



September 28, 2015

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

Re: CHPRC SAF I15-038
Work Order: 380517
SDG: GEL380517

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 03, 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,

Sarah Edwards for
Heather Shaffer
Project Manager

Purchase Order: 300071JDBA 7H
Chain of Custody: I15-038-162 and I15-038-163
Enclosures



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Case Narrative

September 30, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF I15-038
SDG: GEL380517

September 28, 2015

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on September 03, 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
380517001	B32BF2
380517002	B32BF1
380517003	B32BF3

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.

September 30, 2015

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: General Chemistry, Metals and Radiochemistry.

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



Sarah Edwards for
Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# **I15-038-163**
Page 1 of 1

Collector: **D.J. Woehle/CHPRC**
SAF No.: **I15-038**
Telephone No.: **509-376-4650**

Project Title: **100NR2, SEPTEMBER 2015**
Sampling Origin: **Hanford Site**
Purchase Order/Charge Code: **300071**

Shipped To (Lab): **GEL Laboratories, LLC**
Logbook No.: **HNF-N-506.75177**
Ice Chest No.: **GWS-429**

Protocol: **CERCLA**
Method of Shipment: **Commercial Carrier**
Bill of Lading/Air Bill No.: **7744 22009118**

Priority: **30 Days**
Offsite Property No.: **5933**

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

SPECIAL INSTRUCTIONS
Hold Time: _____
Total Activity Exemption: Yes No

Sample No.	Filter	*	Date	Time	Nov/Type Container	Sample Analysis	Holding Time	Preservative
B32BF2	N	W	9/1/15	1205	1x250-mL G/P	9056_ANIONS_IC: COMMON	28 Days/48 Hours	Cool <=6C

Relinquished By D.J. Woehle/CHPRC	Print <i>D.J. Woehle</i>	Sign <i>D.J. Woehle</i>	Date/Time SEP 01 2015 1530	Received By SSU-1	Print SSU-1	Sign SSU-1	Date/Time SEP 01 2015	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By SSU-1	Print <i>B.E. Briggs</i>	Sign <i>B.E. Briggs</i>	Date/Time SEP 02 2015 0800	Received By B.E. Briggs CHPRC	Print <i>B.E. Briggs</i>	Sign <i>B.E. Briggs</i>	Date/Time SEP 02 2015 0830	
Relinquished By B.E. Briggs CHPRC	Print <i>B.E. Briggs</i>	Sign <i>B.E. Briggs</i>	Date/Time SEP 02 2015 1400	Received By FEDEX	Print FEDEX	Sign FEDEX	Date/Time SEP 02 2015 1400	
Relinquished By FEDEX	Print <i>FEDEX</i>	Sign <i>FEDEX</i>	Date/Time SEP 02 2015 1400	Received By M. Kinslow	Print <i>M. Kinslow</i>	Sign <i>M. Kinslow</i>	Date/Time 9-3-15 0855	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)						Disposed By	Date/Time

September 30, 2015

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
380517

C.O.C.# **I15-038-162**
Page 1 of 1

Collector: **D.J. Woehle/CHPRC**

Contact/Requester: **Karen Waters-Husted**

Telephone No.: **509-376-4650**

SAF No.: **I15-038**

Sampling Origin: **Hanford Site**

Purchase Order/Charge Code: **300071**

Project Title: **100NR2, SEPTEMBER 2015**

Logbook No.: **HNF-N-506 75177**

Ice Chest No.: **GWS-4281**

Shipped To (Lab): **GEL Laboratories, LLC**

Method of Shipment: **Commercial Carrier**

Protocol: **CERCLA**

Priority: **30 Days**

Bill of Lading/Air-Bill No.: **7744 2200 9118**

Offsite Property No.: **5933**

Total Activity Exemption: Yes No

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

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B32BF1	N	W	9.1.15	1205	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B32BF1	N	W			1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B32BF1	N	W			2x1-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B32BF1	N	W			1x4-L G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B32BF1	N	W			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B32BF1	N	W			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B32BF3	Y	W	9.1.15	1205	1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2

Relinquished By D.J. Woehle/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By SSU-1	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time SEP 01 2015 1550	Date/Time SEP 01 2015 1550
Relinquished By SSU-1	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By B.E. Briggs/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time SEP 02 2015 0730	Date/Time SEP 02 2015 0730
Relinquished By B.E. Briggs/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By FEDEX	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time SEP 02 2015 0730	Date/Time SEP 02 2015 0730
Relinquished By [Signature]	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By M. Kuslow	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 9-30-15 0835	Date/Time 9-30-15 0835

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

FINAL SAMPLE DISPOSITION

PRINTED ON 8/3/2015

FSR ID = FSR3232

A-6004-842 (REV 2)

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>380577</u>
Received By: <u>MK</u>		Date Received: <u>9-3-15</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>CPRC</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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 type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>E 4092044932</u> Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH:
6	Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Preservation added, Lot#: Sample ID's and containers affected:
7	VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9	Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <input checked="" type="checkbox"/> FedEx Air <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>77442200 9118</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: **CPRC**

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

Project Specific Qualifier Definitions for GEL Client Code: **CPRC**

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

Laboratory Certifications

List of current GEL Certifications as of 28 September 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-18
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

September 30, 2015

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL380517

Work Order #: 380517

Sample ID	Client ID
380517002	B32BF1
380517003	B32BF3
1203386998	Method Blank (MB)ICP
1203386999	Laboratory Control Sample (LCS)
1203387002	380517002(B32BF1L) Serial Dilution (SD)
1203387000	380517002(B32BF1S) Matrix Spike (MS)
1203387001	380517002(B32BF1SD) Matrix Spike Duplicate (MSD)
1203387048	Method Blank (MB)ICP-MS
1203387049	Laboratory Control Sample (LCS)
1203387052	380517002(B32BF1L) Serial Dilution (SD)
1203387050	380517002(B32BF1S) Matrix Spike (MS)
1203387051	380517002(B32BF1SD) Matrix Spike Duplicate (MSD)

