GEL Laboratories LLC
a member of The GEL Group INC

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

gel.com

July 13, 2017

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

Re: CHPRC SAF F13-034
Work Order: 426633
SDG: GEL426633

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 29, 2017. 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,

B Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 304233 - 9C
Chain of Custody: F13-034-068, F13-034-070, F13-034-072 and F13-034-073
Enclosures

Table of Contents

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F13-034
SDG: GEL426633

July 13, 2017

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 29, 2017, 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.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative.

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
426633001	B3BB95
426633002	B3BB97
426633003	B3BJH0
426633004	B3BJH1

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: GC/MS Volatile, General Chemistry and Radiochemistry.

We certify that this package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

B Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426633
Work Order #: 426633

GC/MS Volatile

Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

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

Technical Information

Sample Dilutions/Methanol Dilutions
Samples 1203828646 (B3BB95PS), 1203828647 (B3BB95PSD), 426633001 (B3BB95) and 426633002 (B3BB97) in this SDG were analyzed at a dilution. The samples were not analyzed at a lower dilution. There were positive results for target analytes within the middle to upper range of the calibration curve.

Analyte	426633	
	001	002
Several	10000X	20000X

General Chemistry

Cyanide, Total

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

Technical Information

Sample Dilutions
The following samples 1203822466 (LCS) and 1203822467 (LCSD) were diluted because target analyte concentrations exceeded the calibration range.

Radiochemistry

Alphaspec Am241 Solid

All sample data provided in this report met the acceptance criteria specified in the analytical methods and

procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts
Sample 1203821824 (MB) was recounted due to high carrier/tracer yield. The recount is reported.

Alphaspec Np, Solid

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

Alphaspec Pu, Solid

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

Quality Control (QC) Information

QC Information
Refer to Miscellaneous Information section.

Miscellaneous Information

Alphaspec Th, Solid (Th230&232)

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

Alphaspec U, Solid

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

Dry Weight

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

Gamma I129, Solid

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

Gamma Cs137,Co60,Eu152,Eu154,E155, Pa231,Th234

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

9310_ALPHABETA_GPC: COMMON

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

Technical Information

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.

SRTOT_SEP_PRECIP_GPC: COMMON

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

Technical Information

Recounts
Samples 1203821736 (MB) and 426633001 (B3BB95) were recounted due to results more negative than the three sigma TPU. The second counts are reported.

Liquid Scint Ni63, Solid

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

Technical Information

Recounts
Sample 1203822860 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Liquid Scint Se79, Solid

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

Technical Information

Recounts
Sample 1203822878 (LCS) was recounted due to low recovery. The recount is reported.

Liquid Scint Tc99, Solid

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

Liquid Scint C14, Solid

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

LSC, Tritium Dist, Solid

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

Technical Information

Sample Re-prep/Re-analysis
Samples were reprepped due to low recovery. The re-analysis is being reported.

Miscellaneous Information

Additional Comments
The matrix spike, 1203827285 (Non SDG 426775001MS), aliquot was reduced to conserve sample volume.

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F13-034-068	PAGE 1 OF 2
COLLECTOR Malcom Chunn CHPRC	**COMPANY CONTACT** SUMNER, LC	**TELEPHONE NO.** 376-3922	**PROJECT COORDINATOR** SUMNER, LC	**PRICE CODE** 9C	**DATA TURNAROUND**
SAMPLING LOCATION 200W P&T GAC Container #20-0161	**PROJECT DESIGNATION** 200 West Pump & Treat - Loaded Granular Activated Ccarbon (GAC) for Re		**SAF NO.** F13-034	**AIR QUALITY** ☐	15 Days / 15 Days
ICE CHEST NO. GWS-533	**FIELD LOGBOOK NO.** HNF-N-491-16	**ACTUAL SAMPLE DEPTH** 1'	**COA** 304233	**METHOD OF SHIPMENT** FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 8114		**BILL OF LADING/AIR BILL NO.** 7795 1424 9639		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C	None	None
HOLDING TIME	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	40mL	500mL	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B3BB95	OTHER SOLID	6/28/17	0810	✓	✓	✓

4266633

July 13, 2017

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Malcom Chunn CHPRC	JUN 2 8 2017 0955	Janelle Zunker CHPRC	JUN 2 8 2017 0955
Janelle Zunker CHPRC	JUN 2 8 2017 1400	FEDEX	
	FED EX	STACY BOONE	6-29-17 9:05

SPECIAL INSTRUCTIONS

TRVL-17-154
(1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Vinyl chloride};
(2) TC99_SEP_GPC: COMMON; I129_SEP_LEPS_GS: COMMON; TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON; NI63_LSC: COMMON; SE79_SEP_IE_LSC: COMMON; THISO_IE_PLATE_AEA: COMMON {Thorium-230, Thorium-232};
(3) GAMMA_GS: COMMON; GAMMA_GS: COMMON (Add-on) {Protactinium-231, Thorium-234}; PUISO_PLATE_AEA: COMMON; AMCMISO_EIE_PLATE_AEA: COMMON {Americium-241}; NP237_LLE_PLATE_AEA: COMMON; UISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; ALPHA_GPC: COMMON {Gross alpha}; BETA_GPC: COMMON {Gross beta};

LABORATORY SECTION	**RECEIVED BY**		**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**		**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/14/2017 **FSR ID = FSR46026** **TRVL NUM = TRVL-17-154** A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F13-034-070	PAGE 1 OF 2
COLLECTOR Malcom Chunn CHPRC	**COMPANY CONTACT** SUMNER, LC	**TELEPHONE NO.** 376-3922	**PROJECT COORDINATOR** SUMNER, LC	**PRICE CODE** 9C	**DATA TURNAROUND**
SAMPLING LOCATION 200W P&T GAC Container #20-0163	**PROJECT DESIGNATION** 200 West Pump & Treat - Loaded Granular Activated Ccarbon (GAC) for Re		**SAF NO.** F13-034	**AIR QUALITY** ☐	15 Days / 15 Days
ICE CHEST NO. GWS-533	**FIELD LOGBOOK NO.** HNF-N-491-16	**ACTUAL SAMPLE DEPTH** 1'	**COA** 304233	**METHOD OF SHIPMENT** FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 8114		**BILL OF LADING/AIR BILL NO.** 779514249639		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C	None	None
HOLDING TIME	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	40mL	500mL	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B3BB97	OTHER SOLID	6/28/17	0838	✓	✓	✓

4266633

July 13, 2017

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM Malcom Chunn CHPRC	DATE/TIME JUN 28 2017 0955	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME JUN 28 2017 0955
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC	DATE/TIME JUN 28 2017 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM FEDEX	DATE/TIME	RECEIVED BY/STORED IN STACY BOONE	DATE/TIME 6-29-17 9:08
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
TRVL-17-154
(1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Vinyl chloride};
(2) TC99_SEP_GPC: COMMON; I129_SEP_LEPS_GS: COMMON; TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON; NI63_LSC: COMMON; SE79_SEP_IE_LSC: COMMON; THISO_IE_PLATE_AEA: COMMON {Thorium-230, Thorium-232};
(3) GAMMA_GS: COMMON; GAMMA_GS: COMMON (Add-on) {Protactinium-231, Thorium-234}; PUISO_PLATE_AEA: COMMON; AMCMISO_EIE_PLATE_AEA: COMMON {Americium-241}; NP237_LLE_PLATE_AEA: COMMON; UISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; ALPHA_GPC: COMMON {Gross alpha}; BETA_GPC: COMMON {Gross beta};

LABORATORY SECTION	**RECEIVED BY**		**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**		**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/14/2017 **FSR ID = FSR46027** **TRVL NUM = TRVL-17-154** A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F13-034-072	PAGE 1 OF 1
COLLECTOR Malcom Chunn CHPRC	**COMPANY CONTACT** SUMNER, LC	**TELEPHONE NO.** 376-3922	**PROJECT COORDINATOR** SUMNER, LC	**PRICE CODE** 9C	**DATA TURNAROUND**
SAMPLING LOCATION 200W P&T GAC Container #20-0161	**PROJECT DESIGNATION** 200 West Pump & Treat - Loaded Granular Activated Ccarbon (GAC) for Re		**SAF NO.** F13-034	**AIR QUALITY** ☐	**15 Days / 15 Days**
ICE CHEST NO. GWS-533	**FIELD LOGBOOK NO.** HNF-N-491-16	**ACTUAL SAMPLE DEPTH** 1'	**COA** 304233	**METHOD OF SHIPMENT** FEDERAL EXPRESS	**ORIGINAL**
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 8114		**BILL OF LADING/AIR BILL NO.** 779514249639		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	9012_CYANIDE (TOTAL): COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3BJH0	OTHER SOLID	6/28/17	0810	✓

