B & B ENVIRONMENTAL SAFETY, INC.
AWARENESS, RESPONSE, SOLUTIONS

MEMORANDUM OF RECORD

July 30, 2014

To: Ted Mankowski, Project Manager, LBNL Building 5 Demolition

From: Doc Dennis, Project Manager, BBES RLC Project, Building 5, 16 and 16A

RE: Additional Building 5 sampling conducted by LBNL, post RLC Project Report

Encl: 1) GEL Laboratories Report of Analysis Dated 21 July 2014

Ted,

As per your request, I am providing this Memorandum of Record for inclusion with the RLC Report for Project 1016 finalized by BBES on 7/7/14. This is submitted as a separate note of volumetric sampling conducted by LBNL after completion of the BBES RLC on-site sampling.

On June 16, 2014 LBNL collected a volumetric sample of charred wood that was discovered in the overhead space of Building 5, Room 150/150A. The sample was analyzed by GEL under LBNL's purchase order for isotopes of Am, Cm, Np, Pu, Th and U by alpha spectroscopy. The sample was also analyzed radiochemically by GEL for H-3, C-14, Tc-99, and Sr-90 and by gamma spectroscopy. As noted in the GEL Analysis Report dated July 21, 2014 (Enclosure 1), no regulated radioactivity was identified.

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
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July 21, 2014

Ms. Suying Xu
LBNL - Env. Services Group
Berkeley Lab
1 Cyclotron Road, MS 75B-0101
Berkeley, California 94720

Re: Old Town Project
Work Order: 351128
SDG: ESG-08149

Dear Ms. Xu:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 20, 2014. 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. 4505.

Sincerely,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 7047977,COC#08149
Chain of Custody: 08149
Enclosures

Lawrence Berkeley National Laboratory
Old Town Project
SDG: ESG-08149

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Case Narrative

General Narrative
for
Lawrence Berkeley National Laboratory
Old Town Project
SDG: ESG-08149

July 21, 2014

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 20, 2014, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Items of Note Due to the matrix of sample 73353, the lab was required to do an acid leach for Gross Beta and Gammaspec and a DI water leach for the Tritium and C14 analysis. For sample 73354 Ra226 was not reported because in-growth was not completed, per client request..

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
351128001	73353
351128002	73354
351128003	73353

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

U.C. Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley CA 94720

351128

LBNL ENVIRONMENTAL SERVICES GROUP
Chain of Custody

Send final reports to: Suying Xu, Mailstop 75B0101
For questions contact John Jelinski, e-mail: JAJelinski@lbl.gov
Phone: 510-486-7616 Fax: 510-486-7034

Purpose: Soil Investigation Sampling Program - Old Town Investigation Sampling Part 2, 2014

COC No.: 08149 **Page 1 of 3**
Release Number / Document Control No.: ESG-08149
Collection(s): 7622

Sample Location	Date & Time Sampled	Reference Date/time*	Collection Method	Sample Type	Container Volume & Code**	#	Preservative	Analysis Code	Field Sample ID***	Notes to Lab
73353	6/16/2014 9:00	6/16/2014 9:00	Grab	Soil/Solids	plastic bag	1	None	C14	6 Horton sphere me	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:00	6/16/2014 9:00	Grab	Soil/Solids	plastic bag	1	None	LBLGB	6 Horton sphere me	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:00	6/16/2014 9:00	Grab	Soil/Solids	plastic bag	1	None	LBLGS:OT	6 Horton sphere me	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:00	6/16/2014 9:00	Grab	Soil/Solids	plastic bag	1	None	LBLH3	6 Horton sphere me	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
73354	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	AM+CM:OT	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	C14	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy

Total No. of Containers: 2
Shipping Document ID:
Turnaround Time**:** 20 days
Lab Name: GEL
Sampled by:

Special Instructions/Comments:

Relinquished By (Sampler)		Relinquished By		Relinquished By	
Signature	Time: 0830	Signature	Time	Signature	Time
Printed Name: L K Galloway	Date: 6/19/14	Printed Name	Date	Printed Name	Date
Company		Company		Company	
Received By		**Received By**		**Received By**	
Signature: Chris Zurcher	Time: 8:50	Signature	Time	Signature	Time
Printed Name: Chris Zurcher	Date: 6-20-14	Printed Name	Date	Printed Name	Date
Company: GEL		Company		Company	

*REFERENCE DATE/TIME: Use this value for decay calculations in radiological analyses when applicable **Container Codes: AG = amber glass CG = clear glass PE = polyethylene VV = VOA vial

*** Field Sample ID: If present, use this information as the sample identifier in hard-copy reports (please include Sample Location information in the notes). If blank, and in electronic deliverable files, use Sample Location as the identifier. ****Listed turnaround time is for reporting and is in work days, as defined in the Joint LBNL/LLNL Analytical Services blanket order.

U.C. Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley CA 94720

LBNL ENVIRONMENTAL SERVICES GROUP
Chain of Custody

Send final reports to: Suying Xu, Mailstop 75B0101
For questions contact John Jelinski, e-mail: JAJelinski@lbl.gov
Phone: 510-486-7616 Fax: 510-486-7034

Purpose: Soil Investigation Sampling Program - Old Town Investigation Sampling Part 2, 2014

COC No.: 08149 **Page 2 of 3**
Release Number / Document Control No.: ESG-08149
Collection(s): 7622

Sample Location	Date & Time Sampled	Reference Date/time*	Collection Method	Sample Type	Container Volume & Code**	#	Preservative	Analysis Code	Field Sample ID***	Notes to Lab
73354	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	I125	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	LBLGB	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	LBLGS:OT	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	LBLH3	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	NP	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	PUISO+PU242:OT	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy

Total No. of Containers: 2
Shipping Document ID:
Turnaround Time**:** 20 days
Lab Name: GEL
Sampled by:

Special Instructions/Comments:

Relinquished By (Sampler)		Relinquished By		Relinquished By	
Signature	Time: 0830	Signature	Time	Signature	Time
Printed Name	Date: 6/19/14	Printed Name	Date	Printed Name	Date
Company		Company		Company	
Received By		**Received By**		**Received By**	
Signature	Time	Signature	Time	Signature	Time
Printed Name	Date	Printed Name	Date	Printed Name	Date
Company		Company		Company	

*REFERENCE DATE/TIME: Use this value for decay calculations in radiological analyses when applicable **Container Codes: AG = amber glass CG = clear glass PE = polyethylene VV = VOA vial

*** Field Sample ID: If present, use this information as the sample identifier in hard-copy reports (please include Sample Location information in the notes). If blank, and in electronic deliverable files, use Sample Location as the identifier. ****Listed turnaround time is for reporting and is in work days, as defined in the Joint LBNL/LLNL Analytical Services blanket order.

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For questions contact John Jelinski, e-mail: JAJelinski@lbl.gov
Phone: 510-486-7616 Fax: 510-486-7034

Purpose: Soil Investigation Sampling Program - Old Town Investigation Sampling Part 2, 2014

COC No.: 08149
Release Number / Document Control No.: ESG-08149
Collection(s): 7622

Sample Location	Date & Time Sampled	Reference Date/time*	Collection Method	Sample Type	Container Volume & Code**	#	Preservative	Analysis Code	Field Sample ID***	Notes to Lab
73354	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	SR90:OT	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	TC99	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	UISO:OT	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy
	6/16/2014 9:30	6/16/2014 9:30	Grab	Soil/Solids	plastic bag	1	None	WTHISO	R150 roof wood pla	Hold portion for possible analysis by DOE RESL Ni-1 Modified X-Ray spectroscopy

Total No. of Containers: 2
Shipping Document ID:
Turnaround Time**:** 20 days
Lab Name: GEL
Sampled by:

Special Instructions/Comments:

Relinquished By (Sampler)		Relinquished By		Relinquished By	
Signature	Time: 0836	Signature	Time	Signature	Time
Printed Name	Date: 6/19/14	Printed Name	Date	Printed Name	Date
Company		Company		Company	
Received By		**Received By**		**Received By**	
Signature	Time	Signature	Time	Signature	Time
Printed Name	Date	Printed Name	Date	Printed Name	Date
Company		Company		Company	

*REFERENCE DATE/TIME: Use this value for decay calculations in radiological analyses when applicable **Container Codes: AG = amber glass CG = clear glass PE = polyethylene VV = VOA vial

*** Field Sample ID: If present, use this information as the sample identifier in hard-copy reports (please include Sample Location information in the notes). If blank, and in electronic deliverable files, use Sample Location as the identifier. ****Listed turnaround time is for reporting and is in work days, as defined in the Joint LBNL/LLNL Analytical Services blanket order.

