Eastern Analytical, Inc.

professional laboratory & drilling services

Jim Wieck
GZA GeoEnvironmental, Inc. (NH)
5 Commerce Park North, Suite 201
Bedford , NH 03110

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	159748
Client Identification:	Radionuclides Sampling
Date Received:	8/24/2016

Dear Mr. Wieck :

Enclosed please find the report of analysis for the above identified project.
As discussed, analyses were subcontracted and are listed as follows:

Analysis:	Subcontract - Radionuclide Testing
Subcontractor Lab:	GEL Laboratories, LLC

A complete copy of the report is attached. This report may not be reproduced except in full, without the written approval of the laboratory.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — 9.12.16 — 26

Lorraine Olashaw, Lab Director | Date | # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **159748**

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **Radionuclides Sampling**

Temperature upon receipt (°C): 4.6 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
159748.01	A1R-1	8/24/16	8/22/16	soil		Adheres to Sample Acceptance Policy
159748.02	A1R-2	8/24/16	8/23/16	soil		Adheres to Sample Acceptance Policy
159748.03	A1R-3	8/24/16	8/23/16	soil		Adheres to Sample Acceptance Policy
159748.04	A1Y-1	8/24/16	8/22/16	soil		Adheres to Sample Acceptance Policy
159748.05	A1Y-4	8/24/16	8/24/16	soil		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater,20th Edition, 1998 and 22nd Edition, 2012
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 2nd edition, 1992

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

gel.com

September 08, 2016

Mr. Michael O. Serard
Eastern Analytical, Inc.
25 Chenell Drive
Concord, New Hampshire 03301

Re: Radiochemistry Analyses - Serard
Work Order: 404634

Dear Mr. Serard:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 25, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4289.

Sincerely,

Linda Pullano for
Julie Robinson
Project Manager

Purchase Order: 45015
Chain of Custody: 159748
Enclosures

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

Certificate of Analysis Report
for

ETAI001 Eastern Analytical, Inc.

Client SDG: 404634 GEL Work Order: 404634

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a Tracer compound

** Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

UI Gamma Spectroscopy--Uncertain identification

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Julie Robinson.

Reviewed by Linda O. Sullivan

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

Certificate of Analysis

Report Date: September 8, 2016

Company : Eastern Analytical, Inc.
Address : 25 Chenell Drive

Concord, New Hampshire 03301
Contact: Mr. Michael O. Serard
Project: Radiochemistry Analyses - Serard

Client Sample ID: A1R-1 | Project: ETAI00116
Sample ID: 404634001 | Client ID: ETAI001
Matrix: Soil
Collect Date: 22-AUG-16 10:00
Receive Date: 25-AUG-16
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Cesium-137) "Dry Weight Corrected"													
Cesium-137	U	0.0082	+/-0.0342	0.0669	0.100	pCi/g			MXR1	09/01/16	0902	1593679	1
Rad Gas Flow Proportional Counting													
GFPC, Pb210, Solid "Dry Weight Corrected"													
Lead-210	U	1.58	+/-1.79	3.00	5.00	pCi/g			KSD1	09/06/16	1507	1594027	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Solid "As Received"													
Tritium	U	1.62	+/-2.37	4.04	6.00	pCi/g			GXR1	09/02/16	0732	1593524	3
Liquid Scint C14, Solid "As Received"													
Carbon-14	U	0.389	+/-0.630	1.07	2.00	pCi/g			GXR1	09/04/16	1406	1593523	4
Liquid Scint Ni63, Solid "Dry Weight Corrected"													
Nickel-63	U	-0.975	+/-1.53	2.69	4.00	pCi/g			CXS7	09/06/16	1626	1594197	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JXO1	08/30/16	1234	1593628

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	DOE RP280 Modified	
3	EPA 906.0 Modified	
4	EPA EERF C-01 Modified	
5	DOE RESL Ni-1, Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Lead Carrier	GFPC, Pb210, Solid "Dry Weight Corrected"			81.4	(25%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid "Dry Weight Corrected"			68.3	(25%-125%)

