

July 21, 2015



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gel.com

July 16, 2015

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

Re: CHPRC SAF F15-028
Work Order: 375706
SDG: GEL375706

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 25, 2015. 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,

Chelsea Seagle
Chelsea Seagle for
Heather Shaffer
Project Manager

Purchase Order: 303581 - 7H
Chain of Custody: F15-028-019 and F15-028-032
Enclosures



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Case Narrative

July 21, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F15-028
SDG: GEL375706

July 16, 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 June 25, 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. 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 and DER

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
375706001	B30RR8
375706002	B31T36

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, Metals and Radiochemistry.

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.

Chelsea Seagle
July 21, 2015

Chelsea Seagle for
Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

July 21, 2015

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F15-028-019	PAGE 1 OF 1
COLLECTOR WIGHT	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR TODAK, D		PRICE CODE	7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8796, Interval 35 REQ	PROJECT DESIGNATION 100-KE Characterization Boreholes - Water	FIELD LOGBOOK NO. HNF-N-645 -3 Pg 12	ACTUAL SAMPLE DEPTH 88.9	SAF NO. F15-028	AIR QUALITY		
ICE CHEST NO. GWS-344	OFFSITE PROPERTY NO. S750	BILL OF LADING/AIR BILL NO. F3908546278		COA 303581	METHOD OF SHIPMENT FEDERAL EXPRESS		
GEL Laboratories, LLC		ORIGINAL					
MATRIX* A=Air DL=Drum L=Liquid O=Oil S=Soil SF=Sediment T=Tissue V=Vegetation W=Water WI=Wipec X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2
		HOLDING TIME	6 Months	6 Months	6 Months	6 Months	6 Months
		TYPE OF CONTAINER	G/P	G/P	G/P	G/P	G/P
		NO. OF CONTAINER(S)	1	1	1	1	1
		VOLUME	500mL	500mL	500mL	500mL	500mL
		SAMPLE ANALYSIS	6010_METALS_ICP; COMMON (Chromium);	GAMMA_GS; COMMON;	AMCHISO_ETE_PRECIP_ACA; COMMON;	C14_LSC; COMMON;	1129_SEP_LEPS_GS; COMMON;
		SPECIAL HANDLING AND/OR STORAGE -RADIOACTIVE THE TO-B30RR6 Jct 6123115					
SAMPLE NO. B30RR8	MATRIX* WATER	SAMPLE DATE	6-23-15	SAMPLE TIME	1436		

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM D.E. WIGHT/CHPRC	DATE/TIME JUN 23 2015 1530	RECEIVED BY/STORED IN SSU #1	DATE/TIME JUN 23 2015 1530	TRVL-15-037	
RELINQUISHED BY/REMOVED FROM SSU-1	DATE/TIME JUN 24 2015 1045	RECEIVED BY/STORED IN J.C. Fulton/CHPRC	DATE/TIME JUN 24 2015 1045		
RELINQUISHED BY/REMOVED FROM J.C. Fulton/CHPRC	DATE/TIME JUN 24 2015 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME JUN 24 2015 1400		
RELINQUISHED BY/REMOVED FROM J.C. Fulton/CHPRC	DATE/TIME JUN 24 2015 1400	RECEIVED BY/STORED IN M.Kinslow pl/fklat 6-25-15 CBPO	DATE/TIME JUN 24 2015 1400		
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	

A-6003-618 (REV 2)

July 21, 2015

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F15-028-032	PAGE 1 OF 1
COLLECTOR WIGAT	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8796, Interval 35 REQ	PROJECT DESIGNATION 100-KE Characterization Boreholes - Water	ACTUAL SAMPLE DEPTH 89.9	SAF NO. F15-028	AIR QUALITY	<input type="checkbox"/>
ICE CHEST NO. CWS-314	FIELD LOGBOOK NO. HNFN-645-3 Pg. 12	COA 303581	METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. S750	BILL OF LADING/AIR BILL NO. F73908546278			

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	COOL <=6C	
A=Air	*Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	14 Days	
DL=Drum		G/P	
Liquids		1	
DS=Drum		250ml	
Solids		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	
L=Liquid			
O=Oil			
S=Soil			
SF=Sediment			
T=Tissue			
V=Vegetation			
W=Water			
WI=Wipe			
X=Other			
SPECIAL HANDLING AND/OR STORAGE			
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B31T36	WATER	6-23-15	1436