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: LBNL	**SDG/AR/COC/Work Order:** 351128
Received By: C. Zurcher	**Date Received:** 6-20-14

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 contatiners < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregeated 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 23°
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130462961 Secondary Temperature Device Serial # (If Applicable):
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	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			
14	Carrier and tracking number.	✓			Circle Applicable: FedEx Air (FedEx Ground) UPS Field Services Courier Other 7703 5819 2713

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials KH Date 6/20/2014 Page 1 of 1

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Data Package Qualifier Definitions

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

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

Laboratory Certifications

List of current GEL Certifications as of 21 July 2014

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122014-13
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Radiological Analysis

Radiochemistry Case Narrative
Lawrence Berkeley National Laboratory (LBNL)
SDG ESG-08149
Work Order 351128

Method/Analysis Information

Product:	**Alphaspec Am241, Cm, Solid**
Analytical Method:	DOE EML HASL-300, Am-05-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1400133
Prep Batch Number:	1400062

Sample ID	Client ID
351128002	73354
1203119822	Method Blank (MB)
1203119823	351128002(73354) Sample Duplicate (DUP)
1203119824	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Alphaspec Np, Solid**
Analytical Method:	DOE EML HASL 300
Prep Method:	Dry Soil Prep

Analytical Batch Number: 1400134
Prep Batch Number: 1400062

Sample ID	Client ID
351128002	73354
1203119825	Method Blank (MB)
1203119826	351128002(73354) Sample Duplicate (DUP)
1203119827	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-032 REV# 19.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Alphaspec Th, Solid**
Analytical Method:	DOE EML HASL-300, Th-01-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1400135
Prep Batch Number:	1400062

Sample ID	Client ID
351128002	73354
1203119828	Method Blank (MB)
1203119829	351128002(73354) Sample Duplicate (DUP)

1203119830 Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-032 REV# 19.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203119829 (73354) and 351128002 (73354), Thorium-230 and Thorium-232 relative error ratios are above 1 but results for both sample and duplicate are below MDC.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
Manual integration of alpha spectroscopy spectra 351128002 (73354) was performed to fully separate counts in Regions of Interest which would have been biased.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Alphaspec U, Solid**
Analytical Method:	DOE EML HASL-300, U-02-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1400136
Prep Batch Number:	1400062

Sample ID	Client ID
351128002	73354
1203119831	Method Blank (MB)
1203119832	351128002(73354) Sample Duplicate (DUP)
1203119833	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL

Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volumes in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Samples 1203119832 (73354) and 351128002 (73354) were recounted due to high MDCs. The recounts are reported. Sample 1203119831 (MB) was recounted due to high MDC and then again due to a suspected false positive. The third count is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Alphaspec Pu242, Solid (PUISO+PUISO242)**
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1403086
Prep Batch Number:	1400062

Sample ID	Client ID
351128002	73354
1203126721	Method Blank (MB)
1203126722	351128002(73354) Sample Duplicate (DUP)
1203126723	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volumes in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
Sample 351128002 (73354) was reprepped due to high relative percent difference/relative error ratio. The re-analysis is being reported.

Recounts
Sample 1203126723 (LCS) was recounted due to low recovery. The recount is reported. Sample 1203126721 (MB) was recounted due to poor resolution. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1314873 was generated due to Other. 1. The Pu-236 tracer for the Method blank 1203126721 and LCS 1203126723 does not meet the resolution requirements of having a full width half maximum of 100 keV or less. 1. The tracer peak is within the Pu-236 ROI and the tracer yield recovery does meet the acceptance criteria. Reporting results.

Manual Integration
Manual integration of alpha spectroscopy spectra 1203126723 (LCS) was performed to fully separate counts in Regions of Interest which would have been biased.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **Percent Leach - Acid Leach**
Analytical Method: Client Requested Procedure
Analytical Batch Number: 1400128

Sample ID	Client ID
351128001	73353
351128003	73353

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-026 REV# 14.

Miscellaneous Information:

Additional Comments
Sample 351128001 (73353) was leached in 6M Nitric Acid, serial number 2121746, expiration date 6/20/15. Sample 351128003 (73353) was leached in DI water.

Method/Analysis Information

Product: **Gammaspec, Gamma, Solid**

Analytical Method:	DOE HASL 300, 4.5.2.3/Ga-01-R
Gamma Percent Leach Method:	Client Requested Procedure
Analytical Batch Number:	1400962
Gamma Percent Leach Batch Number:	1400128

Sample ID	Client ID
351128001	73353
1203121680	Method Blank (MB)
1203121681	351128001(73353) Sample Duplicate (DUP)
1203121682	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128001 (73353).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high counting uncertainty.	Radium-226	1203121681	73353(351128001DUP)

Method/Analysis Information

Product: **Gamma I125, Solid**
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Batch Number: 1400970

Sample ID	Client ID

351128002	73354
1203121701	Method Blank (MB)
1203121702	351128002(73354) Sample Duplicate (DUP)
1203121703	351128002(73354) Matrix Spike (MS)
1203121704	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-006 REV# 21.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203121702 (73354) and 351128002 (73354), Iodine-125 relative error ratio is above 1 but results for both sample and duplicate are below MDC.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Gammaspec, Gamma, Solid**
Analytical Method:	DOE HASL 300, 4.5.2.3/Ga-01-R
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1401052
Prep Batch Number:	1400062

Sample ID	Client ID
351128002	73354
1203121936	Method Blank (MB)
1203121937	351128002(73354) Sample Duplicate (DUP)
1203121938	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL

Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1314637 was generated due to RDL less than MDA. The required detection limit (RDL) for Cs-137 was not achieved in samples 351128002, 1203121936 (method blank), and 1203121937 (duplicate). The RDLs were not achieved due to the low sample density and the limited available

mass for analysis. The low density only allowed an aliquot of 21.84 g to be used. Reporting the results.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Per project manager instruction, Ra-226 has been set to DUSE. See attached email for more details.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**GFPC, Sr90, solid**
Analytical Method:	EPA 905.0 Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1400653
Prep Batch Number:	1400062

Sample ID	Client ID
351128002	73354
1203121032	Method Blank (MB)
1203121033	351128002(73354) Sample Duplicate (DUP)
1203121034	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries
All chemical recoveries meet the required acceptance limits for this sample set.

Recounts
Sample 1203121032 (MB) was recounted due to a suspected blank false positive. The recount is reported. Sample 351128002 (73354) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**GFPC, Gross Beta , solid (use for solids/soils)**
Analytical Method:	EPA 900.0/SW846 9310/SM 7110B Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1400666
Prep Batch Number:	1400062

Sample ID	Client ID
351128002	73354
1203121088	Method Blank (MB)
1203121089	351128002(73354) Sample Duplicate (DUP)
1203121090	351128002(73354) Matrix Spike (MS)
1203121091	351128002(73354) Matrix Spike Duplicate (MSD)
1203121092	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001B REV# 17.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable

standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: The matrix spike and matrix spike duplicate, 1203121090 (73354) and 1203121091 (73354), do not meet the relative percent difference requirement; however, they do meet the recovery requirement.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries
All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not

generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**GFPC, Gross Beta , solid (use for solids/soils)**
Analytical Method:	EPA 900.0/SW846 9310/SM 7110B Modified
Gamma Percent Leach Method:	Client Requested Procedure
Analytical Batch Number:	1401137
Gamma Percent Leach Batch Number:	1400128

Sample ID	Client ID
351128001	73353
1203122150	Method Blank (MB)
1203122151	351128001(73353) Sample Duplicate (DUP)
1203122152	351128001(73353) Matrix Spike (MS)
1203122153	351128001(73353) Matrix Spike Duplicate (MSD)
1203122154	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001B REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128001 (73353).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries
All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts
Sample 1203122151 (73353) was recounted due to high MDC. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **Liquid Scint C14, Solid**
Analytical Method: EPA EERF C-01 Modified
Analytical Batch Number: 1400577

Sample ID	Client ID
351128002	73354
351128003	73353
1203120838	Method Blank (MB)
1203120839	351128003(73353) Sample Duplicate (DUP)
1203120840	351128003(73353) Matrix Spike (MS)
1203120841	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 15.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128003 (73353).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Sample 351128003 (73353) was recounted due to the quench number being outside the calibration range. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Sample aliquot for 351128003 (73353) was taken from leach prep batch 1400128.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **LSC, Tritium Dist, Solid (for misc solids only)**
Analytical Method: EPA 906.0 Modified
Analytical Batch Number: 1401231

Sample ID	Client ID
351128002	73354
351128003	73353
1203122333	Method Blank (MB)
1203122334	351128003(73353) Sample Duplicate (DUP)
1203122335	351128003(73353) Matrix Spike (MS)
1203122336	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 21.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128003 (73353).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Sample aliquot for 351128003 (73353) was taken from leach prep batch 1400128.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Liquid Scint Tc99, Solid**
Analytical Method:	DOE EML HASL-300, Tc-02-RC Modified
Analytical Batch Number:	1401238

Sample ID	Client ID
351128002	73354
1203122359	Method Blank (MB)
1203122360	351128002(73354) Sample Duplicate (DUP)
1203122361	Laboratory Control Sample (LCS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-059 REV# 2.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 351128002 (73354).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
Samples were reprepped due to the quench number being outside the calibration range. The re-analysis is being reported.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

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.

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

Qualifier Definition Report
for

LBNL003 Lawrence Berkeley National Laboratory

Client SDG: ESG-08149 GEL Work Order: 351128

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

M M if above MDC and less than LLD

M REMP Result > MDC/CL and < RDL

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

UI Gamma Spectroscopy--Uncertain identification

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Theresa L. Austin **Name: Theresa Austin**

Date: 17 JUL 2014 **Title: Group Leader**

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
16-JUL-14	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GAMMA SPECTROMETER	DOE HASL 300, 4.5.2.3/Ga-01-R	Solid	LBNL
Batch ID:	**Sample Numbers:**		
1401052	See Below		

Potentially affected work order(s)(SDG): 351128(ESG-08149)

Application Issues:

RDL less than MDA

Specification and Requirements Exception Description:	DER Disposition:
The required detection limit (RDL) for Cs-137 was not achieved in samples 351128002, 1203121936 (method blank), and 1203121937 (duplicate).	The RDLs were not achieved due to the low sample density and the limited available mass for analysis. The low density only allowed an aliquot of 21.84 g to be used. Reporting the results.