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

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Certificate of Analysis

Report Date: September 8, 2016

Company :	Eastern Analytical, Inc.
Address :	25 Chenell Drive
	Concord, New Hampshire 03301
Contact:	Mr. Michael O. Serard
Project:	Radiochemistry Analyses - Serard

Client Sample ID:	A1R-1	Project:	ETAI00116
Sample ID:	404634001	Client ID:	ETAI001

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

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: September 8, 2016

Company : Eastern Analytical, Inc.
Address : 25 Chenell Drive

Concord, New Hampshire 03301
Contact: Mr. Michael O. Serard
Project: Radiochemistry Analyses - Serard

Client Sample ID: A1R-2
Sample ID: 404634002
Matrix: Soil
Collect Date: 23-AUG-16 11:35
Receive Date: 25-AUG-16
Collector: Client

Project: ETAI00116
Client ID: ETAI001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Cesium-137) "Dry Weight Corrected"													
Cesium-137	U	0.0311	+/-0.0284	0.0614	0.100	pCi/g			MXR1	09/01/16	0903	1593679	1
Rad Gas Flow Proportional Counting													
GFPC, Pb210, Solid "Dry Weight Corrected"													
Lead-210	U	1.91	+/-2.17	3.65	5.00	pCi/g			KSD1	09/06/16	1151	1594027	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Solid "As Received"													
Tritium	U	-0.563	+/-2.29	4.10	6.00	pCi/g			GXR1	09/02/16	0833	1593524	3
Liquid Scint C14, Solid "As Received"													
Carbon-14	U	0.556	+/-0.693	1.17	2.00	pCi/g			GXR1	09/04/16	1447	1593523	4
Liquid Scint Ni63, Solid "Dry Weight Corrected"													
Nickel-63	U	0.944	+/-1.65	2.79	4.00	pCi/g			CXS7	09/06/16	1659	1594197	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JXO1	08/30/16	1234	1593628

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	DOE RP280 Modified	
3	EPA 906.0 Modified	
4	EPA EERF C-01 Modified	
5	DOE RESL Ni-1, Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Lead Carrier	GFPC, Pb210, Solid "Dry Weight Corrected"			80	(25%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid "Dry Weight Corrected"			63.5	(25%-125%)

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

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Certificate of Analysis

Report Date: September 8, 2016

Company :	Eastern Analytical, Inc.
Address :	25 Chenell Drive
	Concord, New Hampshire 03301
Contact:	Mr. Michael O. Serard
Project:	Radiochemistry Analyses - Serard

Client Sample ID:	A1R-2	Project:	ETAI00116
Sample ID:	404634002	Client ID:	ETAI001

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

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: September 8, 2016

Company :	Eastern Analytical, Inc.
Address :	25 Chenell Drive
	Concord, New Hampshire 03301
Contact:	Mr. Michael O. Serard
Project:	Radiochemistry Analyses - Serard

Client Sample ID:	A1R-3	Project:	ETAI00116
Sample ID:	404634003	Client ID:	ETAI001
Matrix:	Soil		
Collect Date:	23-AUG-16 12:20		
Receive Date:	25-AUG-16		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Cesium-137) "Dry Weight Corrected"													
Cesium-137	U	0.00621	+/-0.0273	0.0599	0.100	pCi/g			MXR1	09/01/16	0903	1593679	1
Rad Gas Flow Proportional Counting													
GFPC, Pb210, Solid "Dry Weight Corrected"													
Lead-210	U	3.05	+/-2.52	4.06	5.00	pCi/g			KSD1	09/06/16	1151	1594027	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Solid "As Received"													
Tritium	U	-0.872	+/-2.28	4.12	6.00	pCi/g			GXR1	09/02/16	0934	1593524	3
Liquid Scint C14, Solid "As Received"													
Carbon-14	U	1.26	+/-0.779	1.28	2.00	pCi/g			GXR1	09/04/16	1529	1593523	4
Liquid Scint Ni63, Solid "Dry Weight Corrected"													
Nickel-63	U	-0.994	+/-1.42	2.50	4.00	pCi/g			CXS7	09/06/16	1731	1594197	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JXO1	08/30/16	1234	1593628

