



February 24, 2015

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

Re: CHPRC SAF F14-021
Work Order: 364489
SDG: GEL364489

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 08, 2015. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This data package was revised due to a self-identified error in the lab regarding the TPU result for Alphaspec Am/Cm. In addition, the lab noted a difference in the Method Blank results for Am/Cm.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

Heather Shaffer
Project Manager

Purchase Order: 300416ES20 - 7H
Chain of Custody: F14-021-034 and F14-021-035
Enclosures





To: Distribution List

From: Robert L. Pullano, Director Quality Systems

Subject: CARR150212-928: Tracer Uncertainty Error for Americium and Curium by Alpha Spec

Date: February 20, 2015

During a recent data audit, GEL uncovered a transcription error that affects the Combined Standard Uncertainty (CSU), also referred to as the Total Propagated Uncertainty (TPU), for samples analyzed for Americium/Curium by alpha spectrometry using Americium-243 tracer 1666-A.

Issue:

Tracer Uncertainty for Americium tracer 1666-A was entered incorrectly (entered in percentage format instead of decimal format). Specifically the uncertainty was entered as 0.45 instead of 0.0045.

The error occurred on November 18, 2014. The first batch using this tracer was prepared on November 25, 2014.

How does this affect the reported data:

This transcription error caused the Tracer Yield Uncertainty term to be biased high, resulting in a high bias for the CSU (TPU). Typically Tracer Yield Uncertainty is in the range of 3% to 8%. In this case, the Tracer Yield Uncertainty would be approximately 45%.

The extent of the high bias of the CSU (TPU) is relative to the Count Rate of the sample itself. For samples that have a Counting Uncertainty greater than 100% of sample Activity (which is indicative of samples with Activity below the MDC), the bias in the CSU (TPU) could be considered insignificant due to the overwhelming contribution from the Counting Uncertainty. For samples with Counting Uncertainty Less than 100% of sample Activity, the CSU (TPU) reported may have a significant high bias. Again, the actual bias is dependent on the Counting Uncertainty.

If the reported CSU (TPU) is utilized to make decisions on the presence (or absence) of activity in the sample, the bias in the TPU may result in an improper decision. This occurrence was infrequent in most of the associated data.

Additionally, if a Duplicate Relative Error Ratio (RER) is calculated for the analytical batch and the sample and/or duplicate results have a counting Uncertainty less than 100%, the RER would be significantly biased low.

**What data is NOT affected:**

- No other reportable parameters for Americium/Curium (i.e. Activity, Uncertainty, Minimum Detectable Activity, Critical Level or Decision Level) are affected by this transcription error.
- Samples analyzed prior to November 18, 2014 are not affected
- Americium/Curium analysis analyzed after November 18, 2014 that **did not** utilize Am-243 tracer 1666-A.
- Uranium, Plutonium, Thorium, Neptunium, Radium, Polonium analysis are not affected.
- This transcription error was identified and corrected on February 10, 2015. All data analyzed and reported after this date is not affected.

What samples are affected:

This transcription error is limited to Americium/Curium data analyzed by Alpha Spectrometry which utilized tracer 1666-A. This tracer was validated on 11/18/2014 and subsequently used for analysis. **This affects only the CSU (TPU) and RER reported for Americium/Curium analysis.**

Actions taken:

A query was run on all data analyzed since 11/18/2014 to identify the samples that utilized Am-243 tracer 1666-A and all affected clients were notified of the issue.

All uncertainty data associated with tracers used in the laboratory were validated and found to be correctly transcribed in the database.

All affected data were recalculated and will be re-reported to our clients by February 26, 2015.

Additionally, a second verification step of all new uncertainty data manually transcribed into LIMS was implemented.

We have conducted a thorough investigation of this issue and have determined that the problem was isolated to this one specific instance. We believe the actions that have been implemented will prevent recurrence of this problem.

GEL prides itself on superior performance in all aspects of its testing and this unusual error, while minor in significance, has been brought to the attention of the laboratory management. We regret any inconvenience this error has caused you in the use of the data provided.

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Case Narrative

This data package was revised due to a self-identified error in the lab regarding the TPU result for Alphaspec Am/Cm. In addition, the lab noted a difference in the Method Blank results for Am/Cm.

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F14-021
SDG: GEL364489**

February 24, 2015

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 January 08, 2015, 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. This data package was revised due to a lab identified error for TPU on Am/Cm. in addition to the revised TPU, the method blank for the Americium batch has revised results, MDC and counting uncertainty. The following comment has been included in the narrative: The electronic data file for the originally reported Method Blank 1203248597 was corrupt and could not be restored. Therefore, in addition to the revised TPU values, there are differences between the Method Blank original results, MDCs and counting uncertainties for both Americium-241 and Curium-243/244. The difference between the original results and revised results for the Method Blank is due to reporting a longer count time than was originally reported..