Originator's Name:

Michael Hilton 16-JUL-14

Data Validator/Group Leader:

Shenise Gerideau 16-JUL-14

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
17-JUL-14	Radiochemistry	SOP	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
ALPHA SPECTROMETER	DOE EML HASL-300, Pu-11-RC Modified	Solid	LBNL
Batch ID:	**Sample Numbers:**		
1403086	see below		

Potentially affected work order(s)(SDG): 351128(ESG-08149)

Application Issues:

Other

Specification and Requirements Exception Description:	DER Disposition:
1. The Pu-236 tracer for the Method blank 1203126721 and LCS 1203126723 does not meet the resolution requirements of having a full width half maximum of 100 keV or less.	1. The tracer peak is within the Pu-236 ROI and the tracer yield recovery does meet the acceptance criteria. Reporting results.

Originator's Name:

Jessica Downey 17-JUL-14

Data Validator/Group Leader:

Melanie Aycock 17-JUL-14

Sample Data Summary

Certificate of Analysis

Company : Lawrence Berkeley National Lab
Address : Berkeley Lab
1 Cyclotron Road, MS 75B-101
Berkeley, California 94720

Report Date: July 17, 2014

Contact: Mr. John Jelinski
Project: Old Town Project

Client Sample ID: 73353
Sample ID: 351128001
Matrix: Soil/Solids
Collect Date: 16-JUN-14
Receive Date: 20-JUN-14
Collector: Client

Project: LBNL00309
Client ID: LBNL003

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid "As Received"													
Barium-133	U	-0.0137	+/-0.0592	0.102	+/-0.0595		pCi/g		MXR1	07/10/14	1326	1400962	1
Instrument: GAM18													
Bismuth-212	U	0.300	+/-0.565	1.15	+/-0.582		pCi/g						
Instrument: GAM18													
Bismuth-214	U	0.0458	+/-0.104	0.199	+/-0.106		pCi/g						
Instrument: GAM18													
Cesium-134	U	0.0408	+/-0.0582	0.0775	+/-0.0612		pCi/g						
Instrument: GAM18													
Cesium-137	U	0.0305	+/-0.0383	0.0813	+/-0.0408	0.100	pCi/g						
Instrument: GAM18													
Cobalt-60	U	-0.0024	+/-0.0344	0.0702	+/-0.0344		pCi/g						
Instrument: GAM18													
Europium-152	U	0.00472	+/-0.116	0.185	+/-0.116		pCi/g						
Instrument: GAM18													
Europium-154	U	-0.0462	+/-0.113	0.204	+/-0.115		pCi/g						
Instrument: GAM18													
Europium-155	U	-0.109	+/-0.129	0.211	+/-0.138		pCi/g						
Instrument: GAM18													
Lead-210	U	1.97	+/-7.70	13.6	+/-7.75		pCi/g						
Instrument: GAM18													
Lead-212	U	0.0639	+/-0.112	0.153	+/-0.116		pCi/g						
Instrument: GAM18													
Lead-214	U	-0.0476	+/-0.101	0.183	+/-0.104		pCi/g						
Instrument: GAM18													
Niobium-94	U	-0.0288	+/-0.035	0.059	+/-0.0374		pCi/g						
Instrument: GAM18													
Potassium-40	U	-0.132	+/-0.419	0.860	+/-0.423		pCi/g						
Instrument: GAM18													
Promethium-146	U	-0.0464	+/-0.0613	0.0883	+/-0.0649		pCi/g						
Instrument: GAM18													
Protactinium-234m	U	0.672	+/-4.38	8.82	+/-4.39		pCi/g						
Instrument: GAM18													
Radium-226	U	0.772	+/-1.20	1.11	+/-1.21		pCi/g						
Instrument: GAM18													
Radium-228	U	-0.072	+/-0.169	0.313	+/-0.172		pCi/g						
Instrument: GAM18													
Thallium-208	U	-0.025	+/-0.0511	0.0815	+/-0.0523		pCi/g						
Instrument: GAM18													
Thorium-234	U	-0.766	+/-1.87	3.49	+/-1.91		pCi/g						

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Berkeley, California 94720

Report Date: July 17, 2014

Contact: Mr. John Jelinski
Project: Old Town Project

Client Sample ID: 73353
Sample ID: 351128001

Project: LBNL00309
Client ID: LBNL003

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid "As Received"													
Instrument: GAM18													
Uranium-235	U	-0.0274	+/-0.233	0.400	+/-0.233		pCi/g						
Instrument: GAM18													
Uranium-238	U	-0.766	+/-1.87	3.49	+/-1.91		pCi/g						
Instrument: GAM18													
Rad Gas Flow Proportional Counting													
GFPC, Gross Beta , solid (use for solids/soils) "As Received"													
Beta	U	0.164	+/-1.57	2.97	+/-1.57	3.00	pCi/g		JAOC	07/12/14	1553	1401137	2
Instrument: PIC3D													
Solid Preparation													
Laboratory Composite "As Received"													
Percent Leach - Acid Leach "As Received"													
Leach Percent Removal		100	+/-				percent		CXC1	07/01/14	1400	1400128	4
Instrument: BALCP2202S1													

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
3	GEL Prep Method
4	Client Requested Procedure

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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Berkeley, California 94720

Report Date: July 17, 2014

Contact: Mr. John Jelinski
Project: Old Town Project

Client Sample ID: 73354
Sample ID: 351128002
Matrix: Soil/Solids
Collect Date: 16-JUN-14
Receive Date: 20-JUN-14
Collector: Client
Moisture: 4.19%

Project: LBNL00309
Client ID: LBNL003

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis													
Alphaspec Am241, Cm, Solid "Dry Weight Corrected"													
Americium-241	U	0.0114	+/-0.0801	0.165	+/-0.0801	1.00	pCi/g		MXS2	07/10/14	0953	1400133	1
Instrument: 1211													
Curium-243/244	U	-0.0045	+/-0.0388	0.0899	+/-0.0389	1.00	pCi/g						
Instrument: 1211													
Alphaspec Np, Solid "Dry Weight Corrected"													
Neptunium-237	U	0.0376	+/-0.243	0.497	+/-0.243	1.00	pCi/g		MXS2	07/10/14	1257	1400134	2
Instrument: 1177													
Alphaspec Pu242, Solid (PUISO+PUISO242) "Dry Weight Corrected"													
Plutonium-238	U	0.0755	+/-0.279	0.457	+/-0.280	1.00	pCi/g		MXS2	07/16/14	1019	1403086	3
Instrument: 1071													
Plutonium-239/240	U	0.0992	+/-0.279	0.298	+/-0.280	1.00	pCi/g						
Instrument: 1071													
Plutonium-242	U	0.103	+/-0.352	0.653	+/-0.353	1.00	pCi/g						
Instrument: 1071													
Alphaspec Th, Solid "Dry Weight Corrected"													
Thorium-228	U	0.054	+/-0.298	0.598	+/-0.298	1.00	pCi/g		MXS2	07/10/14	1015	1400135	4
Instrument: 1161													
Thorium-230	U	0.381	+/-0.405	0.590	+/-0.413	1.00	pCi/g						
Instrument: 1161													
Thorium-232	U	-0.0219	+/-0.127	0.314	+/-0.127	1.00	pCi/g						
Instrument: 1161													
Alphaspec U, Solid "Dry Weight Corrected"													
Uranium-233/234	U	0.000351	+/-0.0183	0.0343	+/-0.0183	2.00	pCi/g		MXS2	07/12/14	1051	1400136	5
Instrument: 1129													
Uranium-235/236	U	0.00723	+/-0.016	0.0108	+/-0.016	0.100	pCi/g						
Instrument: 1129													
Uranium-238	U	0.012	+/-0.0216	0.0343	+/-0.0217	0.035	pCi/g						
Instrument: 1129													
Rad Gamma Spec Analysis													
Gamma I125, Solid "As Received"													
Iodine-125	U	-0.837	+/-3.53	7.15	+/-3.55	20.0	pCi/g		BSW1	07/11/14	0915	1400970	6
Instrument: XRAY1													
Gammaspec, Gamma, Solid "Dry Weight Corrected"													
Barium-133	U	0.213	+/-0.267	0.457	+/-0.284		pCi/g		MXR1	07/16/14	0844	1401052	7
Instrument: GAM13													
Bismuth-212	U	0.854	+/-3.00	5.34	+/-3.03		pCi/g						
Instrument: GAM13													