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	DOE RP280 Modified	
3	EPA 906.0 Modified	
4	EPA EERF C-01 Modified	
5	DOE RESL Ni-1, Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Lead Carrier	GFPC, Pb210, Solid "Dry Weight Corrected"			82	(25%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid "Dry Weight Corrected"			73.6	(25%-125%)

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

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Certificate of Analysis

Report Date: September 8, 2016

Company :	Eastern Analytical, Inc.
Address :	25 Chenell Drive
	Concord, New Hampshire 03301
Contact:	Mr. Michael O. Serard
Project:	Radiochemistry Analyses - Serard

Client Sample ID:	A1R-3	Project:	ETAI00116
Sample ID:	404634003	Client ID:	ETAI001

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

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: September 8, 2016

Company : Eastern Analytical, Inc.
Address : 25 Chenell Drive

Concord, New Hampshire 03301
Contact: Mr. Michael O. Serard
Project: Radiochemistry Analyses - Serard

Client Sample ID: A1Y-1
Sample ID: 404634004
Matrix: Soil
Collect Date: 22-AUG-16 10:00
Receive Date: 25-AUG-16
Collector: Client

Project: ETAI00116
Client ID: ETAI001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Cesium-137) "Dry Weight Corrected"													
Cesium-137	UI	0.00	+/-0.0415	0.0519	0.100	pCi/g			MXR1	09/01/16	0903	1593679	1
Rad Gas Flow Proportional Counting													
GFPC, Pb210, Solid "Dry Weight Corrected"													
Lead-210	U	1.62	+/-2.34	4.02	5.00	pCi/g			KSD1	09/06/16	1151	1594027	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Solid "As Received"													
Tritium	U	0.296	+/-2.31	4.05	6.00	pCi/g			GXR1	09/02/16	1035	1593524	3
Liquid Scint C14, Solid "As Received"													
Carbon-14	U	0.436	+/-0.737	1.25	2.00	pCi/g			GXR1	09/04/16	1610	1593523	4
Liquid Scint Ni63, Solid "Dry Weight Corrected"													
Nickel-63	U	-1.52	+/-1.52	2.71	4.00	pCi/g			CXS7	09/06/16	1803	1594197	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JXO1	08/30/16	1234	1593628

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	DOE RP280 Modified	
3	EPA 906.0 Modified	
4	EPA EERF C-01 Modified	
5	DOE RESL Ni-1, Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Lead Carrier	GFPC, Pb210, Solid "Dry Weight Corrected"			78	(25%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid "Dry Weight Corrected"			67.9	(25%-125%)

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

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Certificate of Analysis

Report Date: September 8, 2016

Company :	Eastern Analytical, Inc.
Address :	25 Chenell Drive
	Concord, New Hampshire 03301
Contact:	Mr. Michael O. Serard
Project:	Radiochemistry Analyses - Serard

Client Sample ID:	A1Y-1	Project:	ETAI00116
Sample ID:	404634004	Client ID:	ETAI001

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

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: September 8, 2016

Company : Eastern Analytical, Inc.
Address : 25 Chenell Drive

Concord, New Hampshire 03301
Contact: Mr. Michael O. Serard
Project: Radiochemistry Analyses - Serard

Client Sample ID: A1Y-4
Sample ID: 404634005
Matrix: Soil
Collect Date: 24-AUG-16 08:40
Receive Date: 25-AUG-16
Collector: Client