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 and DER

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
364489001	B30892
364489002	B30893

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: General Chemistry and Radiochemistry.

February 27, 2015

Rev. 1

This package, to the best of my knowledge, 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.



Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-021-034	PAGE 1 OF 1
COLLECTOR <i>P.S. Hawkey</i>	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION 105KW Monthly, Pt 10	PROJECT DESIGNATION 105KW Monthly Sampling - Water		SAF NO. F14-021	AIR QUALITY	
ICE CHEST NO. <i>GWS-198</i>	FIELD LOGBOOK NO. <i>HNF-N-251-4</i>	ACTUAL SAMPLE DEPTH <i>N/A</i>	COA 301348	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. <i>N/A</i>	BILL OF LADING/AIR BILL NO. <i>7734 789/ 5861</i>			

364489

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WF=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.	PRESERVATION Cool <-6C	HOLDING TIME 28 Days/48 Hours	TYPE OF CONTAINER G/P	NO. OF CONTAINER(S) 1	VOLUME 250mL	SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS
SAMPLE NO. B30892	MATRIX* WATER	SAMPLE DATE <i>01-06-15</i>	SAMPLE TIME <i>0830</i>				

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM <i>P.S. Hawkey</i>	DATE/TIME <i>01-06-15</i>	RECEIVED BY/STORED IN <i>F.M. Hall/CHPRC</i>	DATE/TIME <i>JAN 06 2015</i>	TRVL-14-212 (1) 9056 ANIONS_IC: COMMON; 9056 ANIONS_IC: COMMON (Add-on) {Bromide, Phosphorus in phosphate}; 120.1_CONDUCTIVITY: COMMON; TRITIUM_DIST_LSC: COMMON;	
RELINQUISHED BY/REMOVED FROM <i>F.M. Hall</i>	DATE/TIME <i>JAN 06 2015</i>	RECEIVED BY/STORED IN <i>PEDEX</i>	DATE/TIME <i>JAN 06 2015</i>	TRVL-14-212	
RELINQUISHED BY/REMOVED FROM <i>FEA EX</i>	DATE/TIME <i>JAN 06 2015</i>	RECEIVED BY/STORED IN <i>Shanta m.c. Vetter</i>	DATE/TIME <i>1/8/15 8:45</i>		
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	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-021-035	PAGE 1 OF 1
COLLECTOR P.S. HAKKEY	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION 105KW Monthly, Pt 10	PROJECT DESIGNATION 105KW Monthly Sampling - Water		SAF NO. F14-021	AIR QUALITY	
ICE CHEST NO. GWS-198	FIELD LOGBOOK NO. HNF-N-251-4	ACTUAL SAMPLE DEPTH N/A	COA 301348	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. 7724 7991 5861			

MATRIX*	PRESERVATION	HNO3 to pH <2
A=Air	HOLDING TIME	6 Months
DL=Drum	TYPE OF CONTAINER	G/P
Liquids	NO. OF CONTAINER(S)	1
DS=Drum	VOLUME	1L
Solids	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
L=Liquid	SAMPLE DATE	01-06-15
O=Oil	SAMPLE TIME	0830
S=Soil	MATRIX*	WATER
SE=Sediment	SPECIAL HANDLING AND/OR STORAGE	
T=Tissue		
V=Vegetation		
W=Water		
WI=Wipe		
X=Other		

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM P.S. HAKKEY	DATE/TIME 01-06-15	RECEIVED BY/STORED IN FEDEX	DATE/TIME 06 2015	TRVL-14-212 (1) GAMMA_GS: COMMON {Cesium-137}; AMCMISO_EIE_PLATE_AEA: COMMON; COMMON {Americium-241}; PUISO_PLATE_AEA: COMMON; UIISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON;	
RELINQUISHED BY/REMOVED FROM Fed Ex	DATE/TIME 06 2015	RECEIVED BY/STORED IN Shanta Mack	DATE/TIME 1/8/15 8:45	TRVL-14-212	
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	

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>304489</u>
Received By: <u>SHANTA MACK</u>		Date Received: <u>1/8/15 8:45</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>820 cpm</u>
Classified Radioactive II or III by RSO?	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input type="checkbox"/>	Hazard Class Shipped: UN#: <u>2910</u>
Samples identified as Foreign Soil?	<input type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <u>all temperatures are recorded in Celsius</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>130462962</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7 Are Encore containers present?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.				Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7724 7891 5861</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HS Date 1/8/15 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	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	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol-condensation product	Y	Organics	Semi-Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H Hold Date In RAD replaces UI. Same usage as standard X as well.
N	Programmed	Spike Sample recovery is outside control limits.	Y			
*	Programmed	Duplicate analysis not within control limits	Y	Inorganics		
>	Programmed	Result greater than quantifiable range or greater than upper limit of the analysis range	Y	General Chemistry		
Z	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
B	Programmed	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).	Y	Inorganics	Metals	Replaces J Estimated Value
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (Organics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely performed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	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).	Y	General Chemistry		Replaces J Estimated Value
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	Inorganics	Metals	Replaces B Blank Detection
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	General Chemistry		Replaces B Blank Detection
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
UX	Manual	Gamma Spectroscopy--Uncertain identification	Y	Radiological		

