



August 23, 2013

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MISN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHPRC SAF F11-031 | Spent GAC
Work Order: 331181
SDG: GEL331181

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 08, 2013. 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
Project Manager

Purchase Order: 302853ES20
Chain of Custody: F11-031-032, F11-031-038, F11-031-044 and F11-031-050
Enclosures



Table of Contents

Case Narrative.....1
Chain of Custody and Supporting Documentation.....3
Laboratory Certifications.....9
Radiological Analysis.....11
 Sample Data Summary.....26
 Quality Control Data.....35

Case Narrative

**Receipt Narrative
for
Hanford MSA (51204)
SDG: GEL331181
Work Order: 331181**

August 23, 2013

Laboratory Identification:

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

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on August 08, 2013 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. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's 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.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-031-044	PAGE 1 OF 1
COLLECTOR <i>Kawar Aguilar</i>	COMPANY CONTACT EVANS, RT	TELEPHONE NO. 373-7924	PROJECT COORDINATOR EVANS, RT	PRICE CODE 9C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 200-PW1-SET 3 GAC COMPOSITE	PROJECT DESIGNATION 200-PW-1 & 200-ZP-1 Spent GAC Canisters and Filters	FIELD LOGBOOK NO. 4819/30	SAF NO. F11-031	AIR QUALITY	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. Guss-215	FIELD PROPERTY NO. 4511	ACTUAL SAMPLE DEPTH N/A	COA 302853ES10	ORIGINAL	
SHIPPED TO GEL Laboratories, LLC					
BILL OF LADING/AIR BILL NO. SEE PTR 98414614808					

POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	None	6 Months	G/P	1	60mL	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
	None	6 Months	G/P	1	60mL	THIS IE PLAT E.AEA: COMMON (Thorium-232);
	None	6 Months	G/P	1	60mL	SE79_SEP_IE_L SC: COMMON;

SPECIAL HANDLING AND/OR STORAGE	SAMPLE DATE	SAMPLE TIME
OTHER SOLID	8-7-13	1021

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM <i>Kawar Aguilar</i>	DATE/TIME 8-7-13	RECEIVED BY/STORED IN <i>FED-X</i>	DATE/TIME 8-7-13	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. TRVL-13-080. COMPOSITE FROM CANISTERS AE-1083, AE-1087, AE-1211, AE-1079, AE-1203, AE-1091, AE-1084, AE-1086, AE-1214	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(1) TC99_SEP_GPC: COMMON; I129_SEP_LEPS_GS: COMMON; TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON; NI63_LSC: COMMON; UTOT_KPA: COMMON;	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-13-080	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TITLE	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	DISPOSED BY	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME	
LABORATORY SECTION	RECEIVED BY <i>Jay</i>	TITLE <i>Jennifer Pellegrini</i>		DATE/TIME 8-8-13 0855	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-031-050	PAGE 1 OF 1
COLLECTOR <i>Karen El Aguilar</i>	COMPANY CONTACT EVANS, RT	TELEPHONE NO. 373-7924	PROJECT COORDINATOR EVANS, RT	PRICE CODE 9C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 200-ZP1-SET 1 GAC COMPOSITE	PROJECT DESIGNATION 200-PW-1 & 200-ZP-1 Spent GAC Canisters and Filters	FIELD LOGBOOK NO. 9155	SAF NO. F11-031	AIR QUALITY	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. GWS-215	FIELD PROPERTY NO. HNF-N-491-9/60	ACTUAL SAMPLE DEPTH N/A	COA 302853ES10	ORIGINAL	
SHIPPED TO GEL Laboratories, LLC					
BILL OF LADING/AIR BILL NO. SEE PTR 98414614808					

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	None	None	None
A=Air DL=Drum L=Liquid DS=Drum S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WT=Wipe X=Other	**Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	HOLDING TIME	6 Months	6 Months	6 Months
		TYPE OF CONTAINER	G/P	G/P	G/P
		NO. OF CONTAINER(S)	1	1	1
		VOLUME	60mL	60mL	60mL
		SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	THIS IS PLAT E AREA: COMMON (Thorium-232);	SE79_SEP_I_E_L SC: COMMON;
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B2R1J0	OTHER SOLID	8-7-13	0745	✓	✓