375706

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-15-037	
D.E. WIGHT/CHPRC	JUN 23 2015 1530	SSU	JUN 23 2015 1570	(1) 2320_ALKALINITY: COMMON {Alkalinity}; 2320_ALKALINITY: COMMON (Add-on) {Bicarbonate, Carbonate alkalinity, Hydroxylion};	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
SSU	JUN 24 2015 1045	J.C. Fulton/CHPRC	JUN 24 2015 1045		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
J.C. Fulton/CHPRC	JUN 24 2015 1400	FEDEX			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
6070		McKevan	675-15 0840		
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 6/17/2015	FSR ID = FSR1159	TRVL NUM = TRVL-15-037	A-6003-618 (REV 2)		



July 21, 2015

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>375706</u>
Received By: <u>MK</u>		Date Received: <u>6-25-15</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" 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>cpm 0</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" 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 checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Methods: Ice bags <u>2c</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>E 5032015830</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples (EPA 6850) have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
8 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
9 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
10 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
11 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air <u>7739 0854 6278</u> FedEx Ground UPS Field Services Courier Other

Comments (Use Continuation Form if needed):

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 16 July 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
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-17
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

July 21, 2015

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL375706
Work Order #: 375706

Sample ID	Client ID
375706001	B30RR8
1203344006	Method Blank (MB)ICP
1203344007	Laboratory Control Sample (LCS)
1203344013	375706001(B30RR8L) Serial Dilution (SD)
1203344016	375711001(B30R52L) Serial Dilution (SD)
1203344011	375706001(B30RR8S) Matrix Spike (MS)
1203344014	375711001(B30R52S) Matrix Spike (MS)
1203344012	375706001(B30RR8SD) Matrix Spike Duplicate (MSD)
1203344015	375711001(B30R52SD) Matrix Spike Duplicate (MSD)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1488463
Prep Batch :	1488461
Standard Operating Procedures:	GL-MA-E-013 REV# 24 and GL-MA-E-006 REV# 12
Analytical Method:	6010_METALS_ICP
Prep Method :	SW846 3005A

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.

System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

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 recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 375706001 (B30RR8) and 375711001 (B30R52).

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD values between qualifying analyte results in the MS and MSD were within the acceptance limits.

Serial Dilution % Difference Statement

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The sample in this SDG did not require dilutions.

Preparation Information

The sample in this SDG was not diluted and prepared according to the cited SOP.

Miscellaneous Information

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. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

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.

July 21, 2015

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: GEL375706 GEL Work Order: 375706

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- 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).
- 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.

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: 21 JUL 2015

Title: Group Leader

Sample Data Summary

METALS
 -1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL375706

METHOD TYPE: SW846

SAMPLE ID: 375706001

CLIENT ID: B30RR8

CONTRACT: CPRC0F15028

MATRIX: WATER

DATE RECEIVED 25-JUN-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7440-47-3	Chromium	13.2	ug/L			P	1	1	OPTIMA3	070215-1

***Analytical Methods:**

P SW846 3005A/6010C

Quality Control Summary

July 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 21, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 375706

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, RPD/D%, REC%, Range, Anlst, Date, Time. Contains data for Metals Analysis-ICP with various Chromium samples and their results.

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
+ Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
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.
E Reported value is estimated due to interferences. See comment in narrative.
M Duplicate precision not met.
N Spike Sample recovery is outside control limits.
S Reported value determined by the Method of Standard Additions (MSA)
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

July 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 375706

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.										
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.

General Chem Analysis

Case Narrative

July 21, 2015

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL375706
Work Order #: 375706**

Method/Analysis Information

Product: Alkalinity
Analytical Batch: 1488479 **Method:** 2320_ALKALINITY: COMMON + (ADD ON)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in 2320_ALKALINITY:

Sample ID	Client ID
375706002	B31T36
1203344057	Method Blank (MB)
1203344059	Laboratory Control Sample (LCS)
1203344064	375706002(B31T36) Sample Duplicate (DUP)
1203344066	375706002(B31T36) 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-GC-E-033 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 manually operated buret.

Initial Standardization

The titrant was properly standardized

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

Sample 375706002 (B31T36) was selected for QC analysis.

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

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

50mL of sample was used due to limited sample quantity and/or selection for QC. 1203344064 (B31T36DUP), 1203344066 (B31T36MS) and 375706002 (B31T36).

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.