Laboratory Certifications

List of current GEL Certifications as of 24 February 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122014-16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12

General Chem Analysis

Case Narrative

**General Chemistry
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL364489
 Work Order #: 364489**

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1448129 **Method:** 9056_ANIONS_IC: COMMON + (add-on)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

Sample ID	Client ID
364489001	B30892
1203239922	Method Blank (MB)
1203239923	Laboratory Control Sample (LCS)
1203239924	364489001(B30892) Sample Duplicate (DUP)
1203239925	364489001(B30892) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 364489001 (B30892).

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

The following samples were received with insufficient time to prep and/or analyze within the remaining method-specified holding time. The samples were analyzed as soon as possible by the analyst. 1203239924 (B30892DUP), 1203239925 (B30892PS) and 364489001 (B30892).

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1372699. 1203239924 (B30892DUP), 1203239925 (B30892PS) and 364489001 (B30892).

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203239924 (B30892DUP) and 364489001 (B30892).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information**Product:** Specific Conductivity**Analytical Batch:** 1448547**Method:** 120.1_CONDUCTIVITY: COMMON**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

Sample ID	Client ID
364489001	B30892
1203240984	Laboratory Control Sample (LCS)
1203240986	364489001(B30892) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information**Method Blank (MB) Statement**

This batch does not require a method blank.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 364489001 (B30892).

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

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: GEL364489 GEL Work Order: 364489

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.

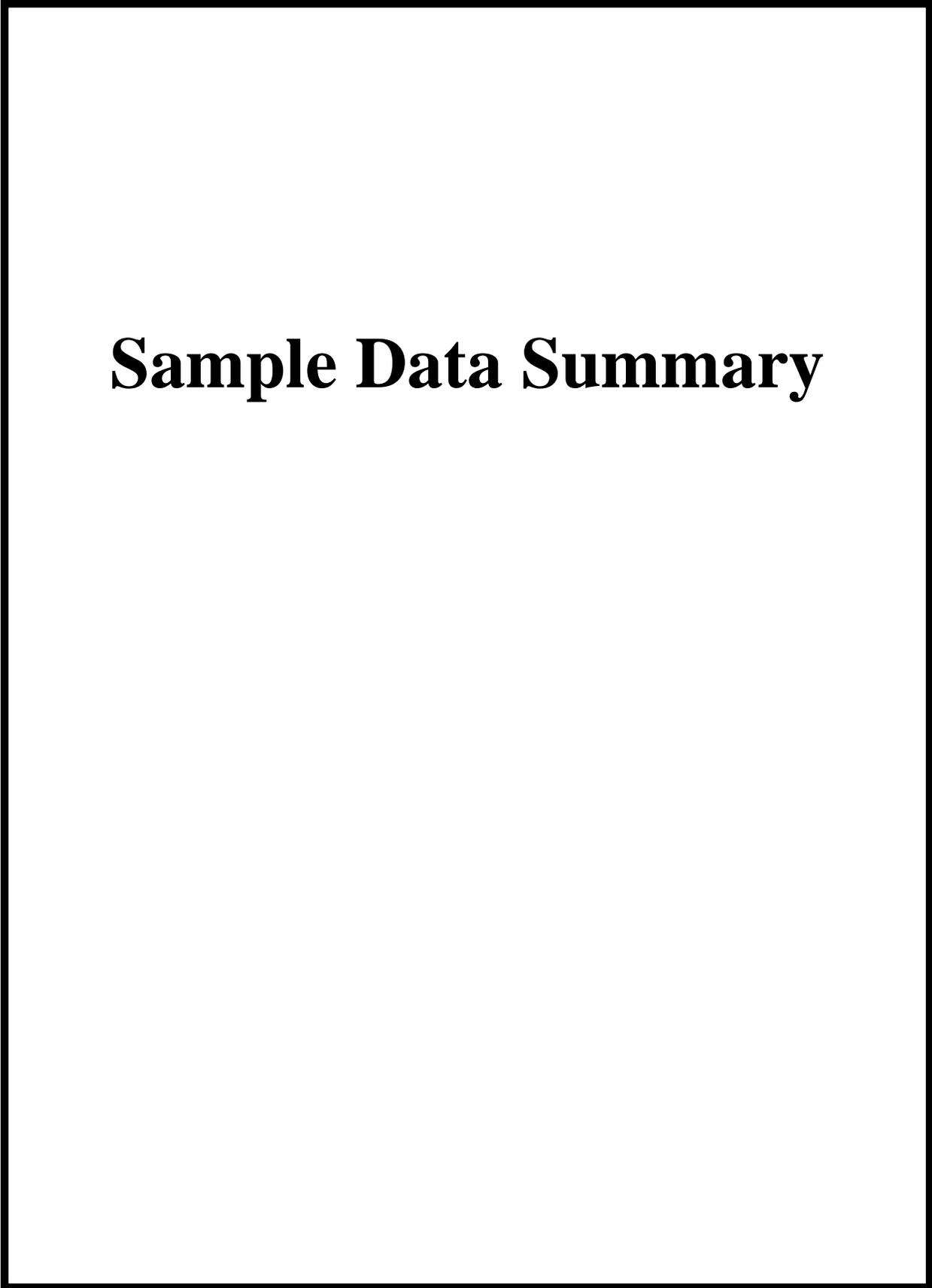
The following data validator verified the information presented in this data report:

Signature: 

Name: Jamie Johnson

Date: 04 FEB 2015

Title: Group Leader



Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF F14-021**

Report Date: February 4, 2015

Client Sample ID:	B30892	Project:	CPRC0F14021
Sample ID:	364489001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	06-JAN-15 08:30		
Receive Date:	08-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
<i>9056_ANIONS_IC: COMMON + (add-on) "As Received"</i>										
Bromide	U	0.00	+/-22.3	67.0	250	ug/L	1	MXL201/08/15	1256	1448129 1
24959-67-9										
Chloride	U	19.1	+/-22.3	67.0	200	ug/L	1			
16887-00-6										
Fluoride	U	0.00	+/-11.0	33.0	500	ug/L	1			
16984-48-8										
Nitrate-N	UX	0.00	+/-11.0	33.0	250	ug/L	1			
14797-55-8										
Nitrite-N	UX	0.00	+/-12.7	38.0	250	ug/L	1			
14797-65-0										
Phosphorus in phosphate	UX	0.00	+/-22.3	67.0	500	ug/L	1			
PO4-P										
Sulfate	U	0.00	+/-44.3	133	500	ug/L	1			
14808-79-8										
Titration and Ion Analysis										
<i>120.1_CONDUCTIVITY: COMMON "As Received"</i>										
Conductivity	U	1.94		3.63	14.5	umhos/cm	1	PXO1 01/09/15	1425	1448547 2

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9056A	
2	EPA 120.1	

Quality Control Summary

February 27, 2015
GEL LABORATORIES LLC

Rev. 1

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

QC Summary

Report Date: February 4, 2015

Page 1 of 3

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 364489

<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
Ion Chromatography											
Batch	1448129										
QC1203239924	364489001	DUP									
Bromide	U	67.0	U	67.0	ug/L	N/A			MXL2	01/08/15	13:28
Chloride	U	67.0	U	67.0	ug/L	N/A					
Fluoride	U	33.0	U	33.0	ug/L	N/A					
Nitrate-N	UX	33.0	UX	33.0	ug/L	N/A					
Nitrite-N	UX	38.0	UX	38.0	ug/L	N/A					
Phosphorus in phosphate	UX	67.0	UX	67.0	ug/L	N/A					
Sulfate	U	133	U	133	ug/L	N/A					
QC1203239923	LCS										
Bromide	1250			1260	ug/L		101	(90%-110%)		01/08/15	15:02
Chloride	5000			4560	ug/L		91.2	(90%-110%)			
Fluoride	2500			2350	ug/L		93.9	(90%-110%)			
Nitrate-N	2500			2330	ug/L		93.4	(90%-110%)			
Nitrite-N	2500			2370	ug/L		94.8	(90%-110%)			
Phosphorus in phosphate	1250			1270	ug/L		101	(90%-110%)			
Sulfate	10000			9470	ug/L		94.7	(90%-110%)			
QC1203239922	MB										
Bromide			U	67.0	ug/L					01/08/15	14:31
Chloride			U	67.0	ug/L						
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L						