426633

July 13, 2017

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM Malcom Chunn CHPRC	DATE/TIME JUN 28 2017 0955	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME JUN 28 2017 0955	TRVL-17-154
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC	DATE/TIME JUN 28 2017 1410	RECEIVED BY/STORED IN FEDEX	DATE/TIME	
RELINQUISHED BY/REMOVED FROM FEDEX	DATE/TIME	RECEIVED BY/STORED IN STACY BOONE 6-29-17	DATE/TIME 9:05	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/14/2017 **FSR ID = FSR46026** **TRVL NUM = TRVL-17-154** A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F13-034-073	PAGE 1 OF 1
COLLECTOR Malcom Chunn CHPRC	**COMPANY CONTACT** SUMNER, LC	**TELEPHONE NO.** 376-3922	**PROJECT COORDINATOR** SUMNER, LC	**PRICE CODE** 9C	**DATA TURNAROUND**
SAMPLING LOCATION 200W P&T GAC Container #20-0163	**PROJECT DESIGNATION** 200 West Pump & Treat - Loaded Granular Activated Ccarbon (GAC) for Re		**SAF NO.** F13-034	**AIR QUALITY** ☐	15 Days / 15 Days
ICE CHEST NO. GWS-533	**FIELD LOGBOOK NO.** HNF-N-491-16	**ACTUAL SAMPLE DEPTH** 1'	**COA** 304233	**METHOD OF SHIPMENT** FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 8114		**BILL OF LADING/AIR BILL NO.** 779514249639		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	9012_CYANIDE (TOTAL): COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3BJH1	OTHER SOLID	6/28/17	0838	✓

4266633

July 13, 2017

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Malcom Chunn CHPRC	DATE/TIME: JUN 2 8 2017 0955	RECEIVED BY/STORED IN: Janelle Zunker CHPRC	DATE/TIME: JUN 2 8 2017 0955	TRVL-17-154
RELINQUISHED BY/REMOVED FROM: Janelle Zunker CHPRC	DATE/TIME: JUN 2 8 2017 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME	
RELINQUISHED BY/REMOVED FROM: FED EX	DATE/TIME	RECEIVED BY/STORED IN: STACY BOONE	DATE/TIME: 6-29-17 9:05	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

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LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/14/2017 **FSR ID = FSR46027** **TRVL NUM = TRVL-17-154** A-6003-618 (REV 2)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC	SDG/AR/COC/Work Order: 426616033
Received By: Stacy Boone	Date Received: 29-JUN-17
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 7795 1697 5580 -1c 7795 0593 7949 -1c 7795 1424 9639 -1c 7795 1256 6762 1c 7795 1256 6578 -1c 7795 1256 6957 1c

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?		✓	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

	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	Chain of custody documents included with shipment?	✓			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: Wet Ice Ice Packs Dry Ice None Other: *all temperatures are recorded in Celsius TEMP:_____
4	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: IR3-17 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	✓			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	✓			If Yes, Are Encores or Soil Kits present? Yes___ No✓ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes No✓ N/A (If unknown, select No) VOA vials free of headspace? Yes ✓ No___ N/A Sample ID's and containers affected:
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?	✓			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials NS Date 6/30/17 Page 1 of 1

Data Review Qualifier Definitions

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 (843) 556−8171

Report Date: 13−JUL−17

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol−condensation product	Organics	Semi−Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (0rganics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post−digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy−−Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 13 July 2017

State	Certification
Alaska	UST−0110
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122017−1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R−158
Oklahoma	9904
Pennsylvania NELAP	68−00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−17−12
Utah NELAP	SC000122017−22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426633
Work Order #: 426633

Product: **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method: SW846 5035A/8260C
Analytical Procedure: GL-OA-E-038 REV# 26
Analytical Batch: 1681390

Preparation Method: SW846 5035A
Preparation Procedure: GL-OA-E-039 REV# 11
Preparation Batch: 1681389

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203828644	Method Blank (MB)
1203828645	Laboratory Control Sample (LCS)
1203828646	426633001(B3BB95) Post Spike (PS)
1203828647	426633001(B3BB95) Post Spike Duplicate (PSD)
1203828977	Method Blank (MB)
1203828978	High Blank (HB)
1203828979	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Sample Dilutions/Methanol Dilutions
Samples 1203828646 (B3BB95PS), 1203828647 (B3BB95PSD), 426633001 (B3BB95) and 426633002 (B3BB97) in this SDG were analyzed at a dilution. The samples were not analyzed at a lower dilution. There were positive results for target analytes within the middle to upper range of the calibration curve.

Analyte	426633	
	001	002
Several	10000X	20000X

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.

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL426633 GEL Work Order: 426633

The Qualifiers in this report are defined as follows:

D Results are reported from a diluted aliquot of sample.

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

DL Indicates that sample is diluted.

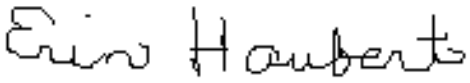
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

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: Erin Haubert**

Date: 13 JUL 2017 **Title: Data Validator**

Sample Data Summary

Volatile

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
Lab Sample ID:	**426633001**	**Date Received:**	**06/29/2017 09:05**	**%Moisture:**	**4.3**
		Client:	**CPRC001**	**Project:**	**CPRC0F13034**
Client ID:	**B3BB95**	**Method:**	**SW846 5035A/8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1681390**	**Inst:**	**VOA3.I**	**Dilution:**	**10000**
Run Date:	**07/12/2017 09:49**	**Analyst:**	**VXY1**	**Purge Vol:**	**5 mL**
Prep Date:	**07/11/2017 14:41**	**Aliquot:**	**5 g**	**Final Volume:**	**10 mL**
Data File:	**071117V3\3L245.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	879000	ug/kg	6000	40000	5.00
67-66-3	Chloroform	D	75400	ug/kg	6000	40000	5.00
75-01-4	Vinyl chloride	DU	6000	ug/kg	6000	40000	10.0

Volatile

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
Lab Sample ID:	**426633002**	**Date Received:**	**06/29/2017 09:05**	**%Moisture:**	**12.5**
		Client:	**CPRC001**	**Project:**	**CPRC0F13034**
Client ID:	**B3BB97**	**Method:**	**SW846 5035A/8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1681390**	**Inst:**	**VOA3.I**	**Dilution:**	**20000**
Run Date:	**07/12/2017 09:18**	**Analyst:**	**VXY1**	**Purge Vol:**	**5 mL**
Prep Date:	**07/11/2017 14:42**	**Aliquot:**	**5 g**	**Final Volume:**	**10 mL**
Data File:	**071117V3\3L244.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	1810000	ug/kg	12000	80000	5.00
67-66-3	Chloroform	D	90800	ug/kg	12000	80000	5.00
75-01-4	Vinyl chloride	DU	12000	ug/kg	12000	80000	10.0

Quality Control Summary

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

QC Summary

Report Date: July 13, 2017

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **426633**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1681390										
QC1203828978 HB										
Carbon tetrachloride			DU	30.0	ug/kg				VXY1	07/11/17 20:08
Chloroform			DU	30.0	ug/kg					
Vinyl chloride			DU	30.0	ug/kg					
**1,2-Dichloroethane-d4	50.0			44.8	ug/L		90	(70%-130%)		
**Bromofluorobenzene	50.0			45.6	ug/L		91	(70%-130%)		
**Toluene-d8	50.0			49.7	ug/L		99	(70%-130%)		
QC1203828645 LCS										
Carbon tetrachloride	50.0			45.7	ug/kg		91	(70%-130%)		07/11/17 12:57
Chloroform	50.0			45.0	ug/kg		90	(70%-130%)		
Vinyl chloride	50.0			48.5	ug/kg		97	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			45.3	ug/L		91	(70%-130%)		
**Bromofluorobenzene	50.0			54.2	ug/L		108	(70%-130%)		
**Toluene-d8	50.0			48.6	ug/L		97	(70%-130%)		
QC1203828979 LCS										
Carbon tetrachloride	50.0			41.3	ug/kg		83	(70%-130%)		07/12/17 01:08

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QC Summary

Workorder: **426633**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1681390										
Chloroform	50.0			44.0	ug/kg		88	(70%-130%)	VXY1	07/12/17 01:08
Vinyl chloride	50.0			44.4	ug/kg		89	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			44.0	ug/L		88	(70%-130%)		
**Bromofluorobenzene	50.0			52.3	ug/L		105	(70%-130%)		
**Toluene-d8	50.0			47.9	ug/L		96	(70%-130%)		
QC1203828644 MB										
Carbon tetrachloride			U	0.300	ug/kg					07/11/17 15:00
Chloroform			U	0.300	ug/kg					
Vinyl chloride			U	0.300	ug/kg					
**1,2-Dichloroethane-d4	50.0			50.1	ug/L		100	(70%-130%)		
**Bromofluorobenzene	50.0			51.1	ug/L		102	(70%-130%)		
**Toluene-d8	50.0			49.8	ug/L		100	(70%-130%)		
QC1203828977 MB										
Carbon tetrachloride			U	0.300	ug/kg					07/12/17 03:11
Chloroform			U	0.300	ug/kg					
Vinyl chloride			U	0.300	ug/kg					
**1,2-Dichloroethane-d4	50.0			48.4	ug/L		97	(70%-130%)		