Project: ETAI00116
Client ID: ETAI001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Cesium-137) "Dry Weight Corrected"													
Cesium-137	U	0.00317	+/-0.0284	0.0571	0.100	pCi/g			MXR1	09/01/16	0904	1593679	1
Rad Gas Flow Proportional Counting													
GFPC, Pb210, Solid "Dry Weight Corrected"													
Lead-210	U	3.37	+/-2.64	4.20	5.00	pCi/g			KSD1	09/06/16	1151	1594027	2
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Solid "As Received"													
Tritium	U	-1.05	+/-2.39	4.33	6.00	pCi/g			GXR1	09/02/16	1137	1593524	3
Liquid Scint C14, Solid "As Received"													
Carbon-14	U	-0.29	+/-0.703	1.23	2.00	pCi/g			GXR1	09/04/16	1651	1593523	4
Liquid Scint Ni63, Solid "Dry Weight Corrected"													
Nickel-63	U	0.382	+/-1.46	2.50	4.00	pCi/g			CXS7	09/06/16	1835	1594197	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JXO1	08/30/16	1234	1593628

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	DOE RP280 Modified	
3	EPA 906.0 Modified	
4	EPA EERF C-01 Modified	
5	DOE RESL Ni-1, Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Lead Carrier	GFPC, Pb210, Solid "Dry Weight Corrected"			80	(25%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid "Dry Weight Corrected"			67.5	(25%-125%)

Notes:
Counting Uncertainty is 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

Report Date: September 8, 2016

Company :	Eastern Analytical, Inc.
Address :	25 Chenell Drive
	Concord, New Hampshire 03301
Contact:	Mr. Michael O. Serard
Project:	Radiochemistry Analyses - Serard

Client Sample ID:	A1Y-4	Project:	ETAI00116
Sample ID:	404634005	Client ID:	ETAI001

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

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

QC Summary

Report Date: September 8, 2016

Eastern Analytical, Inc.
25 Chenell Drive
Concord, New Hampshire

Contact: Mr. Michael O. Serard

Workorder: 404634

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1593679										
QC1203614884 404634001 DUP										
Cesium-137	U	0.0082	U	0.00746	pCi/g	N/A			N/A MXR1	09/01/16 10:13
	Uncertainty	+/-0.0342		+/-0.0332						
QC1203614885 LCS										
Americium-241	489			512	pCi/g		105	(75%-125%)		09/01/16 09:52
	Uncertainty			+/-5.66						
Cobalt-60	162			159	pCi/g		98.1	(75%-125%)		
	Uncertainty			+/-4.04						
Cesium-137	179			180	pCi/g		100	(75%-125%)		
	Uncertainty			+/-3.70						
QC1203614883 MB										
Cesium-137			U	0.00015	pCi/g					09/01/16 09:04
	Uncertainty			+/-0.0182						
Rad Gas Flow										
Batch 1594027										
QC1203615679 404634001 DUP										
Lead-210	U	1.58	U	1.63	pCi/g	N/A			N/A KSD1	09/06/16 11:51
	Uncertainty	+/-1.79		+/-2.39						
QC1203615680 LCS										
Lead-210	513			627	pCi/g		122	(75%-125%)		09/06/16 15:07
	Uncertainty			+/-18.0						
QC1203615678 MB										
Lead-210			U	1.82	pCi/g					09/06/16 11:51
	Uncertainty			+/-2.22						
Rad Liquid Scintillation										
Batch 1593523										
QC1203614568 404634001 DUP										
Carbon-14	U	0.389	U	-0.225	pCi/g	N/A			N/A GXR1	09/04/16 18:14
	Uncertainty	+/-0.630		+/-0.712						
QC1203614570 LCS										
Carbon-14	45.9			45.4	pCi/g		99	(75%-125%)		09/04/16 19:37
	Uncertainty			+/-1.48						
QC1203614567 MB										
Carbon-14			U	0.144	pCi/g					09/04/16 17:33
	Uncertainty			+/-0.622						
QC1203614569 404634001 MS										
Carbon-14	73.5 U	0.389		75.1	pCi/g		102	(75%-125%)		09/04/16 18:55
	Uncertainty	+/-0.630		+/-2.41						
Batch 1593524										
QC1203614572 404634001 DUP										
Tritium	U	1.62	U	-1.27	pCi/g	N/A			N/A GXR1	09/02/16 13:39
	Uncertainty	+/-2.37		+/-2.34						
QC1203614574 LCS										