Sample Analysis

Samples 380517 002 and 003 in this SDG were analyzed for metals on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1505264 and 1505286
Prep Batch :	1505262 and 1505285
Standard Operating Procedures:	GL-MA-E-013 REV# 24, GL-MA-E-006 REV# 12 and GL-MA-E-014 REV# 26
Analytical Method:	6010_METALS_ICP and 6020_METALS_ICPMS
Prep Method :	SW846 3005A

Preparation/Analytical Method Verification

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

System Configuration

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

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 method blanks (MB) analyzed with this SDG met the acceptance criteria. However, tin was greater than the MDL. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203387048 (MB)-ICP-MS.

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: 380517002 (B32BF1)-ICP and ICP-MS.

Matrix Spike (MS/MSD) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

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 was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Certification Statement

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

September 30, 2015

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL380517 GEL Work Order: 380517

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

N Spike Sample recovery is outside control limits.

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 30 SEP 2015

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL380517

METHOD TYPE: SW846

SAMPLE ID: 380517002

CLIENT ID: B32BF1

CONTRACT: CPRC0115038

MATRIX: WATER

DATE RECEIVED 03-SEP-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7429-90-5	Aluminum	15	ug/L	U		MS	15	1	ICPMS12	150916-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	150916-2
7440-38-2	Arsenic	5.09	ug/L			MS	1.7	1	ICPMS12	150916-2
7440-39-3	Barium	37.5	ug/L			MS	0.6	1	ICPMS12	150917-3
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	150917-3
7440-42-8	Boron	20	ug/L	B		P	15	1	OPTIMA3	090915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	150916-2
7440-70-2	Calcium	50600	ug/L			P	50	1	OPTIMA3	090915-1
7440-47-3	Chromium	15.5	ug/L			MS	2	1	ICPMS12	150916-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	150916-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	150916-2
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	090915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	150916-2
7439-95-4	Magnesium	14200	ug/L			P	110	1	OPTIMA3	090915-1
7439-96-5	Manganese	1	ug/L	U		MS	1	1	ICPMS12	150916-2
7439-98-7	Molybdenum	1.94	ug/L			MS	0.165	1	ICPMS12	150917-3
7440-02-0	Nickel	2.23	ug/L			MS	0.5	1	ICPMS12	150916-2
7440-09-7	Potassium	4030	ug/L			P	50	1	OPTIMA3	090915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	150917-4
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS12	150916-2
7440-23-5	Sodium	8850	ug/L			P	100	1	OPTIMA3	090915-1
7440-24-6	Strontium	360	ug/L			MS	2	1	ICPMS12	150916-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	150916-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	150916-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	150917-3
7440-61-1	Uranium	1.86	ug/L			MS	0.067	1	ICPMS12	150916-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL380517

METHOD TYPE: SW846

SAMPLE ID: 380517002

CLIENT ID: B32BF1

CONTRACT: CPRC0115038

MATRIX: WATER

DATE RECEIVED 03-SEP-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7440-62-2	Vanadium	13.9	ug/L			P	1	1	OPTIMA3	090915-1
7440-66-6	Zinc	3.5	ug/L	U		MS	3.5	1	ICPMS12	150916-2

*Analytical Methods:

P SW846 3005A/6010C
MS SW846 3005A/6020A

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL380517

METHOD TYPE: SW846

SAMPLE ID: 380517003

CLIENT ID: B32BF3

CONTRACT: CPRC0115038

MATRIX: WATER

DATE RECEIVED 03-SEP-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7429-90-5	Aluminum	15	ug/L	U		MS	15	1	ICPMS12	150916-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	150916-2
7440-38-2	Arsenic	5.03	ug/L			MS	1.7	1	ICPMS12	150916-2
7440-39-3	Barium	36.9	ug/L			MS	0.6	1	ICPMS12	150917-3
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	150917-3
7440-42-8	Boron	19.9	ug/L	B		P	15	1	OPTIMA3	090915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	150916-2
7440-70-2	Calcium	51700	ug/L			P	50	1	OPTIMA3	090915-1
7440-47-3	Chromium	10.6	ug/L			MS	2	1	ICPMS12	150916-2
7440-48-4	Cobalt	0.147	ug/L	B		MS	0.1	1	ICPMS12	150916-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	150916-2
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	090915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	150916-2
7439-95-4	Magnesium	14500	ug/L			P	110	1	OPTIMA3	090915-1
7439-96-5	Manganese	1	ug/L	U		MS	1	1	ICPMS12	150916-2
7439-98-7	Molybdenum	1.83	ug/L			MS	0.165	1	ICPMS12	150917-3
7440-02-0	Nickel	1.27	ug/L	B		MS	0.5	1	ICPMS12	150916-2
7440-09-7	Potassium	4140	ug/L			P	50	1	OPTIMA3	090915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	150917-4
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS12	150916-2
7440-23-5	Sodium	9000	ug/L			P	100	1	OPTIMA3	090915-1
7440-24-6	Strontium	345	ug/L			MS	2	1	ICPMS12	150916-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	150916-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	150916-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	150917-3
7440-61-1	Uranium	1.82	ug/L			MS	0.067	1	ICPMS12	150916-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL380517

METHOD TYPE: SW846

SAMPLE ID: 380517003

CLIENT ID: B32BF3

CONTRACT: CPRC0115038

MATRIX: WATER

DATE RECEIVED 03-SEP-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7440-62-2	Vanadium	13.9	ug/L			P	1	1	OPTIMA3	090915-1
7440-66-6	Zinc	3.5	ug/L	U		MS	3.5	1	ICPMS12	150916-2