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QC Summary

Workorder: **426633**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1681390											
**Bromofluorobenzene	50.0				49.7	ug/L		99	(70%-130%)	VXY1	07/12/17 03:11
**Toluene-d8	50.0				49.0	ug/L		98	(70%-130%)		
QC1203828646 426633001 PS											
Carbon tetrachloride	50.0	D	44.0	D	87.8	ug/L		88	(70%-130%)		07/12/17 10:19
Chloroform	50.0	D	3.77	D	50.1	ug/L		93	(70%-130%)		
Vinyl chloride	50.0	DU	0.00	D	52.5	ug/L		105	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		41.8		41.7	ug/L		83	(70%-130%)		
**Bromofluorobenzene	50.0		46.3		46.3	ug/L		93	(70%-130%)		
**Toluene-d8	50.0		46.6		45.8	ug/L		92	(70%-130%)		
QC1203828647 426633001 PSD											
Carbon tetrachloride	50.0	D	44.0	D	82.6	ug/L	6	77	(0%-20%)		07/12/17 10:50
Chloroform	50.0	D	3.77	D	49.9	ug/L	0	92	(0%-20%)		
Vinyl chloride	50.0	DU	0.00	D	50.9	ug/L	3	102	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		41.8		43.3	ug/L		87	(70%-130%)		
**Bromofluorobenzene	50.0		46.3		51.3	ug/L		103	(70%-130%)		
**Toluene-d8	50.0		46.6		44.9	ug/L		90	(70%-130%)		

Notes:

The Qualifiers in this report are defined as follows:

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QC Summary

Workorder: **426633**

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

A The TIC is a suspected aldol-condensation product

B The analyte was detected in both the associated QC blank and in the sample.

C Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of sample.

E Concentration exceeds the calibration range of the instrument

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

N Spike Sample recovery is outside control limits.

P Aroclor target analyte with greater than 25% difference between column analyses.

T Spike and/or spike duplicate 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

o Analyte failed to recover within LCS limits (0rganics only)

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

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

Volatile

Surrogate Recovery Report

SDG Number: GEL426633

Matrix Type: SOLID

Sample ID	Client ID	DCED4 %REC		TOL %REC		BFB %REC	
1203828645	LCS for batch 1681389	91		97		108	
1203828644	MB for batch 1681389	100		100		102	
1203828978	HB for batch 1681389	90	D	99	D	91	D
1203828979	LCS for batch 1681389	88		96		105	
1203828977	MB for batch 1681389	97		98		99	
426633002	B3BB97	85	D	98	D	95	D
426633001	B3BB95	84	D	93	D	93	D
1203828646	B3BB95PS	83	D	92	D	93	D
1203828647	B3BB95PSD	87	D	90	D	103	D

Surrogate		Acceptance Limits
DCED4	= 1,2-Dichloroethane-d4	(70%-130%)
TOL	= Toluene-d8	(70%-130%)
BFB	= Bromofluorobenzene	(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

General Chem Analysis

Case Narrative

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426633
Work Order #: 426633

Product: **Cyanide, Total**
Analytical Method: 9012_CYANIDE
Analytical Procedure: GL-GC-E-095 REV# 20
Analytical Batches: 1678717 and 1678716

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

GEL Sample ID#	Client Sample Identification
426633003	B3BJH0
426633004	B3BJH1
1203822465	Method Blank (MB)
1203822466	Laboratory Control Sample (LCS)
1203822467	Laboratory Control Sample Duplicate (LCSD)
1203822468	426633003(B3BJH0) Sample Duplicate (DUP)
1203822469	426633003(B3BJH0) Matrix Spike (MS)
1203823137	426775002(NonSDG) Sample Duplicate (DUP)
1203823138	426775002(NonSDG) Matrix Spike (MS)

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

Data Summary:

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

Technical Information

Sample Dilutions
The following samples 1203822466 (LCS) and 1203822467 (LCSD) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

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

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL426633 GEL Work Order: 426633

The Qualifiers in this report are defined as follows:

D Results are reported from a diluted aliquot of sample.

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: Aubrey Kingsbury**

Date: 06 JUL 2017 **Title: Analyst I**

Sample Data Summary

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

Certificate of Analysis

Report Date: July 6, 2017

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF F13-034

Client Sample ID: B3BJH0
Sample ID: 426633003
Matrix: OTHERSOLID
Collect Date: 28-JUN-17 08:10
Receive Date: 29-JUN-17
Collector: Client

Project: CPRC0F13034
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		583	73.2	219	ug/kg	43.9	1	AXH3	07/03/17	0822	1678717	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	07/03/17	0651	1678716

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

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

Certificate of Analysis

Report Date: July 6, 2017

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF F13-034

Client Sample ID: B3BJH1
Sample ID: 426633004
Matrix: OTHERSOLID
Collect Date: 28-JUN-17 08:38
Receive Date: 29-JUN-17
Collector: Client

Project: CPRC0F13034
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		582	68.4	205	ug/kg	41.0	1	AXH3	07/03/17	0825	1678717	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	07/03/17	0651	1678716

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Quality Control Summary

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

QC Summary

Report Date: July 6, 2017

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **426633**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Flow Injection Analysis										
Batch 1678717										
QC1203822468 426633003 DUP										
Cyanide, Total		583		650	ug/kg	10.8 ^		(+/-208)	AXH3	07/03/17 08:23
QC1203823137 426775002 DUP										
Cyanide, Total	U	80.3	U	81.8	ug/kg	N/A				07/03/17 08:27
QC1203822466 LCS										
Cyanide, Total	108000		D	97000	ug/kg		89.8	(80%-120%)		07/03/17 08:19
QC1203822467 LCSD										
Cyanide, Total	108000		D	97700	ug/kg	0.719	90.5	(0%-35%)		07/03/17 08:20
QC1203822465 MB										
Cyanide, Total			U	83.5	ug/kg					07/03/17 08:18
QC1203822469 426633003 MS										
Cyanide, Total	4240	583		4230	ug/kg		86	(75%-125%)		07/03/17 08:24
QC1203823138 426775002 MS										
Cyanide, Total	4720 U	80.3		4860	ug/kg		103	(75%-125%)		07/03/17 08:32

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- 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.

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

QC Summary

Workorder: **426633**

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

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426633
Work Order #: 426633

Product: **Alphaspec Am241 Solid**
Analytical Method: AMCMISO_EIE_PREC_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1678472

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821824	Method Blank (MB)
1203821825	426633001(B3BB95) Sample Duplicate (DUP)
1203821826	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts
Sample 1203821824 (MB) was recounted due to high carrier/tracer yield. The recount is reported.

Product: **Alphaspec Np, Solid**
Analytical Method: ASTM C 1475-00 Modified
Analytical Procedure: GL-RAD-A-032 REV# 21
Analytical Batch: 1678474

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821833	Method Blank (MB)
1203821834	426633001(B3BB95) Sample Duplicate (DUP)
1203821835	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **Alphaspec Pu, Solid**
Analytical Method: PUISO_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1678475

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821836	Method Blank (MB)
1203821837	426633001(B3BB95) Sample Duplicate (DUP)
1203821838	Laboratory Control Sample (LCS)

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

Data Summary:

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

Quality Control (QC) Information

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information section.

Miscellaneous Information

1. Sample 1203821836 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: **Alphaspec Th, Solid (Th230&232)**
Analytical Method: THISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-038 REV# 17
Analytical Batch: 1678479

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821845	Method Blank (MB)
1203821846	426633001(B3BB95) Sample Duplicate (DUP)
1203821847	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **Alphaspec U, Solid**
Analytical Method: UISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1678480

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821848	Method Blank (MB)

1203821849	426633001(B3BB95) Sample Duplicate (DUP)
1203821850	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **Dry Weight**
Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97

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

Data Summary:

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

Product: **Gamma I129, Solid**
Analytical Method: Gamma I129, Solid
Analytical Procedure: GL-RAD-A-006 REV# 21
Analytical Batch: 1678366

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821583	Method Blank (MB)
1203821584	426633001(B3BB95) Sample Duplicate (DUP)
1203821586	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **Gamma Cs137,Co60,Eu152,Eu154,E155, Pa231,Th234**
Analytical Method: GAMMA_GS
Analytical Procedure: GL-RAD-A-013 REV# 27
Analytical Batch: 1678421

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821716	Method Blank (MB)
1203821717	426633001(B3BB95) Sample Duplicate (DUP)
1203821718	Laboratory Control Sample (LCS)

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

Data Summary:

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

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Results are considered a false positive due to high counting uncertainty.	Thorium-234	426633001	B3BB95
			1203821717	B3BB95(426633001DUP)

Product: **9310_ALPHABETA_GPC: COMMON**

Analytical Method: 9310_ALPHABETA_GPC
Analytical Procedure: GL-RAD-A-001B REV# 18
Analytical Batch: 1678430

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821731	Method Blank (MB)
1203821732	426633002(B3BB97) Sample Duplicate (DUP)
1203821733	426633002(B3BB97) Matrix Spike (MS)
1203821734	426633002(B3BB97) Matrix Spike Duplicate (MSD)
1203821735	Laboratory Control Sample (LCS)

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

Data Summary:

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

Quality Control (QC) Information

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203821732 (B3BB97DUP) and 426633002 (B3BB97) , did not meet the beta relative error requirement due to the matrix of the sample. Sample matrix is composed of charcoal pieces of varying sizes. The relative percent difference is 79%.