QC Summary

Workorder: 404634

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Liquid Scintillation										
Batch 1593524										
Tritium	33.7			27.2	pCi/g		80.8	(75%-125%)		09/02/16 15:42
	Uncertainty			+/-3.59						
QC1203614571 MB										
Tritium			U	-0.121	pCi/g				GXR1	09/02/16 12:38
	Uncertainty			+/-2.42						
QC1203614573 404634001 MS										
Tritium	33.9 U	1.62		35.6	pCi/g		105	(75%-125%)		09/02/16 14:40
	Uncertainty	+/-2.37		+/-3.85						
Batch 1594197										
QC1203616068 404634001 DUP										
Nickel-63	U	-0.975	U	0.540	pCi/g	N/A		N/A	CXS7	09/06/16 19:40
	Uncertainty	+/-1.53		+/-1.27						
QC1203616069 LCS										
Nickel-63	80.7			76.0	pCi/g		94.1	(75%-125%)		09/06/16 20:12
	Uncertainty			+/-2.96						
QC1203616067 MB										
Nickel-63			U	0.0658	pCi/g					09/07/16 09:24
	Uncertainty			+/-1.37						

Notes:

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

The Qualifiers in this report are defined as follows:

**	Analyte is a Tracer compound
<	Result is less than value reported
>	Result is greater than value reported
BD	Results are either below the MDC or tracer recovery is low
FA	Failed analysis.
H	Analytical holding time was exceeded
J	Value is estimated
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
M	M if above MDC and less than LLD
M	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
UI	Gamma Spectroscopy--Uncertain identification

QC Summary

Workorder: 404634

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

UJ	Gamma Spectroscopy--Uncertain identification
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
h	Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

404634

EAI SRB# **159748**

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
A1R-1	8/24/2016 10:00	soil	Subcontract - Radionuclides Soil	
A1R-2	8/24/2016 11:35	soil	Subcontract - Radionuclides Soil	
A1R-3	8/24/2016 12:20	soil	Subcontract - Radionuclides Soil	
A1Y-1	8/24/2016 10:00	soil	Subcontract - Radionuclides Soil	

EAI SRB# **159748** **Project State: NH**

Project ID: 3946

Company GEL Laboratories, LLC
Address 2040 Savage Road
Address Charleston, SC 29417
Account #
Phone # (843) 556-8171
Fax Number (843) 766-1178

Results Needed by: Preferred date

QC Deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ P

Notes about project:

Email pdf of results and invoice to customerservice@eailabs.com.

Tritium, Carbon-14, Lead-210, Nickel-63, and Cesium-137

Eastern Analytical Inc. PO Number: 45015

Please call prior to analyzing, if RUSH surcharges will be applied.

Samples Collected by:

Relinquished by	Date/Time	Received by
	8/24/16 16:00	
		8/25/16 9:20

Relinquished by	Date/Time	Received by

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301 Phone: (603)228-0525 1-800-287-0525 Fax: (603)228-4591

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

EAI SRB# 159748

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
A1Y-4	8/24/2016 08:40	soil	Subcontract - Radionuclides Soil	

EAI SRB# 159748 **Project State: NH**
Project ID: 3946

Company GEL Laboratories, LLC
Address 2040 Savage Road
Address Charleston, SC 29417
Account #
Phone # (843) 556-8171
Fax Number (843) 766-1178

Results Needed by: Preferred date
QC Deliverables
☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ P

Notes about project:
Email pdf of results and invoice to customerservice@eailabs.com.
Tritium, Carbon-14, Lead-210, Nickel-63, and Cesium-137

Eastern Analytical Inc. PO Number: 45015

Please call prior to analyzing, if RUSH surcharges will be applied.