41

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM <i>Karen El Aguilar</i>		RECEIVED BY/STORED IN FED-X	DATE/TIME 8-7-13
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	DATE/TIME
RECEIVED BY	<i>Jenny Pellegri</i>		
DISPOSAL METHOD	TITLE		
LABORATORY SECTION	DISPOSED BY		
FINAL SAMPLE DISPOSITION	DATE/TIME		
	8-8-13 <i>ES</i>		

TRVL-13-080

Client: <u>HMSA</u>		SDG/AR/COC/Work Order: <u>331181</u>
Received By: <u>JP</u>		Date Received: <u>8-8-13</u>
Suspected Hazard Information	Yes	No
COC/Samples marked as radioactive?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Classified Radioactive II or III by RSO?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COC/Samples marked containing PCBs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Shipped as a DOT Hazardous?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Samples identified as Foreign Soil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags <u>Blue ice</u> Dry ice <u>None</u> Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial # <u>4150201</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7904 1461 4808</u>

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 23 August 2013

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	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
Nevada	SC000122011-1
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 Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-13-8
Utah NELAP	SC000122013-8
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Radiological Analysis

Method/Analysis Information

Product: Alphaspec Th, Solid (Th232)
Analytical Method: THISO_IE_PLATE_AEA
Prep Method: Dry Soil Prep
Analytical Batch Number: 1321214
Prep Batch Number: 1321210

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202924237	Method Blank (MB)
1202924238	331181001(B2R1F2) Sample Duplicate (DUP)
1202924239	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-038 REV# 16.

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: 331181001 (B2R1F2).

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

Sample 1202924237 (MB) was recounted due to a peak shift. 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.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **Gamma I129, Solid**
Analytical Method: I129_SEP_LEPS_GS
Analytical Batch Number: 1322884

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202928469	Method Blank (MB)
1202928470	331181001(B2R1F2) Sample Duplicate (DUP)
1202928471	331181001(B2R1F2) Matrix Spike (MS)
1202928472	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# 20.

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: 331181001 (B2R1F2).

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.

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.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: KPA, Total U, Solid
Analytical Method: ASTM D 5174 Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 1322096
Prep Batch Number: 1321210

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202926603	Method Blank (MB)
1202926604	331181001(B2R1F2) Sample Duplicate (DUP)
1202926605	331181001(B2R1F2) Matrix Spike (MS)
1202926606	Laboratory Control Sample (LCS)
1202926607	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-023 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: 331181001 (B2R1F2).

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

MB 1202926603 (MB) was recounted twice due to a suspected false positive from possible carry over. Both recounts verified results below the RDL and MDA. The second 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 1214384 was generated due to Other. 1. Samples, 331181003, 331181004, 1202926603, 1202926604, 1202926605, 1202926606, and 1202926607 failed to meet GEL's reference ratio requirement. 1. All QC sample criteria, post spike recoveries and CCV recoveries meet specifications. The results are reported as valid.

Additional Comments

MB 1202926603 (MB) failed R2 and/or lifetime. This was due to insufficient uranium in the sample for measurement. The results are reported. LCS 1202926606 (LCS) failed R2 and/or lifetime; however, the LCS met recovery requirements. The results are reported as valid.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Liquid Scint Ni63, Solid
Analytical Method:	NI63_LSC
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1321592
Prep Batch Number:	1321210

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202925244	Method Blank (MB)
1202925245	331181001(B2R1F2) Sample Duplicate (DUP)
1202925246	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-022 REV# 16.

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: 331181001 (B2R1F2).

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 recounted due to the quench number being outside the calibration range. The recounts are 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.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Liquid Scint Te99, Solid

Analytical Method: TC99_TR_SEP_GPC

Analytical Batch Number: 1321597

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202925266	Method Blank (MB)
1202925267	331181002(B2R1F8) Sample Duplicate (DUP)
1202925268	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: 331181002 (B2R1F8).