*Analytical Methods:

P SW846 3005A/6010C
MS SW846 3005A/6020A

Quality Control Summary

September 30, 2015
GEL LABORATORIES LLC

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

QC Summary

Report Date: September 30, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 380517

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1505286										
QC1203387049	LCS										
Aluminum	2000			2040	ug/L		102	(80%-120%)	BAJ	09/16/15	17:53
Antimony	50.0			50.8	ug/L		102	(80%-120%)			
Arsenic	50.0			52.3	ug/L		105	(80%-120%)			
Barium	50.0			50.2	ug/L		100	(80%-120%)		09/17/15	14:28
Beryllium	50.0			59.2	ug/L		118	(80%-120%)			
Cadmium	50.0			50.2	ug/L		100	(80%-120%)		09/16/15	17:53
Chromium	50.0			47.9	ug/L		95.8	(80%-120%)			
Cobalt	50.0			47.1	ug/L		94.2	(80%-120%)			
Copper	50.0			50.2	ug/L		100	(80%-120%)			
Lead	50.0			50.1	ug/L		100	(80%-120%)			
Manganese	50.0			48.9	ug/L		97.7	(80%-120%)			
Molybdenum	50.0			51.1	ug/L		102	(80%-120%)		09/17/15	14:28
Nickel	50.0			48.4	ug/L		96.8	(80%-120%)		09/16/15	17:53
Selenium	50.0			52.8	ug/L		106	(80%-120%)		09/17/15	15:39
Silver	50.0			48.9	ug/L		97.7	(80%-120%)		09/16/15	17:53
Strontium	50.0			51.6	ug/L		103	(80%-120%)			
Thallium	50.0			47.4	ug/L		94.8	(80%-120%)			
Thorium	50.0			48.4	ug/L		96.9	(80%-120%)			
Tin	50.0			52.3	ug/L		105	(80%-120%)		09/17/15	14:28
Uranium	50.0			50.7	ug/L		101	(80%-120%)		09/16/15	17:53

September 30, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 380517

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1505286										
Zinc	50.0			48.1	ug/L		96.2	(80%-120%)	BAJ	09/16/15	17:53
QC1203387048	MB										
Aluminum			U	ND	ug/L					09/16/15	17:50
Antimony			U	ND	ug/L						
Arsenic			U	ND	ug/L						
Barium			U	ND	ug/L					09/17/15	14:26
Beryllium			U	ND	ug/L						
Cadmium			U	ND	ug/L					09/16/15	17:50
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Lead			U	ND	ug/L						
Manganese			U	ND	ug/L						
Molybdenum			U	ND	ug/L					09/17/15	14:26
Nickel			U	ND	ug/L					09/16/15	17:50
Selenium			U	ND	ug/L					09/17/15	15:37
Silver			U	ND	ug/L					09/16/15	17:50
Strontium			U	ND	ug/L						
Thallium			U	ND	ug/L						
Thorium			U	ND	ug/L						
Tin			B	2.61	ug/L					09/17/15	14:26
Uranium			U	ND	ug/L					09/16/15	17:50

September 30, 2015
GEL LABORATORIES LLC

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QC Summary

Workorder: **380517**

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1505286										
Zinc			U	ND	ug/L				BAJ	09/16/15	17:50
QC1203387050	380517002	MS									
Aluminum	2000	U	ND	1990	ug/L		99.1	(75%-125%)		09/16/15	18:00
Antimony	50.0	U	ND	51.9	ug/L		102	(75%-125%)			
Arsenic	50.0		5.09	57.0	ug/L		104	(75%-125%)			
Barium	50.0		37.5	85.8	ug/L		96.5	(75%-125%)		09/17/15	14:32
Beryllium	50.0	U	ND	55.3	ug/L		111	(75%-125%)			
Cadmium	50.0	U	ND	49.1	ug/L		98.1	(75%-125%)		09/16/15	18:00
Chromium	50.0		15.5	62.2	ug/L		93.5	(75%-125%)			
Cobalt	50.0	U	ND	46.6	ug/L		93.1	(75%-125%)			
Copper	50.0	U	ND	47.7	ug/L		94.9	(75%-125%)			
Lead	50.0	U	ND	47.6	ug/L		95.3	(75%-125%)			
Manganese	50.0	U	ND	48.8	ug/L		96.8	(75%-125%)			
Molybdenum	50.0		1.94	54.0	ug/L		104	(75%-125%)		09/17/15	14:32
Nickel	50.0		2.23	48.1	ug/L		91.7	(75%-125%)		09/16/15	18:00
Selenium	50.0	U	ND	52.2	ug/L		102	(75%-125%)		09/17/15	15:42
Silver	50.0	U	ND	46.7	ug/L		93.4	(75%-125%)		09/16/15	18:00
Strontium	50.0		360	403	ug/L		N/A	(75%-125%)			
Thallium	50.0	U	ND	46.3	ug/L		92.6	(75%-125%)			
Thorium	50.0	U	ND	49.5	ug/L		98.2	(75%-125%)			
Tin	50.0	U	ND	52.5	ug/L		103	(75%-125%)		09/17/15	14:32
Uranium	50.0		1.86	53.0	ug/L		102	(75%-125%)		09/16/15	18:00