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Berkeley, California 94720

Report Date: July 17, 2014

Contact: Mr. John Jelinski
Project: Old Town Project

Client Sample ID: 73354
Sample ID: 351128002

Project: LBNL00309
Client ID: LBNL003

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid "Dry Weight Corrected"													
Bismuth-214	U	0.0125	+/-0.595	0.864	+/-0.595		pCi/g						
Instrument: GAM13													
Cesium-134	U	-0.105	+/-0.247	0.413	+/-0.252		pCi/g						
Instrument: GAM13													
Cesium-137	U	-0.0453	+/-0.227	0.371	+/-0.228	0.100	pCi/g						
Instrument: GAM13													
Cobalt-60	U	0.264	+/-0.191	0.456	+/-0.226		pCi/g						
Instrument: GAM13													
Europium-152	U	0.193	+/-0.581	0.959	+/-0.588		pCi/g						
Instrument: GAM13													
Europium-154	U	0.514	+/-0.589	1.20	+/-0.635		pCi/g						
Instrument: GAM13													
Europium-155	U	-0.224	+/-0.440	0.673	+/-0.452		pCi/g						
Instrument: GAM13													
Lead-210	U	-2.87	+/-3.03	4.16	+/-3.30		pCi/g						
Instrument: GAM13													
Lead-212	U	0.546	+/-0.472	0.609	+/-0.534		pCi/g						
Instrument: GAM13													
Lead-214	U	0.149	+/-0.466	0.783	+/-0.471		pCi/g						
Instrument: GAM13													
Niobium-94	U	0.0712	+/-0.205	0.365	+/-0.208		pCi/g						
Instrument: GAM13													
Potassium-40	U	-1.87	+/-2.36	3.71	+/-2.51		pCi/g						
Instrument: GAM13													
Promethium-146	U	-0.141	+/-0.248	0.396	+/-0.257		pCi/g						
Instrument: GAM13													
Protactinium-234m	U	17.8	+/-32.9	55.8	+/-34.0		pCi/g						
Instrument: GAM13													
Radium-228	U	0.473	+/-1.02	1.77	+/-1.04		pCi/g						
Instrument: GAM13													
Thallium-208	U	0.0319	+/-0.246	0.404	+/-0.246		pCi/g						
Instrument: GAM13													
Thorium-234	U	1.01	+/-2.15	6.55	+/-2.21		pCi/g						
Instrument: GAM13													
Uranium-235	U	0.0127	+/-0.812	1.69	+/-0.812		pCi/g						
Instrument: GAM13													
Uranium-238	U	1.01	+/-2.15	6.55	+/-2.21		pCi/g						
Instrument: GAM13													
Rad Gas Flow Proportional Counting													
GFPC, Gross Beta , solid (use for solids/soils) "Dry Weight Corrected"													
Beta	M	2.66	+/-0.772	1.14	+/-0.855	3.00	pCi/g		JAOC	07/14/14	1635	1400666	8
Instrument: PIC1A													

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Report Date: July 17, 2014

Contact: Mr. John Jelinski
Project: Old Town Project

Client Sample ID: 73354
Sample ID: 351128002

Project: LBNL00309
Client ID: LBNL003

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gas Flow Proportional Counting													
GFPC, Sr90, solid "Dry Weight Corrected"													
Strontium-90	U	0.033	+/-0.116	0.205	+/-0.116	0.300	pCi/g		KSD1	07/16/14	0650	1400653	9
Instrument: PIC5D													
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Solid (for misc solids only) "As Received"													
Tritium	U	0.225	+/-2.30	4.07	+/-2.30	5.00	pCi/g		BYS1	07/09/14	1912	1401231	10
Instrument: LSCBLUE													
Liquid Scint C14, Solid "As Received"													
Carbon-14	U	-20.2	+/-29.5	53.0	+/-29.5	100	pCi/g		BYS1	07/09/14	1701	1400577	11
Instrument: LSCBLUE													
Liquid Scint Tc99, Solid "As Received"													
Technetium-99	U	1.83	+/-2.41	4.06	+/-2.42	5.00	pCi/g		MYM 1	07/13/14	1027	1401238	12
Instrument: LSCBROWN													
Solid Preparation													
Laboratory Composite "As Received"													

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	KYW2	07/01/14	1540	1400062

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL 300
3	DOE EML HASL-300, Pu-11-RC Modified
4	DOE EML HASL-300, Th-01-RC Modified
5	DOE EML HASL-300, U-02-RC Modified
6	DOE EML HASL-300,I-01 Modified
7	DOE HASL 300, 4.5.2.3/Ga-01-R
8	EPA 900.0/SW846 9310/SM 7110B Modified
9	EPA 905.0 Modified
10	EPA 906.0 Modified
11	EPA EERF C-01 Modified
12	DOE EML HASL-300, Tc-02-RC Modified
13	GEL Prep Method

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241, Cm, Solid "Dry Weight Corrected"	1400133	78.1	(15%-125%)
Americium-243 Tracer	Alphaspec Np, Solid "Dry Weight Corrected"	1400134	96.0	(15%-125%)
Plutonium-236 Tracer	Alphaspec Pu242, Solid (PUISO+PUISO242) "Dry Weight Corrected"	1403086	57.0	(15%-125%)

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Report Date: July 17, 2014

Contact: Mr. John Jelinski
Project: Old Town Project

Client Sample ID: 73354
Sample ID: 351128002

Project: LBNL00309
Client ID: LBNL003

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**						**Batch ID**		**Recovery %**	**Acceptable Limits**			
Thorium-229 Tracer		Alphaspec Th, Solid "Dry Weight Corrected"					1400135		109	(15%-125%)			
Uranium-232 Tracer		Alphaspec U, Solid "Dry Weight Corrected"					1400136		79.1	(15%-125%)			
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1400653		90.2	(25%-125%)			
Technetium-99m Tracer		Liquid Scint Tc99, Solid "As Received"					1401238		92.3	(15%-125%)			

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

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Report Date: July 17, 2014

Contact: Mr. John Jelinski
Project: Old Town Project

Client Sample ID: 73353
Sample ID: 351128003
Matrix: Soil/Solids
Collect Date: 16-JUN-14
Receive Date: 20-JUN-14
Collector: Client

Project: LBNL00309
Client ID: LBNL003

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Liquid Scintillation Analysis													
LSC, Tritium Dist, Solid (for misc solids only) "As Received"													
Tritium	U	1.35	+/-2.18	3.73	+/-2.20	5.00	pCi/g		BYS1	07/09/14	1944	1401231	1
Instrument: LSCBLUE													
Liquid Scint C14, Solid "As Received"													
Carbon-14	U	-38	+/-37.2	67.8	+/-37.2	100	pCi/g		BYS1	07/10/14	2028	1400577	2
Instrument: LSCBLUE													
Solid Preparation													
Laboratory Composite "As Received"													
Percent Leach - DI water leach "As Received"													
Leach Percent Removal		100	+/-				percent		CXC1	07/01/14	1400	1400128	4
Instrument: BALCP2202S1													

The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified
2	EPA EERF C-01 Modified
3	GEL Prep Method
4	Client Requested Procedure

Surrogate/Tracer Recovery	Test	Batch ID	Recovery %	Acceptable Limits

Notes:

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

Quality Control Data

QC Summary

Report Date: July 17, 2014
Page 1 of 15

Client : Lawrence Berkeley National Lab
Berkeley Lab
1 Cyclotron Road, MS 75B-101
Berkeley, California 94720

Contact: Mr. John Jelinski

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1400133									
QC1203119822 MB									
Americium-241			U	0.0213	pCi/g			MXS2	07/10/1409:53
Uncert:				+/-0.0599					
TPU:				+/-0.0599					
Curium-243/244			U	0.00	pCi/g				
Uncert:				+/-0.0423					
TPU:				+/-0.0424					
QC1203119823 351128002 DUP									
Americium-241	U	0.0114	U	-0.0336	pCi/g				07/10/1409:53
Uncert:		+/-0.0801		+/-0.0542		RPD:	0	N/A	
TPU:		+/-0.0801		+/-0.0543		RER:	0.335	(0-1)	
Curium-243/244	U	-0.0045	U	-0.00461	pCi/g				
Uncert:		+/-0.0388		+/-0.0692		RPD:	0	N/A	
TPU:		+/-0.0389		+/-0.0693		RER:	0.00105	(0-1)	
QC1203119824 LCS									
Americium-241	2.71			2.77	pCi/g	REC:	102	(75%-125%)	07/10/1409:53
Uncert:				+/-0.464					
TPU:				+/-0.615					
Curium-243/244	5.45			5.38	pCi/g	REC:	99	(75%-125%)	
Uncert:				+/-0.640					
TPU:				+/-1.01					
Batch 1400134									
QC1203119825 MB									
Neptunium-237			U	0.231	pCi/g			MXS2	07/10/1412:57
Uncert:				+/-0.273					
TPU:				+/-0.274					
QC1203119826 351128002 DUP									
Neptunium-237	U	0.0376	U	0.074	pCi/g				07/10/1412:57
Uncert:		+/-0.243		+/-0.208		RPD:	0	N/A	
TPU:		+/-0.243		+/-0.208		RER:	0.223	(0-3)	
QC1203119827 LCS									
Neptunium-237	39.5			41.9	pCi/g	REC:	106	(75%-125%)	07/10/1412:57
Uncert:				+/-3.98					
TPU:				+/-6.15					
Batch 1400135									
QC1203119828 MB									
Thorium-228			U	0.268	pCi/g			MXS2	07/10/1410:15
Uncert:				+/-0.432					
TPU:				+/-0.434					
Thorium-230			U	0.0507	pCi/g				
Uncert:				+/-0.330					
TPU:				+/-0.332					
Thorium-232			U	0.0311	pCi/g				
Uncert:				+/-0.212					

