

August 17, 2016

REV 1



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
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gel.com

January 08, 2016

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

Re: CHPRC SAF F15-011
Work Order: 388008
SDG: GEL388008

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on December 23, 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,

Heather Shaffer
Project Manager

Purchase Order: 302632 8C
Chain of Custody: F15-011-456 and F15-011-457
Enclosures



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Sample Issue Resolution

SAMPLE ISSUE RESOLUTION	SIR NUM	SIR16-158
	REV NUM	0
	DATE INITIATED	1/7/2016

SAMPLE EVENT INFORMATION

SAF NUM(S) F15-011
OPERABLE UNIT(S) 200-DV-1
PROJECT(S) 200-DV-1
SAMPLE EVENT TITLE(S) 200-DV-1 OU Waste Sites
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B33MF0
SAMPLE MATRIX SOIL
COLLECTION DATE 11/18/2015 - 11/18/2015
SDG NUM GEL388008

ISSUE BACKGROUND

CLASS Sample Management Issues
TYPE Other SDM issue (specify)
DESCRIPTION The sample B33MF0 was received out of holding for Mercury analysis. The collection date was 11/16/2015. The receive date was 12/23/15.

DISPOSITION

DESCRIPTION Proposed disposition: Note the hold time and proceed with analysis. The data will be qualified as out of holding.

JUSTIFICATION Final disposition: Accept proposed resolution.

SUBMITTED BY: Heather Shaffer Date: 01/05/15
 ACCEPTED BY: Scot Fitzgerald DATE: 01/07/2015

SAMPLE ISSUE RESOLUTION	SIR NUM	SIR16-172
	REV NUM	0
	DATE INITIATED	1/7/2016

SAMPLE EVENT INFORMATION

SAF NUM(S) F15-011
OPERABLE UNIT(S) 200-DV-1
PROJECT(S) 200-DV-1
SAMPLE EVENT TITLE(S) 200-DV-1 OU Waste Sites
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B33MF0
SAMPLE MATRIX SOIL
COLLECTION DATE 11/18/2015 - 11/18/2015
SDG NUM GEL388008

ISSUE BACKGROUND

CLASS Laboratory Issue
TYPE Quality Control Failure

DESCRIPTION The lab has a slight U-238 blank hit for the Uranium analysis on soil sample 388008001. The blank result is 0.89554 pCi/G, which is greater than the MDC achieved of 0.76069 pCi/G. The result is less than the RDL of 1pCi/G and less than the MDC plus the Uncertainty (MDC plus Unc=1.54067 pCi/G), which meets the GEL standard requirements but not the client specific requirements of being less than MDC. There is not significant activity in the sample, so the blank result is not less than 5 percent of the least active sample. The lab is requesting relief to report.

DISPOSITION

DESCRIPTION Proposed resolution: Report results and note blank excursion in narrative.

JUSTIFICATION Final Disposition: Accept proposed resolution.

SUBMITTED BY: Heather Shaffer DATE: 01/07/2016
ACCEPTED BY: Scot Fitzgerald DATE: 01/08/2016

SAMPLE ISSUE RESOLUTION	SIR NUM	SIR16-400
	REV NUM	0
	DATE INITIATED	6/7/2016

SAMPLE EVENT INFORMATION

SAF NUM(S) F15-011
OPERABLE UNIT(S) 200-DV-1
PROJECT(S) 200-DV-1
SAMPLE EVENT TITLE(S) 200-DV-1 OU Waste Sites
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 2
SAMPLE NUMBERS B33MF0, B33MF1
SAMPLE MATRIX SOIL
COLLECTION DATE 11/18/2015 - 11/18/2015
SDG NUM GEL388008

ISSUE BACKGROUND

CLASS Field Sampling Issue
TYPE Analysis Hold Time Exceeded
DESCRIPTION Due to shipping delays, hold times were missed for cyanide on B33MF0 and anions for B33MF1.

DISPOSITION

DESCRIPTION Document and close.
JUSTIFICATION Document and close.

SUBMITTED BY: Scot Fitzgerald DATE: 06/07/16
ACCEPTED BY: Scot Fitzgerald DATE: 06/07/2016

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F15-011
SDG: GEL388008**

January 08, 2016

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 December 23, 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
388008001	B33MF0
388008002	B33MF1

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 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.

August 17, 2016

REV 1

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F15-011-456	PAGE 1 OF 2
COLLECTOR D.L. Floyd/CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9510, I-002	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites - Soil	SAF NO. F15-011		AIR QUALITY	
ICE CHEST NO. GWS-477	FIELD LOGBOOK NO. HNF-50733 Pg 18	ACTUAL SAMPLE DEPTH 7' 9.2'	COA 302632	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. 7752 7301 5273			

MATRIX*	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS	SAMPLE DATE	SAMPLE TIME	MATRIX*
A=Air DL=Drum L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	None	6 Months	G/P	1	250mL	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	11-18-15	0900	SOIL
*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, NA	None	14 Days	G	1	60mL	SEE ITEM (2) IN SPECIAL INSTRUCTIONS			
SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B33MD9									

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
D.L. Floyd/CHPRC	NOV 18 2015 1200	SSU #1	NOV 18 2015 1200
SSU #1	DEC 22 2015 0835	C.M. Aguilar/CHPRC (MVA)	DEC 22 2015 0835
C.M. Aguilar/CHPRC	DEC 22 2015 1400	FED EX	
		A. Foston/MSL	12/23/15
			1/10

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME
PRINTED ON 11/6/2015	FSR ID = FSR9256	TRVL NUM = TRVL-16-018	A-6003-618 (REV 2)

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F15-011-456	PAGE 2 OF 2
COLLECTOR D.L. Floyd/CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9510, I-002	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites - Soil	FIELD LOGBOOK NO. HNF-N-507 33 Pg 18	SAF NO. F15-011	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. CWS 477	ACTUAL SAMPLE DEPTH 7.9	OFFSITE PROPERTY NO.	COA 302632	ORIGINAL	
SHIPPED TO GEL Laboratories, LLC	BILL OF LADING/AIR BILL NO. 7752 7301 5273				
<p>SPECIAL INSTRUCTIONS</p> <p>TRVL-16-018</p> <p>(1) 6020_METALS_ICPMS: COMMON {Aluminum, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium}; 6010_METALS_ICP: COMMON {Antimony, Silver}; 7471_MERCURY_CV: COMMON (SOLIDS); (2) GAMMA_GS: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; PUISO_PLATE_AEA: COMMON {Plutonium-238, Plutonium-239/240}; UIISO_PLATE_AEA: COMMON {Uranium-233/234, Uranium-235, Uranium-238}; C14_LSC: COMMON; #129_SEP_LEPS-65-COMMON; #163_LSC: COMMON; NP237_IE_PRECIP_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON {Total beta radiostrontium}; TC99_EIE_LSC: COMMON; TRITIUM_DIST_LSC: COMMON;</p>					

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		PAGE 1 OF 1	
COLLECTOR D.L. Floyd/CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9510, I-002	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites - Soil	FIELD LOGBOOK NO. HNF-50733	SAF NO. F15-011	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. 625-417	ACTUAL SAMPLE DEPTH 7'-9.2'	COA 302632	BILL OF LADING/AIR BILL NO. 7752 7301 5273	ORIGINAL	
SHIPPED TO GEL Laboratories, LLC	PRESERVATION Cool <=6C	HOLDING TIME 28 Days/48 Hours			
MATRIX* A=Air DL=Drum L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	NO. OF CONTAINER(S) 1	TYPE OF CONTAINER G/P			
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. NA	VOLUME 60ml	SAMPLE ANALYSIS			
SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B33MD9	SAMPLE DATE 11-18-15	SAMPLE TIME 0900			
SAMPLE NO. B33MF1	MATRIX* SOIL				

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM D.L. Floyd/CHPRC	DATE/TIME NOV 18 2015 1220	RECEIVED BY/STORED IN SSA #1	DATE/TIME NOV 18 2015 1223	TRVL-16-018	
RELINQUISHED BY/REMOVED FROM SSA #1	DATE/TIME 12-22-15 0815	RECEIVED BY/STORED IN C.M. Aguilar/CHPRC	DATE/TIME DEC 22 2015	(1) 9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: COMMON (Add-on)	
RELINQUISHED BY/REMOVED FROM C.M. Aguilar/CHPRC	DATE/TIME DEC 2 2015 1400	RECEIVED BY/STORED IN FLOEX	DATE/TIME DEC 2 2015	{Phosphorus in phosphate};	
RELINQUISHED BY/REMOVED FROM PDET	DATE/TIME	RECEIVED BY/STORED IN M. Kinsler	DATE/TIME 12-23-15 1110		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 11/6/2015	FSR ID = FSR9256	TRVL NUM = TRVL-16-018		A-6003-618 (REV 2)	