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.

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.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: LSC, Tritium Dist, Solid
Analytical Method: TRITIUM_DIST_LSC
Analytical Batch Number: 1321605

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202925293	Method Blank (MB)
1202925294	331181001(B2R1F2) Sample Duplicate (DUP)
1202925295	331181001(B2R1F2) Matrix Spike (MS)
1202925296	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: 331181001 (B2R1F2).

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.

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.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Liquid Scint Se79, Solid
Analytical Method:	SE79_SEP_IE_LSC
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1322036
Prep Batch Number:	1321210

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202926420	Method Blank (MB)
1202926421	331181001(B2R1F2) Sample Duplicate (DUP)

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-031 REV# 10.

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: 331181001 (B2R1F2).

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.

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.

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: C14_LSC
Analytical Batch Number: 1322645

Sample ID	Client ID
331181001	B2R1F2
331181002	B2R1F8
331181003	B2R1H4
331181004	B2R1J0
1202927856	Method Blank (MB)
1202927857	331181001(B2R1F2) Sample Duplicate (DUP)
1202927858	331181001(B2R1F2) Matrix Spike (MS)
1202927859	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: 331181001 (B2R1F2).

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 reprepared due to low recovery. The re-analysis is being 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.

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**

HMSA001 Hanford MSA (51204)

Client SDG: GEL331181 GEL Work Order: 331181

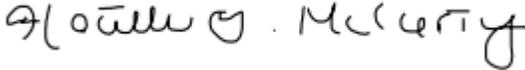
The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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: 

Name: Heather McCarty

Date: 23 AUG 2013

Title: Analyst II

DATA EXCEPTION REPORT

Mo.Day Yr. 23-AUG-13	Division: Radiochemistry	Quality Criteria:	Type: Process
Instrument Type: Kinetic Phosphorescence Analyzer	Test / Method: ATSM D 5174 Modified	Matrix Type: Solid	Client Code: HMSA001
Batch ID: 1322096	Sample Numbers: 331181003, 331181004, 1202926603, 1202926604, 1202926605, 1202926606, 1202926607		
Potentially affected work order(s)(SDG): 331181(GEL331181)			
Application Issues: Other			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples, 331181003, 331181004, 1202926603, 1202926604, 1202926605, 1202926606, and 1202926607 failed to meet GEL's reference ratio requirement.		1. All QC sample criteria, post spike recoveries and CCV recoveries meet specifications. The results are reported as valid.	

Originator's Name:
Jesse Craig 23-AUG-13

Data Validator/Group Leader:
Robert Timm 23-AUG-13

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F11-031 | Spent GAC
 Client Sample ID: B2R1F2
 Sample ID: 331181001

Report Date: August 23, 2013

Project: HMSA00111
 Client ID: HMSA001

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 (Th232) "Dry Weight Corrected"					1321214	102	(15%-125%)				
Nickel Carrier		Liquid Scint Ni63, Solid "Dry Weight Corrected"					1321592	67.2	(25%-125%)				
Selenium Carrier		Liquid Scint Se79, Solid "Dry Weight Corrected"					1322036	84.5	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "As Received"					1321597	78.5	(15%-125%)				

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352

Report Date: August 23, 2013

Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F11-031 | Spent GAC

Client Sample ID: B2R1F8
 Sample ID: 331181002
 Matrix: OTHER SOLID
 Collect Date: 07-AUG-13
 Receive Date: 08-AUG-13
 Collector: Client
 Moisture: 17.6%