Technical Information

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.

Product: **SRTOT_SEP_PRECIP_GPC: COMMON**
Analytical Method: SRTOT_SEP_PRECIP_GPC
Analytical Procedure: GL-RAD-A-004 REV# 18
Analytical Batch: 1678431

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203821736	Method Blank (MB)
1203821737	426633001(B3BB95) Sample Duplicate (DUP)
1203821738	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts
Samples 1203821736 (MB) and 426633001 (B3BB95) were recounted due to results more negative than the three sigma TPU. The second counts are reported.

Product: Liquid Scint Ni63, Solid
Analytical Method: NI63_LSC
Analytical Procedure: GL-RAD-A-022 REV# 18
Analytical Batch: 1678884

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203822860	Method Blank (MB)
1203822861	426633001(B3BB95) Sample Duplicate (DUP)
1203822862	Laboratory Control Sample (LCS)

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

Data Summary:

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

applicable, with the following exceptions.

Technical Information

Recounts
Sample 1203822860 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Product: **Liquid Scint Se79, Solid**
Analytical Method: SE79_SEP_IE_LSC
Analytical Procedure: GL-RAD-A-031 REV# 13
Analytical Batch: 1678890

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1678309

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203822876	Method Blank (MB)
1203822877	426633001(B3BB95) Sample Duplicate (DUP)
1203822878	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts
Sample 1203822878 (LCS) was recounted due to low recovery. The recount is reported.

Product: **Liquid Scint Tc99, Solid**
Analytical Method: TC99_EIE_LSC
Analytical Procedure: GL-RAD-A-059 REV# 5
Analytical Batch: 1678899

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203822903	Method Blank (MB)
1203822904	426736001(NonSDG) Sample Duplicate (DUP)
1203822906	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **Liquid Scint C14, Solid**
Analytical Method: C14_LSC
Analytical Procedure: GL-RAD-A-003 REV# 15
Analytical Batch: 1678936

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203822984	Method Blank (MB)
1203822985	426633001(B3BB95) Sample Duplicate (DUP)
1203822986	426633001(B3BB95) Matrix Spike (MS)
1203822987	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **LSC, Tritium Dist, Solid**
Analytical Method: TRITIUM_DIST_LSC
Analytical Procedure: GL-RAD-A-002 REV# 22
Analytical Batch: 1680886

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

GEL Sample ID#	Client Sample Identification
426633001	B3BB95
426633002	B3BB97
1203827282	Method Blank (MB)
1203827283	426775001(NonSDG) Sample Duplicate (DUP)
1203827285	426775001(NonSDG) Matrix Spike (MS)
1203827287	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Sample Re-prep/Re-analysis
Samples were reprepped due to low recovery. The re-analysis is being reported.

Miscellaneous Information

Additional Comments
The matrix spike, 1203827285 (Non SDG 426775001MS), aliquot was reduced to conserve sample volume.

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

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL426633 GEL Work Order: 426633

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.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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: Heather McCarty **Name: Heather McCarty**

Date: 13 JUL 2017 **Title: Analyst II**

Sample Data Summary

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Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678472**	**Method:**	**AMCMISO_EIE_PREC_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/08/2017 11:32**	**Analyst:**	**MXS2**	**Instrument:**	**1090**
Data File:	**S0426633001_AM.1A.gcnf**	**Aliquot:**	**0.103 g**	**Count Time:**	**239.9998 min**
Prep Batch:	**1678472**	**Prep Method:**	**DOE EML HASL-300, Am-05**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	-0.0748	pCi/g	+/-0.142	0.142	0.437	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	18.3	20.4	pCi/g	90	(30%-105%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678474**	**Method:**	**ASTM C 1475-00 Modified**	**SOP Ref:**	**GL-RAD-A-032**
Run Date:	**07/08/2017 11:17**	**Analyst:**	**MXS2**	**Instrument:**	**1205**
Data File:	**S0426633001_NP.1A.gcnf**	**Aliquot:**	**0.106 g**	**Count Time:**	**240 min**
Prep Batch:	**1678474**	**Prep Method:**	**ASTM C 1475-00 Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	-0.0398	pCi/g	+/-0.176	0.176	0.459	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1630	2020	pCi/g	80.8	(30%-105%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678475**	**Method:**	**PUISO_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/08/2017 11:32**	**Analyst:**	**MXS2**	**Instrument:**	**1103**
Data File:	**S0426633001_PU.1A.gcnf**	**Aliquot:**	**0.103 g**	**Count Time:**	**240 min**
Prep Batch:	**1678475**	**Prep Method:**	**DOE EML HASL-300, Pu-11-**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13981-16-3	Plutonium-238	U	0.0376	pCi/g	+/-0.209	0.209	0.400	1.00
OER-100-70	Plutonium-239/240	U	-0.0347	pCi/g	+/-0.153	0.154	0.400	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	14.7	19.1	pCi/g	77.1	(30%-105%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678479**	**Method:**	**THISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-038**
Run Date:	**07/08/2017 11:12**	**Analyst:**	**MXS2**	**Instrument:**	**1186**
Data File:	**S0426633001_TH.1A.gcnf**	**Aliquot:**	**0.105 g**	**Count Time:**	**240 min**
Prep Batch:	**1678479**	**Prep Method:**	**DOE EML HASL-300, Th-01-**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14269-63-7	Thorium-230	U	0.571	pCi/g	+/-0.620	0.633	0.917	1.00
TH-232 *7440-29-1*	Thorium-232	U	0.249	pCi/g	+/-0.371	0.373	0.469	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	16.9	19.7	pCi/g	85.8	(30%-105%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678480**	**Method:**	**UISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/08/2017 11:01**	**Analyst:**	**MXS2**	**Instrument:**	**1125**
Data File:	**S0426633001_UU.1A.gcnf**	**Aliquot:**	**0.103 g**	**Count Time:**	**240 min**
Prep Batch:	**1678480**	**Prep Method:**	**DOE EML HASL-300, U-02-R**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 *13968-55-3/13966-29-5*	Uranium-233/234	U	0.386	pCi/g	+/-0.470	0.474	0.630	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.00	pCi/g	+/-0.238	0.239	0.354	1.00
7440-61-1	Uranium-238	U	0.382	pCi/g	+/-0.421	0.425	0.287	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	17.6	20.2	pCi/g	86.9	(30%-105%)

Comments:

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

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

The MDC is a sample specific MDC.

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Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678430**	**Method:**	**9310_ALPHABETA_GPC**	**SOP Ref:**	**GL-RAD-A-001B**
Run Date:	**07/08/2017 11:04**	**Analyst:**	**BXG2**	**Instrument:**	**PIC12C**
Data File:	**AB1678430.xls**	**Aliquot:**	**0.1065 g**	**Count Time:**	**60 min**
Prep Batch:	**1678430**	**Prep Method:**	**EPA 900.0/SW846 9310/SM 71**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 13:56**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha *ALPHA*		8.55	pCi/g	+/-3.08	3.51	2.79	5.00
12587-47-2	Beta *BETA*		4.64	pCi/g	+/-2.28	2.39	3.09	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678431**	**Method:**	**SRTOT_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**07/06/2017 10:37**	**Analyst:**	**KSD1**	**Instrument:**	**PIC3C**
Data File:	**S1678431r.xls**	**Aliquot:**	**0.324 g**	**Count Time:**	**60 min**
Prep Batch:	**1678431**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**06/30/2017 14:22**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	-0.319	pCi/g	+/-0.402	0.402	0.893	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.20	7.75	mg	80	(40%-110%)

Comments:

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

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Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"As Received"**
Batch ID:	**1678366**	**Method:**	**Gamma I129, Solid**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**07/07/2017 13:21**	**Analyst:**	**MJH1**	**Instrument:**	**GAM05**
Data File:	**I426633001.CNF;1**	**Aliquot:**	**3.16 g**	**Count Time:**	**120 min**
Prep Batch:	**1678366**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**07/07/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.0555	pCi/g	+/-0.175	0.177	0.301	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678421**	**Method:**	**GAMMA_GS**	**SOP Ref:**	**GL-RAD-A-013**
Run Date:	**07/03/2017 19:14**	**Analyst:**	**MXR1**	**Instrument:**	**GAM05**
Data File:	**G426633001.CNF;1**	**Aliquot:**	**64.58 g**	**Count Time:**	**1000 min**
Prep Batch:	**1678421**	**Prep Method:**	**DOE HASL 300, 4.5.2.3/Ga-01**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**06/30/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	0.00293	pCi/g	+/-0.011	0.0111	0.0189	0.100
10198-40-0	Cobalt-60	U	0.00968	pCi/g	+/-0.0115	0.0123	0.0216	0.050
14683-23-9	Europium-152	U	-0.0105	pCi/g	+/-0.0257	0.0261	0.044	0.100
15585-10-1	Europium-154	U	-0.0114	pCi/g	+/-0.0314	0.0318	0.0541	
14391-16-3	Europium-155	U	0.00641	pCi/g	+/-0.0194	0.0196	0.0327	
14331-85-2	Protactinium-231	U	0.0631	pCi/g	+/-0.143	0.146	0.214	
15065-10-8	Thorium-234	UX	0.00	pCi/g	+/-0.255	0.265	0.179	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678884**	**Method:**	**NI63_LSC**	**SOP Ref:**	**GL-RAD-A-022**
Run Date:	**07/06/2017 20:10**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCSILVER**
Data File:	**N1678884R.xls**	**Aliquot:**	**0.274 g**	**Count Time:**	**20 min**
Prep Batch:	**1678884**	**Prep Method:**	**DOE RESL Ni-1, Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/03/2017 15:45**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	2.22	pCi/g	+/-6.87	6.88	11.9	30.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	20.1	25.2	mg	79.8	(40%-110%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678890**	**Method:**	**SE79_SEP_IE_LSC**	**SOP Ref:**	**GL-RAD-A-031**
Run Date:	**07/12/2017 10:17**	**Analyst:**	**CXS7**	**Instrument:**	**LSCBLUE**
Data File:	**SE1678890r.xls**	**Aliquot:**	**1.065 g**	**Count Time:**	**15 min**
Prep Batch:	**1678890**	**Prep Method:**	**NERC ORD**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/10/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15758-45-9	Selenium-79	U	-0.319	pCi/g	+/-2.09	2.09	3.65	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Selenium Carrier	16.8	20.0	mg	84	(40%-110%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"As Received"**
Batch ID:	**1678899**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**07/10/2017 05:38**	**Analyst:**	**GXR1**	**Instrument:**	**LSCGREEN**
Data File:	**E1678899.xls**	**Aliquot:**	**0.304 g**	**Count Time:**	**25 min**
Prep Batch:	**1678899**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**07/06/2017 11:53**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-0.018	pCi/g	+/-7.64	7.64	13.2	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	21400	25800	CPM	83.2	(30%-105%)

Comments:

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

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The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"As Received"**
Batch ID:	**1678936**	**Method:**	**C14_LSC**	**SOP Ref:**	**GL-RAD-A-003**
Run Date:	**07/06/2017 16:43**	**Analyst:**	**BXM4**	**Instrument:**	**LSCGOLD**
Data File:	**C1678936.xls**	**Aliquot:**	**0.508 g**	**Count Time:**	**45 min**
Prep Batch:	**1678936**	**Prep Method:**	**EPA EERF C-01 Modified**		
Prep Date:	**07/06/2017 11:48**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-0.0816	pCi/g	+/-2.28	2.28	3.92	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633001**	**Date Collected:**	**06/28/2017 08:10**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**4.3**
Client ID:	**B3BB95**			**Prep Basis:**	**"As Received"**
Batch ID:	**1680886**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**07/11/2017 18:21**	**Analyst:**	**BXM4**	**Instrument:**	**LSCRED**
Data File:	**T1680886.xls**	**Aliquot:**	**1.251 g**	**Count Time:**	**20 min**
Prep Batch:	**1680886**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**07/11/2017 10:05**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	4.45	pCi/g	+/-13.2	13.2	23.2	30.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678472**	**Method:**	**AMCMISO_EIE_PREC_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/08/2017 11:32**	**Analyst:**	**MXS2**	**Instrument:**	**1091**
Data File:	**S0426633002_AM.1A.gcnf**	**Aliquot:**	**0.107 g**	**Count Time:**	**239.9998 min**
Prep Batch:	**1678472**	**Prep Method:**	**DOE EML HASL-300, Am-05**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.161	pCi/g	+/-0.256	0.257	0.354	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	16.0	19.6	pCi/g	81.8	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678474**	**Method:**	**ASTM C 1475-00 Modified**	**SOP Ref:**	**GL-RAD-A-032**
Run Date:	**07/08/2017 11:17**	**Analyst:**	**MXS2**	**Instrument:**	**1206**
Data File:	**S0426633002_NP.1A.gcnf**	**Aliquot:**	**0.101 g**	**Count Time:**	**240 min**
Prep Batch:	**1678474**	**Prep Method:**	**ASTM C 1475-00 Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	0.120	pCi/g	+/-0.316	0.316	0.568	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	2020	2120	pCi/g	95.4	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678475**	**Method:**	**PUISO_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/08/2017 11:32**	**Analyst:**	**MXS2**	**Instrument:**	**1104**
Data File:	**S0426633002_PU.1A.gcnf**	**Aliquot:**	**0.107 g**	**Count Time:**	**240 min**
Prep Batch:	**1678475**	**Prep Method:**	**DOE EML HASL-300, Pu-11-**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13981-16-3	Plutonium-238	U	-0.0456	pCi/g	+/-0.138	0.138	0.387	1.00
OER-100-70	Plutonium-239/240	U	0.147	pCi/g	+/-0.290	0.291	0.491	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	15.8	18.4	pCi/g	86.2	(30%-105%)

Comments:

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

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The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678479**	**Method:**	**THISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-038**
Run Date:	**07/08/2017 11:12**	**Analyst:**	**MXS2**	**Instrument:**	**1187**
Data File:	**S0426633002_TH.1A.gcnf**	**Aliquot:**	**0.107 g**	**Count Time:**	**240 min**
Prep Batch:	**1678479**	**Prep Method:**	**DOE EML HASL-300, Th-01-**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14269-63-7	Thorium-230	U	0.103	pCi/g	+/-0.534	0.536	1.06	1.00
TH-232 *7440-29-1*	Thorium-232	U	0.188	pCi/g	+/-0.334	0.336	0.382	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	16.0	19.3	pCi/g	82.7	(30%-105%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678480**	**Method:**	**UISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/08/2017 11:01**	**Analyst:**	**MXS2**	**Instrument:**	**1126**
Data File:	**S0426633002_UU.1A.gcnf**	**Aliquot:**	**0.107 g**	**Count Time:**	**240 min**
Prep Batch:	**1678480**	**Prep Method:**	**DOE EML HASL-300, U-02-R**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 *13968-55-3/13966-29-5*	Uranium-233/234		1.29	pCi/g	+/-0.654	0.680	0.433	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.193	pCi/g	+/-0.331	0.333	0.290	1.00
7440-61-1	Uranium-238	U	0.216	pCi/g	+/-0.311	0.313	0.375	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	17.5	19.5	pCi/g	89.6	(30%-105%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678430**	**Method:**	**9310_ALPHABETA_GPC**	**SOP Ref:**	**GL-RAD-A-001B**
Run Date:	**07/08/2017 11:04**	**Analyst:**	**BXG2**	**Instrument:**	**PIC12D**
Data File:	**AB1678430.xls**	**Aliquot:**	**0.101 g**	**Count Time:**	**60 min**
Prep Batch:	**1678430**	**Prep Method:**	**EPA 900.0/SW846 9310/SM 71**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/06/2017 13:56**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha *ALPHA*	U	2.25	pCi/g	+/-2.64	2.68	4.43	5.00
12587-47-2	Beta *BETA*		4.04	pCi/g	+/-2.30	2.38	3.27	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678431**	**Method:**	**SRTOT_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**07/03/2017 15:07**	**Analyst:**	**KSD1**	**Instrument:**	**PIC10B**
Data File:	**S1678431r.xls**	**Aliquot:**	**0.337 g**	**Count Time:**	**60 min**
Prep Batch:	**1678431**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**06/30/2017 14:22**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	-0.645	pCi/g	+/-0.661	0.661	1.50	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.00	7.75	mg	77.4	(40%-110%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"As Received"**
Batch ID:	**1678366**	**Method:**	**Gamma I129, Solid**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**07/07/2017 13:21**	**Analyst:**	**MJH1**	**Instrument:**	**XRAY1**
Data File:	**I426633002.CNF;1**	**Aliquot:**	**3.312 g**	**Count Time:**	**120 min**
Prep Batch:	**1678366**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**07/07/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.0646	pCi/g	+/-0.138	0.141	0.232	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678421**	**Method:**	**GAMMA_GS**	**SOP Ref:**	**GL-RAD-A-013**
Run Date:	**07/03/2017 19:15**	**Analyst:**	**MXR1**	**Instrument:**	**GAM07**
Data File:	**G426633002.CNF;1**	**Aliquot:**	**63.29 g**	**Count Time:**	**1000 min**
Prep Batch:	**1678421**	**Prep Method:**	**DOE HASL 300, 4.5.2.3/Ga-01**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**06/30/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	-7.24E-05	pCi/g	+/-0.0147	0.0147	0.0217	0.100
10198-40-0	Cobalt-60	U	0.00367	pCi/g	+/-0.013	0.0131	0.0233	0.050
14683-23-9	Europium-152	U	-0.0141	pCi/g	+/-0.0302	0.0309	0.0503	0.100
15585-10-1	Europium-154	U	-0.0288	pCi/g	+/-0.0528	0.0544	0.0659	
14391-16-3	Europium-155	U	0.0404	pCi/g	+/-0.0356	0.0401	0.0484	
14331-85-2	Protactinium-231	U	0.106	pCi/g	+/-0.151	0.160	0.264	
15065-10-8	Thorium-234	U	0.140	pCi/g	+/-0.594	0.595	0.503	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678884**	**Method:**	**NI63_LSC**	**SOP Ref:**	**GL-RAD-A-022**
Run Date:	**07/06/2017 20:31**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCSILVER**
Data File:	**N1678884R.xls**	**Aliquot:**	**0.21 g**	**Count Time:**	**20 min**
Prep Batch:	**1678884**	**Prep Method:**	**DOE RESL Ni-1, Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/03/2017 15:45**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	-0.943	pCi/g	+/-8.95	8.95	15.8	30.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	19.6	25.2	mg	77.8	(40%-110%)