SAMPLE RECEIPT & REVIEW FORM

Client: <u>OPRC</u>		SDG/AR/COC/Work Order: <u>388008</u>		
Received By: <u>MK</u>		Date Received: <u>12-23-15</u>		
Suspected Hazard Information	Yes <input checked="" 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>MD/HP = 0.6</u>		
Classified Radioactive (I, II, 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#: <u>2910</u>		
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 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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: <u>ice bags</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 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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7752 7301 5273</u>
Comments (Use Continuation Form if needed):				

PM (or PMA) review: Initials DS Date 12/23/15 Page 1 of 1 GL-CHL-SR-001 Rev 2

Data Review Qualifier Definitions

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 (843) 556-8171

Report Date: 07-JAN-16

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

August 17, 2016

REV 1

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

Report Date: 07-JAN-16

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 08 January 2016

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	P330-15-00283, P330-15-00253
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	SC000122016-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-19
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL388008
Work Order #: 388008

Sample ID	Client ID
388008001	B33MF0
1203458941	Method Blank (MB) ICP
1203458942	Laboratory Control Sample (LCS)
1203458945	388008001(B33MF0L) Serial Dilution (SD)
1203458943	388008001(B33MF0D) Sample Duplicate (DUP)
1203458944	388008001(B33MF0S) Matrix Spike (MS)
1203458906	Method Blank (MB) ICP-MS
1203458907	Laboratory Control Sample (LCS)
1203458910	388008001(B33MF0L) Serial Dilution (SD)
1203458908	388008001(B33MF0D) Sample Duplicate (DUP)
1203458909	388008001(B33MF0S) Matrix Spike (MS)
1203461144	388008001(B33MF0PS) Post Spike (PS)
1203461325	Method Blank (MB) CVAA
1203461326	Laboratory Control Sample (LCS)
1203461332	388008001(B33MF0L) Serial Dilution (SD)
1203461330	388008001(B33MF0D) Sample Duplicate (DUP)
1203461331	388008001(B33MF0S) Matrix Spike (MS)

Sample Analysis

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" basis.

Method/Analysis Information

Analytical Batch:	1533372, 1533358 and 1534271
Prep Batch :	1533371, 1533357 and 1534268
Standard Operating Procedures:	GL-MA-E-013 REV# 24, GL-MA-E-009 REV# 26, GL-MA-E-014 REV# 26 and GL-MA-E-010 REV# 31
Analytical Method:	6010_METALS_ICP, 6020_METALS_ICPMS and 7471_HG_CVAA
Prep Method :	SW846 3050B and SW846 7471B Prep

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.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

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 MBs 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: 388008001 (B33MF0)-ICP, ICP-MS and CVAA.

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 MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
--------	---------	-------

1203458909 (B33MF0MS)	Chromium	65.2* (75%-125%)
-----------------------	----------	------------------

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Sample	Analyte	Value
1203458910 (B33MF0SDILT)	Copper	11.2 *(0%-10%)

Post Spike (PS) Recovery Statement

The PS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the absence of matrix interferences in the post-digested sample.

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. Samples 388008001 (B33MF0), 1203461330 (B33MF0DUP), 1203461331 (B33MF0MS) and 1203461332 (B33MF0SDILT) did not meet holding time requirements due to being received after the holding time had expired. The data has been qualified. The data has been qualified.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Sample was diluted for titanium in order to bring raw values within the linear range of the instrument, and for the analytes interfered with, in order to ensure that the inter-element correction factors were valid for antimony. 388008001 (B33MF0)-ICP. Sample 388008001 (B33MF0)-ICP-MS was diluted to ensure that the analyte concentration was within the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times. ICP-MS.

Analyte	388008
	001
Several	5X 40X 2X 1X

Preparation Information

The samples in this SDG were 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 (DER) was generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) 1481140 was generated for samples 1203458909 (B33MF0MS) and 1203458910 (B33MF0SDILT) in this SDG/batch. A data exception report (DER) 1481898 was generated for samples 388008001 (B33MF0), 1203461330 (B33MF0DUP), 1203461331 (B33MF0MS) and 1203461332 (B33MF0SDILT) in this SDG/batch.

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.

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL388008 GEL Work Order: 388008

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.
- M Duplicate precision not met.
- 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

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: Nik-Cole Elmore

Date: 08 JAN 2016

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL388008

METHOD TYPE: SW846

SAMPLE ID: 388008001

CLIENT ID: B33MF0

CONTRACT: CPRC0F15011

MATRIX:SOIL

DATE RECEIVED 23-DEC-15

LEVEL: Low %SOLIDS: 92.6

<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>
7429-90-5	Aluminum	7720000	ug/kg	D		MS	61500	40	ICPMS7	151230-7
7440-36-0	Antimony	1680	ug/kg	UD		P	1680	5	OPTIMA3	010416A-1
7440-38-2	Arsenic	3240	ug/kg	D		MS	205	2	ICPMS7	151229-3
7440-39-3	Barium	77300	ug/kg	D		MS	2050	40	ICPMS7	151230-7
7440-41-7	Beryllium	253	ug/kg	D		MS	20.5	2	ICPMS7	151229-6
7440-43-9	Cadmium	134	ug/kg	BD		MS	20.5	2	ICPMS7	151229-3
7440-47-3	Chromium	10600	ug/kg	D	N	MS	205	2	ICPMS7	151229-3
7440-48-4	Cobalt	7410	ug/kg	D		MS	61.5	2	ICPMS7	151229-3
7440-50-8	Copper	13100	ug/kg	D	M	MS	67.6	2	ICPMS7	151229-3
7439-92-1	Lead	4740	ug/kg	D		MS	102	2	ICPMS7	151229-3
7439-96-5	Manganese	330000	ug/kg	D		MS	4100	40	ICPMS7	151230-7
7439-97-6	Mercury	7.71	ug/kg	BhX		AV	4.01	1	HG3	010516S8-8
7439-98-7	Molybdenum	264	ug/kg	D		MS	61.5	2	ICPMS12	151230-2
7440-02-0	Nickel	10800	ug/kg	D		MS	102	2	ICPMS7	151229-3
7782-49-2	Selenium	338	ug/kg	UD		MS	338	2	ICPMS7	151229-3
7440-22-4	Silver	786	ug/kg			P	102	1	OPTIMA3	010416A-1
7440-61-1	Uranium	541	ug/kg	D		MS	13.5	2	ICPMS7	151230-7

*Analytical Methods:

AV SW846 7471B
P SW846 3050B/6010C
MS SW846 3050B/6020A

Quality Control Summary

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QC Summary

Report Date: January 8, 2016

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

Contact: Mr. Scot Fitzgerald

Workorder: 388008

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1533358										
QC1203458908	388008001	DUP									
Aluminum	D	7720000	D	7000000	ug/kg	9.87		(0%-20%)	SKJ	12/30/15	19:40
Arsenic	D	3240	D	3430	ug/kg	5.64	^	(+/-1080)		12/29/15	20:54
Barium	D	77300	D	81900	ug/kg	5.72		(0%-20%)		12/30/15	19:40
Beryllium	D	253	D	295	ug/kg	15	^	(+/-108)		12/30/15	09:44
Cadmium	BD	134	BD	125	ug/kg	6.77	^	(+/-216)		12/29/15	20:54
Chromium	DN	10600	D	11200	ug/kg	5.75		(0%-20%)			
Cobalt	D	7410	D	8060	ug/kg	8.47		(0%-20%)			
Copper	DM	13100	D	13700	ug/kg	4.43		(0%-20%)			
Lead	D	4740	D	4480	ug/kg	5.62		(0%-20%)			
Manganese	D	330000	D	394000	ug/kg	17.7		(0%-20%)		12/30/15	19:40
Molybdenum	D	264	D	296	ug/kg	11.4	^	(+/-216)	BAJ	12/31/15	10:15
Nickel	D	10800	D	10600	ug/kg	1.94		(0%-20%)	SKJ	12/29/15	20:54
Selenium	DU	ND	DU	ND	ug/kg	N/A					
Uranium	D	541	D	547	ug/kg	1.08		(0%-20%)		12/30/15	20:06
QC1203458907	LCS										
Aluminum	188000		D	172000	ug/kg	91.3		(80%-120%)		12/30/15	19:37
Arsenic	4710		D	4890	ug/kg	104		(80%-120%)		12/29/15	20:38
Barium	4710		D	4740	ug/kg	101		(80%-120%)		12/30/15	19:37
Beryllium	4710		D	4900	ug/kg	104		(80%-120%)		12/30/15	09:41
Cadmium	4710		D	4630	ug/kg	98.4		(80%-120%)		12/29/15	20:38