July 21, 2015

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: GEL375706 GEL Work Order: 375706

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Thomas Lewis

Date: 20 JUL 2015

Title: Data Validator

Sample Data Summary

~~JUL 21 2015~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 20, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F15-028

Client Sample ID: B31T36	Project: CPRC0F15028
Sample ID: 375706002	Client ID: CPRC001
Matrix: WATER	
Collect Date: 23-JUN-15 14:36	
Receive Date: 25-JUN-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis											
2320_ALKALINITY: COMMON + (ADD ON) "As Received"											
Alkalinity, Total as CaCO3		111000	1450	2000	ug/L		PX01	06/27/15	1355	1488479	1
Bicarbonate alkalinity (CaCO3)		111000	1450	2000	ug/L						
Carbonate alkalinity (CaCO3)	U	1450	1450	2000	ug/L						
Hydroxide alkalinity as CaCO3	U	1450	1450	2000	ug/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

Quality Control Summary

July 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 20, 2015

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 375706

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, RPD%, REC%, Range, Anlst, Date, Time. Rows include Titration and Ion Analysis, Alkalinity, Total as CaCO3, Bicarbonate alkalinity (CaCO3), Carbonate alkalinity (CaCO3), Hydroxide alkalinity as CaCO3, and various QC1203344064, QC1203344059, QC1203344057, QC1203344066 entries.

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

July 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 375706

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	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.
^ 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

July 21, 2015
Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL375706
Work Order #: 375706

Method/Analysis Information

Product: AMCMISO_EIE_PRECIP_AEA: COMMON

Analytical Method: AMCMISO_EIE_PREC_AEA

Analytical Batch Number: 1489314

Sample ID	Client ID
375706001	B30RR8
1203346289	Method Blank (MB)
1203346292	Laboratory Control Sample (LCS)
1203346291	375889001(B30RT1) 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: 375889001 (B30RT1).

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

The batch was reprep'd due to elevated MDC's. The reanalysis is being reported.

Recounts

Samples 1203346289 (MB) and 375706001 (B30RR8) were recounted due to high MDCs. The recounts are reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1427256 was generated due to RDL less than MDA. 1. Duplicate Sample 1203346290 does not meet the detection limits for Cm-243/244 due to lower tracer yield recovery. 1. The tracer yield recovery does meet the client acceptance criteria. Sample was recounted for the maximum count time of 1000 minutes in order to achieve the best possible MDC's. The QC sample 374612011 does meet the detection limits and there is no reportable activity present in either of the samples. Reporting results.

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: PUIISO_PRECIP_AEA:COMMON

Analytical Method: PUIISO_PLATE_AEA

Analytical Batch Number: 1489315

Sample ID	Client ID
375706001	B30RR8
1203346295	Method Blank (MB)
1203346298	Laboratory Control Sample (LCS)
1203346297	375889001(B30RT1) 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 volumes in this batch.

Designated QC

The following sample was used for QC: 375889001 (B30RT1).

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

Batch was reprepared due to elevated MDC's. The reanalysis is being reported.

Recounts

Samples 1203346295 (MB) and 375706001 (B30RR8) were recounted due to high MDCs. The recounts are reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

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.

July 21, 2015

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: UISO_IE_PRECIP_AEA:COMMON

Analytical Method: UISO_IE_PRECIP_AEA

Analytical Batch Number: 1489317

Sample ID	Client ID
375706001	B30RR8
1203346299	Method Blank (MB)
1203346302	Laboratory Control Sample (LCS)
1203346301	375889001(B30RT1) 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: 375889001 (B30RT1).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GAMMA_GS:COMMON (Cs137,Co60,Eu152,Eu154,Eu155)
Analytical Method: 901.1_GAMMA_GS
Analytical Batch Number: 1488730

Sample ID	Client ID
375706001	B30RR8
1203344710	Method Blank (MB)
1203344713	Laboratory Control Sample (LCS)
1203344712	375706001(B30RR8) 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: 375706001 (B30RR8).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: I129_SEP_LEPS_GS: COMMON
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Batch Number: 1488741

Sample ID	Client ID
375706001	B30RR8
1203344746	Method Blank (MB)
1203344749	Laboratory Control Sample (LCS)
1203346888	Laboratory Control Sample Duplicate (LCSD)

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

SOP Reference

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

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

A laboratory control sample and duplicate, 1203344749 (LCS) and 1203346888 (LCSD), were analyzed for precision.

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: SRTOT_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Batch Number: 1488476

Sample ID	Client ID
375706001	B30RR8
1203344052	Method Blank (MB)
1203344056	Laboratory Control Sample (LCS)
1203344054	375706001(B30RR8) 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.

July 21, 2015

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: 375706001 (B30RR8).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Chemical Recoveries

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	TRITIUM_DIST_LSC: COMMON
Analytical Method:	TRITIUM_DIST_LSC
Analytical Batch Number:	1488605

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Sample ID	Client ID
375706001	B30RR8
1203344361	Method Blank (MB)
1203344366	Laboratory Control Sample (LCS)
1203344362	375706001(B30RR8) Sample Duplicate (DUP)
1203344364	375706001(B30RR8) 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: 375706001 (B30RR8).