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1400135									
	TPU:			+/-0.212					
QC1203119829 351128002 DUP									
Thorium-228		U 0.054	U	-0.0672	pCi/g				07/10/1410:15
	Uncert:	+/-0.298		+/-0.342		RPD:	0	N/A	
	TPU:	+/-0.298		+/-0.342		RER:	0.524	(0-1)	
Thorium-230		U 0.381	U	-0.144	pCi/g				
	Uncert:	+/-0.405		+/-0.218		RPD:	22	N/A	
	TPU:	+/-0.413		+/-0.219		RER:	3.20	(0-1)	
Thorium-232		U -0.0219	U	0.145	pCi/g				
	Uncert:	+/-0.127		+/-0.262		RPD:	0	N/A	
	TPU:	+/-0.127		+/-0.263		RER:	1.12	(0-1)	
QC1203119830 LCS									
Thorium-228			U	-0.0297	pCi/g				07/10/1410:15
	Uncert:			+/-0.427					
	TPU:			+/-0.428					
Thorium-230	19.6			22.4	pCi/g	REC:	114	(75%-125%)	
	Uncert:			+/-2.77					
	TPU:			+/-4.61					
Thorium-232			U	0.0174	pCi/g				
	Uncert:			+/-0.256					
	TPU:			+/-0.257					
Batch 1400136									
QC1203119831 MB									
Uranium-233/234			U	0.00849	pCi/g			MXS2	07/14/1413:20
	Uncert:			+/-0.0333					
	TPU:			+/-0.0333					
Uranium-235/236			U	0.00	pCi/g				
	Uncert:			+/-0.0252					
	TPU:			+/-0.0252					
Uranium-238			U	0.0297	pCi/g				
	Uncert:			+/-0.0276					
	TPU:			+/-0.0279					
QC1203119832 351128002 DUP									
Uranium-233/234		U 0.000351	U	-0.000646	pCi/g				07/12/1410:51
	Uncert:	+/-0.0183		+/-0.0286		RPD:	0	N/A	
	TPU:	+/-0.0183		+/-0.0286		RER:	0.0212	(0-1)	
Uranium-235/236		U 0.00723	U	-0.00703	pCi/g				
	Uncert:	+/-0.016		+/-0.0307		RPD:	0	N/A	
	TPU:	+/-0.016		+/-0.0307		RER:	0.305	(0-1)	
Uranium-238		U 0.012	U	0.0115	pCi/g				
	Uncert:	+/-0.0216		+/-0.0202		RPD:	0	N/A	
	TPU:	+/-0.0217		+/-0.0202		RER:	0.013	(0-1)	
QC1203119833 LCS									
Uranium-233/234				5.25	pCi/g				07/10/1415:45
	Uncert:			+/-0.308					
	TPU:			+/-0.738					
Uranium-235/236				0.300	pCi/g				
	Uncert:			+/-0.0861					
	TPU:			+/-0.0943					
Uranium-238	5.23			5.39	pCi/g	REC:	103	(75%-125%)	

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1400136									
	Uncert:			+/-0.313					
	TPU:			+/-0.757					
Batch 1403086									
QC1203126721 MB									
Plutonium-238			U	0.615	pCi/g			MXS2	07/17/1410:36
	Uncert:			+/-0.727					
	TPU:			+/-0.745					
Plutonium-239/240			U	0.165	pCi/g				
	Uncert:			+/-0.460					
	TPU:			+/-0.462					
Plutonium-242			U	-0.115	pCi/g				
	Uncert:			+/-0.342					
	TPU:			+/-0.345					
QC1203126722 351128002 DUP									
Plutonium-238	U	0.0755	U	0.597	pCi/g				07/16/1410:19
	Uncert:	+/-0.279		+/-0.527		RPD:	0	N/A	
	TPU:	+/-0.280		+/-0.540		RER:	0.636	(0-1)	
Plutonium-239/240	U	0.0992	U	-0.0635	pCi/g				
	Uncert:	+/-0.279		+/-0.192		RPD:	0	N/A	
	TPU:	+/-0.280		+/-0.192		RER:	0.345	(0-1)	
Plutonium-242	U	0.103	U	-0.0599	pCi/g				
	Uncert:	+/-0.352		+/-0.271		RPD:	0	N/A	
	TPU:	+/-0.353		+/-0.271		RER:	0.261	(0-1)	
QC1203126723 LCS									
Plutonium-238			M	0.887	pCi/g				07/17/1410:36
	Uncert:			+/-0.737					
	TPU:			+/-0.767					
Plutonium-239/240	19.3			16.5	pCi/g	REC:	85	(75%-125%)	
	Uncert:			+/-2.92					
	TPU:			+/-4.78					
Plutonium-242			M	0.663	pCi/g				
	Uncert:			+/-0.637					
	TPU:			+/-0.655					
Rad Gamma Spec									
Batch 1400962									
QC1203121680 MB									
Barium-133			U	0.0897	pCi/g			MXR1	07/10/1413:27
	Uncert:			+/-0.0684					
	TPU:			+/-0.0798					
Bismuth-212			U	-0.179	pCi/g				
	Uncert:			+/-0.713					
	TPU:			+/-0.717					
Bismuth-214			U	0.00205	pCi/g				
	Uncert:			+/-0.143					
	TPU:			+/-0.143					
Cesium-134			U	-0.0219	pCi/g				
	Uncert:			+/-0.0486					
	TPU:			+/-0.0497					
Cesium-137			U	-0.0126	pCi/g				

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Gamma Spec										
Batch 1400962										
	Uncert:			+/-0.0567						
	TPU:			+/-0.057						
Cobalt-60			U	0.00529	pCi/g					
	Uncert:			+/-0.0542						
	TPU:			+/-0.0543						
Europium-152			U	0.0742	pCi/g					
	Uncert:			+/-0.154						
	TPU:			+/-0.158						
Europium-154			U	-0.0407	pCi/g					
	Uncert:			+/-0.177						
	TPU:			+/-0.178						
Europium-155			U	-0.0395	pCi/g					
	Uncert:			+/-0.149						
	TPU:			+/-0.150						
Lead-210			U	-0.392	pCi/g					
	Uncert:			+/-5.38						
	TPU:			+/-5.39						
Lead-212			U	0.0321	pCi/g					
	Uncert:			+/-0.0957						
	TPU:			+/-0.0969						
Lead-214			U	-0.103	pCi/g					
	Uncert:			+/-0.106						
	TPU:			+/-0.116						
Niobium-94			U	-0.000314	pCi/g					
	Uncert:			+/-0.055						
	TPU:			+/-0.055						
Potassium-40			U	0.0385	pCi/g					
	Uncert:			+/-0.527						
	TPU:			+/-0.527						
Promethium-146			U	-0.00133	pCi/g					
	Uncert:			+/-0.0596						
	TPU:			+/-0.0596						
Protactinium-234m			U	-3.02	pCi/g					
	Uncert:			+/-6.17						
	TPU:			+/-6.33						
Radium-226			U	-1.09	pCi/g					
	Uncert:			+/-1.12						
	TPU:			+/-1.23						
Radium-228			U	0.123	pCi/g					
	Uncert:			+/-0.226						
	TPU:			+/-0.233						
Thallium-208			U	-0.0178	pCi/g					
	Uncert:			+/-0.0586						
	TPU:			+/-0.0592						
Thorium-234			U	0.895	pCi/g					
	Uncert:			+/-1.99						
	TPU:			+/-2.04						
Uranium-235			U	-0.333	pCi/g					
	Uncert:			+/-0.312						
	TPU:			+/-0.348						

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1400962									
Uranium-238			U	0.895	pCi/g				
	Uncert:			+/-1.99					
	TPU:			+/-2.04					
QC1203121681 351128001 DUP									
Barium-133	U	-0.0137	U	-0.0796	pCi/g				07/10/1415:24
	Uncert:	+/-0.0592		+/-0.0848		RPD: 0	N/A		
	TPU:	+/-0.0595		+/-0.0923		RER: 0.434	(0-1)		
Bismuth-212	U	0.300	U	0.700	pCi/g				
	Uncert:	+/-0.565		+/-0.947		RPD: 0	N/A		
	TPU:	+/-0.582		+/-1.00		RER: 0.253	(0-1)		
Bismuth-214	U	0.0458	U	-0.00736	pCi/g				
	Uncert:	+/-0.104		+/-0.145		RPD: 0	N/A		
	TPU:	+/-0.106		+/-0.145		RER: 0.212	(0-1)		
Cesium-134	U	0.0408	U	0.0149	pCi/g				
	Uncert:	+/-0.0582		+/-0.0642		RPD: 0	N/A		
	TPU:	+/-0.0612		+/-0.0645		RER: 0.206	(0-1)		
Cesium-137	U	0.0305	U	-0.0146	pCi/g				
	Uncert:	+/-0.0383		+/-0.0785		RPD: 0	N/A		
	TPU:	+/-0.0408		+/-0.0788		RER: 0.377	(0-1)		
Cobalt-60	U	-0.0024	U	-0.0605	pCi/g				
	Uncert:	+/-0.0344		+/-0.0715		RPD: 0	N/A		
	TPU:	+/-0.0344		+/-0.0767		RER: 0.523	(0-1)		
Europium-152	U	0.00472	U	0.0251	pCi/g				
	Uncert:	+/-0.116		+/-0.160		RPD: 0	N/A		
	TPU:	+/-0.116		+/-0.160		RER: 0.0738	(0-1)		
Europium-154	U	-0.0462	U	0.00944	pCi/g				
	Uncert:	+/-0.113		+/-0.186		RPD: 0	N/A		
	TPU:	+/-0.115		+/-0.186		RER: 0.184	(0-1)		
Europium-155	U	-0.109	U	-0.00213	pCi/g				
	Uncert:	+/-0.129		+/-0.136		RPD: 0	N/A		
	TPU:	+/-0.138		+/-0.136		RER: 0.391	(0-1)		
Lead-210	U	1.97	U	-0.197	pCi/g				
	Uncert:	+/-7.70		+/-0.889		RPD: 0	N/A		
	TPU:	+/-7.75		+/-0.893		RER: 0.250	(0-1)		
Lead-212	U	0.0639	U	0.0108	pCi/g				
	Uncert:	+/-0.112		+/-0.123		RPD: 0	N/A		
	TPU:	+/-0.116		+/-0.123		RER: 0.222	(0-1)		
Lead-214	U	-0.0476	U	-0.0272	pCi/g				
	Uncert:	+/-0.101		+/-0.133		RPD: 0	N/A		
	TPU:	+/-0.104		+/-0.134		RER: 0.0859	(0-1)		
Niobium-94	U	-0.0288	U	-0.017	pCi/g				
	Uncert:	+/-0.035		+/-0.0596		RPD: 0	N/A		
	TPU:	+/-0.0374		+/-0.0601		RER: 0.121	(0-1)		
Potassium-40	U	-0.132	U	-0.0838	pCi/g				
	Uncert:	+/-0.419		+/-0.668		RPD: 0	N/A		
	TPU:	+/-0.423		+/-0.669		RER: 0.0444	(0-1)		
Promethium-146	U	-0.0464	U	0.0658	pCi/g				
	Uncert:	+/-0.0613		+/-0.0746		RPD: 0	N/A		
	TPU:	+/-0.0649		+/-0.0806		RER: 0.771	(0-1)		
Protactinium-234m	U	0.672	U	3.63	pCi/g				