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1533358										
Chromium	4710		D	4850	ug/kg		103	(80%-120%)			
Cobalt	4710		D	4630	ug/kg		98.4	(80%-120%)	SKJ	12/29/15	20:38
Copper	4710		D	4740	ug/kg		101	(80%-120%)			
Lead	4710		D	4840	ug/kg		103	(80%-120%)			
Manganese	4710		D	4830	ug/kg		103	(80%-120%)		12/30/15	19:37
Molybdenum	4710		D	4580	ug/kg		97.4	(80%-120%)	BAJ	12/31/15	10:12
Nickel	4710		D	4720	ug/kg		100	(80%-120%)	SKJ	12/29/15	20:38
Selenium	4710		D	4820	ug/kg		102	(80%-120%)			
Uranium	4710		D	4750	ug/kg		101	(34%-166%)		12/30/15	19:37
QC1203458906 MB											
Aluminum			DU	ND	ug/kg					12/30/15	19:35
Arsenic			DU	ND	ug/kg					12/29/15	20:34
Barium			DU	ND	ug/kg					12/30/15	19:35
Beryllium			DU	ND	ug/kg					12/30/15	09:39
Cadmium			DU	ND	ug/kg					12/29/15	20:34
Chromium			DU	ND	ug/kg						
Cobalt			DU	ND	ug/kg						
Copper			DU	ND	ug/kg						
Lead			DU	ND	ug/kg						
Manganese			DU	ND	ug/kg					12/30/15	19:35
Molybdenum			DU	ND	ug/kg				BAJ	12/31/15	10:11
Nickel			DU	ND	ug/kg				SKJ	12/29/15	20:34
Selenium			DU	ND	ug/kg						

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1533358										
Uranium			DU	ND	ug/kg				SKJ	12/30/15	19:35
QC1203458909	388008001	MS									
Aluminum	203000	D	7720000	D	8730000	ug/kg		N/A (75%-125%)		12/30/15	19:42
Arsenic	5070	D	3240	D	8250	ug/kg	98.9	(75%-125%)		12/29/15	20:58
Barium	5070	D	77300	D	123000	ug/kg		N/A (75%-125%)		12/30/15	19:42
Beryllium	5070	D	253	D	5330	ug/kg	100	(75%-125%)		12/30/15	09:45
Cadmium	5070	BD	134	D	5190	ug/kg	99.7	(75%-125%)		12/29/15	20:58
Chromium	5070	DN	10600	DN	13900	ug/kg	65.2*	(75%-125%)			
Cobalt	5070	D	7410	D	13500	ug/kg	121	(75%-125%)			
Copper	5070	DM	13100	D	19000	ug/kg	115	(75%-125%)			
Lead	5070	D	4740	D	9740	ug/kg	98.7	(75%-125%)			
Manganese	5070	D	330000	D	395000	ug/kg		N/A (75%-125%)		12/30/15	19:42
Molybdenum	5070	D	264	D	4980	ug/kg	93	(75%-125%)	BAJ	12/31/15	10:16
Nickel	5070	D	10800	D	15200	ug/kg	85.6	(75%-125%)	SKJ	12/29/15	20:58
Selenium	5070	DU	ND	D	4980	ug/kg	97.8	(75%-125%)			
Uranium	5070	D	541	D	5740	ug/kg	103	(75%-125%)		12/30/15	20:08
QC1203461144	388008001	PS									
Chromium	25.0	DN	51.7	D	77.0	ug/L	101	(80%-120%)		12/29/15	21:01
QC1203458910	388008001	SDILT									
Aluminum		D	1880	D	360	ug/L	4.46	(0%-10%)		12/30/15	19:44
Arsenic		D	15.8	D	3.82	ug/L	20.6	(0%-10%)		12/29/15	21:05
Barium		D	18.9	D	3.72	ug/L	1.35	(0%-10%)		12/30/15	19:44
Beryllium		D	1.24	D	0.337	ug/L	36.3	(0%-10%)		12/30/15	09:46

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1533358										
Cadmium	BD	0.654	D	0.132	ug/L	.917		(0%-10%)		12/29/15	21:05
Chromium	DN	51.7	D	11.0	ug/L	6.15		(0%-10%)	SKJ		
Cobalt	D	36.1	D	7.81	ug/L	8.03		(0%-10%)			
Copper	DM	64.1	DM	14.2	ug/L	11.2*		(0%-10%)			
Lead	D	23.1	D	4.71	ug/L	1.81		(0%-10%)			
Manganese	D	80.4	D	16.4	ug/L	1.66		(0%-10%)		12/30/15	19:44
Molybdenum	D	1.29	DU	ND	ug/L	N/A		(0%-10%)	BAJ	12/31/15	10:19
Nickel	D	52.9	D	11.6	ug/L	9.61		(0%-10%)	SKJ	12/29/15	21:05
Selenium	DU	ND	DU	ND	ug/L	N/A		(0%-10%)			
Uranium	D	2.64	D	0.515	ug/L	2.5		(0%-10%)		12/30/15	20:12
Metals Analysis-ICP											
Batch	1533372										
QC1203458943	388008001	DUP									
Antimony	DU	ND	DU	ND	ug/kg	N/A			HSC	01/04/16	12:29
Silver		786		800	ug/kg	1.84	^	(+/-536)		01/04/16	11:55
QC1203458942	LCS										
Antimony	46600			46600	ug/kg	99.9		(80%-120%)		01/04/16	11:48
Silver	46600			46200	ug/kg	99.1		(80%-120%)			
QC1203458941	MB										
Antimony			U	ND	ug/kg					01/04/16	11:45
Silver			U	ND	ug/kg						
QC1203458944	388008001	MS									
Antimony	50600	DU	ND	D	47500	ug/kg	91.7	(75%-125%)		01/04/16	12:33
Silver	50600		786		50500	ug/kg	98.3	(75%-125%)		01/04/16	11:58
QC1203458945	388008001	SDILT									
Antimony	DU	ND	DU	ND	ug/L	N/A		(0%-10%)		01/04/16	12:39

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1533372										
Silver		7.69	D	1.94	ug/L	26.4		(0%-10%)		01/04/16	12:02
Metals Analysis-Mercury											
Batch	1534271										
QC1203461330	388008001	DUP									
Mercury		BX	7.71	UX	ND	ug/kg	71.5 ^	(+/-12.4)	MTM1	01/05/16	14:20
QC1203461326	LCS										
Mercury	55.0			61.6	ug/kg		112	(80%-120%)		01/05/16	13:41
QC1203461325	MB										
Mercury			U	ND	ug/kg					01/05/16	13:39
QC1203461331	388008001	MS									
Mercury	126	BX	7.71	X	134	ug/kg		100	(80%-120%)	01/05/16	14:21
QC1203461332	388008001	SDILT									
Mercury		BX	0.129	DX	0.075	ug/L	191	(0%-10%)		01/05/16	14:23

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.
- 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