QC Information

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

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced

July 21, 2015

SOP or contractual documents. The following DER was generated for this SDG: DER 1427598 was generated due to RDL less than MDA. 1. Samples 375107001, 375228001, and 1203344361 do not meet the required detection limit. The samples were counted the maximum count time of 120 minutes to achieve the best possible results. 1. Reporting results.

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: C14_LSC: COMMON
Analytical Method: C14_LSC
Analytical Batch Number: 1489699

Sample ID	Client ID
375706001	B30RR8
1203347173	Method Blank (MB)
1203347176	Laboratory Control Sample (LCS)
1203347174	375889001(B30RT1) Sample Duplicate (DUP)
1203347175	375889001(B30RT1) 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-003 REV# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 375889001 (B30RT1).

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 prep or reanalysis.

Recounts

Sample 375706001 (B30RR8) was recounted to verify sample result. The recount result is similar to the original result. Original result is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

The matrix spike, 1203347175 (B30RT1MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TC99_EIE_LSC: COMMON
Analytical Method: TC99_EIE_LSC
Analytical Batch Number: 1490616

Sample ID	Client ID
375706001	B30RR8
1203349274	Method Blank (MB)

July 21, 2015

1203349277 Laboratory Control Sample (LCS)
1203349275 376156006(B317M4) Sample Duplicate (DUP)
1203349276 375889001(B30RT1) 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-059 REV# 3.

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 samples were used for QC: 375889001 (B30RT1) and 376156006 (B317M4).

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.

July 21, 2015

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.

July 21, 2015

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: GEL375706 GEL Work Order: 375706

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kate Gellatly

Date: 20 JUL 2015

Title: Analyst I

DATA EXCEPTION REPORT

Mo.Day Yr. 06-JUL-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: 1489314	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 374557(GEL374557),374612(GEL374612),374830(GEL374830),375052(GEL375052),375432(GEL375432),375706(GEL375706),375889(GEL375889)			
Application Issues: RDL less than MDA			
Specification and Requirements Exception Description:		DER Disposition:	
1. Duplicate Sample 1203346290 does not meet the detection limits for Cm-243/244 due to lower tracer yield recovery.		1. The tracer yield recovery does meet the client acceptance criteria. Sample was recounted for the maximum count time of 1000 minutes in order to achieve the best possible MDC's. The QC sample 374612011 does meet the detection limits and there is no reportable activity present in either of the samples. Reporting results.	

Originator's Name:
Jessica Downey 06-JUL-15

Data Validator/Group Leader:
Jessica Davis 06-JUL-15

DATA EXCEPTION REPORT			
Mo.Day Yr. 07-JUL-15	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA 906.0 Modified	Matrix Type: Liquid	Client Code: CPRC
Batch ID: 1488605	Sample Numbers: See below		
<p>Potentially affected work order(s)(SDG): 374830(GEL374830),374834(GEL374834),375052(GEL375052),375100(GEL375100),375107(GEL375107),375228(GEL375228),375236(GEL375236),375432(GEL375432),375514(GEL375514),375515(GEL375515),375706(GEL375706)</p> <p>Application Issues:</p> <p>RDL less than MDA</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 375107001, 375228001, and 1203344361 do not meet the required detection limit. The samples were counted the maximum count time of 120 minutes to achieve the best possible results.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Lyndsey Pace 07-JUL-15

Data Validator/Group Leader:

Lesley Anderson 07-JUL-15

Sample Data Summary

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: AMCMISO_EIE_PREC_AEA	Prep Basis: As Received
Batch ID: 1489314	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 07/02/2015 15:48	Aliquot: 0.05 L	Instrument: 1220
Data File: S0375706001_AM.1B.genf	Prep Method: DOE EML HASL-300, Am-05	Count Time: 1000 min
Prep Batch: 1489314		
Prep Date: 06/30/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.178	pCi/L	+/-0.308	0.308	0.454	1.00
	Curium-243/244	U	0.00	pCi/L	+/-0.229	0.229	0.448	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	27.4	42.8	pCi/L	64.0	(15%-125%)

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).

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: PUIISO_PLATE_AEA	Prep Basis: As Received
Batch ID: 1489315	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 07/02/2015 15:54	Aliquot: 0.05 L	Instrument: 1069
Data File: S0375706001_PU.2A.gcnf	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 1000 min
Prep Batch: 1489315		
Prep Date: 06/30/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	-0.101	pCi/L	+/-0.174	0.175	0.414	1.00
OER-100-70	Plutonium-239/240	U	-1.68E-08	pCi/L	+/-0.187	0.187	0.372	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	32.3	39.4	pCi/L	82.2	(15%-125%)

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).