QC Summary

Workorder: 364489

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1448129										
Phosphorus in phosphate			U	67.0	ug/L				MXL2	01/08/15	14:31
Sulfate			U	133	ug/L						
QC1203239925	364489001	PS									
Bromide	1.25	U	0.00	1.28	mg/L		102	(90%-110%)		01/08/15	13:59
Chloride	5.00	U	0.0191	4.65	mg/L		92.7	(90%-110%)			
Fluoride	2.50	U	0.00	2.39	mg/L		95.5	(90%-110%)			
Nitrate-N	2.50	UX	0.00 X	2.40	mg/L		95.8	(90%-110%)			
Nitrite-N	2.50	UX	0.00 X	2.43	mg/L		97	(90%-110%)			
Phosphorus in phosphate	1.25	UX	0.00 X	1.27	mg/L		102	(90%-110%)			
Sulfate	10.0	U	0.00	9.82	mg/L		98.2	(90%-110%)			

Titration and Ion Analysis

Batch	1448547										
QC1203240986	364489001	DUP									
Conductivity		U	3.63	U	3.63	umhos/cm	N/A		PXO1	01/09/15	14:26
QC1203240984	LCS										
Conductivity	1410				1410	umhos/cm		99.9	(95%-105%)		01/09/15 14:24

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.
- 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

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QC Summary

Workorder: 364489

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

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.

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 13-JAN-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: CPRC
Batch ID: 1448129	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 364489(GEL364489)			
Application Issues: Sample Analyzed out of Holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample Analyzed out of Holding: 364489 001 QC 1203239924DUP,1203239925PS		1.The samples was received with insufficient time to prep and/or analyze within the remaining method-specified holding time. The sample was analyzed as soon as possible by the analyst.	

Originator's Name:
Marcy Lamb 13-JAN-15

Data Validator/Group Leader:
Mary Sherwood 03-FEB-15

Radiological Analysis

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL364489
Work Order #: 364489

Method/Analysis Information

Product: UISO_IE_PLATE_AEA:COMMON
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number: 1448168

Sample ID	Client ID
364489002	B30893
1203240032	MB for batch 1448168
1203240034	Laboratory Control Sample (LCS)
1203240033	364489002(B30893) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:**Blank Information**

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

Designated QC

The following sample was used for QC: 364489002 (B30893).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The U-235/236 blank

activity is equal to the MDC but is less than five percent of the lowest activity in the batch.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 364489002 (B30893) was given additional clean-up steps and recounted in attempt to remove suspected interferences. The original count is reported. Sample 1203240033 (B30893DUP) was given additional clean-up steps and recounted in order to improve the resolution. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

Manual integration of alpha spectroscopy spectra 364489002 (B30893) was performed to fully separate counts in Regions of Interest which would have been biased.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: AMCMISO_EIE_PLATE_AEA:
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Analytical Batch Number: 1451801

Sample ID	Client ID
364489002	B30893
1203248597	MB for batch 1451801
1203248599	Laboratory Control Sample (LCS)
1203248598	364489002(B30893) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:**Blank Information**

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

Designated QC

The following sample was used for QC: 364489002 (B30893).

QC Information

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

Technical Information:**Holding Time**

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

Sample Re-prep/Re-analysis

Samples were re-prepped due to high carrier/tracer yield. The re-analysis is being reported.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1375134 was generated due to RDL less than MDA. 1. Samples 364489002 and 1203248598 did not meet the Cm-243/244 detection limit due to the small sample aliquots used. The blank, 1203248597, did not meet the Am-241 and Cm-243/244 detection limits due to keeping the volume consistent with the other sample aliquots. 1. The sample aliquots were reduced for the re-analysis due to the high Am-241 activity and in attempt to achieve acceptable tracer yields and to minimize interference. Reporting results.

Manual Integration

Manual integrations of alpha spectroscopy spectra 1203248598 (B30893DUP) and 364489002 (B30893) were

performed to fully separate counts in Regions of Interest which would have been biased.

Sample-Specific MDA/MDC

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

Additional Comments

This data package revision contains revised TPU values and results for Americium-241 and Curium-243/244. In addition, the Relative Error Ratio (RER) has been revised for both Americium-241 and Curium-243/244. The electronic data file for the originally reported Method Blank 1203248597 was corrupt and could not be restored. Therefore, in addition to the revised TPU values, there are differences between the Method Blank original results, MDCs and counting uncertainties for both Americium-241 and Curium-243/244. The difference between the original results and revised results for the Method Blank is due to reporting a longer count time than was originally reported.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: PUIISO_PLATE_AEA:COMMON
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number: 1451803

Sample ID	Client ID
364489002	B30893
1203248604	MB for batch 1451803
1203248606	Laboratory Control Sample (LCS)
1203248605	364489002(B30893) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:**Blank Information**

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

Designated QC

The following sample was used for QC: 364489002 (B30893).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The blank, 1203248605 (B30893DUP), did not meet the Pu-238 and Pu-239/240 detection limits due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Technical Information:**Holding Time**

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

Sample Re-prep/Re-analysis

Samples were re-prepped due to high carrier/tracer yield. The re-analysis is being reported.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