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QC Summary

Workorder: 388008

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<u>Parmname</u>	<u>NOM</u>	<u>Sample Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD/D%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
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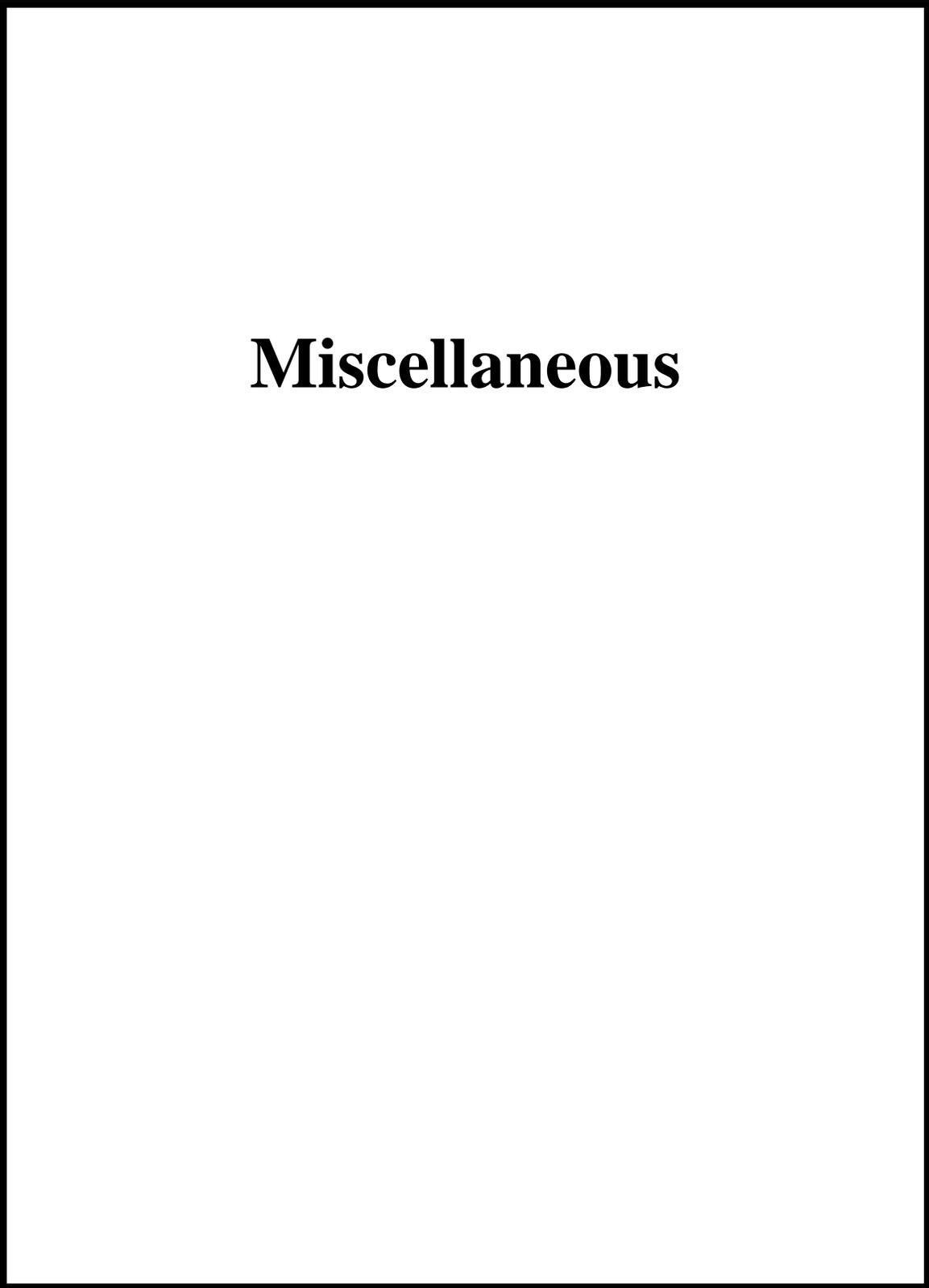
N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ 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.



Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 31-DEC-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ICP/MS	Test / Method: SW846 3050B/6020A	Matrix Type: Solid	Client Code: CPRC
Batch ID: 1533358	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 388008(GEL388008)</p> <p>Application Issues: Failed Recovery for MS/MSD, or PS/PSD Failed difference for SDILT</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/MSD, or PS/PSD: QC 1203458909MS</p> <p>2. Failed difference for SDILT: QC 1203458910SDILT</p>		<p>1. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity. 1203458909 (B33MF0MS) Chromium [65.2* (75%-125%)].</p> <p>2. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified. 1203458910 (B33MF0SDILT) Copper [11.2 *(0%-10%)].</p>	

Originator's Name:
Samantha Jacobs 04-JAN-16

Data Validator/Group Leader:
Paul Boyd 04-JAN-16

DATA EXCEPTION REPORT			
Mo. Day Yr. 05-JAN-16	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: MERCURY	Test / Method: SW846 7471A, SW846 7471B	Matrix Type: Solid	Client Code: CPRC, FBWP, PCGE
Batch ID: 1534271	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 387672,387788,388008(GEL388008),388124			
Application Issues: Sample received out of holding Failed RPD for DUP			
Specification and Requirements Exception Description:		DER Disposition:	
1. Failed RPD for DUP: QC 1203461327DUP 2. Sample received out of holding: 388008 001 QC 1203461330DUP, 1203461331MS, 1203461332SDILT		1. Not all the applicable analyte RPD values were within the acceptance criteria. 1203461327 (D3D1X009-04-01DUP) Mercury [120* (0.0%-20.0%)]. 2. Samples 388008001 (B33MF0), 1203461330 (B33MF0DUP), 1203461331 (B33MF0MS) and 1203461332 (B33MF0SDILT) did not meet holding time requirements due to being received after the holding time had expired. The data has been qualified. The data has been qualified.	

Originator's Name:
Monifa Basdeo 05-JAN-16

Data Validator/Group Leader:
Alan Stanley 05-JAN-16

General Chem Analysis

Case Narrative

**General Chemistry
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL388008
 Work Order #: 388008**

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1534435	Method:	9010_CYANIDE: COMMON
Prep Batch :	1534434	Method:	SW846 9010C Distillation

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9012B:

Sample ID	Client ID
388008001	B33MF0
1203461788	Method Blank (MB)
1203461789	Laboratory Control Sample (LCS)
1203461790	Laboratory Control Sample Duplicate (LCSD)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" 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-095 REV# 17.

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 Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

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.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD between the LCS and LCSD met the acceptance limits.

Quality Control (QC) Designation

No samples were selected for QC analysis.

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

Sample (See Below) was received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
388008001 (B33MF0)		Received 23-DEC-15, out of holding 02-DEC-15

Sample Dilutions

The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203461789 (LCS) and 1203461790 (LCSD).

Sample Re-analysis

Sample 1203461789 (LCS) was re-analyzed to verify the result.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1481172 was generated for sample 388008001 (B33MF0) in this SDG/batch.

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:	Ion Chromatography		
Analytical Batch:	1533389	Method:	9056_ANIONS_IC:COMMON + (Add-on)
Prep Batch :	1533388	Method:	SW846 9056A

Sample Analysis

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

Sample ID	Client ID
388008002	B33MF1
1203458976	Method Blank (MB)
1203458977	Laboratory Control Sample (LCS)
1203458978	388008002(B33MF1) Sample Duplicate (DUP)
1203458979	388008002(B33MF1) Matrix Spike (MS)

Sample 388008 002 in this SDG was analyzed on a "dry weight corrected" 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# 25.

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

Sample 388008002 (B33MF1) 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 where applicable.

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

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203458978 (B33MF1DUP)		Received 23-DEC-15, out of holding 16-DEC-15
1203458979 (B33MF1MS)		Received 23-DEC-15, out of holding 16-DEC-15
388008002 (B33MF1)		Received 23-DEC-15, out of holding 16-DEC-15

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**

A data exception report (DER) 1480380 was generated for samples 388008002 (B33MF1), 1203458978 (B33MF1DUP) and 1203458979 (B33MF1MS) in this SDG/batch.

Manual Integrations

Samples 1203458978 (B33MF1DUP) and 388008002 (B33MF1) were manually integrated to correctly position the baseline as set in the calibration standards.

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: GEL388008 GEL Work Order: 388008

The Qualifiers in this report are defined as follows:

- 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.
- 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: Thomas Lewis

Date: 07 JAN 2016

Title: Data Validator

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 7, 2016

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F15-011

Client Sample ID:	B33MF0	Project:	CPRC0F15011
Sample ID:	388008001	Client ID:	CPRC001
Matrix:	SOIL		
Collect Date:	18-NOV-15 09:00		
Receive Date:	23-DEC-15		
Collector:	Client		
Moisture:	7.43%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
9010_CYANIDE: COMMON "Dry Weight Corrected"											
Cyanide, Total	UX	83.5	83.5	250	ug/kg	1	AXH3	12/31/15	1230	1534435	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	12/31/15	0910	1534434

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9012B	

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 7, 2016

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F15-011

Client Sample ID: B33MF1 Project: CPRC0F15011
 Sample ID: 388008002 Client ID: CPRC001
 Matrix: SOIL
 Collect Date: 18-NOV-15 09:00
 Receive Date: 23-DEC-15
 Collector: Client
 Moisture: 7.36%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC:COMMON + (Add-on) "Dry Weight Corrected"											
Chloride	B	1740	721	2150	ug/Kg	1	MXL2	12/24/15	0856	1533389	1
Fluoride		1770	355	1080	ug/Kg	1					
Nitrate-N		3000	355	1080	ug/Kg	1					
Nitrite-N	B	401	355	1080	ug/Kg	1					
Phosphorus in phosphate	U	721	721	2150	ug/Kg	1					
Sulfate	B	3920	1430	4310	ug/Kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9056A	SW846 9056A Total Anions in Soil	MXL2	12/23/15	1722	1533388

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: January 7, 2016

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CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 388008