Comments:

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

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

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1678890**	**Method:**	**SE79_SEP_IE_LSC**	**SOP Ref:**	**GL-RAD-A-031**
Run Date:	**07/12/2017 10:34**	**Analyst:**	**CXS7**	**Instrument:**	**LSCBLUE**
Data File:	**SE1678890r.xls**	**Aliquot:**	**1.069 g**	**Count Time:**	**15 min**
Prep Batch:	**1678890**	**Prep Method:**	**NERC ORD**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**07/10/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15758-45-9	Selenium-79	U	-0.761	pCi/g	+/-2.04	2.04	3.59	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Selenium Carrier	16.7	20.0	mg	83.5	(40%-110%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"As Received"**
Batch ID:	**1678899**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**07/10/2017 06:04**	**Analyst:**	**GXR1**	**Instrument:**	**LSCGREEN**
Data File:	**E1678899.xls**	**Aliquot:**	**0.366 g**	**Count Time:**	**25 min**
Prep Batch:	**1678899**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**07/06/2017 11:53**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	4.19	pCi/g	+/-6.67	6.68	11.3	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	20500	25800	CPM	79.6	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"As Received"**
Batch ID:	**1678936**	**Method:**	**C14_LSC**	**SOP Ref:**	**GL-RAD-A-003**
Run Date:	**07/06/2017 17:30**	**Analyst:**	**BXM4**	**Instrument:**	**LSCGOLD**
Data File:	**C1678936.xls**	**Aliquot:**	**0.504 g**	**Count Time:**	**45 min**
Prep Batch:	**1678936**	**Prep Method:**	**EPA EERF C-01 Modified**		
Prep Date:	**07/06/2017 11:48**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-1.04	pCi/g	+/-2.28	2.28	3.96	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL426633**	**Client:**	**CPRC001**	**Project:**	**CPRC0F13034**
Lab Sample ID:	**426633002**	**Date Collected:**	**06/28/2017 08:38**	**Matrix:**	**OTHERSOLID**
		Date Received:	**06/29/2017 09:05**	**%Moisture:**	**12.5**
Client ID:	**B3BB97**			**Prep Basis:**	**"As Received"**
Batch ID:	**1680886**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**07/11/2017 18:43**	**Analyst:**	**BXM4**	**Instrument:**	**LSCRED**
Data File:	**T1680886.xls**	**Aliquot:**	**1.254 g**	**Count Time:**	**20 min**
Prep Batch:	**1680886**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**07/11/2017 10:05**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	0.501	pCi/g	+/-12.8	12.8	23.1	30.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

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

Contact: Mr. Scot Fitzgerald

Workorder: 426633

Report Date: July 13, 2017

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1678472									
QC1203821824 MB									
Americium-241			U	0.0997	pCi/g			MXS2	07/10/1713:54
Uncert:				+/-0.196					
TPU:				+/-0.196					
**Americium-243 Tracer	19.6			18.8	pCi/g	REC: 96	(30%-105%)		
Uncert:				+/-2.06					
TPU:				+/-3.19					
QC1203821825 426633001 DUP									
Americium-241		U -0.0748	U	0.157	pCi/g				07/08/1711:32
Uncert:		+/-0.142		+/-0.226		RPD: 0	N/A		
TPU:		+/-0.142		+/-0.227		RER: 1.7	(0-2)		
**Americium-243 Tracer	20.4	18.3		19.5	pCi/g	REC: 96	(30%-105%)		
Uncert:		+/-2.20		+/-2.10					
TPU:		+/-3.41		+/-3.28					
QC1203821826 LCS									
Americium-241	18.4			17.8	pCi/g	REC: 97	(80%-120%)		07/08/1711:32
Uncert:				+/-2.14					
TPU:				+/-3.18					
**Americium-243 Tracer	19.6			16.5	pCi/g	REC: 84	(30%-105%)		
Uncert:				+/-2.23					
TPU:				+/-3.42					
Batch 1678474									
QC1203821833 MB									
Neptunium-237			U	0.278	pCi/g			MXS2	07/08/1711:17
Uncert:				+/-0.400					
TPU:				+/-0.401					
**Americium-243 Tracer	2020			1380	pCi/g	REC: 68	(30%-105%)		
QC1203821834 426633001 DUP									
Neptunium-237		U -0.0398	U	-0.0542	pCi/g				07/08/1711:17
Uncert:		+/-0.176		+/-0.240		RPD: 0	N/A		
TPU:		+/-0.176		+/-0.240		RER: 0.0948	(0-2)		
**Americium-243 Tracer	2040	1630		1230	pCi/g	REC: 60	(30%-105%)		
QC1203821835 LCS									
Neptunium-237	42.1			43.8	pCi/g	REC: 104	(80%-120%)		07/08/1711:17
Uncert:				+/-3.41					
TPU:				+/-5.83					
**Americium-243 Tracer	2020			1980	pCi/g	REC: 98	(30%-105%)		
Batch 1678475									
QC1203821836 MB									
Plutonium-238			U	0.103	pCi/g			MXS2	07/08/1711:32
Uncert:				+/-0.235					
TPU:				+/-0.236					
Plutonium-239/240			U	-0.0297	pCi/g				
Uncert:				+/-0.205					