Project: HMSA00111
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis													
<i>Alphaspec Th, Solid (Th232) "Dry Weight Corrected"</i>													
Thorium-232	U	0.300	+/-0.362	0.412	+/-0.365	1.00	pCi/g		JXH2	08/19/13	1122	1321214	1
Rad Gamma Spec Analysis													
<i>Gamma I129, Solid "As Received"</i>													
Iodine-129	U	-0.122	+/-0.406	0.711	+/-0.410	2.00	pCi/g		BSW1	08/19/13	1230	1322884	2
Rad Liquid Scintillation Analysis													
<i>LSC, Tritium Dist, Solid "As Received"</i>													
Tritium	U	5.54	+/-9.87	17.0	+/-9.95	30.0	pCi/g		BYS1	08/13/13	0613	1321605	3
<i>Liquid Scint C14, Solid "As Received"</i>													
Carbon-14	U	-0.255	+/-2.22	3.81	+/-2.22	5.00	pCi/g		BYS1	08/15/13	1905	1322645	4
<i>Liquid Scint Ni63, Solid "Dry Weight Corrected"</i>													
Nickel-63	U	1.44	+/-9.67	16.7	+/-9.67	30.0	pCi/g		TYJ1	08/16/13	1344	1321592	5
<i>Liquid Scint Se79, Solid "Dry Weight Corrected"</i>													
Selenium-79	U	0.770	+/-1.41	2.38	+/-1.42	10.0	pCi/g		EXK2	08/20/13	1924	1322036	6
<i>Liquid Scint Tc99, Solid "As Received"</i>													
Technetium-99	U	2.46	+/-7.55	13.0	+/-7.55	15.0	pCi/g		MYM1	08/18/13	0813	1321597	7
Rad Total Uranium													
<i>KPA, Total U, Solid "Dry Weight Corrected"</i>													
Total Uranium		1.31	+/-0.305	0.0614	+/-0.522	1.00	ug/g		KDF1	08/22/13	1339	1322096	8

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	08/09/13	0627	1321210

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Th-01-RC Modified
2	DOE EML HASL-300,I-01 Modified
3	EPA 906.0 Modified
4	EPA EERF C-01 Modified
5	DOE RESL Ni-1, Modified
6	NERC ORD
7	DOE EML HASL-300, Tc-02-RC Modified
8	ASTM D 5174 Modified

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

Company : CH2MHill Plateau Remediation
 Address : Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F11-031 | Spent GAC
 Client Sample ID: B2R1F8
 Sample ID: 331181002

Report Date: August 23, 2013

Project: HMSA00111
 Client ID: HMSA001

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 (Th232) "Dry Weight Corrected"					1321214	85.4	(15%-125%)				
Nickel Carrier		Liquid Scint Ni63, Solid "Dry Weight Corrected"					1321592	67.2	(25%-125%)				
Selenium Carrier		Liquid Scint Se79, Solid "Dry Weight Corrected"					1322036	99.0	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "As Received"					1321597	78.7	(15%-125%)				

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352

Report Date: August 23, 2013

Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F11-031 | Spent GAC

Client Sample ID: B2R1H4
 Sample ID: 331181003
 Matrix: OTHER SOLID
 Collect Date: 07-AUG-13
 Receive Date: 08-AUG-13
 Collector: Client
 Moisture: 16%

Project: HMSA00111
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis													
<i>Alphaspec Th, Solid (Th232) "Dry Weight Corrected"</i>													
Thorium-232		0.631	+/-0.454	0.369	+/-0.465	1.00	pCi/g		JXH2	08/19/13	1122	1321214	1
Rad Gamma Spec Analysis													
<i>Gamma I129, Solid "As Received"</i>													
Iodine-129	U	-0.368	+/-0.409	0.673	+/-0.443	2.00	pCi/g		BSW1	08/19/13	1231	1322884	2
Rad Liquid Scintillation Analysis													
<i>LSC, Tritium Dist, Solid "As Received"</i>													
Tritium	U	0.00	+/-9.37	16.8	+/-9.37	30.0	pCi/g		BYS1	08/13/13	0644	1321605	3
<i>Liquid Scint C14, Solid "As Received"</i>													
Carbon-14	U	-0.679	+/-2.17	3.74	+/-2.17	5.00	pCi/g		BYS1	08/15/13	2016	1322645	4
<i>Liquid Scint Ni63, Solid "Dry Weight Corrected"</i>													
Nickel-63	U	-5.43	+/-10.7	18.9	+/-10.7	30.0	pCi/g		TYJ1	08/16/13	1416	1321592	5
<i>Liquid Scint Se79, Solid "Dry Weight Corrected"</i>													
Selenium-79	U	1.08	+/-1.78	3.00	+/-1.79	10.0	pCi/g		EXK2	08/20/13	2126	1322036	6
<i>Liquid Scint Tc99, Solid "As Received"</i>													
Technetium-99	U	-3.18	+/-7.06	12.5	+/-7.06	15.0	pCi/g		MYM1	08/18/13	0834	1321597	7
Rad Total Uranium													
<i>KPA, Total U, Solid "Dry Weight Corrected"</i>													
Total Uranium		1.37	+/-0.318	0.057	+/-0.537	1.00	ug/g		KDF1	08/22/13	1341	1322096	8