September 30, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: **380517**

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1505286										
Zinc	50.0	U	ND	47.9	ug/L		91	(75%-125%)	BAJ	09/16/15	18:00
QC1203387051	380517002 MSD										
Aluminum	2000	U	ND	2040	ug/L	2.45	102	(0%-20%)		09/16/15	18:03
Antimony	50.0	U	ND	52.5	ug/L	1.14	103	(0%-20%)			
Arsenic	50.0		5.09	56.8	ug/L	0.285	103	(0%-20%)			
Barium	50.0		37.5	87.4	ug/L	1.84	99.7	(0%-20%)		09/17/15	14:34
Beryllium	50.0	U	ND	54.7	ug/L	1.01	109	(0%-20%)			
Cadmium	50.0	U	ND	49.8	ug/L	1.44	99.5	(0%-20%)		09/16/15	18:03
Chromium	50.0		15.5	60.9	ug/L	2.02	91	(0%-20%)			
Cobalt	50.0	U	ND	45.9	ug/L	1.52	91.7	(0%-20%)			
Copper	50.0	U	ND	45.5	ug/L	4.61	90.6	(0%-20%)			
Lead	50.0	U	ND	47.3	ug/L	0.699	94.6	(0%-20%)			
Manganese	50.0	U	ND	47.5	ug/L	2.89	94	(0%-20%)			
Molybdenum	50.0		1.94	54.5	ug/L	0.926	105	(0%-20%)		09/17/15	14:34
Nickel	50.0		2.23	47.9	ug/L	0.344	91.4	(0%-20%)		09/16/15	18:03
Selenium	50.0	U	ND	53.6	ug/L	2.57	105	(0%-20%)		09/17/15	15:43
Silver	50.0	U	ND	48.0	ug/L	2.71	96	(0%-20%)		09/16/15	18:03
Strontium	50.0		360	408	ug/L	1.26	N/A	(0%-20%)			
Thallium	50.0	U	ND	45.9	ug/L	0.819	91.8	(0%-20%)			
Thorium	50.0	U	ND	49.1	ug/L	0.696	97.5	(0%-20%)			
Tin	50.0	U	ND	54.2	ug/L	3.27	106	(0%-20%)		09/17/15	14:34
Uranium	50.0		1.86	52.8	ug/L	0.317	102	(0%-20%)		09/16/15	18:03

September 30, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 380517

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1505286										
Zinc	50.0	U	ND		48.2	ug/L	0.768	91.7	(0%-20%)	BAJ	09/16/15 18:03
QC1203387052	380517002	SDILT									
Aluminum		U	ND DU	ND		ug/L	N/A		(0%-10%)		09/16/15 18:06
Antimony		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Arsenic			5.09 DU	ND		ug/L	N/A		(0%-10%)		
Barium			37.5 D	7.31		ug/L	2.51		(0%-10%)		09/17/15 14:36
Beryllium		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Cadmium		U	ND DU	ND		ug/L	N/A		(0%-10%)		09/16/15 18:06
Chromium			15.5 D	2.91		ug/L	5.86		(0%-10%)		
Cobalt		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Copper		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Lead		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Manganese		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Molybdenum			1.94 D	0.441		ug/L	13.4		(0%-10%)		09/17/15 14:36
Nickel			2.23 D	0.511		ug/L	14.7		(0%-10%)		09/16/15 18:06
Selenium		U	ND DU	ND		ug/L	N/A		(0%-10%)		09/17/15 15:45
Silver		U	ND DU	ND		ug/L	N/A		(0%-10%)		09/16/15 18:06
Strontium			360 D	66.3		ug/L	7.84		(0%-10%)		
Thallium		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Thorium		U	ND DU	ND		ug/L	N/A		(0%-10%)		
Tin		U	ND DU	ND		ug/L	N/A		(0%-10%)		09/17/15 14:36
Uranium			1.86 D	0.380		ug/L	2.15		(0%-10%)		09/16/15 18:06

September 30, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 380517

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1505286										
Zinc		U	ND DU	ND	ug/L	N/A		(0%-10%)	BAJ	09/16/15	18:06
Metals Analysis-ICP											
Batch	1505264										
QC1203386999	LCS										
Boron	500			513	ug/L		103	(80%-120%)	HSC	09/09/15	08:28
Calcium	5000			4970	ug/L		99.4	(80%-120%)			
Iron	5000			5160	ug/L		103	(80%-120%)			
Magnesium	5000			5250	ug/L		105	(80%-120%)			
Potassium	5000			5030	ug/L		101	(80%-120%)			
Sodium	5000			4980	ug/L		99.5	(80%-120%)			
Vanadium	500			506	ug/L		101	(80%-120%)			
QC1203386998	MB										
Boron			U	ND	ug/L					09/09/15	08:25
Calcium			U	ND	ug/L						
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Potassium			U	ND	ug/L						
Sodium			U	ND	ug/L						
Vanadium			U	ND	ug/L						
QC1203387000	380517002 MS										
Boron	500	B	20.0	555	ug/L		107	(75%-125%)		09/09/15	08:35
Calcium	5000		50600	55400	ug/L		N/A	(75%-125%)			
Iron	5000	U	ND	5280	ug/L		105	(75%-125%)			
Magnesium	5000		14200	19700	ug/L		109	(75%-125%)			

September 30, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: **380517**

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1505264										
Potassium	5000	4030		9170	ug/L		103	(75%-125%)			
Sodium	5000	8850		14300	ug/L		109	(75%-125%)	HSC	09/09/15	08:35
Vanadium	500	13.9		530	ug/L		103	(75%-125%)			
QC1203387001 380517002 MSD											
Boron	500	B	20.0	553	ug/L	0.431	107	(0%-20%)		09/09/15	08:38
Calcium	5000		50600	55300	ug/L	0.182	N/A	(0%-20%)			
Iron	5000	U	ND	5230	ug/L	0.999	104	(0%-20%)			
Magnesium	5000		14200	19500	ug/L	1.11	105	(0%-20%)			
Potassium	5000		4030	9150	ug/L	0.219	102	(0%-20%)			
Sodium	5000		8850	13900	ug/L	2.48	102	(0%-20%)			
Vanadium	500		13.9	527	ug/L	0.623	103	(0%-20%)			
QC1203387002 380517002 SDILT											
Boron		B	20.0	DU	ND	ug/L	N/A	(0%-10%)		09/09/15	08:41
Calcium			50600	D	9990	ug/L	1.32	(0%-10%)			
Iron		U	ND	DU	ND	ug/L	N/A	(0%-10%)			
Magnesium			14200	D	2810	ug/L	1.26	(0%-10%)			
Potassium			4030	D	800	ug/L	.791	(0%-10%)			
Sodium			8850	D	1740	ug/L	1.88	(0%-10%)			
Vanadium			13.9	D	2.70	ug/L	3.22	(0%-10%)			