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QC Summary

Workorder: 426633

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1678475									
TPU:				+/-0.205					
**Plutonium-242 Tracer	18.4			14.1	pCi/g	REC: 77	(30%-105%)		
Uncert:				+/-2.19					
TPU:				+/-3.27					
QC1203821837 426633001 DUP									
Plutonium-238		U 0.0376	U	-0.0167	pCi/g				
Uncert:		+/-0.209		+/-0.250		RPD: 0	N/A		
TPU:		+/-0.209		+/-0.251		RER: 0.326	(0-2)		
Plutonium-239/240		U -0.0347	U	-0.10	pCi/g				
Uncert:		+/-0.153		+/-0.190		RPD: 0	N/A		
TPU:		+/-0.154		+/-0.190		RER: 0.525	(0-2)		
**Plutonium-242 Tracer	19.1	14.7		12.7	pCi/g	REC: 67	(30%-105%)		
Uncert:		+/-2.31		+/-2.49					
TPU:		+/-3.45		+/-3.69					
QC1203821838 LCS									
Plutonium-238			U	0.209	pCi/g				07/08/1711:32
Uncert:				+/-0.310					
TPU:				+/-0.311					
Plutonium-239/240	18.5			18.3	pCi/g	REC: 99	(80%-120%)		
Uncert:				+/-2.21					
TPU:				+/-3.30					
**Plutonium-242 Tracer	18.4			15.0	pCi/g	REC: 82	(30%-105%)		
Uncert:				+/-2.22					
TPU:				+/-3.31					
Batch 1678479									
QC1203821845 MB									
Thorium-230			U	-0.00361	pCi/g			MXS2	07/08/1711:12
Uncert:				+/-0.352					
TPU:				+/-0.353					
Thorium-232			U	0.0985	pCi/g				
Uncert:				+/-0.244					
TPU:				+/-0.244					
**Thorium-229 Tracer	19.3			18.8	pCi/g	REC: 97	(30%-105%)		
Uncert:				+/-2.29					
TPU:				+/-3.67					
QC1203821846 426633001 DUP									
Thorium-230		U 0.571	U	0.463	pCi/g				07/08/1712:05
Uncert:		+/-0.620		+/-0.530		RPD: 0	N/A		
TPU:		+/-0.633		+/-0.541		RER: 0.256	(0-2)		
Thorium-232		U 0.249	U	0.182	pCi/g				
Uncert:		+/-0.371		+/-0.326		RPD: 0	N/A		
TPU:		+/-0.373		+/-0.327		RER: 0.265	(0-2)		
**Thorium-229 Tracer	19.5	16.9		16.6	pCi/g	REC: 85	(30%-105%)		
Uncert:		+/-2.67		+/-2.69					
TPU:		+/-4.17		+/-4.18					
QC1203821847 LCS									
Thorium-230				1.63	pCi/g				07/08/1711:12
Uncert:				+/-0.792					
TPU:				+/-0.843					
Thorium-232	18.6			21.5	pCi/g	REC: 116	(80%-120%)		

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QC Summary

Workorder: 426633

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1678479									
Uncert:				+/-2.64					
TPU:				+/-4.30					
**Thorium-229 Tracer	19.3			19.4	pCi/g	REC: 100	(30%-105%)		
Uncert:				+/-2.51					
TPU:				+/-3.95					
Batch 1678480									
QC1203821848 MB									
Uranium-233/234			U	-0.0592	pCi/g			MXS2	07/08/1711:01
Uncert:				+/-0.200					
TPU:				+/-0.200					
Uranium-235/236			U	-0.0382	pCi/g				
Uncert:				+/-0.169					
TPU:				+/-0.169					
Uranium-238			U	0.0206	pCi/g				
Uncert:				+/-0.235					
TPU:				+/-0.235					
**Uranium-232 Tracer	19.5			20.4	pCi/g	REC: 105	(30%-105%)		
Uncert:				+/-2.21					
TPU:				+/-3.44					
QC1203821849 426633001 DUP									
Uranium-233/234		U 0.386	U	0.321	pCi/g				07/08/1711:01
Uncert:		+/-0.470		+/-0.390		RPD: 0	N/A		
TPU:		+/-0.474		+/-0.393		RER: 0.209	(0-2)		
Uranium-235/236		U 0.00	U	0.00	pCi/g				
Uncert:		+/-0.238		+/-0.198		RPD: 0	N/A		
TPU:		+/-0.239		+/-0.198		RER: 0	(0-2)		
Uranium-238		U 0.382	U	0.140	pCi/g				
Uncert:		+/-0.421		+/-0.275		RPD: 0	(0% - 100%)		
TPU:		+/-0.425		+/-0.275		RER: 0.939	(0-2)		
**Uranium-232 Tracer	20.2	17.6		17.9	pCi/g	REC: 89	(30%-105%)		
Uncert:		+/-2.74		+/-2.50					
TPU:		+/-4.16		+/-3.84					
QC1203821850 LCS									
Uranium-233/234				29.2	pCi/g				07/08/1711:01
Uncert:				+/-3.56					
TPU:				+/-6.05					
Uranium-235/236			U	0.662	pCi/g				
Uncert:				+/-0.674					
TPU:				+/-0.683					
Uranium-238	25.2			27.3	pCi/g	REC: 108	(80%-120%)		
Uncert:				+/-3.44					
TPU:				+/-5.72					
**Uranium-232 Tracer	19.5			11.9	pCi/g	REC: 61	(30%-105%)		
Uncert:				+/-2.92					
TPU:				+/-4.37					
Rad Gamma Spec									
Batch 1678366									
QC1203821583 MB									
Iodine-129			U	0.0154	pCi/g			MJH1	07/07/1715:35