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	08/09/13	0627	1321210

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Th-01-RC Modified
2	DOE EML HASL-300,I-01 Modified
3	EPA 906.0 Modified
4	EPA EERF C-01 Modified
5	DOE RESL Ni-1, Modified
6	NERC ORD
7	DOE EML HASL-300, Tc-02-RC Modified
8	ASTM D 5174 Modified

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

Company : CH2MHill Plateau Remediation
 Address : Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F11-031 | Spent GAC
 Client Sample ID: B2R1H4
 Sample ID: 331181003

Report Date: August 23, 2013

Project: HMSA00111
 Client ID: HMSA001

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 (Th232) "Dry Weight Corrected"					1321214	91.6	(15%-125%)				
Nickel Carrier		Liquid Scint Ni63, Solid "Dry Weight Corrected"					1321592	63.4	(25%-125%)				
Selenium Carrier		Liquid Scint Se79, Solid "Dry Weight Corrected"					1322036	87.5	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "As Received"					1321597	73.2	(15%-125%)				

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352

Report Date: August 23, 2013

Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F11-031 | Spent GAC

Client Sample ID: B2R1J0
 Sample ID: 331181004
 Matrix: OTHER SOLID
 Collect Date: 07-AUG-13
 Receive Date: 08-AUG-13
 Collector: Client
 Moisture: 12.1%

Project: HMSA00111
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis													
<i>Alphaspec Th, Solid (Th232) "Dry Weight Corrected"</i>													
Thorium-232	U	0.0811	+/-0.248	0.347	+/-0.248	1.00	pCi/g		JXH2	08/19/13	1123	1321214	1
Rad Gamma Spec Analysis													
<i>Gamma I129, Solid "As Received"</i>													
Iodine-129	U	-0.201	+/-0.404	0.722	+/-0.414	2.00	pCi/g		BSW1	08/19/13	1231	1322884	2
Rad Liquid Scintillation Analysis													
<i>LSC, Tritium Dist, Solid "As Received"</i>													
Tritium	U	4.31	+/-9.81	17.1	+/-9.86	30.0	pCi/g		BYS1	08/13/13	0716	1321605	3
<i>Liquid Scint C14, Solid "As Received"</i>													
Carbon-14	U	1.59	+/-2.11	3.55	+/-2.11	5.00	pCi/g		BYS1	08/15/13	2127	1322645	4
<i>Liquid Scint Ni63, Solid "Dry Weight Corrected"</i>													
Nickel-63	U	-1.28	+/-9.96	17.3	+/-9.96	30.0	pCi/g		TYJ1	08/16/13	1447	1321592	5
<i>Liquid Scint Se79, Solid "Dry Weight Corrected"</i>													
Selenium-79	U	0.691	+/-1.74	2.95	+/-1.75	10.0	pCi/g		EXK2	08/20/13	2329	1322036	6
<i>Liquid Scint Tc99, Solid "As Received"</i>													
Technetium-99	U	-4.88	+/-6.82	12.2	+/-6.82	15.0	pCi/g		MYM1	08/18/13	0855	1321597	7
Rad Total Uranium													
<i>KPA, Total U, Solid "Dry Weight Corrected"</i>													
Total Uranium		1.51	+/-0.351	0.0565	+/-0.591	1.00	ug/g		KDF1	08/22/13	1344	1322096	8

