/g						
Cobalt-60	U	-0.0303	+/-0.0369	0.0628	0.0262	+/-0.0395		pCi/g						
Europium-154	U	-0.00768	+/-0.119	0.232	0.102	+/-0.119		pCi/g						
Lead-212		0.854	+/-0.113	0.0907	0.0423	+/-0.136		pCi/g						
Lead-214		1.03	+/-0.160	0.120	0.055	+/-0.183		pCi/g						
Potassium-40		9.66	+/-1.23	0.502	0.200	+/-1.50		pCi/g						
Protactinium-231	UI	0.00	+/-0.493	0.962	0.452	+/-0.563		pCi/g						
Radium-226		0.918	+/-0.144	0.0976	0.0431	+/-0.163		pCi/g						
Radium-228		0.633	+/-0.212	0.183	0.0774	+/-0.233		pCi/g						
Thallium-208		0.295	+/-0.0704	0.0606	0.0274	+/-0.0746		pCi/g						
Tin-126	U	0.00684	+/-0.0788	0.150	0.0721	+/-0.0788		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		11.6	+/-3.30	3.92	1.74	+/-4.05	4.00	pCi/g		BXF1	03/04/16	0745	1547857	2
Beta		15.9	+/-2.44	3.01	1.43	+/-3.33	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	1523	1547783

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery Test

Batch ID Recovery% Acceptable Limits

GEL LABORATORIES LLC

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Company : MJW Technical Services
Address : 15 Hazelwood Drive
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Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.7.2
Sample ID: 392043011

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).