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: UIISO_IE_PRECIP_AEA	Prep Basis: As Received
Batch ID: 1489317	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 07/01/2015 10:04	Aliquot: 0.05 L	Instrument: 1013
Data File: S0375706001_UU.1A.gcnf	Prep Method: DOE EML HASL-300, U-02-R	Count Time: 240 min
Prep Batch: 1489317		
Prep Date: 06/30/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234	U	0.809	pCi/L	+/-0.741	0.751	0.912	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.00	pCi/L	+/-0.307	0.308	0.457	1.00
7440-61-1	Uranium-238		0.774	pCi/L	+/-0.693	0.703	0.753	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	36.5	42.4	pCi/L	86.1	(15%-125%)

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).

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: As Received
Batch ID: 1488476	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 07/01/2015 13:26	Aliquot: 0.3 L	Instrument: PIC10C
Data File: S1488476r2.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1488476		
Prep Date: 06/29/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	0.554	pCi/L	+/-0.659	0.671	1.11	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.90	8.10	mg	97.5	(25%-125%)

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).

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706
 Lab Sample ID: 375706001

 Client ID: B30RR8
 Batch ID: 1488730
 Run Date: 06/30/2015 14:52
 Data File: G375706001.CNF;1
 Prep Batch: 1488730
 Prep Date: 06/30/2015 00:00

Client: CPRC001
 Date Collected: 06/23/2015 14:36
 Date Received: 06/25/2015 08:40

 Method: 901.1_GAMMA_GS
 Analyst: MJH1
 Aliquot: 2 L
 Prep Method: EPA 901.1

Project: CPRC0F15028
 Matrix: WATER

 Prep Basis: As Received
 SOP Ref: GL-RAD-A-013
 Instrument: GAM32
 Count Time: 120 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	-1.91	pCi/L	+/-2.72	2.86	4.77	10.0
10198-40-0	Cobalt-60	U	3.15	pCi/L	+/-2.82	3.17	6.54	
14683-23-9	Europium-152	U	3.93	pCi/L	+/-8.69	8.87	16.0	
15585-10-1	Europium-154	U	1.21	pCi/L	+/-6.91	6.94	14.2	
14391-16-3	Europium-155	U	6.28	pCi/L	+/-12.2	12.6	21.9	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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).

July 21 2015
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**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: As Received
Batch ID: 1488741	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 07/07/2015 12:43	Aliquot: 1.5 L	Instrument: XRAY1
Data File: I375706001.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 90 min
Prep Batch: 1488741		
Prep Date: 07/01/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.150	pCi/L	+/-0.262	0.271	0.553	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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).

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: TRITIUM_DIST_LSC	Prep Basis: As Received
Batch ID: 1488605	Analyst: GXR1	SOP Ref: GL-RAD-A-002
Run Date: 07/06/2015 00:37	Aliquot: 50 mL	Instrument: LSCPINK
Data File: T1488605.xls	Prep Method: EPA 906.0 Modified	Count Time: 120.0296 min
Prep Batch: 1488605		
Prep Date: 07/01/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		231	pCi/L	+/-74.9	87.1	105	100

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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).

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: C14_LSC	Prep Basis: As Received
Batch ID: 1489699	Analyst: EXK2	SOP Ref: GL-RAD-A-003
Run Date: 07/12/2015 14:04	Aliquot: 0.25 L	Instrument: LSCYELLOW
Data File: C1489699.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 131.699996948242 min
Prep Batch: 1489699		
Prep Date: 07/11/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		139	pCi/L	+/-3.86	26.1	3.54	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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).

July 21 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL375706	Client: CPRC001	Project: CPRC0F15028
Lab Sample ID: 375706001	Date Collected: 06/23/2015 14:36	Matrix: WATER
	Date Received: 06/25/2015 08:40	
Client ID: B30RR8	Method: TC99_EIE_LSC	Prep Basis: As Received
Batch ID: 1490616	Analyst: MYM1	SOP Ref: GL-RAD-A-059
Run Date: 07/14/2015 06:33	Aliquot: 0.3 L	Instrument: LSCBLUE
Data File: E1490616.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 30 min
Prep Batch: 1490616		
Prep Date: 07/09/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	3.64	pCi/L	+/-5.64	5.66	9.55	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	63000	63600	CPM	99.1	(15%-125%)

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).