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

Manual Integration

Manual integrations of alpha spectroscopy spectra 1203248605 (B30893DUP) and 364489002 (B30893) were performed to fully separate counts in Regions of Interest which would have been biased.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	GAMMA_GS:COMMON (Cs137)
Analytical Method:	EPA 901.1
Analytical Batch Number:	1448507

Sample ID	Client ID
364489002	B30893
1203240872	MB for batch 1448507
1203240874	Laboratory Control Sample (LCS)
1203240873	364489002(B30893) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 364489002 (B30893).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Co-60 and Eu-154 were positively identified in sample 364489002 (B30893) and added to the batch.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: SRTOT_SEP_PRECIP_GPC: COMMON

Analytical Method: EPA 905.0 Modified

Analytical Batch Number: 1451151

Sample ID	Client ID
364489002	B30893
1203246936	MB for batch 1451151
1203246938	Laboratory Control Sample (LCS)
1203246937	364997002(B30895) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:**Blank Information**

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

Designated QC

The following sample was used for QC: 364997002 (B30895).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The blank 1203246936 (MB) activity is greater than the MDC but is less than five percent of the lowest activity in the batch.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	TRITIUM_DIST_LSC: COMMON
Analytical Method:	EPA 906.0 Modified
Analytical Batch Number:	1451221

Sample ID	Client ID
364489001	B30892
1203247167	MB for batch 1451221

1203247170 Laboratory Control Sample (LCS)
1203247168 364997001(B30894) Sample Duplicate (DUP)
1203247169 364997001(B30894) Matrix Spike (MS)

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

SOP Reference

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

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:**Blank Information**

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

Designated QC

The following sample was used for QC: 364997001 (B30894).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The Matrix Spike 1203247169 (B30894MS) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration. The blank, 1203247167 (MB), did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Technical Information:**Holding Time**

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

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Samples were recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL364489 GEL Work Order: 364489

The Qualifiers in this report are defined as follows:

B The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample

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: Theresa Austin

Date: 19 FEB 2015

Title: Group Leader

DATA EXCEPTION REPORT			
Mo.Day Yr. 22-JAN-15	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Liquid	Client Code: CPRC
Batch ID: 1451801	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 364489(GEL364489)			
Application Issues: RDL less than MDA			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 364489002 and 1203248598 did not meet the Cm-243/244 detection limit due to the small sample aliquots used. The blank, 1203248597, did not meet the Am-241 and Cm-243/244 detection limits due to keeping the volume consistent with the other sample aliquots.</p>		<p>1. The sample aliquots were reduced for the re-analysis due to the high Am-241 activity and in attempt to achieve acceptable tracer yields and to minimize interference. Reporting results.</p>	

Originator's Name:
Melanie Aycock 22-JAN-15

Data Validator/Group Leader:
Jessica Davis 26-JAN-15

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F14-021

Report Date: February 19, 2015

Client Sample ID:	B30892	Project:	CPRC0F14021
Sample ID:	364489001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	06-JAN-15		
Receive Date:	08-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Liquid Scintillation Analysis													
<i>TRITIUM_DIST_LSC: COMMON "As Received"</i>													
Tritium 10028-17-8		1.16E+06	+/-22400	837	+/- 2.25E+05	100	pCi/L		BYS1	01/22/15	1422	1451221	1

The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

Notes:
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96 sigma).
 The Qualifiers in this report are defined as follows :

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 - 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 associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample
 - C Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq 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.
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 - 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
- The above sample is reported on an "as received" basis.

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F14-021

Report Date: February 19, 2015

Client Sample ID:	B30893	Project:	CPRC0F14021
Sample ID:	364489002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	06-JAN-15		
Receive Date:	08-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time Batch	Mtd.
Rad Alpha Spec Analysis												
<i>AMCMISO_EIE_PLATE_AEA: "As Received"</i>												
Americium-241 14596-10-2		10700	+/-814	86.8	+/-1630	1.00	pCi/L	MXS2	01/22/15	0926	1451801	1
Curium-243/244	U	-4.81	+/-32.3	78.7	+/-32.4	1.00	pCi/L					
<i>PUISO_PLATE_AEA:COMMON "As Received"</i>												
Plutonium-238 13981-16-3		1430	+/-321	55.6	+/-394	1.00	pCi/L	MXS2	01/22/15	0926	1451803	2
Plutonium-239/240 OER-100-70		10700	+/-873	113	+/-1920	1.00	pCi/L					
<i>UIISO_IE_PLATE_AEA:COMMON "As Received"</i>												
Uranium-233/234 U-233/234		87.9	+/-5.46	0.422	+/-15.8	1.00	pCi/L	MXS2	01/21/15	1014	1448168	3
Uranium-235/236 15117-96-1/13982-70-2		14.6	+/-2.23	0.265	+/-3.32	1.00	pCi/L					
Uranium-238 7440-61-1		70.2	+/-4.88	0.538	+/-12.8	1.00	pCi/L					
Rad Gamma Spec Analysis												
<i>GAMMA_GS:COMMON (Cs137) "As Received"</i>												
Cesium-137 10045-97-3		1.23E+06	+/-1240	175	+/-1.02E+05	15.0	pCi/L	MJH1	01/19/15	0606	1448507	4
Cobalt-60 10198-40-0		22.8	+/-10.7	12.3	+/-10.9		pCi/L					
Europium-154 15585-10-1		608	+/-71.7	43.6	+/-90.6		pCi/L					
Rad Gas Flow Proportional Counting												
<i>SRTOT_SEP_PRECIP_GPC: COMMON "As Received"</i>												
Total Strontium SR-RAD	B	6.39E+05	+/-407	1.67	+/-1.47E+05	2.00	pCi/L	KSD1	01/30/15	1522	1451151	5