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1400962									
	Uncert:	+/-4.38		+/-8.99					
	TPU:	+/-4.39		+/-9.14		RPD:	0	N/A	
						RER:	0.219	(0-1)	
Radium-226	U	0.772	UI	0.00	pCi/g				
	Uncert:	+/-1.20		+/-2.01		RPD:	0	N/A	
	TPU:	+/-1.21		+/-2.01		RER:	0.386	(0-1)	
Radium-228	U	-0.072	U	-0.16	pCi/g				
	Uncert:	+/-0.169		+/-0.292		RPD:	0	N/A	
	TPU:	+/-0.172		+/-0.301		RER:	0.187	(0-1)	
Thallium-208	U	-0.025	U	-0.0499	pCi/g				
	Uncert:	+/-0.0511		+/-0.072		RPD:	0	N/A	
	TPU:	+/-0.0523		+/-0.0755		RER:	0.194	(0-1)	
Thorium-234	U	-0.766	U	1.03	pCi/g				
	Uncert:	+/-1.87		+/-1.64		RPD:	0	N/A	
	TPU:	+/-1.91		+/-1.72		RER:	0.496	(0-1)	
Uranium-235	U	-0.0274	U	0.0534	pCi/g				
	Uncert:	+/-0.233		+/-0.440		RPD:	0	N/A	
	TPU:	+/-0.233		+/-0.440		RER:	0.120	(0-1)	
Uranium-238	U	-0.766	U	1.03	pCi/g				
	Uncert:	+/-1.87		+/-1.64		RPD:	0	N/A	
	TPU:	+/-1.91		+/-1.72		RER:	0.496	(0-1)	
QC1203121682 LCS									
Americium-241	578			573	pCi/g	REC:	99	(75%-125%)	07/10/1413:27
	Uncert:			+/-9.27					
	TPU:			+/-46.5					
Barium-133			U	-0.32	pCi/g				
	Uncert:			+/-1.03					
	TPU:			+/-1.04					
Bismuth-212			U	-5.42	pCi/g				
	Uncert:			+/-11.2					
	TPU:			+/-11.5					
Bismuth-214			U	0.817	pCi/g				
	Uncert:			+/-1.51					
	TPU:			+/-1.56					
Cesium-134			U	-0.312	pCi/g				
	Uncert:			+/-1.18					
	TPU:			+/-1.19					
Cesium-137	204			213	pCi/g	REC:	104	(75%-125%)	
	Uncert:			+/-4.20					
	TPU:			+/-17.5					
Cobalt-60	186			193	pCi/g	REC:	104	(75%-125%)	
	Uncert:			+/-4.60					
	TPU:			+/-15.6					
Europium-152			U	-0.697	pCi/g				
	Uncert:			+/-2.40					
	TPU:			+/-2.43					
Europium-154			U	1.75	pCi/g				
	Uncert:			+/-1.60					
	TPU:			+/-1.79					
Europium-155			U	0.0357	pCi/g				

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1400962									
	Uncert:			+/-2.00					
	TPU:			+/-2.00					
Lead-210				6760	pCi/g				
	Uncert:			+/-212					
	TPU:			+/-510					
Lead-212			U	0.0564	pCi/g				
	Uncert:			+/-1.27					
	TPU:			+/-1.27					
Lead-214			U	1.02	pCi/g				
	Uncert:			+/-1.77					
	TPU:			+/-1.83					
Niobium-94			U	-0.472	pCi/g				
	Uncert:			+/-0.701					
	TPU:			+/-0.734					
Potassium-40			U	-1.28	pCi/g				
	Uncert:			+/-3.23					
	TPU:			+/-3.29					
Promethium-146			U	0.00427	pCi/g				
	Uncert:			+/-1.29					
	TPU:			+/-1.29					
Protactinium-234m			U	19.5	pCi/g				
	Uncert:			+/-131					
	TPU:			+/-131					
Radium-226			U	10.1	pCi/g				
	Uncert:			+/-13.5					
	TPU:			+/-14.3					
Radium-228			U	-3.28	pCi/g				
	Uncert:			+/-4.46					
	TPU:			+/-4.72					
Thallium-208			U	0.176	pCi/g				
	Uncert:			+/-0.815					
	TPU:			+/-0.819					
Thorium-234			U	13.9	pCi/g				
	Uncert:			+/-25.3					
	TPU:			+/-26.2					
Uranium-235			U	1.44	pCi/g				
	Uncert:			+/-3.90					
	TPU:			+/-3.96					
Uranium-238			U	13.9	pCi/g				
	Uncert:			+/-25.3					
	TPU:			+/-26.2					
Batch 1400970									
QC1203121701 MB									
Iodine-125			U	-0.367	pCi/g			BSW1	07/11/1409:16
	Uncert:			+/-2.46					
	TPU:			+/-2.47					
QC1203121702 351128002 DUP									
Iodine-125	U	-0.837	U	2.08	pCi/g				07/11/1409:16
	Uncert:	+/-3.53		+/-3.57		RPD:	0	N/A	
	TPU:	+/-3.55		+/-3.70		RER:	1.12	(0-1)	

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1400970									
QC1203121703 351128002 MS									
Iodine-129	404 U	-1.74		349	pCi/g	REC: 86	(75%-125%)		07/11/1409:18
	Uncert:	+/-3.76		+/-29.8					
	TPU:	+/-3.84		+/-46.0					
Iodine-125	U	-0.837		37.7	pCi/g				
	Uncert:	+/-3.53		+/-18.4					
	TPU:	+/-3.55		+/-25.5					
QC1203121704 LCS									
Iodine-129	323			326	pCi/g	REC: 101	(75%-125%)		07/11/1409:31
	Uncert:			+/-40.6					
	TPU:			+/-52.5					
Iodine-125			U	3.00	pCi/g				
	Uncert:			+/-7.62					
	TPU:			+/-7.74					
Batch 1401052									
QC1203121936 MB									
Barium-133			U	-0.107	pCi/g			MXR1	07/16/1408:45
	Uncert:			+/-0.119					
	TPU:			+/-0.128					
Bismuth-212			U	-0.0287	pCi/g				
	Uncert:			+/-1.42					
	TPU:			+/-1.42					
Bismuth-214			U	0.139	pCi/g				
	Uncert:			+/-0.247					
	TPU:			+/-0.255					
Cesium-134			U	0.0345	pCi/g				
	Uncert:			+/-0.119					
	TPU:			+/-0.120					
Cesium-137			U	-0.054	pCi/g				
	Uncert:			+/-0.114					
	TPU:			+/-0.116					
Cobalt-60			U	0.00199	pCi/g				
	Uncert:			+/-0.0991					
	TPU:			+/-0.0991					
Europium-152			U	0.157	pCi/g				
	Uncert:			+/-0.276					
	TPU:			+/-0.285					
Europium-154			U	0.0804	pCi/g				
	Uncert:			+/-0.287					
	TPU:			+/-0.289					
Europium-155			U	0.116	pCi/g				
	Uncert:			+/-0.227					
	TPU:			+/-0.234					
Lead-210			U	-0.135	pCi/g				
	Uncert:			+/-1.51					
	TPU:			+/-1.51					
Lead-212			U	0.0508	pCi/g				
	Uncert:			+/-0.171					
	TPU:			+/-0.173					
Lead-214			U	-0.0394	pCi/g				