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

General Chem Analysis

Case Narrative

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL380517
Work Order #: 380517

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1505221 **Method:** 9056_ANIONS_IC: COMMON

Sample Analysis

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

Sample ID	Client ID
380517001	B32BF2
1203386912	Method Blank (MB)
1203386913	Laboratory Control Sample (LCS)
1203386914	380525001(B32CJ7) Sample Duplicate (DUP)
1203386915	380525001(B32CJ7) Post Spike (PS)

Sample 380517 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-GC-E-086 REV# 24.

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 380525001 (B32CJ7) was selected for QC analysis.

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

The MS/PS recoveries for this sample set were within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203386914 (Non SDG 380525001DUP), 1203386915 (Non SDG 380525001PS) and 380517001 (B32BF2). The following samples in this sample group were diluted due to matrix interference. 1203386914 (Non SDG 380525001DUP) and 1203386915 (Non SDG 380525001PS).

Analyte	380517
	001
Chloride	10X
Nitrate	10X
Sulfate	10X

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

Samples 1203386914 (Non SDG 380525001DUP), 1203386915 (Non SDG 380525001PS) and 380517001 (B32BF2) 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.

Method/Analysis Information

Product: Alkalinity
Analytical Batch: 1506594 **Method:** 2320_ALKALINITY: GW 01

Sample Analysis

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

Sample ID	Client ID
380517002	B32BF1
1203390382	Method Blank (MB)
1203390383	Laboratory Control Sample (LCS)
1203392284	380517002(B32BF1) Sample Duplicate (DUP)

Sample 380517 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-GC-E-033 REV# 11.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 380517002 (B32BF1) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance

limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Alkalinity, Total as CaCO ₃	1203392284 (B32BF1DUP)	29.2* (0.0%-20.0%)
Bicarbonate alkalinity (CaCO ₃)	1203392284 (B32BF1DUP)	29.2* (0.0%-20.0%)

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1447790 was generated for sample 1203392284 (B32BF1DUP) 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.

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.

September 30, 2015

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL380517 GEL Work Order: 380517

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.

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: 29 SEP 2015

Title: Data Validator

Sample Data Summary

Certificate of Analysis

Report Date: September 29, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF I15-038

Client Sample ID: B32BF2	Project: CPRC0I15038
Sample ID: 380517001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-SEP-15 12:05	
Receive Date: 03-SEP-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON "As Received"											
Fluoride	B	153	33.0	500	ug/L	1	MXL2	09/03/15	1225	1505221	1
Nitrite-N	U	38.0	38.0	250	ug/L	1					
Chloride	D	14700	670	2000	ug/L	10	MXL2	09/03/15	1257	1505221	2
Nitrate-N	D	6930	330	1000	ug/L	10					
Sulfate	D	73200	1330	4000	ug/L	10					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	

Notes:

Certificate of Analysis

Report Date: September 29, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF I15-038

Client Sample ID: B32BF1	Project: CPRC0I15038
Sample ID: 380517002	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-SEP-15 12:05	
Receive Date: 03-SEP-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis											
2320_ALKALINITY: GW 01 "As Received"											
Alkalinity, Total as CaCO3		76700	725	1000	ug/L		AMB	09/11/15	1824	1506594	1
Bicarbonate alkalinity (CaCO3)		76700	725	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	725	725	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

Quality Control Summary

September 30, 2015
GEL LABORATORIES LLC

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

QC Summary

Report Date: September 29, 2015

Page 1 of 3

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 380517

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1505221										
QC1203386914	380525001	DUP									
Chloride	D	13900	D	13900	ug/L	0.0144		(0%-20%)	MXL2	09/03/15	18:47
Fluoride	B	222	B	224	ug/L	0.628 ^		(+/-500)		09/03/15	16:09
Nitrate-N	D	3210	D	3210	ug/L	0.0935		(0%-20%)		09/03/15	18:47
Nitrite-N	U	38.0	U	38.0	ug/L	N/A				09/03/15	16:09
Sulfate	D	82200	D	82300	ug/L	0.0645		(0%-20%)		09/03/15	18:47
QC1203386913	LCS										
Chloride		5000		4830	ug/L		96.7	(90%-110%)		09/03/15	20:23
Fluoride		2500		2480	ug/L		99.3	(90%-110%)			
Nitrate-N		2500		2470	ug/L		98.8	(90%-110%)			
Nitrite-N		2500		2490	ug/L		99.5	(90%-110%)			
Sulfate		10000		10000	ug/L		100	(90%-110%)			
QC1203386912	MB										
Chloride			U	67.0	ug/L					09/03/15	19:51
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L						
Sulfate			U	133	ug/L						
QC1203386915	380525001	PS									
Chloride	5.00	D	1.39	D	6.35	mg/L	99.2	(90%-110%)		09/03/15	19:19
Fluoride	2.50	B	0.222		2.71	mg/L	99.5	(90%-110%)		09/03/15	16:40
Nitrate-N	2.50	D	0.321	D	2.73	mg/L	96.3	(90%-110%)		09/03/15	19:19