Samples Collected by:

Relinquished by	Date/Time	Received by
[signature]	8/24/16 1600	[signature]
[signature]	8/25/16 9:20	[signature]

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301 Phone: (603)228-0525 1-800-287-0525 Fax: (603)228-4591

As a subcontract lab to EAI, you will defend, indemnify and hold Eastern Analytical, Inc., its officers, employees, and agents harmless from and against any and all liability, loss, expense or claims for injury or damages arising out of the performance against this chain of custody but only in proportion to and to the extent such liability, loss, expense, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of you as a subcontract lab, your officers, agents or employees

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ETAI			**SDG/AR/COC/Work Order:** 404634
Received By: ZKW			**Date Received:** 8/25/16
Suspected Hazard Information	**Yes**	**No**	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: (Ice bags) Blue ice Dry ice None Other (describe) *all temperatures are ~~recorded~~ in Celsius 1°C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): ES03201583O
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?			✓	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?			✓	Sample ID's and containers affected:
7	VOA vials contain acid preservation?			✓	(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?			✓	Sample ID's and containers affected:
9	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	✓			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?			✓	Sample ID's affected: Collect Date on all samples except A1Y-4 is 8/23/16
13	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			✓	
15	COC form is properly signed in relinquished/received sections?	✓			
16	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground (UPS) Field Services Courier Other 1Z X46 599 01 9218 9076

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials SR Date 8-25-16 Page 1 of 1

GL-CHL-SR-001 Rev 3

List of current GEL Certifications as of 08 September 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Radiochemistry
Technical Case Narrative
Eastern Analytical, Inc. (ETAI)
SDG #: 404634

Product: **Gammaspec, Gamma, Solid (Cesium-137)**
Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R
Analytical Procedure: GL-RAD-A-013 REV# 25
Analytical Batch: 1593679

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1593628

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
404634001	A1R-1
404634002	A1R-2
404634003	A1R-3
404634004	A1Y-1
404634005	A1Y-4
1203614883	Method Blank (MB)
1203614884	404634001(A1R-1) Sample Duplicate (DUP)
1203614885	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to no valid peak.	Cesium-137	404634004	A1Y-1

Product: **GFPC, Pb210, Solid**
Analytical Method: DOE RP280 Modified
Analytical Procedure: GL-RAD-A-018 REV# 13
Analytical Batch: 1594027

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1593628

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
404634001	A1R-1
404634002	A1R-2
404634003	A1R-3
404634004	A1Y-1
404634005	A1Y-4
1203615678	Method Blank (MB)
1203615679	404634001(A1R-1) Sample Duplicate (DUP)
1203615680	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts
Sample 1203615680 (LCS) was recounted due to high recovery. The recount is reported. Sample 404634001 (A1R-1) was recounted due to a suspected false positive. The recount is reported.

Product: **Liquid Scint C14, Solid**
Analytical Method: EPA EERF C-01 Modified
Analytical Procedure: GL-RAD-A-003 REV# 15
Analytical Batch: 1593523

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
404634001	A1R-1
404634002	A1R-2
404634003	A1R-3
404634004	A1Y-1
404634005	A1Y-4
1203614567	Method Blank (MB)
1203614568	404634001(A1R-1) Sample Duplicate (DUP)
1203614569	404634001(A1R-1) Matrix Spike (MS)
1203614570	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: **LSC, Tritium Dist, Solid**
Analytical Method: EPA 906.0 Modified
Analytical Procedure: GL-RAD-A-002 REV# 21
Analytical Batch: 1593524

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
404634001	A1R-1
404634002	A1R-2
404634003	A1R-3
404634004	A1Y-1
404634005	A1Y-4
1203614571	Method Blank (MB)
1203614572	404634001(A1R-1) Sample Duplicate (DUP)
1203614573	404634001(A1R-1) Matrix Spike (MS)
1203614574	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts
Samples were recounted due to high MDCs and low recovery. Recounts are reported.