Quality Control Data

GEL LABORATORIES LLC

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QC Summary

Report Date: July 19, 2015
Page 1 of 6

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 375706

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1489314								
QC1203346289	MB								
Americium-241			U	0.257	pCi/L			MXS2	07/02/1515:48
				Uncert: +/-0.302					
				TPU: +/-0.303					
Curium-243/244			U	0.00	pCi/L				
				Uncert: +/-0.199					
				TPU: +/-0.199					
**Americium-243 Tracer	42.8			29.0	pCi/L	REC: 68	(15%-125%)		
				Uncert: +/-2.91					
				TPU: +/-4.75					
QC1203346291	375889001	DUP							
Americium-241		U	-0.12	U	0.0952	pCi/L			07/01/1510:04
				Uncert: +/-0.363	+/-0.615		RPD: 0	N/A	
				TPU: +/-0.364	+/-0.615		RER: 0.591	(0-2)	
Curium-243/244		U	0.00659	U	0.382	pCi/L			
				Uncert: +/-0.489	+/-0.676		RPD: 0	N/A	
				TPU: +/-0.489	+/-0.678		RER: 0.881	(0-2)	
**Americium-243 Tracer	42.8		31.3		28.1	pCi/L	REC: 66	(15%-125%)	
				Uncert: +/-5.22	+/-5.29				
				TPU: +/-7.75	+/-7.85				
QC1203346292	LCS								
Americium-241				39.5		pCi/L	REC: 91	(80%-120%)	
				Uncert: +/-4.62					
				TPU: +/-6.56					
Curium-243/244				54.6		pCi/L	REC: 105	(80%-120%)	
				Uncert: +/-5.78					
				TPU: +/-9.41					
**Americium-243 Tracer	42.8			35.7		pCi/L	REC: 84	(15%-125%)	
				Uncert: +/-5.00					
				TPU: +/-7.46					
Batch	1489315								
QC1203346295	MB								
Plutonium-238			U	-0.365	pCi/L			MXS2	07/02/1515:54
				Uncert: +/-0.334					
				TPU: +/-0.334					
Plutonium-239/240			U	-0.182	pCi/L				
				Uncert: +/-0.419					
				TPU: +/-0.419					
**Plutonium-242 Tracer	39.4			25.3	pCi/L	REC: 64	(15%-125%)		
				Uncert: +/-2.67					
				TPU: +/-4.35					
QC1203346297	375889001	DUP							
Plutonium-238		U	0.138	U	0.0465	pCi/L			07/01/1510:04
				Uncert: +/-0.471	+/-0.486		RPD: 0	N/A	
				TPU: +/-0.472	+/-0.487		RER: 0.264	(0-2)	

~~JULY 01, 2015~~
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QC Summary

Workorder: 375706

Page 2 of 6

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1489315								
Plutonium-239/240		U	-0.053	U	0.0863	pCi/L			
	Uncert:		+/-0.495		+/-0.480		RPD: 0	N/A	
	TPU:		+/-0.496		+/-0.480		RER: 0.396	(0-2)	
**Plutonium-242 Tracer	39.4		32.8		29.0	pCi/L	REC: 74	(15%-125%)	
	Uncert:		+/-4.50		+/-5.04				
	TPU:		+/-6.72		+/-7.45				
QC1203346298	LCS								
Plutonium-238					0.889	pCi/L			07/01/1510:31
	Uncert:				+/-0.734				
	TPU:				+/-0.743				
Plutonium-239/240	39.4				33.4	pCi/L	REC: 85	(80%-120%)	
	Uncert:				+/-4.14				
	TPU:				+/-5.92				
**Plutonium-242 Tracer	39.4				33.7	pCi/L	REC: 86	(15%-125%)	
	Uncert:				+/-4.49				
	TPU:				+/-6.70				
Batch	1489317								
QC1203346299	MB								
Uranium-233/234				U	0.211	pCi/L		MXS2	07/01/1510:04
	Uncert:				+/-0.479				
	TPU:				+/-0.480				
Uranium-235/236				U	0.400	pCi/L			
	Uncert:				+/-0.576				
	TPU:				+/-0.579				
Uranium-238				U	0.206	pCi/L			
	Uncert:				+/-0.406				
	TPU:				+/-0.407				
**Uranium-232 Tracer	42.4				41.9	pCi/L	REC: 99	(15%-125%)	
	Uncert:				+/-4.39				
	TPU:				+/-7.78				
QC1203346301	375889001	DUP							
Uranium-233/234		U	0.335	U	0.790	pCi/L			
	Uncert:		+/-0.542		+/-0.807		RPD: 0	N/A	
	TPU:		+/-0.545		+/-0.817		RER: 0.908	(0-2)	
Uranium-235/236		U	0.0769	U	0.309	pCi/L			
	Uncert:		+/-0.427		+/-0.607		RPD: 0	N/A	
	TPU:		+/-0.428		+/-0.609		RER: 0.611	(0-2)	
Uranium-238		U	0.512		0.960	pCi/L			
	Uncert:		+/-0.585		+/-0.793		RPD: 27	(0% - 100%)	
	TPU:		+/-0.591		+/-0.808		RER: 0.878	(0-2)	
**Uranium-232 Tracer	42.4		40.4		37.9	pCi/L	REC: 89	(15%-125%)	
	Uncert:		+/-4.47		+/-4.86				
	TPU:		+/-7.87		+/-8.32				
QC1203346302	LCS								
Uranium-233/234					60.2	pCi/L			
	Uncert:				+/-5.75				
	TPU:				+/-11.2				
Uranium-235/236					2.73	pCi/L			
	Uncert:				+/-1.43				
	TPU:				+/-1.49				