September 30, 2015
GEL LABORATORIES LLC

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QC Summary

Workorder: **380517**

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1505221										
Nitrite-N	2.50	U	0.00		2.51	mg/L	100	(90%-110%)		09/03/15	16:40
Sulfate	10.0	D	8.22	D	18.7	mg/L	105	(90%-110%)	MXL2	09/03/15	19:19
Titration and Ion Analysis											
Batch	1506594										
QC1203392284	380517002	DUP									
Alkalinity, Total as CaCO3			76700		57200	ug/L	29.2*	(0%-20%)	AMB	09/11/15	18:26
Bicarbonate alkalinity (CaCO3)			76700		57200	ug/L	29.2*	(0%-20%)			
Carbonate alkalinity (CaCO3)		U	725	U	725	ug/L	N/A				
Hydroxide alkalinity as CaCO3		U	725	U	725	ug/L	N/A				
QC1203390383	LCS										
Alkalinity, Total as CaCO3	50000				51700	ug/L		103	(90%-110%)	09/11/15	17:32
QC1203390382	MB										
Alkalinity, Total as CaCO3			U		725	ug/L				09/11/15	17:24
Bicarbonate alkalinity (CaCO3)			U		725	ug/L					
Carbonate alkalinity (CaCO3)			U		725	ug/L					
Hydroxide alkalinity as CaCO3			U		725	ug/L					

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 \geq EQL or is $>$ 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- 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

September 30, 2015
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QC Summary

Workorder: 380517

Page 3 of 3

<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>
-----------------	------------	---------------	-------------	-----------	--------------	-------------	-------------	--------------	--------------	-------------	-------------

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. 12-SEP-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: BURET	Test / Method: SM 2320B	Matrix Type: Liquid	Client Code: CPRC, FBWP, GEOS, NEVA,
Batch ID: 1506594	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 380517(GEL380517),380525(GEL380525),380532			
Application Issues: Failed RPD for DUP			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed RPD for DUP:</p> <p>QC 1203392284DUP</p>		<p>1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203392284 (B32BF1DUP).</p>	

Originator's Name:

Alyson Boltz 12-SEP-15

Data Validator/Group Leader:

Elzbieta Szulc 21-SEP-15

Radiological Analysis

September 30, 2015

Radiochemistry

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL380517

Work Order #: 380517

Method/Analysis Information

Product: GAMMA_GS:COMMON + GW 01

Analytical Method: 901.1_GAMMA_GS

Analytical Batch Number: 1505824

Sample ID	Client ID
380517002	B32BF1
1203388290	Method Blank (MB)
1203388293	Laboratory Control Sample (LCS)
1203388291	380339001(B31TW6) Sample Duplicate (DUP)

Sample 380517 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-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 380339001 (B31TW6).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Batch Number: 1506148

Sample ID	Client ID
380517002	B32BF1
1203389237	Method Blank (MB)
1203389239	Laboratory Control Sample (LCS)
1203389238	380343001(B32C99) Sample Duplicate (DUP)

Sample 380517 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-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 380343001 (B32C99).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Chemical Recoveries

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

Recounts

Sample 1203389238 (Non SDG 380343001DUP) was verified by recounting at least five days from the separation date. 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.

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: 9310_ALPHABETA_GPC: COMMON
Analytical Method: BETA_GPC
Analytical Batch Number: 1506150

Sample ID	Client ID
380517002	B32BF1
1203389240	Method Blank (MB)
1203389244	Laboratory Control Sample (LCS)
1203389241	380525003(B32CJ6) Sample Duplicate (DUP)
1203389242	380525003(B32CJ6) Matrix Spike (MS)
1203389243	380525003(B32CJ6) Matrix Spike Duplicate (MSD)

Sample 380517 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-RAD-A-001 REV# 18.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 380525003 (B32CJ6).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Chemical Recoveries

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

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

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 and matrix spike duplicate, 1203389242 (Non SDG 380525003MS) and 1203389243 (Non SDG 380525003MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TRITIUM_DIST_LSC: COMMON
Analytical Method: TRITIUM_DIST_LSC
Analytical Batch Number: 1507565

Sample ID	Client ID
380517002	B32BF1
1203393075	Method Blank (MB)
1203393080	Laboratory Control Sample (LCS)
1203393076	380994002(B31TY6) Sample Duplicate (DUP)
1203393078	380994002(B31TY6) Matrix Spike (MS)

Sample 380517 002 in this SDG was analyzed on an "as received" basis.

SOP Reference

September 30, 2015

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

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 380994002 (B31TY6).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The blank, 1203393075 (MB), did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

Samples were recounted due to low recovery. 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.

September 30, 2015

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL380517 GEL Work Order: 380517

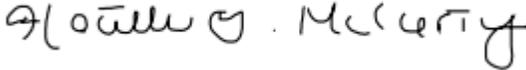
The Qualifiers in this report are defined as follows:

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: 26 SEP 2015

Title: Analyst II

Sample Data Summary

September 30, 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL380517	Client: CPRC001	Project: CPRC0115038
Lab Sample ID: 380517002	Date Collected: 09/01/2015 12:05	Matrix: WATER
	Date Received: 09/03/2015 08:55	
Client ID: B32BF1	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1506148	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 09/18/2015 17:32	Aliquot: 300 mL	Instrument: PIC13D
Data File: S1506148.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1506148		
Prep Date: 09/17/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.27	pCi/L	+/-0.658	0.658	1.35	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	8.10	8.10	mg	100	(25%-125%)

Comments:

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

September 30, 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL380517	Client: CPRC001	Project: CPRC0115038
Lab Sample ID: 380517002	Date Collected: 09/01/2015 12:05	Matrix: WATER
	Date Received: 09/03/2015 08:55	
Client ID: B32BF1	Method: BETA_GPC	Prep Basis: "As Received"
Batch ID: 1506150	Analyst: JXB7	SOP Ref: GL-RAD-A-001
Run Date: 09/24/2015 10:59	Aliquot: 150 mL	Instrument: LB4100E3
Data File: AB1506150.xls	Prep Method: EPA 900.0/SW846 9310	Count Time: 130 min
Prep Batch: 1506150		
Prep Date: 09/23/2015 12:05		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha ALPHA		2.31	pCi/L	+/-1.62	1.66	2.29	3.00
12587-47-2	Beta BETA	U	2.44	pCi/L	+/-1.90	1.95	3.12	4.00

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).