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Flow Injection Analysis											
Batch	1534435										
QC1203461789	LCS										
Cyanide, Total	90600		D	80800	ug/kg		89.2	(70%-130%)	AXH3	12/31/15	14:15
QC1203461790	LCSD										
Cyanide, Total	90600		D	70900	ug/kg	14.8	78.3	(0%-31%)		12/31/15	12:27
QC1203461788	MB										
Cyanide, Total			U	83.5	ug/kg					12/31/15	12:25
Ion Chromatography											
Batch	1533389										
QC1203458978	388008002	DUP									
Chloride		B	1740	B	1740	ug/Kg	0.248	^	(+/-2150)	MXL2	12/24/15 09:28
Fluoride			1770		1770	ug/Kg	0	^	(+/-1080)		
Nitrate-N			3000		3050	ug/Kg	1.64	^	(+/-1080)		
Nitrite-N		B	401	B	380	ug/Kg	5.24	^	(+/-1080)		
Phosphorus in phosphate		U	721	U	721	ug/Kg	N/A				
Sulfate		B	3920	B	3970	ug/Kg	1.12	^	(+/-4310)		
QC1203458977	LCS										
Chloride	50000			47600	ug/Kg		95.2	(70%-130%)		12/24/15	08:24
Fluoride	25000			23600	ug/Kg		94.2	(70%-130%)			
Nitrate-N	25000			23600	ug/Kg		94.5	(70%-130%)			
Nitrite-N	25000			23700	ug/Kg		94.6	(70%-130%)			
Phosphorus in phosphate	12500			12300	ug/Kg		98.8	(70%-130%)			
Sulfate	100000			97100	ug/Kg		97.1	(70%-130%)			
QC1203458976	MB										
Chloride			U	668	ug/Kg					12/24/15	07:52
Fluoride			U	329	ug/Kg						

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1533389										
Nitrate-N			U	329	ug/Kg				MXL2	12/24/15	07:52
Nitrite-N			U	329	ug/Kg						
Phosphorus in phosphate			U	668	ug/Kg						
Sulfate			U	1330	ug/Kg						
QC1203458979 388008002 MS											
Chloride	53800	B	1740	51700	ug/Kg		92.8	(48%-145%)		12/24/15	09:59
Fluoride	26900		1770	25500	ug/Kg		88	(30%-135%)			
Nitrate-N	26900		3000	28500	ug/Kg		94.7	(70%-125%)			
Nitrite-N	26900	B	401	26100	ug/Kg		95.6	(70%-120%)			
Phosphorus in phosphate	13500	U	721	9970	ug/Kg		70.3	(35%-134%)			
Sulfate	108000	B	3920	108000	ug/Kg		96.8	(45%-162%)			

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

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QC Summary

Workorder: 388008

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<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>
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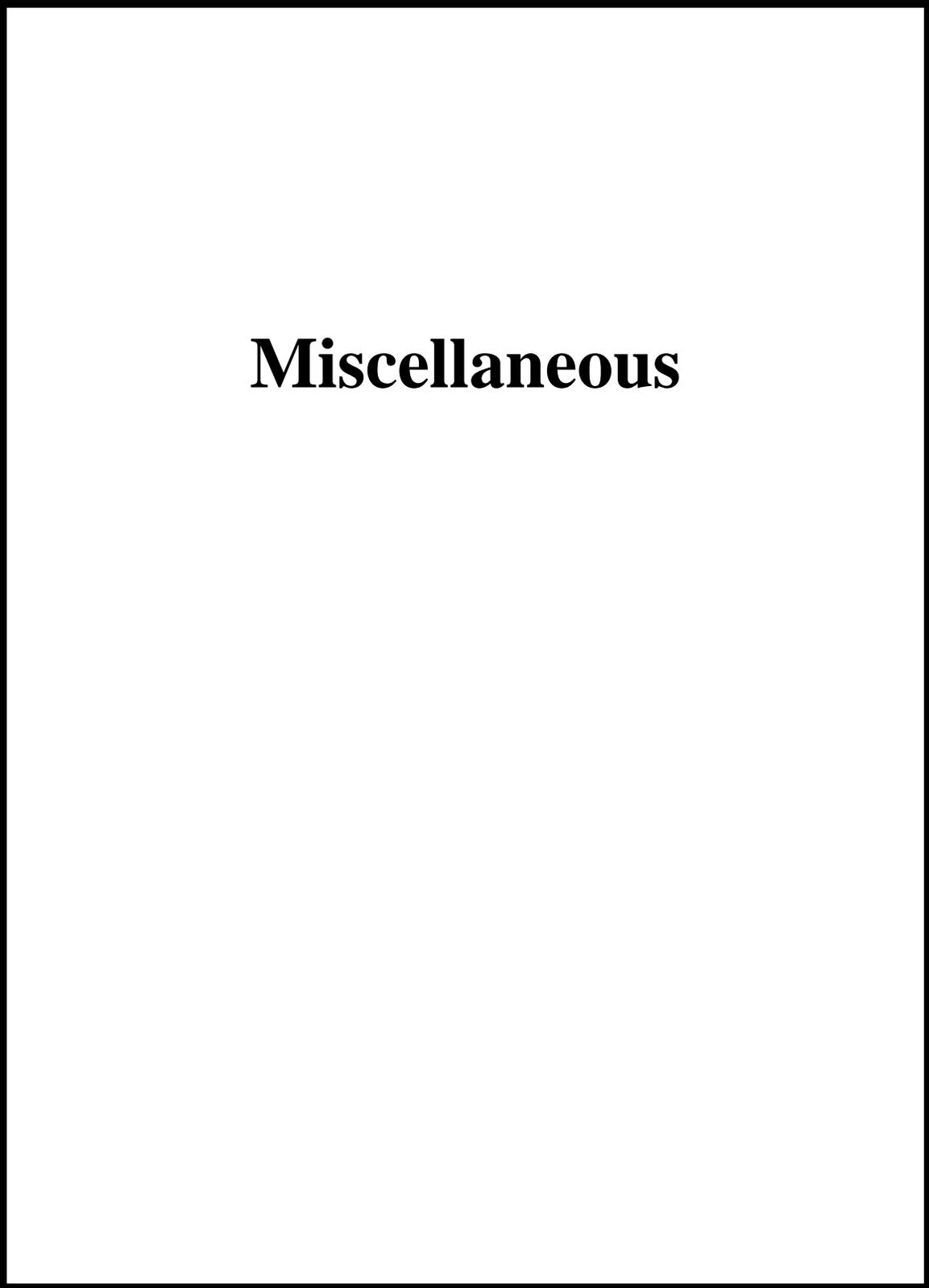
N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ 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.



Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 29-DEC-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Solid	Client Code: CPRC
Batch ID: 1533389	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 388008(GEL388008)			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample received out of holding: 388008 002 QC 1203458978DUP,1203458979MS		1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203458978 (B33MF1DUP) [Received 23-DEC-15, out of holding 16-DEC-15]. 1203458979 (B33MF1MS) [Received 23-DEC-15, out of holding 16-DEC-15]. 388008002 (B33MF1) [Received 23-DEC-15, out of holding 16-DEC-15].	

Originator's Name:
Marcy Lamb 29-DEC-15

Data Validator/Group Leader:
Thomas Lewis 05-JAN-16

DATA EXCEPTION REPORT			
Mo.Day Yr. 31-DEC-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: SW846 9012B	Matrix Type: Solid	Client Code: CPRC
Batch ID: 1534435	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 388008(GEL388008)			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample received out of holding: 388008 001		1. Sample (See Below) was received by the laboratory outside of the method specified holding time. The data is qualified. 388008001 (B33MF0) [Received 23-DEC-15, out of holding 02-DEC-15].	

Originator's Name:
Aubrey Kingsbury 31-DEC-15

Data Validator/Group Leader:
Kristen Mizzell 04-JAN-16

Radiological Analysis

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL388008
Work Order #: 388008

Method/Analysis Information

Product: AMCMISO_EIE_PRECIP_AEA: COMMON
Analytical Method: AMCMISO_EIE_PREC_AEA
Prep Method: Dry Soil Prep
Analytical Batch Number: 1533676
Prep Batch Number: 1533674

Sample ID	Client ID
388008001	B33MF0
1203459730	Method Blank (MB)
1203459732	Laboratory Control Sample (LCS)
1203459731	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" 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# 26.

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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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: PUIISO_PRECIP_AEA:COMMON
Analytical Method: PUIISO_PLATE_AEA
Prep Method: Dry Soil Prep
Analytical Batch Number: 1533677
Prep Batch Number: 1533674

Sample ID	Client ID
388008001	B33MF0
1203459733	Method Blank (MB)
1203459735	Laboratory Control Sample (LCS)
1203459734	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" 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# 26.

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.