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	08/09/13	0627	1321210

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Th-01-RC Modified
2	DOE EML HASL-300,I-01 Modified
3	EPA 906.0 Modified
4	EPA EERF C-01 Modified
5	DOE RESL Ni-1, Modified
6	NERC ORD
7	DOE EML HASL-300, Tc-02-RC Modified
8	ASTM D 5174 Modified

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

Company : CH2MHill Plateau Remediation
 Address : Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F11-031 | Spent GAC
 Client Sample ID: B2R1J0
 Sample ID: 331181004

Report Date: August 23, 2013

Project: HMSA00111
 Client ID: HMSA001

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 (Th232) "Dry Weight Corrected"					1321214	74.2	(15%-125%)				
Nickel Carrier		Liquid Scint Ni63, Solid "Dry Weight Corrected"					1321592	69.2	(25%-125%)				
Selenium Carrier		Liquid Scint Se79, Solid "Dry Weight Corrected"					1322036	88.0	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "As Received"					1321597	73.1	(15%-125%)				

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

Quality Control Data

QC Summary

Report Date: August 23, 2013
 Page 1 of 4

Client : CH2MHill Plateau Remediation Company
 MISN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 331181

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1321214								
QC1202924237	MB								
Thorium-232			U	-0.0241	pCi/g			JXH2	08/19/1315:57
				Uncert: +/-0.146					
				TPU: +/-0.147					
QC1202924238	331181001 DUP								
Thorium-232		U 0.131	U	0.321	pCi/g				08/19/1311:23
				Uncert: +/-0.237		RPD: 0	N/A		
				TPU: +/-0.238		RER: 0.855	(0-2)		
QC1202924239	LCS								
Thorium-230	19.5			18.4	pCi/g	REC: 95	(80%-120%)		08/19/1311:23
				Uncert: +/-2.18					
				TPU: +/-3.53					
Thorium-232			U	0.175	pCi/g				
				Uncert: +/-0.263					
				TPU: +/-0.264					
Rad Gamma Spec									
Batch	1322884								
QC1202928469	MB								
Iodine-129			U	-0.221	pCi/g			BSW1	08/19/1312:31
				Uncert: +/-0.426					
				TPU: +/-0.438					
QC1202928470	331181001 DUP								
Iodine-129		U 0.196	U	-0.00776	pCi/g				08/19/1313:44
				Uncert: +/-0.419		RPD: 0	N/A		
				TPU: +/-0.428		RER: 0.572	(0-2)		
QC1202928471	331181001 MS								
Iodine-129	41.6	U 0.196		38.0	pCi/g	REC: 91	(75%-125%)		08/19/1313:44
				Uncert: +/-0.419					
				TPU: +/-0.428					
QC1202928472	LCS								
Iodine-129	41.6			44.1	pCi/g	REC: 106	(80%-120%)		08/19/1314:32
				Uncert: +/-4.53					
				TPU: +/-6.38					
Rad Liquid Scintillation									
Batch	1321592								
QC1202925244	MB								
Nickel-63			U	1.60	pCi/g			TYJ1	08/16/1315:18
				Uncert: +/-9.69					
				TPU: +/-9.69					
QC1202925245	331181001 DUP								
Nickel-63		U 3.39	U	-3.26	pCi/g				08/16/1315:50
				Uncert: +/-9.82		RPD: 0	N/A		
				TPU: +/-9.84		RER: 0.884	(0-2)		
QC1202925246	LCS								