September 30, 2015

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Certificate of Analysis
Sample Summary

SDG Number: GEL380517
Lab Sample ID: 380517002

Client ID: B32BF1
Batch ID: 1505824
Run Date: 09/12/2015 10:03
Data File: G380517002.CNF;1
Prep Batch: 1505824
Prep Date: 09/11/2015 00:00

Client: CPRC001
Date Collected: 09/01/2015 12:05
Date Received: 09/03/2015 08:55

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

Project: CPRC0115038
Matrix: WATER

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-013
Instrument: GAM29
Count Time: 120 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14234-35-6	Antimony-125	U	4.47	pCi/L	+/-6.99	7.28	13.5	
13967-70-9	Cesium-134	U	3.68	pCi/L	+/-1.66	2.38	4.46	
10045-97-3	Cesium-137	U	-0.221	pCi/L	+/-2.90	2.90	5.17	10.0
10198-40-0	Cobalt-60	U	-0.11	pCi/L	+/-2.45	2.45	4.69	
14683-23-9	Europium-152	U	2.28	pCi/L	+/-7.70	7.77	14.4	
15585-10-1	Europium-154	U	-1.09	pCi/L	+/-8.06	8.08	13.0	
14391-16-3	Europium-155	U	1.75	pCi/L	+/-9.76	9.79	17.4	
13966-00-2	Potassium-40	U	14.3	pCi/L	+/-32.1	32.1	50.6	

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).

September 30, 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL380517	Client: CPRC001	Project: CPRC0115038
Lab Sample ID: 380517002	Date Collected: 09/01/2015 12:05	Matrix: WATER
	Date Received: 09/03/2015 08:55	
Client ID: B32BF1	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1507565	Analyst: GXR1	SOP Ref: GL-RAD-A-002
Run Date: 09/21/2015 17:48	Aliquot: 50 mL	Instrument: LSCPINK
Data File: T1507565R.xls	Prep Method: EPA 906.0 Modified	Count Time: 120.0297 min
Prep Batch: 1507565		
Prep Date: 09/17/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		7800	pCi/L	+/-284	1540	108	100

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Comments:

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

Quality Control Data

GEL LABORATORIES LLC

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QC Summary

Report Date: September 26, 2015
Page 1 of 4

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

Contact: Mr. Scot Fitzgerald

Workorder: 380517

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1505824								
QC1203388290	MB								
Antimony-125			U	1.99	pCi/L			MJH1	09/14/1509:34
				Uncert: +/-6.73					
				TPU: +/-6.79					
Cesium-134			U	-0.0669	pCi/L				
				Uncert: +/-2.59					
				TPU: +/-2.59					
Cesium-137			U	-0.526	pCi/L				
				Uncert: +/-2.44					
				TPU: +/-2.45					
Cobalt-60			U	1.88	pCi/L				
				Uncert: +/-2.78					
				TPU: +/-2.91					
Europium-152			U	-4.93	pCi/L				
				Uncert: +/-6.97					
				TPU: +/-7.33					
Europium-154			U	-1.83	pCi/L				
				Uncert: +/-6.46					
				TPU: +/-6.52					
Europium-155			U	-1.56	pCi/L				
				Uncert: +/-7.53					
				TPU: +/-7.57					
Potassium-40			U	-13.8	pCi/L				
				Uncert: +/-30.1					
				TPU: +/-30.8					
QC1203388291	380339001	DUP							
Antimony-125		U	-1.77	U	-2.84	pCi/L			09/14/1509:38
			Uncert: +/-7.72		+/-7.80		RPD: 0	N/A	
			TPU: +/-7.76		+/-7.91		RER: 0.189	(0-2)	
Cesium-134		U	-1.59	U	-2.04	pCi/L			
			Uncert: +/-2.91		+/-3.12		RPD: 0	N/A	
			TPU: +/-3.00		+/-3.26		RER: 0.203	(0-2)	
Cesium-137		U	1.45	U	1.85	pCi/L			
			Uncert: +/-2.96		+/-3.48		RPD: 0	N/A	
			TPU: +/-3.03		+/-3.58		RER: 0.166	(0-2)	
Cobalt-60		U	-1.67	U	1.68	pCi/L			
			Uncert: +/-3.26		+/-3.23		RPD: 0	N/A	
			TPU: +/-3.35		+/-3.32		RER: 1.39	(0-2)	
Europium-152		U	4.93	U	-3.67	pCi/L			
			Uncert: +/-8.26		+/-9.60		RPD: 0	N/A	
			TPU: +/-8.57		+/-9.75		RER: 1.3	(0-2)	
Europium-154		U	-2.98	U	6.33	pCi/L			
			Uncert: +/-8.81		+/-6.54		RPD: 0	N/A	
			TPU: +/-8.91		+/-7.15		RER: 1.6	(0-2)	
Europium-155		U	11.0	U	2.43	pCi/L			