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 901.1

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F14-021

Report Date: February 19, 2015

Client Sample ID: B30893 Project: CPRC0F14021
 Sample ID: 364489002 Client ID: CPRC001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
5	EPA 905.0	Modified											

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Americium-243 Tracer	AMCMISO_EIE_PLATE_AEA: "	111	(15%-125%)
Plutonium-236 Tracer	PUISO_PLATE_AEA:COMMON	72.8	(15%-125%)
Uranium-232 Tracer	UIISO_IE_PLATE_AEA:COMMO	83.5	(15%-125%)
Strontium Carrier	SRTOT_SEP_PRECIP_GPC: COM	91.4	(25%-125%)

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

QC Summary

Report Date: February 19, 2015
 Page 1 of 4

Client : CH2MHill Plateau Remediation Company
 MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 364489

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1448168								
QC1203240032	MB								
Uranium-233/234			U	0.119	pCi/L			MXS2	01/21/1510:14
				Uncert: +/-0.270					
				TPU: +/-0.271					
Uranium-235/236			U	0.199	pCi/L				
				Uncert: +/-0.262					
				TPU: +/-0.264					
Uranium-238			U	-0.0953	pCi/L				
				Uncert: +/-0.154					
				TPU: +/-0.154					
QC1203240033	364489002	DUP							
Uranium-233/234		87.9		95.1	pCi/L				01/22/1522:04
				Uncert: +/-5.46		RPD: 8 (0% - 20%)			
				TPU: +/-15.8		RER: 0.573 (0-2)			
Uranium-235/236		14.6		14.9	pCi/L				
				Uncert: +/-2.23		RPD: 2 (0% - 20%)			
				TPU: +/-3.32		RER: 0.128 (0-2)			
Uranium-238		70.2		75.1	pCi/L				
				Uncert: +/-4.88		RPD: 7 (0% - 20%)			
				TPU: +/-12.8		RER: 0.474 (0-2)			
QC1203240034	LCS								
Uranium-233/234				28.0	pCi/L				01/21/1510:14
				Uncert: +/-2.95					
				TPU: +/-5.46					
Uranium-235/236				0.889	pCi/L				
				Uncert: +/-0.576					
				TPU: +/-0.594					
Uranium-238		27.2		27.2	pCi/L	REC: 100 (80%-120%)			
				Uncert: +/-2.91					
				TPU: +/-5.33					
Batch	1451801								
QC1203248597	MB								
Americium-241			U	16.9	pCi/L			MXS2	01/22/1509:26
				Uncert: +/-46.4					
				TPU: +/-46.4					
Curium-243/244			U	-6.23	pCi/L				
				Uncert: +/-27.5					
				TPU: +/-27.6					
QC1203248598	364489002	DUP							
Americium-241		10700		10700	pCi/L				
				Uncert: +/-814		RPD: 0 (0% - 20%)			
				TPU: +/-1630		RER: 0.0167 (0-2)			
Curium-243/244		U -4.81	U	60.7	pCi/L				
				Uncert: +/-32.3		RPD: 0 N/A			
				TPU: +/-32.4		RER: 1.61 (0-2)			