QC Summary

Workorder: 331181

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1321592								
Nickel-63	617			700	pCi/g	REC: 113 (80%-120%)			
				Uncert: +/-23.1					
				TPU: +/-132					
Batch	1321597								
QC1202925266	MB								
Technetium-99			U	-3.92	pCi/g			MYM1	08/18/1309:16
				Uncert: +/-4.79					
				TPU: +/-4.79					
QC1202925267	331181002	DUP							
Technetium-99		U	2.46	U	-2.8				08/18/1309:37
				Uncert: +/-7.55		RPD: 0 N/A			
				TPU: +/-7.55		RER: 0.987 (0-2)			
QC1202925268	LCS								
Technetium-99	249			232	pCi/g	REC: 93 (80%-120%)			08/18/1309:58
				Uncert: +/-10.7					
				TPU: +/-29.0					
Batch	1321605								
QC1202925293	MB								
Tritium			U	-3.63	pCi/g			BYS1	08/13/1307:47
				Uncert: +/-8.65					
				TPU: +/-8.65					
QC1202925294	331181001	DUP							
Tritium		U	-5.16	U	10.4				08/13/1308:18
				Uncert: +/-9.18		RPD: 0 N/A			
				TPU: +/-9.18		RER: 2.25 (0-2)			
QC1202925295	331181001	MS							
Tritium	90.9	U	-5.16		82.0	pCi/g	REC: 90 (75%-125%)		08/13/1308:49
				Uncert: +/-9.18					
				TPU: +/-9.18					
QC1202925296	LCS								
Tritium	88.1			87.0	pCi/g	REC: 99 (80%-120%)			08/13/1309:20
				Uncert: +/-14.1					
				TPU: +/-24.3					
Batch	1322036								
QC1202926420	MB								
Selenium-79			U	-0.218	pCi/g			EXK2	08/21/1301:31
				Uncert: +/-2.01					
				TPU: +/-2.01					
QC1202926421	331181001	DUP							
Selenium-79		U	3.14	U	-1.13	pCi/g			08/21/1311:24
				Uncert: +/-2.90		RPD: 0 N/A			
				TPU: +/-2.98		RER: 1.98 (0-2)			
QC1202926422	LCS								
Selenium-79	1780			1840	pCi/g	REC: 103 (80%-120%)			08/21/1306:42
				Uncert: +/-36.5					
				TPU: +/-413					
Batch	1322645								
QC1202927856	MB								
Carbon-14			U	0.343	pCi/g			BYS1	08/15/1322:39

QC Summary

Workorder: 331181

Page 3 of 4

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch	1322645									
				Uncert:						
				TPU:						
QC1202927857	331181001	DUP								
Carbon-14		U	-0.64	U	0.185					08/15/1323:50
				Uncert:	+/-1.99	+/-2.06	RPD: 0	N/A		
				TPU:	+/-1.99	+/-2.06	RER: 0.565	(0-2)		
QC1202927858	331181001	MS								
Carbon-14	216	U	-0.64		213		REC: 99	(75%-125%)		08/16/1301:01
				Uncert:	+/-1.99	+/-5.03				
				TPU:	+/-1.99	+/-16.8				
QC1202927859	LCS									
Carbon-14	199				188		REC: 94	(80%-120%)		08/16/1302:12
				Uncert:		+/-4.57				
				TPU:		+/-14.8				
Rad Total U										
Batch	1322096									
QC1202926603	MB									
Total Uranium				U	0.0351			KDF1		08/22/1314:24
				Uncert:		+/-0.0478				
				TPU:		+/-0.049				
QC1202926604	331181001	DUP								
Total Uranium			1.47		1.60					08/22/1313:49
				Uncert:	+/-0.341	+/-0.369	RPD: 8	(0% - 20%)		
				TPU:	+/-0.572	+/-0.625	RER: 0.292	(0-2)		
QC1202926605	331181001	MS								
Total Uranium	9.26		1.47		8.42		REC: 75	(75%-125%)		08/22/1313:54
				Uncert:	+/-0.341	+/-1.54				
				TPU:	+/-0.572	+/-3.10				
QC1202926606	LCS									
Total Uranium	8.62				10.1		REC: 118	(80%-120%)		08/22/1313:58
				Uncert:		+/-1.88				
				TPU:		+/-3.68				
QC1202926607	LCS									
Total Uranium	0.862				0.886		REC: 103	(80%-120%)		08/22/1313:59
				Uncert:		+/-0.206				
				TPU:		+/-0.344				

Notes:

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

The Qualifiers in this report are defined as follows:

- B The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

QC Summary

Workorder: 331181

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

** Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

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.