QC Information

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

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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: UIISO_IE_PRECIP_AEA:COMMON

Analytical Method: UIISO_IE_PRECIP_AEA

Prep Method: Dry Soil Prep

Analytical Batch Number: 1533679

Prep Batch Number: 1533674

Sample ID	Client ID
388008001	B33MF0
1203459736	Method Blank (MB)
1203459738	Laboratory Control Sample (LCS)
1203459737	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" 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# 26.

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.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The U-238 Method

blank 1203459736 result is greater than the MDC but less than the detection limit and the MDC plus the Uncertainty.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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 1203459736 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

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:	NP237_IE_PRECIP_AEA: COMMON
Analytical Method:	ASTM C 1476-00 Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1533680
Prep Batch Number:	1533674

Sample ID	Client ID
388008001	B33MF0

1203459739 Method Blank (MB)
1203459741 Laboratory Control Sample (LCS)
1203459740 388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-032 REV# 20.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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

Procedure: Dry Weight-Percent Moisture

Analytical Method: ASTM D 2216 (Modified)

Analytical Batch Number: 1533673

Sample ID	Client ID
388008001	B33MF0
1203459726	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was 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-OA-E-020 REV# 10.

Calibration Information:

Quality Control (QC) Information:

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

Technical Information:

Holding Time

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

Miscellaneous Information:

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Procedure: Dry Weight-Percent Moisture

Analytical Method: ASTM D 2216 (Modified)

Analytical Batch Number: 1533719

Sample ID	Client ID
388008002	B33MF1
1203459824	388124001(2015-7349/RB-005-S06) Sample Duplicate (DUP)

Sample 388008 002 in this SDG was 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-OA-E-020 REV# 10.

Calibration Information:**Quality Control (QC) Information:****Designated QC**

The following sample was used for QC: 388124001 (2015-7349/RB-005-S06).

Technical Information:**Holding Time**

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

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

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GAMMA_GS:COMMON
 Analytical Method: GAMMA_GS
 Prep Method: Dry Soil Prep
 Analytical Batch Number: 1533675
 Prep Batch Number: 1533674

Sample ID	Client ID
388008001	B33MF0
1203459727	Method Blank (MB)
1203459729	Laboratory Control Sample (LCS)
1203459728	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" 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.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The blank, 1203459727 (MB), did not meet the detection limit for Cs-137 due to keeping the blank aliquot consistent with the other samples. All other samples met the detection limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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: SRTOT_SEP_PRECIP_GPC
 Prep Method: Dry Soil Prep
 Analytical Batch Number: 1533681
 Prep Batch Number: 1533674

Sample ID	Client ID
388008001	B33MF0
1203459742	Method Blank (MB)
1203459744	Laboratory Control Sample (LCS)
1203459743	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" 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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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

Samples 1203459742 (MB), 1203459743 (B33MF0DUP) and 388008001 (B33MF0) 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.

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: NI63_LSC: COMMON
Analytical Method: NI63_LSC
Prep Method: Dry Soil Prep
Analytical Batch Number: 1533682
Prep Batch Number: 1533674

Sample ID	Client ID
388008001	B33MF0
1203459745	Method Blank (MB)
1203459747	Laboratory Control Sample (LCS)
1203459746	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was analyzed on a "dry weight corrected" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-022 REV# 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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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: TC99_EIE_LSC: COMMON
 Analytical Method: TC99_EIE_LSC
 Analytical Batch Number: 1533683

Sample ID	Client ID
388008001	B33MF0
1203459748	Method Blank (MB)
1203459750	Laboratory Control Sample (LCS)
1203459749	388008001(B33MF0) Sample Duplicate (DUP)

Sample 388008 001 in this SDG was 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# 5.

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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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 due to low recovery. 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.

Method/Analysis Information

Product:	TRITIUM_DIST_LSC: COMMON
Analytical Method:	TRITIUM_DIST_LSC
Analytical Batch Number:	1533684

Sample ID	Client ID
388008001	B33MF0
1203463037	Method Blank (MB)
1203463039	Laboratory Control Sample (LCS)
1203463038	388008001(B33MF0) Sample Duplicate (DUP)
1203463206	388008001(B33MF0) Matrix Spike (MS)

Sample 388008 001 in this SDG was 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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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

The matrix spike, 1203463206 (B33MF0MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: C14_LSC: COMMON

Analytical Method: C14_LSC

Analytical Batch Number: 1533685

Sample ID	Client ID
388008001	B33MF0
1203459755	Method Blank (MB)
1203459758	Laboratory Control Sample (LCS)
1203459756	388008001(B33MF0) Sample Duplicate (DUP)
1203459757	388008001(B33MF0) Matrix Spike (MS)

Sample 388008 001 in this SDG was 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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 388008001 (B33MF0).

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 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.

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: GEL388008 GEL Work Order: 388008

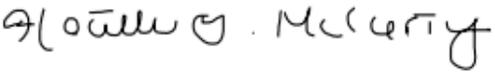
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Heather McCarty

Date: 07 JAN 2016

Title: Analyst II

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008
Lab Sample ID: 388008001

Client: CPRC001
Date Collected: 11/18/2015 09:00
Date Received: 12/23/2015 11:10

Project: CPRC0F15011
Matrix: SOIL
%Moisture: 7.4

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0		Prep Basis: "Dry Weight Corrected"
Batch ID: 1533675	Method: GAMMA_GS	SOP Ref: GL-RAD-A-013
Run Date: 12/30/2015 08:03	Analyst: JXC5	Instrument: WELL
Data File: G388008001.CNF;1	Aliquot: 22.6003 g	Count Time: 240 min
Prep Batch: 1533675	Prep Method: DOE HASL 300, 4.5.2.3/Ga-01	Prep SOP Ref: GL-RAD-A-021
Prep Date: 12/30/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I0045-97-3	Cesium-137		21200	pCi/g	+/-56.8	1780	9.07	0.100
I0198-40-0	Cobalt-60	U	0.721	pCi/g	+/-1.25	1.30	2.10	
I4683-23-9	Europium-152	U	-0.943	pCi/g	+/-25.0	25.0	42.2	
I5585-10-1	Europium-154	U	1.51	pCi/g	+/-2.49	2.58	4.87	
I4391-16-3	Europium-155	U	-5.12	pCi/g	+/-17.0	17.2	28.2	

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0		Prep Basis: "Dry Weight Corrected"
Batch ID: 1533676	Method: AMCMISO_EIE_PREC_AEA	SOP Ref: GL-RAD-A-011
Run Date: 01/06/2016 13:59	Analyst: JXC5	Instrument: 1214
Data File: S0388008001_AM.1A.gcnf	Aliquot: 0.05368 g	Count Time: 240 min
Prep Batch: 1533676	Prep Method: DOE EML HASL-300, Am-05	Prep SOP Ref: GL-RAD-A-021
Prep Date: 01/04/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.213	pCi/g	+/-0.489	0.490	0.775	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	38.4	39.8	pCi/g	96.5	(20%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0		Prep Basis: "Dry Weight Corrected"
Batch ID: 1533677	Method: PUIISO_PLATE_AEA	SOP Ref: GL-RAD-A-011
Run Date: 01/06/2016 13:59	Analyst: JXC5	Instrument: 1210
Data File: S0388008001_PU.1A.gcnf	Aliquot: 0.05368 g	Count Time: 240 min
Prep Batch: 1533677	Prep Method: DOE EML HASL-300, Pu-11-	Prep SOP Ref: GL-RAD-A-021
Prep Date: 01/04/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	0.261	pCi/g	+/-0.512	0.514	0.710	1.00
OER-100-70	Plutonium-239/240	U	0.414	pCi/g	+/-0.670	0.674	1.04	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-236 Tracer	22.7	24.4	pCi/g	93.2	(20%-105%)

Comments:

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

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0	Method: UIISO_IE_PRECIP_AEA	Prep Basis: "Dry Weight Corrected"
Batch ID: 1533679	Analyst: JXC5	SOP Ref: GL-RAD-A-011
Run Date: 01/05/2016 14:02	Aliquot: 0.05368 g	Instrument: 1126
Data File: S0388008001_UU.1A.genf	Prep Method: DOE EML HASL-300, U-02-R	Count Time: 505 min
Prep Batch: 1533679		Prep SOP Ref: GL-RAD-A-021
Prep Date: 01/04/2016 00:00		

CAS No.	Parname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234		1.34	pCi/g	+/-0.714	0.732	0.649	1.00
15117-96-1/13982-7	Uranium-235/236		0.503	pCi/g	+/-0.493	0.497	0.302	1.00
7440-61-1	Uranium-238		1.42	pCi/g	+/-0.705	0.725	0.478	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	31.5	39.1	pCi/g	80.5	(20%-105%)

Comments:

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

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0	Method: ASTM C 1476-00 Modified	Prep Basis: "Dry Weight Corrected"
Batch ID: 1533680	Analyst: JXC5	SOP Ref: GL-RAD-A-032
Run Date: 01/05/2016 18:21	Aliquot: 0.05368 g	Instrument: 1233
Data File: S0388008001_NP.1A.gcnf	Prep Method: ASTM C 1476-00 Modified	Count Time: 505 min
Prep Batch: 1533680		Prep SOP Ref: GL-RAD-A-021
Prep Date: 01/04/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	-0.0349	pCi/g	+/-0.278	0.278	0.627	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	3650	3740	pCi/g	97.4	(20%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0	Method: SRTOT_SEP_PRECIP_GPC	Prep Basis: "Dry Weight Corrected"
Batch ID: 1533681	Analyst: JXC5	SOP Ref: GL-RAD-A-004
Run Date: 01/06/2016 11:13	Aliquot: 0.10736 g	Instrument: PIC7B
Data File: S1533681r1.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 150 min
Prep Batch: 1533681		Prep SOP Ref: GL-RAD-A-021
Prep Date: 01/04/2016 00:00		

CAS No.	Parname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	-0.472	pCi/g	+/-0.982	0.983	1.93	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	8.00	9.34	mg	85.7	(30%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0		Prep Basis: "Dry Weight Corrected"
Batch ID: 1533682	Method: NI63_LSC	SOP Ref: GL-RAD-A-022
Run Date: 01/06/2016 10:39	Analyst: JXC5	Instrument: LSCGOLD
Data File: N1533682.xls	Aliquot: 0.10736 g	Count Time: 45 min
Prep Batch: 1533682	Prep Method: DOE RESL Ni-1, Modified	Prep SOP Ref: GL-RAD-A-021
Prep Date: 01/04/2016 00:00		

CAS No.	Parname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	-3.41	pCi/g	+/-11.6	11.6	20.2	30.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	22.7	24.4	mg	93	(30%-105%)

Comments:

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

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0		Prep Basis: "As Received"
Batch ID: 1533683	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 01/06/2016 05:51	Analyst: JXC5	Instrument: LSCGOLD
Data File: E1533683.xls	Aliquot: 0.5355 g	Count Time: 30 min
Prep Batch: 1533683	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 01/05/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-4.41	pCi/g	+/-5.73	5.73	10.1	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	2.76E+05	5.27E+05	CPM	52.4	(20%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0		Prep Basis: "As Received"
Batch ID: 1533684	Method: TRITIUM_DIST_LSC	SOP Ref: GL-RAD-A-002
Run Date: 01/05/2016 11:49	Analyst: JXC5	Instrument: LSCBLUE
Data File: T1533684.xls	Aliquot: 1.2168 g	Count Time: 15 min
Prep Batch: 1533684	Prep Method: EPA 906.0 Modified	
Prep Date: 01/05/2016 00:00		

CAS No.	Parname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-12.1	pCi/g	+/-14.4	14.4	27.6	30.0

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008	Client: CPRC001	Project: CPRC0F15011
Lab Sample ID: 388008001	Date Collected: 11/18/2015 09:00	Matrix: SOIL
	Date Received: 12/23/2015 11:10	%Moisture: 7.4
Client ID: B33MF0		Prep Basis: "As Received"
Batch ID: 1533685	Method: C14_LSC	SOP Ref: GL-RAD-A-003
Run Date: 01/06/2016 08:06	Analyst: JXC5	Instrument: LSCSILVER
Data File: C1533685R.xls	Aliquot: 0.5784 g	Count Time: 30 min
Prep Batch: 1533685	Prep Method: EPA EERF C-01 Modified	
Prep Date: 01/05/2016 00:00		

CAS No.	Parname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-0.992	pCi/g	+/-2.47	2.47	4.31	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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL388008
Lab Sample ID: 388008002

Client: CPRC001
Date Collected: 11/18/2015 09:00
Date Received: 12/23/2015 11:10

Project: CPRC0F15011
Matrix: SOIL
%Moisture: 7.4

Quality Control Data

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QC Summary

Report Date: January 7, 2016
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Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 388008

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1533675								
QC1203459727	MB								
Cesium-137			U	0.356	pCi/g			JXC5	12/30/1519:10
				Uncert: +/-1.13					
				TPU: +/-1.13					
Cobalt-60			U	0.0546	pCi/g				
				Uncert: +/-1.13					
				TPU: +/-1.13					
Europium-152			U	0.439	pCi/g				
				Uncert: +/-2.19					
				TPU: +/-2.20					
Europium-154			U	0.0909	pCi/g				
				Uncert: +/-2.04					
				TPU: +/-2.04					
Europium-155			U	-0.537	pCi/g				
				Uncert: +/-1.62					
				TPU: +/-1.64					
QC1203459728	388008001	DUP							
Cesium-137		21200		21100	pCi/g				12/30/1512:05
				Uncert: +/-56.8		RPD: 0 (0% - 20%)			
				TPU: +/-1780		RER: 0.0312 (0-2)			
Cobalt-60		U 0.721	U	0.860	pCi/g				
				Uncert: +/-1.25		RPD: 0 N/A			
				TPU: +/-1.30		RER: 0.151 (0-2)			
Europium-152		U -0.943	U	-2.97	pCi/g				
				Uncert: +/-25.0		RPD: 0 N/A			
				TPU: +/-25.0		RER: 0.113 (0-2)			
Europium-154		U 1.51	U	1.05	pCi/g				
				Uncert: +/-2.49		RPD: 0 N/A			
				TPU: +/-2.58		RER: 0.253 (0-2)			
Europium-155		U -5.12	U	-14.8	pCi/g				
				Uncert: +/-17.0		RPD: 0 N/A			
				TPU: +/-17.2		RER: 0.752 (0-2)			
QC1203459729	LCS								
Americium-241		1310		1260	pCi/g	REC: 96 (70%-130%)			12/31/1515:07
				Uncert: +/-18.0					
				TPU: +/-127					
Cesium-137		489		472	pCi/g	REC: 97 (70%-130%)			
				Uncert: +/-9.42					
				TPU: +/-40.7					
Cobalt-60		476		480	pCi/g	REC: 101 (70%-130%)			
				Uncert: +/-10.8					
				TPU: +/-41.8					
Europium-152			U	0.358	pCi/g				
				Uncert: +/-5.43					
				TPU: +/-5.43					

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
High Rad Testing										
Batch	1533675									
Europium-154			U	-0.0324	pCi/g					
				Uncert: +/-3.65						
				TPU: +/-3.65						
Europium-155			U	3.26	pCi/g					
				Uncert: +/-4.55						
				TPU: +/-4.79						
Batch	1533676									
QC1203459730 MB										
Americium-241			U	0.545	pCi/g			JXC5	01/06/1613:59	
				Uncert: +/-0.690						
				TPU: +/-0.694						
**Americium-243 Tracer	39.8			39.5	pCi/g	REC: 99	(20%-105%)			
				Uncert: +/-4.87						
				TPU: +/-7.37						
QC1203459731 388008001 DUP										
Americium-241		U	0.213	U	-0.173	pCi/g			01/06/1613:59	
				Uncert: +/-0.489		RPD: 0	N/A			
				TPU: +/-0.490		RER: 1.28	(0-2)			
**Americium-243 Tracer	39.8		38.4	39.7	pCi/g	REC: 100	(20%-105%)			
				Uncert: +/-4.63						
				TPU: +/-7.05						
QC1203459732 LCS										
Americium-241				36.7	37.9	pCi/g	REC: 103	(70%-130%)		01/06/1613:59
				Uncert: +/-4.52						
				TPU: +/-6.77						
**Americium-243 Tracer	39.8			38.6	38.6	pCi/g	REC: 97	(20%-105%)		
				Uncert: +/-4.61						
				TPU: +/-7.03						
Batch	1533677									
QC1203459733 MB										
Plutonium-238			U	1.00	pCi/g			JXC5	01/06/1613:59	
				Uncert: +/-0.977						
				TPU: +/-0.994						
Plutonium-239/240			U	-0.318	pCi/g					
				Uncert: +/-0.675						
				TPU: +/-0.675						
**Plutonium-236 Tracer	23.6			19.8	pCi/g	REC: 84	(20%-105%)			
				Uncert: +/-3.98						
				TPU: +/-5.84						
QC1203459734 388008001 DUP										
Plutonium-238		U	0.261	U	0.448	pCi/g			01/06/1613:59	
				Uncert: +/-0.512		RPD: 0	N/A			
				TPU: +/-0.514		RER: 0.416	(0-2)			
Plutonium-239/240		U	0.414	U	0.0071	pCi/g				
				Uncert: +/-0.670		RPD: 0	N/A			
				TPU: +/-0.674		RER: 0.933	(0-2)			
**Plutonium-236 Tracer	24.4		22.7	18.4	pCi/g	REC: 76	(20%-105%)			
				Uncert: +/-3.80						
				TPU: +/-5.61						
QC1203459735 LCS										