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QC Summary

Workorder: 375706

Page 3 of 6

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1489317								
Uranium-238	54.3			60.9	pCi/L	REC: 112	(80%-120%)		
	Uncert:			+/-5.78					
	TPU:			+/-11.3					
*Uranium-232 Tracer	42.4			35.4	pCi/L	REC: 83	(15%-125%)		
	Uncert:			+/-4.88					
	TPU:			+/-8.34					
Rad Gamma Spec									
Batch	1488730								
QC1203344710	MB								
Cesium-137			U	0.195	pCi/L			MJH1	06/30/1514:53
	Uncert:			+/-2.62					
	TPU:			+/-2.62					
Cobalt-60			U	0.834	pCi/L				
	Uncert:			+/-2.64					
	TPU:			+/-2.67					
Europium-152			U	0.751	pCi/L				
	Uncert:			+/-7.51					
	TPU:			+/-7.52					
Europium-154			U	0.233	pCi/L				
	Uncert:			+/-7.12					
	TPU:			+/-7.12					
Europium-155			U	-1.4	pCi/L				
	Uncert:			+/-9.53					
	TPU:			+/-9.55					
QC1203344712	375706001 DUP								
Cesium-137		U	-1.91	U	-4.36	pCi/L			06/30/1517:56
	Uncert:		+/-2.72		+/-4.31		RPD: 0	N/A	
	TPU:		+/-2.86		+/-4.75		RER: 0.868	(0-2)	
Cobalt-60		U	3.15	U	-0.65	pCi/L			
	Uncert:		+/-2.82		+/-3.03		RPD: 0	N/A	
	TPU:		+/-3.17		+/-3.05		RER: 1.69	(0-2)	
Europium-152		U	3.93	U	8.71	pCi/L			
	Uncert:		+/-8.69		+/-9.61		RPD: 0	N/A	
	TPU:		+/-8.87		+/-10.4		RER: 0.685	(0-2)	
Europium-154		U	1.21	U	6.45	pCi/L			
	Uncert:		+/-6.91		+/-12.4		RPD: 0	N/A	
	TPU:		+/-6.94		+/-12.7		RER: 0.709	(0-2)	
Europium-155		U	6.28	U	-2.97	pCi/L			
	Uncert:		+/-12.2		+/-9.52		RPD: 0	N/A	
	TPU:		+/-12.6		+/-9.62		RER: 1.14	(0-2)	
QC1203344713	LCS								
Americium-241	34400			35500	pCi/L	REC: 103	(80%-120%)		06/30/1515:38
	Uncert:			+/-1210					
	TPU:			+/-3660					
Cesium-137	13700			14200	pCi/L	REC: 104	(80%-120%)		
	Uncert:			+/-333					
	TPU:			+/-1220					
Cobalt-60	15400			16000	pCi/L	REC: 104	(80%-120%)		
	Uncert:			+/-394					
	TPU:			+/-1300					