QC Summary

Workorder: 380517

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1505824								
		Uncert:	+/-11.1	+/-11.9					
		TPU:	+/-12.2	+/-12.0		RPD: 0	N/A		
						RER: 0.977	(0-2)		
Potassium-40		U	8.87	U	12.9	pCi/L			
		Uncert:	+/-40.8	+/-36.2		RPD: 0	N/A		
		TPU:	+/-41.0	+/-36.7		RER: 0.144	(0-2)		
QC1203388293	LCS								
Americium-241	34400			37600	pCi/L	REC: 109	(80%-120%)		09/12/1510:06
		Uncert:		+/-1270					
		TPU:		+/-4860					
Antimony-125			U	-0.18	pCi/L				
		Uncert:		+/-211					
		TPU:		+/-211					
Cesium-134			U	5.83	pCi/L				
		Uncert:		+/-84.4					
		TPU:		+/-84.5					
Cesium-137	13700			14000	pCi/L	REC: 102	(80%-120%)		
		Uncert:		+/-327					
		TPU:		+/-1220					
Cobalt-60	15000			15200	pCi/L	REC: 102	(80%-120%)		
		Uncert:		+/-381					
		TPU:		+/-1240					
Europium-152			U	-44.2	pCi/L				
		Uncert:		+/-199					
		TPU:		+/-200					
Europium-154			U	63.0	pCi/L				
		Uncert:		+/-129					
		TPU:		+/-132					
Europium-155			U	53.0	pCi/L				
		Uncert:		+/-262					
		TPU:		+/-264					
Potassium-40			U	45.2	pCi/L				
		Uncert:		+/-258					
		TPU:		+/-259					
Rad Gas Flow									
Batch	1506148								
QC1203389237	MB								
Strontium-90			U	1.16	pCi/L			KSD1	09/18/1517:32
		Uncert:		+/-1.03					
		TPU:		+/-1.05					
**Strontium Carrier	8.10			6.20	mg	REC: 77	(25%-125%)		
QC1203389238	380343001	DUP							
Strontium-90			18.8	18.7	pCi/L				09/23/1506:11
		Uncert:	+/-1.73	+/-1.65		RPD: 1	(0% - 20%)		
		TPU:	+/-3.40	+/-3.34		RER: 0.0636	(0-2)		
**Strontium Carrier	8.10		6.90	7.90	mg	REC: 98	(25%-125%)		
QC1203389239	LCS								
Strontium-90	72.5			73.0	pCi/L	REC: 101	(80%-120%)		09/18/1517:32
		Uncert:		+/-4.57					
		TPU:		+/-12.3					

~~September 20, 2015~~
GEL LABORATORIES LLC

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QC Summary

Workorder: 380517

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1506148								
**Strontium Carrier									
Batch	1506150								
QC1203389240	8.10			6.50	mg	REC: 80	(25%-125%)		
Alpha			U	0.0196	pCi/L			JXB7	09/24/1510:59
				Uncert: +/-0.831					
				TPU: +/-0.832					
Beta			U	-1.18	pCi/L				
				Uncert: +/-1.56					
				TPU: +/-1.56					
QC1203389241	380525003	DUP							
Alpha		U	-0.462	U 2.51	pCi/L				09/24/1511:09
			Uncert: +/-2.51	+/-2.20		RPD: 0	N/A		
			TPU: +/-2.51	+/-2.24		RER: 1.74	(0-2)		
Beta			10.3	13.7	pCi/L				
			Uncert: +/-2.70	+/-3.01		RPD: 28	(0% - 100%)		
			TPU: +/-3.18	+/-3.76		RER: 1.35	(0-2)		
QC1203389242	380525003	MS							
Alpha	479	U	-0.462	402	pCi/L	REC: 84	(75%-125%)		09/24/1512:02
			Uncert: +/-2.51	+/-48.5					
			TPU: +/-2.51	+/-81.7					
Beta	1740		10.3	1990	pCi/L	REC: 114	(75%-125%)		
			Uncert: +/-2.70	+/-75.6					
			TPU: +/-3.18	+/-340					
QC1203389243	380525003	MSD							
Alpha	479	U	-0.462	442	pCi/L	REC: 92	(75%-125%)		09/24/1512:02
			Uncert: +/-2.51	+/-48.1		RPD: 9	(0%-20%)		
			TPU: +/-2.51	+/-86.8		RER: 0.653	(0-2)		
Beta	1740		10.3	1860	pCi/L	REC: 106	(75%-125%)		
			Uncert: +/-2.70	+/-69.9		RPD: 7	(0%-20%)		
			TPU: +/-3.18	+/-313		RER: 0.559	(0-2)		
QC1203389244	LCS								
Alpha	79.9			75.3	pCi/L	REC: 94	(80%-120%)		09/24/1512:02
				Uncert: +/-7.68					
				TPU: +/-14.6					
Beta	290			306	pCi/L	REC: 106	(80%-120%)		
				Uncert: +/-11.5					
				TPU: +/-51.5					
Rad Liquid Scintillation									
Batch	1507565								
QC1203393075	MB								
Tritium			U	23.8	pCi/L			GXR1	09/22/1509:21
				Uncert: +/-62.3					
				TPU: +/-62.5					
QC1203393076	380994002	DUP							
Tritium			133	164	pCi/L				09/22/1511:24
			Uncert: +/-70.3	+/-73.0		RPD: 21	(0% - 100%)		
			TPU: +/-74.8	+/-79.6		RER: 0.563	(0-2)		
QC1203393078	380994002	MS							
Tritium	1810		133	1510	pCi/L	REC: 76	(75%-125%)		09/21/1509:03
			Uncert: +/-70.3	+/-360					

QC Summary

Workorder: 380517

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1507565								
		TPU:	+/-74.8	+/-463					
QC1203393080	LCS								
Tritium	1800			1630	pCi/L	REC: 90 (80%-120%)			09/21/1509:20
		Uncert:		+/-376					
		TPU:		+/-491					

Notes:

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 >= 2X the MDA and, after corrections, result is >= MDA for this sample
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- UX Gamma Spectroscopy--Uncertain identification
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

** Indicates analyte is a surrogate compound.

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

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

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