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1401052									
	Uncert:			+/-0.220					
	TPU:			+/-0.221					
Niobium-94			U	0.0764	pCi/g				
	Uncert:			+/-0.110					
	TPU:			+/-0.116					
Potassium-40			U	0.165	pCi/g				
	Uncert:			+/-1.12					
	TPU:			+/-1.12					
Promethium-146			U	-0.091	pCi/g				
	Uncert:			+/-0.124					
	TPU:			+/-0.130					
Protactinium-234m			U	-0.49	pCi/g				
	Uncert:			+/-15.6					
	TPU:			+/-15.6					
Radium-228			U	-0.304	pCi/g				
	Uncert:			+/-0.408					
	TPU:			+/-0.432					
Thallium-208			U	0.126	pCi/g				
	Uncert:			+/-0.0969					
	TPU:			+/-0.0975					
Thorium-234			U	0.0763	pCi/g				
	Uncert:			+/-0.916					
	TPU:			+/-0.917					
Uranium-235			U	0.677	pCi/g				
	Uncert:			+/-0.523					
	TPU:			+/-0.612					
Uranium-238			U	0.0763	pCi/g				
	Uncert:			+/-0.916					
	TPU:			+/-0.917					
QC1203121937 351128002 DUP									
Barium-133	U	0.213	U	-0.0255	pCi/g				07/16/1410:58
	Uncert:	+/-0.267		+/-0.113		RPD:	0	N/A	
	TPU:	+/-0.284		+/-0.113		RER:	0.601	(0-1)	
Bismuth-212	U	0.854	U	-1.34	pCi/g				
	Uncert:	+/-3.00		+/-1.76		RPD:	0	N/A	
	TPU:	+/-3.03		+/-1.87		RER:	0.449	(0-1)	
Bismuth-214	U	0.0125	U	-0.118	pCi/g				
	Uncert:	+/-0.595		+/-0.279		RPD:	0	N/A	
	TPU:	+/-0.595		+/-0.284		RER:	0.148	(0-1)	
Cesium-134	U	-0.105	U	0.027	pCi/g				
	Uncert:	+/-0.247		+/-0.120		RPD:	0	N/A	
	TPU:	+/-0.252		+/-0.120		RER:	0.354	(0-1)	
Cesium-137	U	-0.0453	U	0.0974	pCi/g				
	Uncert:	+/-0.227		+/-0.118		RPD:	0	N/A	
	TPU:	+/-0.228		+/-0.126		RER:	0.403	(0-1)	
Cobalt-60	U	0.264	U	-0.0598	pCi/g				
	Uncert:	+/-0.191		+/-0.117		RPD:	0	N/A	
	TPU:	+/-0.226		+/-0.120		RER:	0.937	(0-1)	
Europium-152	U	0.193	U	0.209	pCi/g				
	Uncert:	+/-0.581		+/-0.295		RPD:	0	N/A	

QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1401052									
	TPU:	+/-0.588		+/-0.310					
						RER:	0.0184	(0-1)	
Europium-154	U	0.514	U	0.0723	pCi/g				
	Uncert:	+/-0.589		+/-0.313		RPD:	0	N/A	
	TPU:	+/-0.635		+/-0.315		RER:	0.466	(0-1)	
Europium-155	U	-0.224	U	-0.0304	pCi/g				
	Uncert:	+/-0.440		+/-0.228		RPD:	0	N/A	
	TPU:	+/-0.452		+/-0.229		RER:	0.284	(0-1)	
Lead-210	U	-2.87	U	0.155	pCi/g				
	Uncert:	+/-3.03		+/-1.49		RPD:	0	N/A	
	TPU:	+/-3.30		+/-1.49		RER:	0.631	(0-1)	
Lead-212	U	0.546	U	-0.0591	pCi/g				
	Uncert:	+/-0.472		+/-0.195		RPD:	0	N/A	
	TPU:	+/-0.534		+/-0.197		RER:	0.828	(0-1)	
Lead-214	U	0.149	U	0.0148	pCi/g				
	Uncert:	+/-0.466		+/-0.218		RPD:	0	N/A	
	TPU:	+/-0.471		+/-0.218		RER:	0.195	(0-1)	
Niobium-94	U	0.0712	U	-0.0949	pCi/g				
	Uncert:	+/-0.205		+/-0.101		RPD:	0	N/A	
	TPU:	+/-0.208		+/-0.110		RER:	0.522	(0-1)	
Potassium-40	U	-1.87	U	0.317	pCi/g				
	Uncert:	+/-2.36		+/-1.24		RPD:	0	N/A	
	TPU:	+/-2.51		+/-1.25		RER:	0.580	(0-1)	
Promethium-146	U	-0.141	U	0.139	pCi/g				
	Uncert:	+/-0.248		+/-0.112		RPD:	0	N/A	
	TPU:	+/-0.257		+/-0.129		RER:	0.726	(0-1)	
Protactinium-234m	U	17.8	U	-9.04	pCi/g				
	Uncert:	+/-32.9		+/-14.7		RPD:	0	N/A	
	TPU:	+/-34.0		+/-15.3		RER:	0.544	(0-1)	
Radium-228	U	0.473	U	0.120	pCi/g				
	Uncert:	+/-1.02		+/-0.451		RPD:	0	N/A	
	TPU:	+/-1.04		+/-0.454		RER:	0.235	(0-1)	
Thallium-208	U	0.0319	U	0.0682	pCi/g				
	Uncert:	+/-0.246		+/-0.0902		RPD:	0	N/A	
	TPU:	+/-0.246		+/-0.0903		RER:	0.108	(0-1)	
Thorium-234	U	1.01	U	0.0336	pCi/g				
	Uncert:	+/-2.15		+/-1.61		RPD:	0	N/A	
	TPU:	+/-2.21		+/-1.61		RER:	0.256	(0-1)	
Uranium-235	U	0.0127	U	-0.43	pCi/g				
	Uncert:	+/-0.812		+/-0.504		RPD:	0	N/A	
	TPU:	+/-0.812		+/-0.542		RER:	0.327	(0-1)	
Uranium-238	U	1.01	U	0.0336	pCi/g				
	Uncert:	+/-2.15		+/-1.61		RPD:	0	N/A	
	TPU:	+/-2.21		+/-1.61		RER:	0.256	(0-1)	
QC1203121938 LCS									
Americium-241	491			502	pCi/g	REC:	102	(75%-125%)	07/16/1408:46
	Uncert:			+/-4.92					
	TPU:			+/-54.3					
Barium-133			U	0.066	pCi/g				

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1401052									
	Uncert:			+/-0.860					
	TPU:			+/-0.860					
Bismuth-212			U	2.39	pCi/g				
	Uncert:			+/-13.7					
	TPU:			+/-13.7					
Bismuth-214			U	0.083	pCi/g				
	Uncert:			+/-1.54					
	TPU:			+/-1.54					
Cesium-134			U	-0.379	pCi/g				
	Uncert:			+/-1.06					
	TPU:			+/-1.07					
Cesium-137	189			180	pCi/g	REC:	96 (75%-125%)		
	Uncert:			+/-3.77					
	TPU:			+/-14.7					
Cobalt-60	215			203	pCi/g	REC:	94 (75%-125%)		
	Uncert:			+/-4.60					
	TPU:			+/-16.7					
Europium-152			U	-0.109	pCi/g				
	Uncert:			+/-1.97					
	TPU:			+/-1.97					
Europium-154			U	0.550	pCi/g				
	Uncert:			+/-1.54					
	TPU:			+/-1.56					
Europium-155			U	-0.65	pCi/g				
	Uncert:			+/-1.43					
	TPU:			+/-1.46					
Lead-210				5950	pCi/g				
	Uncert:			+/-54.1					
	TPU:			+/-626					
Lead-212			U	-0.501	pCi/g				
	Uncert:			+/-1.06					
	TPU:			+/-1.08					
Lead-214			U	-0.215	pCi/g				
	Uncert:			+/-1.52					
	TPU:			+/-1.52					
Niobium-94			U	-0.0263	pCi/g				
	Uncert:			+/-0.721					
	TPU:			+/-0.721					
Potassium-40			U	-0.836	pCi/g				
	Uncert:			+/-3.22					
	TPU:			+/-3.24					
Promethium-146			U	-0.0794	pCi/g				
	Uncert:			+/-1.12					
	TPU:			+/-1.13					
Protactinium-234m			U	-60.8	pCi/g				
	Uncert:			+/-136					
	TPU:			+/-139					
Radium-228			U	-3.03	pCi/g				
	Uncert:			+/-4.58					
	TPU:			+/-4.79					