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QC Summary

Workorder: 375706

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1488730								
Europium-152			U	-107	pCi/L				
				Uncert: +/-216					
				TPU: +/-221					
Europium-154			U	-48.1	pCi/L				
				Uncert: +/-133					
				TPU: +/-135					
Europium-155			U	57.1	pCi/L				
				Uncert: +/-260					
				TPU: +/-261					
Batch	1488741								
QC1203344746	MB								
Iodine-129			U	-0.003	pCi/L			MJH1	07/07/1514:59
				Uncert: +/-0.267					
				TPU: +/-0.267					
QC1203344749	LCS								
Iodine-129		27.7		26.6	pCi/L	REC: 96 (80%-120%)			07/07/1516:11
				Uncert: +/-2.76					
				TPU: +/-3.83					
QC1203346888	LCSD								
Iodine-129		27.7		26.2	pCi/L	REC: 95 (80%-120%)			07/07/1516:12
				Uncert: +/-2.84		RPD: 1 (0%-20%)			
				TPU: +/-3.87		RER: 0.115 (0-2)			
Rad Gas Flow									
Batch	1488476								
QC1203344052	MB								
Total Strontium			U	-0.874	pCi/L			KSD1	07/01/1513:28
				Uncert: +/-0.604					
				TPU: +/-0.604					
**Strontium Carrier		8.10		7.50	mg	REC: 93 (25%-125%)			
QC1203344054	375706001	DUP							
Total Strontium			U	0.554	U	-0.0165			07/01/1513:28
				Uncert: +/-0.659		+/-0.568	RPD: 0 N/A		
				TPU: +/-0.671		+/-0.568	RER: 1.27 (0-2)		
**Strontium Carrier		8.10		7.90	mg	REC: 99 (25%-125%)			
QC1203344056	LCS								
Total Strontium		72.8		68.5	pCi/L	REC: 94 (80%-120%)			07/01/1513:23
				Uncert: +/-3.70					
				TPU: +/-16.3					
**Strontium Carrier		8.10		7.60	mg	REC: 94 (25%-125%)			
Rad Liquid Scintillation									
Batch	1488605								
QC1203344361	MB								
Tritium			U	2.34	pCi/L			GXR1	07/06/1502:40
				Uncert: +/-57.3					
				TPU: +/-57.3					
QC1203344362	375706001	DUP							
Tritium		231		268	pCi/L				07/06/1505:57
				Uncert: +/-74.9		+/-76.6	RPD: 15 (0% - 100%)		
				TPU: +/-87.1		+/-92.5	RER: 0.582 (0-2)		

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QC Summary

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1488605								
QC1203344364	375706001	MS							
Tritium	1830	231		1910	pCi/L	REC: 92	(75%-125%)		07/06/1508:00
	Uncert:	+/-74.9		+/-397					
	TPU:	+/-87.1		+/-542					
QC1203344366	LCS								
Tritium	1830			1740	pCi/L	REC: 95	(80%-120%)		07/06/1508:17
	Uncert:			+/-389					
	TPU:			+/-513					
Batch	1489699								
QC1203347173	MB								
Carbon-14			U	-0.60	pCi/L			EXK2	07/12/1518:49
	Uncert:			+/-2.00					
	TPU:			+/-2.00					
QC1203347174	375889001	DUP							
Carbon-14		76.7		71.9	pCi/L				07/12/1521:20
	Uncert:	+/-3.54		+/-3.52		RPD: 6	(0% - 20%)		
	TPU:	+/-14.7		+/-13.8		RER: 0.464	(0-2)		
QC1203347175	375889001	MS							
Carbon-14	3030	76.7		3160	pCi/L	REC: 102	(75%-125%)		07/12/1523:52
	Uncert:	+/-3.54		+/-151					
	TPU:	+/-14.7		+/-606					
QC1203347176	LCS								
Carbon-14	303			311	pCi/L	REC: 103	(80%-120%)		07/13/1500:08
	Uncert:			+/-15.2					
	TPU:			+/-59.7					
Batch	1490616								
QC1203349274	MB								
Technetium-99			U	0.255	pCi/L			MYM1	07/14/1509:28
	Uncert:			+/-5.96					
	TPU:			+/-5.96					
**Technetium-99m Tracer	63600			57400	CPM	REC: 90	(15%-125%)		
QC1203349275	376156006	DUP							
Technetium-99		1310		1370	pCi/L				07/14/1510:01
	Uncert:	+/-28.8		+/-30.2		RPD: 5	(0% - 20%)		
	TPU:	+/-148		+/-155		RER: 0.589	(0-2)		
**Technetium-99m Tracer	63600	58500		55400	CPM	REC: 87	(15%-125%)		
QC1203349276	375889001	DUP							
Technetium-99		U	3.56	U	2.43	pCi/L			07/14/1510:34
	Uncert:	+/-5.74		+/-5.77		RPD: 0	N/A		
	TPU:	+/-5.75		+/-5.77		RER: 0.270	(0-2)		
**Technetium-99m Tracer	63600	61600		60400	CPM	REC: 95	(15%-125%)		
QC1203349277	LCS								
Technetium-99	287			268	pCi/L	REC: 93	(80%-120%)		07/14/1511:07
	Uncert:			+/-11.2					
	TPU:			+/-31.7					
**Technetium-99m Tracer	63600			61000	CPM	REC: 96	(15%-125%)		

Notes:

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

The Qualifiers in this report are defined as follows:

QC Summary

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
*						Duplicate analysis not within control limits				
+						Correlation coefficient for Method of Standard Additions (MSA) is < 0.995				
<						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).				
B						The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample				
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						Reported value is estimated due to interferences. See comment in narrative.				
M						Duplicate precision not met.				
N						Spike Sample recovery is outside control limits.				
S						Reported value determined by the Method of Standard Additions (MSA)				
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				
W						Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.				
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.

** 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.