QC Summary

Workorder: 364489

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1451801								
QC1203248599	LCS								
Americium-241	2820			3330	pCi/L	REC: 118	(80%-120%)		
	Uncert:			+/-469					
	TPU:			+/-650					
Curium-243/244	5550			4990	pCi/L	REC: 90	(80%-120%)		
	Uncert:			+/-568					
	TPU:			+/-881					
Batch	1451803								
QC1203248604	MB								
Plutonium-238			U	117	pCi/L			MXS2	01/22/1509:26
	Uncert:			+/-110					
	TPU:			+/-111					
Plutonium-239/240			U	34.7	pCi/L				
	Uncert:			+/-83.4					
	TPU:			+/-83.6					
QC1203248605	364489002	DUP							
Plutonium-238		1430		1430	pCi/L				
	Uncert:	+/-321		+/-304		RPD: 1	(0% - 20%)		
	TPU:	+/-394		+/-373		RER: 0.0298	(0-2)		
Plutonium-239/240		10700		11000	pCi/L				
	Uncert:	+/-873		+/-829		RPD: 3	(0% - 20%)		
	TPU:	+/-1920		+/-1860		RER: 0.247	(0-2)		
QC1203248606	LCS								
Plutonium-238				211	pCi/L				
	Uncert:			+/-143					
	TPU:			+/-147					
Plutonium-239/240	3940			4200	pCi/L	REC: 107	(80%-120%)		
	Uncert:			+/-570					
	TPU:			+/-905					
Rad Gamma Spec									
Batch	1448507								
QC1203240872	MB								
Cobalt-60			U	-0.999	pCi/L			MJH1	01/19/1506:06
	Uncert:			+/-4.55					
	TPU:			+/-4.58					
Cesium-137			U	2.94	pCi/L				
	Uncert:			+/-4.33					
	TPU:			+/-4.53					
Europium-154			U	-4.4	pCi/L				
	Uncert:			+/-12.9					
	TPU:			+/-13.1					
QC1203240873	364489002	DUP							
Cobalt-60		22.8		33.4	pCi/L				01/19/1508:52
	Uncert:	+/-10.7		+/-18.7		RPD: 38	(0% - 100%)		
	TPU:	+/-10.9		+/-18.9		RER: 0.957	(0-2)		
Cesium-137		1.23E+06		1.21E+06	pCi/L				
	Uncert:	+/-1240		+/-1460		RPD: 2	(0% - 20%)		
	TPU:	+/-1.02E+05		+/-1.03E+05		RER: 0.284	(0-2)		
Europium-154		608		579	pCi/L				
	Uncert:	+/-71.7		+/-173		RPD: 5	(0% - 20%)		

QC Summary

Workorder: 364489

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1448507								
	TPU:	+/-90.6		+/-180					
						RER:	0.286 (0-2)		
QC1203240874	LCS								
Americium-241	1.10E+05			1.11E+05	pCi/L	REC:	100 (80%-120%)		01/19/1506:08
	Uncert:			+/-1610					
	TPU:			+/-11900					
Cobalt-60	52300			51900	pCi/L	REC:	99 (80%-120%)		
	Uncert:			+/-1180					
	TPU:			+/-4550					
Cesium-137	44400			45900	pCi/L	REC:	103 (80%-120%)		
	Uncert:			+/-961					
	TPU:			+/-3950					
Europium-154			U	-232	pCi/L				
	Uncert:			+/-409					
	TPU:			+/-423					
Rad Gas Flow									
Batch	1451151								
QC1203246936	MB								
Total Strontium			B	16.9	pCi/L			KSD1	01/30/1515:08
	Uncert:			+/-2.22					
	TPU:			+/-4.49					
QC1203246937	364997002	DUP							
Total Strontium		B	2730	B	2510	pCi/L			01/30/1515:08
	Uncert:		+/-27.1		+/-25.8	RPD:	8 (0% - 20%)		
	TPU:		+/-629		+/-592	RER:	0.499 (0-2)		
QC1203246938	LCS								
Total Strontium	119		B	124	pCi/L	REC:	104 (80%-120%)		01/30/1515:08
	Uncert:			+/-5.72					
	TPU:			+/-29.0					
Rad Liquid Scintillation									
Batch	1451221								
QC1203247167	MB								
Tritium			U	20.3	pCi/L			BYS1	01/22/1514:37
	Uncert:			+/-59.1					
	TPU:			+/-59.2					
QC1203247168	364997001	DUP							
Tritium		1.20E+06		1.17E+06	pCi/L				01/22/1516:40
	Uncert:		+/-23300		+/-22700	RPD:	2 (0% - 20%)		
	TPU:		+/-2.33E+05		+/-2.28E+05	RER:	0.177 (0-2)		
QC1203247169	364997001	MS							
Tritium	1870	1.20E+06		1.24E+06	pCi/L	REC:	N/A		01/22/1516:45
	Uncert:		+/-23300		+/-24100				
	TPU:		+/-2.33E+05		+/-2.41E+05				
QC1203247170	LCS								
Tritium	1870			1850	pCi/L	REC:	99 (80%-120%)		01/22/1516:50
	Uncert:			+/-398					
	TPU:			+/-535					

Notes:

QC Summary

Workorder: 364489

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more 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 acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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