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
High Rad Testing										
Batch	1533677									
Plutonium-238			U	0.215	pCi/g					
				Uncert: +/-0.603						
				TPU: +/-0.605						
Plutonium-239/240	36.7			45.1	pCi/g	REC: 123	(70%-130%)			
				Uncert: +/-6.13						
				TPU: +/-10.9						
**Plutonium-236 Tracer	23.6			15.1	pCi/g	REC: 64	(20%-105%)			
				Uncert: +/-4.44						
				TPU: +/-6.47						
Batch	1533679									
QC1203459736 MB										
Uranium-233/234			U	0.725	pCi/g			JXC5	01/06/1613:58	
				Uncert: +/-0.724						
				TPU: +/-0.731						
Uranium-235/236			U	0.299	pCi/g					
				Uncert: +/-0.587						
				TPU: +/-0.589						
Uranium-238				0.896	pCi/g					
				Uncert: +/-0.770						
				TPU: +/-0.780						
**Uranium-232 Tracer	39.0			38.0	pCi/g	REC: 97	(20%-105%)			
				Uncert: +/-4.59						
				TPU: +/-7.23						
QC1203459737 388008001 DUP										
Uranium-233/234		1.34		0.943	pCi/g				01/05/1614:02	
				Uncert: +/-0.714		RPD: 35	(0% - 100%)			
				TPU: +/-0.732		RER: 0.855	(0-2)			
Uranium-235/236		0.503	U	0.345	pCi/g					
				Uncert: +/-0.493		RPD: 37	(0% - 100%)			
				TPU: +/-0.497		RER: 0.49	(0-2)			
Uranium-238		1.42		1.15	pCi/g					
				Uncert: +/-0.705		RPD: 21	(0% - 100%)			
				TPU: +/-0.725		RER: 0.566	(0-2)			
**Uranium-232 Tracer	39.1	31.5		35.1	pCi/g	REC: 90	(20%-105%)			
				Uncert: +/-3.53						
				TPU: +/-5.93						
QC1203459738 LCS										
Uranium-233/234				47.0	pCi/g				01/05/1614:02	
				Uncert: +/-3.45						
				TPU: +/-6.36						
Uranium-235/236				3.40	pCi/g					
				Uncert: +/-1.04						
				TPU: +/-1.11						
Uranium-238	50.6			41.9	pCi/g	REC: 83	(70%-130%)			
				Uncert: +/-3.26						
				TPU: +/-5.77						
**Uranium-232 Tracer	39.0			36.8	pCi/g	REC: 94	(20%-105%)			
				Uncert: +/-3.16						
				TPU: +/-5.50						
Batch	1533680									

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
High Rad Testing										
Batch	1533680									
QC1203459739 MB										
Neptunium-237			U	0.094	pCi/g			JXC5	01/05/1618:22	
				Uncert: +/-0.278						
				TPU: +/-0.278						
**Americium-243 Tracer	3740			3770	pCi/g	REC: 101	(20%-105%)			
QC1203459740 388008001 DUP										
Neptunium-237		U	-0.0349	U	-0.16				01/05/1618:22	
				Uncert: +/-0.278		RPD: 0	N/A			
				TPU: +/-0.278		RER: 0.61	(0-2)			
**Americium-243 Tracer	3740		3650	3750	pCi/g	REC: 100	(20%-105%)			
QC1203459741 LCS										
Neptunium-237	80.3			78.6	pCi/g	REC: 98	(70%-130%)		01/05/1618:22	
				Uncert: +/-4.75						
				TPU: +/-10.1						
**Americium-243 Tracer	3740			3750	pCi/g	REC: 100	(20%-105%)			
Batch	1533681									
QC1203459742 MB										
Total Strontium			U	-1.19	pCi/g			JXC5	01/06/1611:13	
				Uncert: +/-0.936						
				TPU: +/-0.936						
**Strontium Carrier	9.34			7.50	mg	REC: 80	(30%-105%)			
QC1203459743 388008001 DUP										
Total Strontium		U	-0.472	U	-0.802				01/06/1611:14	
				Uncert: +/-0.982		RPD: 0	N/A			
				TPU: +/-0.983		RER: 0.477	(0-2)			
**Strontium Carrier	9.34		8.00	7.80	mg	REC: 84	(30%-105%)			
QC1203459744 LCS										
Total Strontium	1010			1130	pCi/g	REC: 113	(70%-130%)		01/05/1614:32	
				Uncert: +/-29.0						
				TPU: +/-295						
**Strontium Carrier	9.34			7.10	mg	REC: 76	(30%-105%)			
Batch	1533682									
QC1203459745 MB										
Nickel-63			U	-5.28	pCi/g			JXC5	01/06/1611:26	
				Uncert: +/-12.2						
				TPU: +/-12.2						
**Nickel Carrier	24.4			21.4	mg	REC: 88	(30%-105%)			
QC1203459746 388008001 DUP										
Nickel-63		U	-3.41	U	-3.56				01/06/1612:12	
				Uncert: +/-11.6		RPD: 0	N/A			
				TPU: +/-11.6		RER: 0.0178	(0-2)			
**Nickel Carrier	24.4		22.7	21.6	mg	REC: 89	(30%-105%)			
QC1203459747 LCS										
Nickel-63	1260			1180	pCi/g	REC: 94	(70%-130%)		01/06/1612:59	
				Uncert: +/-33.5						
				TPU: +/-231						
**Nickel Carrier	24.4			21.4	mg	REC: 88	(30%-105%)			
Batch	1533683									
QC1203459748 MB										

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
High Rad Testing										
Batch	1533683									
Technetium-99			U	-3.65	pCi/g			JXC5	01/06/1606:23	
				Uncert: +/-4.19						
				TPU: +/-4.19						
**Technetium-99m Tracer	5.27E+05			3.41E+05	CPM	REC: 65	(20%-105%)			
QC1203459749	388008001	DUP								
Technetium-99		U	-4.41	U	-0.939	pCi/g			01/06/1606:56	
				Uncert: +/-5.73		RPD: 0	N/A			
				TPU: +/-5.73		RER: 0.957	(0-2)			
**Technetium-99m Tracer	5.27E+05	2.76E+05		3.46E+05	CPM	REC: 66	(20%-105%)			
QC1203459750	LCS									
Technetium-99	147			107	pCi/g	REC: 73	(70%-130%)		01/06/1607:28	
				Uncert: +/-6.84						
				TPU: +/-14.0						
**Technetium-99m Tracer	5.27E+05			3.43E+05	CPM	REC: 65	(20%-105%)			
Batch	1533684									
QC1203463037	MB									
Tritium			U	-18.1	pCi/g			JXC5	01/05/1612:05	
				Uncert: +/-13.9						
				TPU: +/-13.9						
QC1203463038	388008001	DUP								
Tritium		U	-12.1	U	-11.3	pCi/g			01/05/1612:21	
				Uncert: +/-14.4		RPD: 0	N/A			
				TPU: +/-14.4		RER: 0.0758	(0-2)			
QC1203463039	LCS									
Tritium	98.2			90.4	pCi/g	REC: 92	(70%-130%)		01/05/1612:54	
				Uncert: +/-21.3						
				TPU: +/-29.5						
QC1203463206	388008001	MS								
Tritium	125	U	-12.1		107	pCi/g	REC: 86	(60%-140%)	01/05/1612:38	
				Uncert: +/-14.4						
				TPU: +/-14.4						
Batch	1533685									
QC1203459755	MB									
Carbon-14			U	0.769	pCi/g			JXC5	01/06/1608:38	
				Uncert: +/-2.52						
				TPU: +/-2.52						
QC1203459756	388008001	DUP								
Carbon-14		U	-0.992	U	-0.719	pCi/g			01/06/1609:10	
				Uncert: +/-2.47		RPD: 0	N/A			
				TPU: +/-2.47		RER: 0.151	(0-2)			
QC1203459757	388008001	MS								
Carbon-14	144	U	-0.992		147	pCi/g	REC: 102	(60%-140%)	01/06/1609:41	
				Uncert: +/-2.47						
				TPU: +/-2.47						
QC1203459758	LCS									
Carbon-14	131			131	pCi/g	REC: 100	(70%-130%)		01/06/1610:00	
				Uncert: +/-6.89						
				TPU: +/-11.8						

Notes:

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QC Summary

Workorder: 388008

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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
- < 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 $\geq 2X$ 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.
- 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.