Product: **Liquid Scint Ni63, Solid**
Analytical Method: DOE RESL Ni-1, Modified
Analytical Procedure: GL-RAD-A-022 REV# 18
Analytical Batch: 1594197

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1593628

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
404634001	A1R-1
404634002	A1R-2
404634003	A1R-3
404634004	A1Y-1
404634005	A1Y-4
1203616067	Method Blank (MB)
1203616068	404634001(A1R-1) Sample Duplicate (DUP)
1203616069	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts
Sample 1203616067 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

CHAIN-OF-CUSTODY RECORD

159748

GZANH 25

Sample IDs	Date/Time (Composites need start and stop dates/times)	Matrix	Parameters and Sample Notes	# of containers
Soil A1R-1	8/22/16 1000	soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	1
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Soil A1R-2	8/23/16 1135	soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	1
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Soil A1R-3	8/23/16 1220	soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	1
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Soil A1Y-1	8/22/16 1000	soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	1
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐

SAMPLE LOCATION ID'S per COC 8/24/16

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID

Project Name Radionuclides Testing

State NH

Client (Pro Mgr) Jim Wieck

Customer GZA GeoEnvironmental, Inc. (NH)

Address 5 Commerce Park North, Suite 201

City Bedford NH 03110

Phone 623-3600 **Fax** 624-9463 (37)

Email: James.Wieck@gza.com

Direct 232-8732

Results Needed by: Preferred date 10 day

Notes:

Tritium, Carbon-14, Lead-210, Nickel-63, and Cesium -137

QC deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ PC

ReportingOptions

☒ HC ☐ NO FAX

☒ EDD PDF ☐ Partial FAX

☒ EDD email ☒ PDF Invoice

☒ PDF prelim, NO FAX ☐ EQUIS

☐ e-mail Login Confirmation

PO# verbal

Quote#:

Temp 4.6 C

Ice Y ☑ N ☐

Samples Collected by: Christopher Melloy

Relinquished by	Date/Time	Received by
Christopher B. Melloy	8/24/16 1515	

Relinquished by	Date/Time	Received by

CHAIN-OF-CUSTODY RECORD

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
Soil A1Y-4	8/24/10 0840	soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	1
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Soil		soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Soil		soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Soil		soil Grab or Comp	SolTotDry/RadionuclidesSoilSubGEL	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐

SAMPLE LOCATION ID'S per COC [signature] 8/24/10

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID
Project Name Radionuclides Testing

State NH
Client (Pro Mgr) Jim Wieck
Customer GZA GeoEnvironmental, Inc. (NH)
Address 5 Commerce Park North, Suite 201
City Bedford NH 03110
Phone 623-3600 **Fax** 624-9463 (37)
Email: James.Wieck@gza.com
Direct 232-8732

Results Needed by: Preferred date 10day
Notes:

Tritium, Carbon-14, Lead-210, Nickel-63, and Cesium -137

QC deliverables
☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ PC

ReportingOptions
☒ HC ☐ NO FAX
☒ EDD PDF ☐ Partial FAX
☒ EDD email ☒ PDF Invoice
☒ PDF prelim, NO FAX ☐ EQUIS
☐ e-mail Login Confirmation

PO# verbal
Quote#:
Temp 4.0°C
Ice Y ☒ N ☐

Samples Collected by: Christopher Malloy

Relinquished by	Date/Time	Received by
[signature]	8/24/10 1515	[signature]

Eastern Analytical, Inc. www.eailabs.com | 800.287.0525 | customerservice@eailabs.com