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QC Summary

Workorder: 426633

Parmname			NOM		Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Gamma Spec													
Batch 1678366													
			Uncert:				+/-0.154						
			TPU:				+/-0.154						
QC1203821584	426633001	DUP											
Iodine-129				U	0.0555	U	0.159	pCi/g					07/07/1717:33
			Uncert:		+/-0.175		+/-0.165		RPD:	0	N/A		
			TPU:		+/-0.177		+/-0.180		RER:	0.806	(0-2)		
QC1203821586	LCS												
Iodine-129			12.6				11.7	pCi/g	REC:	93	(80%-120%)		07/07/1717:40
			Uncert:				+/-0.853						
			TPU:				+/-1.45						
Batch 1678421													
QC1203821716	MB												
Cesium-137						U	-0.0165	pCi/g				MXR1	07/03/1719:15
			Uncert:				+/-0.023						
			TPU:				+/-0.0242						
Cobalt-60						U	0.00465	pCi/g					
			Uncert:				+/-0.0147						
			TPU:				+/-0.0149						
Europium-152						U	0.0183	pCi/g					
			Uncert:				+/-0.0354						
			TPU:				+/-0.0363						
Europium-154						U	-0.000786	pCi/g					
			Uncert:				+/-0.0354						
			TPU:				+/-0.0354						
Europium-155						U	0.0218	pCi/g					
			Uncert:				+/-0.0366						
			TPU:				+/-0.0379						
Protactinium-231						U	0.0893	pCi/g					
			Uncert:				+/-0.163						
			TPU:				+/-0.169						
Thorium-234						U	-0.738	pCi/g					
			Uncert:				+/-1.11						
			TPU:				+/-1.17						
QC1203821717	426633001	DUP											
Cesium-137				U	0.00293	U	0.00607	pCi/g					07/05/1716:31
			Uncert:		+/-0.011		+/-0.0154		RPD:	0	N/A		
			TPU:		+/-0.0111		+/-0.0156		RER:	0.321	(0-2)		
Cobalt-60				U	0.00968	U	0.00257	pCi/g					
			Uncert:		+/-0.0115		+/-0.0168		RPD:	0	N/A		
			TPU:		+/-0.0123		+/-0.0169		RER:	0.668	(0-2)		
Europium-152				U	-0.0105	U	-0.00321	pCi/g					
			Uncert:		+/-0.0257		+/-0.0364		RPD:	0	N/A		
			TPU:		+/-0.0261		+/-0.0364		RER:	0.321	(0-2)		
Europium-154				U	-0.0114	U	-0.0409	pCi/g					
			Uncert:		+/-0.0314		+/-0.0449		RPD:	0	N/A		
			TPU:		+/-0.0318		+/-0.0486		RER:	0.995	(0-2)		
Europium-155				U	0.00641	U	0.0181	pCi/g					
			Uncert:		+/-0.0194		+/-0.0243		RPD:	0	N/A		
			TPU:		+/-0.0196		+/-0.0256		RER:	0.71	(0-2)		
Protactinium-231				U	0.0631	U	-0.324	pCi/g					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1678421									
	Uncert:	+/-0.143		+/-0.300					
	TPU:	+/-0.146		+/-0.341		RPD:	0	N/A	
						RER:	2.05	(0-2)	
Thorium-234	UX	0.00	UX	0.00	pCi/g				
	Uncert:	+/-0.255		+/-0.277		RPD:	0	N/A	
	TPU:	+/-0.265		+/-0.281		RER:	0.427	(0-2)	
QC1203821718 LCS									
Americium-241	489			499	pCi/g	REC:	102	(80%-120%)	07/05/1709:36
	Uncert:			+/-5.62					
	TPU:			+/-41.0					
Cesium-137	176			173	pCi/g	REC:	98	(80%-120%)	
	Uncert:			+/-2.11					
	TPU:			+/-14.8					
Cobalt-60	146			143	pCi/g	REC:	98	(80%-120%)	
	Uncert:			+/-2.27					
	TPU:			+/-13.7					
Europium-152			U	-0.299	pCi/g				
	Uncert:			+/-0.841					
	TPU:			+/-0.852					
Europium-154			U	0.126	pCi/g				
	Uncert:			+/-0.613					
	TPU:			+/-0.615					
Europium-155			U	-0.466	pCi/g				
	Uncert:			+/-0.820					
	TPU:			+/-0.847					
Protactinium-231			U	-2.66	pCi/g				
	Uncert:			+/-3.83					
	TPU:			+/-4.06					
Thorium-234			U	0.281	pCi/g				
	Uncert:			+/-9.77					
	TPU:			+/-9.77					
Rad Gas Flow									
Batch 1678430									
QC1203821731 MB									
Alpha			U	-1.6	pCi/g			BXG2	07/08/1711:04
	Uncert:			+/-1.48					
	TPU:			+/-1.48					
Beta			U	2.27	pCi/g				
	Uncert:			+/-2.25					
	TPU:			+/-2.28					
QC1203821732 426633002 DUP									
Alpha	U	2.25	U	-0.271	pCi/g				
	Uncert:	+/-2.64		+/-2.17		RPD:	0	N/A	
	TPU:	+/-2.68		+/-2.17		RER:	1.43	(0-2)	
Beta		4.04		9.26	pCi/g				
	Uncert:	+/-2.30		+/-3.27		RPD:	79	(0% - 100%)	
	TPU:	+/-2.38		+/-3.55		RER:	2.4*	(0-2)	
QC1203821733 426633002 MS									
Alpha	111 U	2.25		130	pCi/g	REC:	118	(75%-125%)	07/08/1710:48
	Uncert:	+/-2.64		+/-13.2					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch 1678430									
	TPU:	+/-2.68		+/-28.4					
Beta	400	4.04		500	pCi/g	REC: 124	(75%-125%)		
	Uncert:	+/-2.30		+/-18.1					
	TPU:	+/-2.38		+/-73.8					
QC1203821734 426633002 MSD									
Alpha	119	U 2.25		148	pCi/g	REC: 125	(75%-125%)		07/08/1710:49
	Uncert:	+/-2.64		+/-13.8		RPD: 13	(0%-20%)		
	TPU:	+/-2.68		+/-31.7		RER: 0.824	(0-2)		
Beta	429	4.04		477	pCi/g	REC: 110	(75%-125%)		
	Uncert:	+/-2.30		+/-17.2		RPD: 5	(0%-20%)		
	TPU:	+/-2.38		+/-71.1		RER: 0.436	(0-2)		
QC1203821735 LCS									
Alpha	105			114	pCi/g	REC: 109	(80%-120%)		07/08/1710:50
	Uncert:			+/-10.1					
	TPU:			+/-24.1					
Beta	380			419	pCi/g	REC: 110	(80%-120%)		
	Uncert:			+/-14.7					
	TPU:			+/-59.6					
Batch 1678431									
QC1203821736 MB									
Total Strontium			U	-0.989	pCi/g			KSD1	07/05/1715:25
	Uncert:			+/-0.423					
	TPU:			+/-0.423					
**Strontium Carrier	7.75			6.70	mg	REC: 87	(40%-110%)		
QC1203821737 426633001 DUP									
Total Strontium		U -0.319	U	-0.205	pCi/g				07/03/1715:08
	Uncert:	+/-0.402		+/-0.645		RPD: 0	N/A		
	TPU:	+/-0.402		+/-0.645		RER: 0.293	(0-2)		
**Strontium Carrier	7.75	6.20		6.30	mg	REC: 81	(40%-110%)		
QC1203821738 LCS									
Total Strontium	64.8			67.1	pCi/g	REC: 104	(80%-120%)		07/03/1715:08
	Uncert:			+/-4.04					
	TPU:			+/-17.6					
**Strontium Carrier	7.75			6.80	mg	REC: 88	(40%-110%)		
Rad Liquid Scintillation									
Batch 1678884									
QC1203822860 MB									
Nickel-63			U	0.683	pCi/g			TXJ1	07/07/1708:12
	Uncert:			+/-4.22					
	TPU:			+/-4.22					
**Nickel Carrier	25.2			19.4	mg	REC: 77	(40%-110%)		
QC1203822861 426633001 DUP									
Nickel-63		U 2.22	U	1.72	pCi/g				07/06/1721:14
	Uncert:	+/-6.87		+/-6.33		RPD: 0	N/A		
	TPU:	+/-6.88		+/-6.33		RER: 0.104	(0-2)		
**Nickel Carrier	25.2	20.1		21.3	mg	REC: 85	(40%-110%)		
QC1203822862 LCS									
Nickel-63	479			482	pCi/g	REC: 101	(80%-120%)		07/06/1721:35
	Uncert:			+/-18.7					
	TPU:			+/-91.4					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1678884									
**Nickel Carrier	25.2			21.1	mg	REC: 84	(40%-110%)		
Batch 1678890									
QC1203822876 MB									
Selenium-79			U	0.269	pCi/g			CXS7	07/12/1710:50
Uncert:				+/-1.65					
TPU:				+/-1.65					
**Selenium Carrier	20.0			20.4	mg	REC: 102	(40%-110%)		
QC1203822877 426633001 DUP									
Selenium-79	U	-0.319	U	0.491	pCi/g				07/12/1711:07
Uncert:		+/-2.09		+/-2.51		RPD: 0	N/A		
TPU:		+/-2.09		+/-2.51		RER: 0.486	(0-2)		
**Selenium Carrier	20.0	16.8		13.5	mg	REC: 68	(40%-110%)		
QC1203822878 LCS									
Selenium-79	1600			1470	pCi/g	REC: 92	(80%-120%)		07/12/1712:28
Uncert:				+/-28.9					
TPU:				+/-331					
**Selenium Carrier	20.0			21.2	mg	REC: 106	(40%-110%)		
Batch 1678899									
QC1203822903 MB									
Technetium-99			U	0.136	pCi/g			GXR1	07/10/1707:24
Uncert:				+/-1.51					
TPU:				+/-1.51					
**Technetium-99m Tracer	25800			24900	CPM	REC: 97	(30%-105%)		
QC1203822904 426736001 DUP									
Technetium-99	U	0.575	U	-0.15	pCi/g				07/10/1707:51
Uncert:		+/-1.58		+/-1.57		RPD: 0	N/A		
TPU:		+/-1.59		+/-1.57		RER: 0.637	(0-2)		
**Technetium-99m Tracer	25800	25700		25300	CPM	REC: 98	(30%-105%)		
QC1203822906 LCS									
Technetium-99	68.2			58.5	pCi/g	REC: 86	(80%-120%)		07/10/1708:17
Uncert:				+/-2.79					
TPU:				+/-7.28					
**Technetium-99m Tracer	25800			25800	CPM	REC: 100	(30%-105%)		
Batch 1678936									
QC1203822984 MB									
Carbon-14			U	-0.537	pCi/g			BXM4	07/06/1718:17
Uncert:				+/-2.25					
TPU:				+/-2.25					
QC1203822985 426633001 DUP									
Carbon-14	U	-0.0816	U	-0.952	pCi/g				07/06/1719:04
Uncert:		+/-2.28		+/-2.29		RPD: 0	N/A		
TPU:		+/-2.28		+/-2.29		RER: 0.528	(0-2)		
QC1203822986 426633001 MS									
Carbon-14	147 U	-0.0816		143	pCi/g	REC: 97	(75%-125%)		07/06/1719:51
Uncert:		+/-2.28		+/-4.50					
TPU:		+/-2.28		+/-11.5					
QC1203822987 LCS									
Carbon-14	147			146	pCi/g	REC: 99	(80%-120%)		07/06/1720:38
Uncert:				+/-4.50					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1678936									
	TPU:			+/-11.7					
Batch 1680886									
QC1203827282 MB									
Tritium			U	1.63	pCi/g			BXM4	07/11/1719:47
	Uncert:			+/-12.9					
	TPU:			+/-12.9					
QC1203827283 426775001 DUP									
Tritium	U	-1.22	U	-5.05	pCi/g				07/11/1720:08
	Uncert:	+/-12.6		+/-12.4		RPD:	0	N/A	
	TPU:	+/-12.6		+/-12.4		RER:	0.423	(0-2)	
QC1203827285 426775001 MS									
Tritium	148 U	-1.22		147	pCi/g	REC:	100	(75%-125%)	07/11/1720:30
	Uncert:	+/-12.6		+/-31.6					
	TPU:	+/-12.6		+/-46.0					
QC1203827287 LCS									
Tritium	88.9			80.0	pCi/g	REC:	90	(80%-120%)	07/11/1720:51
	Uncert:			+/-18.2					
	TPU:			+/-25.7					

Notes:

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

The Qualifiers in this report are defined as follows:

<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
>	Result greater than quantifiable range or greater than upper limit of the analysis range
A	The TIC is a suspected aldol-condensation product
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
B	The analyte was detected in both the associated QC blank and in the sample.
B	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
C	Analyte has been confirmed by GC/MS analysis
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
D	Results are reported from a diluted aliquot of sample.
E	Concentration exceeds the calibration range of the instrument
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
N	Spike Sample recovery is outside control limits.
P	Aroclor target analyte with greater than 25% difference between column analyses.
T	Spike and/or spike duplicate 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.
UX	Gamma Spectroscopy--Uncertain identification
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
o	Analyte failed to recover within LCS limits (0rganics only)

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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 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.