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1401052									
Thallium-208			U	0.0626	pCi/g				
Uncert:				+/-0.763					
TPU:				+/-0.764					
Thorium-234			U	-11.7	pCi/g				
Uncert:				+/-11.8					
TPU:				+/-13.2					
Uranium-235			U	0.201	pCi/g				
Uncert:				+/-2.88					
TPU:				+/-2.88					
Uranium-238			U	-11.7	pCi/g				
Uncert:				+/-11.8					
TPU:				+/-13.2					
Rad Gas Flow									
Batch 1400653									
QC1203121032 MB									
Strontium-90			U	0.0746	pCi/g			KSD1	07/16/1406:50
Uncert:				+/-0.135					
TPU:				+/-0.136					
QC1203121033 351128002 DUP									
Strontium-90	U	0.033	U	0.0349	pCi/g				07/15/1415:30
Uncert:		+/-0.116		+/-0.120		RPD:	0	N/A	
TPU:		+/-0.116		+/-0.120		RER:	0.0082	(0-1)	
QC1203121034 LCS									
Strontium-90	7.20			7.41	pCi/g	REC:	103	(75%-125%)	07/15/1415:30
Uncert:				+/-0.435					
TPU:				+/-1.39					
Batch 1400666									
QC1203121088 MB									
Beta			U	-0.757	pCi/g			JAOC	07/14/1416:35
Uncert:				+/-0.678					
TPU:				+/-0.678					
QC1203121089 351128002 DUP									
Beta	M	2.66	M	1.36	pCi/g				07/14/1416:35
Uncert:		+/-0.772		+/-0.753		RPD:	65	(0% - 100%)	
TPU:		+/-0.855		+/-0.776		RER:	0.796	(0-1)	
QC1203121090 351128002 MS									
Beta	491 M	2.66		599	pCi/g	REC:	121	(75%-125%)	07/14/1416:35
Uncert:		+/-0.772		+/-7.50					
TPU:		+/-0.855		+/-79.3					
QC1203121091 351128002 MSD									
Beta	389 M	2.66		460	pCi/g	REC:	117	(75%-125%)	07/14/1416:35
Uncert:		+/-0.772		+/-5.78		RPD:	26*	(0%-20%)	
TPU:		+/-0.855		+/-63.9		RER:	0.967	(0-1)	
QC1203121092 LCS									
Beta	373			418	pCi/g	REC:	112	(75%-125%)	07/14/1416:35
Uncert:				+/-5.67					
TPU:				+/-58.2					
Batch 1401137									
QC1203122150 MB									

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch 1401137									
Beta			U	-0.311	pCi/g			JAOC	07/12/1415:53
Uncert:				+/-1.48					
TPU:				+/-1.48					
QC1203122151 351128001 DUP									
Beta	U	0.164	U	0.104	pCi/g				07/14/1409:30
Uncert:		+/-1.57		+/-1.59		RPD: 0	N/A		
TPU:		+/-1.57		+/-1.59		RER: 0.019	(0-1)		
QC1203122152 351128001 MS									
Beta	450 U	0.164		484	pCi/g	REC: 108	(75%-125%)		07/12/1415:53
Uncert:		+/-1.57		+/-18.8					
TPU:		+/-1.57		+/-72.9					
QC1203122153 351128001 MSD									
Beta	450 U	0.164		481	pCi/g	REC: 107	(75%-125%)		07/12/1415:53
Uncert:		+/-1.57		+/-19.2		RPD: 1	(0%-20%)		
TPU:		+/-1.57		+/-70.8		RER: 0.0206	(0-1)		
QC1203122154 LCS									
Beta	450			533	pCi/g	REC: 119	(75%-125%)		07/12/1415:53
Uncert:				+/-18.6					
TPU:				+/-78.2					
Rad Liquid Scintillation									
Batch 1400577									
QC1203120838 MB									
Carbon-14			U	-16.4	pCi/g			BYS1	07/09/1417:34
Uncert:				+/-28.2					
TPU:				+/-28.2					
QC1203120839 351128003 DUP									
Carbon-14	U	-38	U	-9.49	pCi/g				07/09/1417:50
Uncert:		+/-37.2		+/-37.6		RPD: 0	N/A		
TPU:		+/-37.2		+/-37.6		RER: 0.380	(0-3)		
QC1203120840 351128003 MS									
Carbon-14	1400 U	-38		1250	pCi/g	REC: 90	(75%-125%)		07/09/1418:07
Uncert:		+/-37.2		+/-75.2					
TPU:		+/-37.2		+/-119					
QC1203120841 LCS									
Carbon-14	1080			1140	pCi/g	REC: 106	(75%-125%)		07/09/1418:23
Uncert:				+/-61.0					
TPU:				+/-104					
Batch 1401231									
QC1203122333 MB									
Tritium			U	2.15	pCi/g			BYS1	07/09/1420:16
Uncert:				+/-2.28					
TPU:				+/-2.33					
QC1203122334 351128003 DUP									
Tritium	U	1.35	U	3.13	pCi/g				07/09/1420:47
Uncert:		+/-2.18		+/-2.34		RPD: 0	N/A		
TPU:		+/-2.20		+/-2.44		RER: 0.383	(0-1)		
QC1203122335 351128003 MS									
Tritium	16.4 U	1.35		17.7	pCi/g	REC: 108	(75%-125%)		07/09/1421:19
Uncert:		+/-2.18		+/-3.10					
TPU:		+/-2.20		+/-5.08					

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Liquid Scintillation										
Batch 1401231										
QC1203122336 LCS										
Tritium	16.4			20.3	pCi/g	REC:	124	(75%-125%)		07/09/1421:51
	Uncert:			+/-3.24						
	TPU:			+/-5.63						
Batch 1401238										
QC1203122359 MB										
Technetium-99			U	0.886	pCi/g				MYM1	07/13/1410:58
	Uncert:			+/-2.09						
	TPU:			+/-2.09						
QC1203122360 351128002 DUP										
Technetium-99	U	1.83	U	-0.588	pCi/g					07/13/1411:31
	Uncert:	+/-2.41		+/-2.38		RPD:	0	N/A		
	TPU:	+/-2.42		+/-2.38		RER:	0.503	(0-3)		
QC1203122361 LCS										
Technetium-99	101			90.5	pCi/g	REC:	90	(75%-125%)		07/13/1412:03
	Uncert:			+/-4.02						
	TPU:			+/-11.2						

Notes:

TPU and Counting Uncertainty are 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, or LOD.
UI	Gamma Spectroscopy--Uncertain identification
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.

QC Summary

Workorder: 351128

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time

^ 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.
** Indicates analyte is a surrogate compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence 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.
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.

GEL Laboratories LLC

problem solved

P.O. Box 30712~Charleston, S.C. 29417~2040 Savage Road~29407
(843)556-8171~Fax(843)766-1178

Invoice for Analytical Services

Accounts Payable Dept – LBNL
Lawrence Berkeley National Laboratory
1 Cyclotron Rd – MS 90J0106
Berkeley, California 94720

PO: 7047977,COC#08149

Invoice #: 290529
Invoice Date: 21-JUL-14
Terms:
Client: Lawrence Berkeley National Laboratory
Description (Order):Old Town Project
Workorder/SDG:ESG-08149
Project: LBNL00309
Project Manager: Heather Shaffer

GELID: 351128001 **Matrix:**Misc Solid **ClientID:** 73353 **Report:** Level3 **Collected:** 16-JUN-14 **Received:** 20-JUN-14

Line Item	Description	Methods	Turn Days	Charge*
LBLGB	GFPC, Gross Beta , solid (use for solids/soils)	EPA 900.0/SW846 9310/SM 7110B Mo	20	$45.00
LBLGS:OT	Gammaspec, Gamma, Solid	DOE HASL 300, 4.5.2.3/Ga-01-R	20	$108.00
	Percent Leach – Acid Leach	Client Requested Procedure	20	$0.00
metal disks	Laboratory Composite	GEL Prep Method	20	$0.00
			Sample Total:	**$153.00**

GELID: 351128002 **Matrix:**Misc Solid **ClientID:** 73354 **Report:** Level3 **Collected:** 16-JUN-14 **Received:** 20-JUN-14

Line Item	Description	Methods	Turn Days	Charge*
PUISO+PU242:OT	Alphaspec Pu242, Solid (PUISO+PUISO242)	DOE EML HASL-300, Pu-11-RC Mo	20	$297.00
AM+CM:OT	Alphaspec Am241, Cm, Solid	DOE EML HASL-300, Am-05-RC M	20	$148.50
NP	Alphaspec Np, Solid	DOE EML HASL 300	20	$148.50
WTHISO	Alphaspec Th, Solid	DOE EML HASL-300, Th-01-RC Mo	20	$148.50
UISO:OT	Alphaspec U, Solid	DOE EML HASL-300, U-02-RC Mod	20	$148.50
SR90:OT	GFPC, Sr90, solid	EPA 905.0 Modified	20	$126.00
LBLGB	GFPC, Gross Beta , solid (use for solids/soils)	EPA 900.0/SW846 9310/SM 7110B Mo	20	$45.00
LBLGS:OT	Gammaspec, Gamma, Solid	DOE HASL 300, 4.5.2.3/Ga-01-R	20	$108.00
I125	Gamma I125, Solid	DOE EML HASL-300,I-01 Modified	20	$135.00
	Laboratory Composite	GEL Prep Method	20	$0.00
TC99	Liquid Scint Tc99, Solid	DOE EML HASL-300, Tc-02-RC Mo	20	$112.50
LBLH3	LSC, Tritium Dist, Solid (for misc solids only)	EPA 906.0 Modified	20	$67.50
C14	Liquid Scint C14, Solid	EPA EERF C-01 Modified	20	$117.00
			Sample Total:	**$1,602.00**

GELID: 351128003 **Matrix:**Misc Solid **ClientID:** 73353 **Report:** Level3 **Collected:** 16-JUN-14 **Received:** 20-JUN-14

Line Item	Description	Methods	Turn Days	Charge*
	Percent Leach – DI water leach	Client Requested Procedure	20	$0.00
metal disks	Laboratory Composite	GEL Prep Method	20	$0.00
LBLH3	LSC, Tritium Dist, Solid (for misc solids only)	EPA 906.0 Modified	20	$67.50
C14	Liquid Scint C14, Solid	EPA EERF C-01 Modified	20	$117.00
			Sample Total:	**$184.50**

Miscellaneous Charge	Description	Charge
	Invoice Total:	$1939.50

***Charges include the Listed Multiplier. A Multiplier less than 100 represents a discount; whereas, multipliers greater than 100 are mark-ups.**