

7/15/2016



July 15, 2016

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

Re: CHPRC SAF F16-043
Work Order: 400579
SDG: GEL400579

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 02, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 304070 - 8C
Chain of Custody: F16-043-045 and F16-043-049
Enclosures



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Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F16-043
SDG: GEL400579**

July 15, 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 July 02, 2016, 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
400579001	B35X97
400579002	B35XB1

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.

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

7/15/2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400579
Work Order #: 400579

Metals

Determination of Metals by ICP

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

Quality Control (QC) Information

Matrix Spike (MS/MSD) Recovery Statement

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
1203579927 (B35X97MS)	Potassium	72* (75%-125%)

Duplicate Relative Percent Difference (RPD) Statement

Not all the applicable analyte RPD values were within the acceptance criteria.

Sample	Analyte	Value
1203579926 (B35X97DUP)	Calcium	36.8* (0%-20%)
	Iron	32.3* (0%-20%)
	Magnesium	37.7* (0%-20%)
	Phosphorous	31.3* (0%-20%)
	Potassium	38* (0%-20%)
	Sodium	39.1* (0%-20%)

Technical Information

Sample Dilutions

Samples were 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. 400579001 (B35X97) and 400579002 (B35XB1).

	400579	
Analyte	001	002
Antimony	5X	5X

Determination of Metals by ICP-MS

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

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of zinc. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203579918 (MB).

Matrix Spike (MS/MSD) Recovery Statement

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

Sample	Analyte	Value
1203579921 (B35X97MS)	Cobalt	133* (75%-125%)
	Copper	27.3* (75%-125%)

Post Spike (PS) Recovery Statement

The PS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the presence of matrix interferences.

Sample	Analyte	Value
1203583458 (B35X97PS)	Copper	75.8* (80%-120%)

Serial Dilution % Difference Statement

Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Sample	Analyte	Value
1203579922 (B35X97SDILT)	Copper	11.5 *(0%-10%)

Technical Information

Sample Dilutions

Samples 400579001 (B35X97) and 400579002 (B35XB1) were diluted to ensure that the analyte concentrations were within the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times.

Analyte	400579	
	001	002
Several	2X	2X
	10X	10X

General Chemistry

pH

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

Technical Information

Holding Times

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

Sample	Analyte	Value
1203578549 (B35VN2DUP)	pH	Received 01-JUL-16, out of holding 30-JUN-16
400579001 (B35X97)	pH	Received 02-JUL-16, out of holding 30-JUN-16
400579002 (B35XB1)	pH	Received 02-JUL-16, out of holding 30-JUN-16

Radiochemistry

Dry Weight

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

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F16-043-049	PAGE 1 OF 1
COLLECTOR Will Wise CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9403, I-003	PROJECT DESIGNATION 100-NR-2 Drilling - Soil		SAF NO. F16-043	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. GWS-314	FIELD LOGBOOK NO. H2F-N-6454/23	ACTUAL SAMPLE DEPTH 49.6 to 52.1 FT	COA 304070		ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 6791		BILL OF LADING/AIR BILL NO. 7764 6073 9654		
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/JATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA	PRESERVATION None	None	None	
	HOLDING TIME	6 Months	ASAP	None	
	TYPE OF CONTAINER	G/P	G/P	Moisture Resistant Cont.	
	NO. OF CONTAINER(S)	1	1	1	
	VOLUME	250ml	60ml	200g	
	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	9045 pH (Non-Aqueous); COMMON;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	
SPECIAL HANDLING AND/OR STORAGE					
SAMPLE NO. B35XB1	MATRIX* SOIL	SAMPLE DATE JUN 30 2016	SAMPLE TIME 1425		

400574

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Will Wise CHPRC	DATE/TIME JUN 30 2016 15	RECEIVED BY/STORED IN SSO #1	DATE/TIME JUN 30 2016 15	SPLIT SPOON PARTS B & A WILL BE COMBINED TO ENSURE ADEQUATE SAMPLE MATERIAL FOR ANALYSIS; SAMPLE A AND B PORTION SAMPLES B35XB1, B35XB2, B35XB3	
RELINQUISHED BY/REMOVED FROM Troy Bacon CHPRC	DATE/TIME JUL 01 2016 1400	RECEIVED BY/STORED IN Troy Bacon CHPRC	DATE/TIME JUL 01 2016 1200	(1) 6020_METALS_ICPMS: COMMON {Aluminum, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Selenium};	
RELINQUISHED BY/REMOVED FROM Troy Bacon CHPRC	DATE/TIME JUL 01 2016 1400	RECEIVED BY/STORED IN M. Koston CHPRC	DATE/TIME JUL 01 2016 0815	6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Arsenic, Manganese, Nickel, Silver, Strontium, Vanadium, Zinc};	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Phosphorus};	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(2) Moisture Content - D2216 {Percent moisture (wet sample)};	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 6/2/2016	FSR ID = FSR33025	TRVL NUM = TRVL-16-165		A-6003-618 (REV 2)	

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRE</u>		SDG/AR/COC/Work Order: <u>400579</u>
Received By: <u>MK</u>		Date Received: <u>7-2-16</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?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>cpm 0</u>
Classified Radioactive II or III by RSO?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	Yes <input type="checkbox"/> No <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?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	Yes <input type="checkbox"/> No <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: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2C</u>
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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 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: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7766 6073 9656 2C</u> <u>9380 21C NO ICE</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials NS Date 7/5/16 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 15 July 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400579
Work Order #: 400579

Product: Determination of Metals by ICP-MS**Analytical Method:** 6020_METALS_ICPMS**Analytical Procedure:** GL-MA-E-014 REV# 28**Analytical Batch:** 1579661**Product: Determination of Metals by ICP****Analytical Method:** 6010_METALS_ICP**Analytical Procedure:** GL-MA-E-013 REV# 26**Analytical Batch:** 1579663**Preparation Method:** SW846 3050B**Preparation Procedure:** GL-MA-E-009 REV# 26**Preparation Batches:** 1579660 and 1579662

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400579001	B35X97
400579002	B35XB1
1203579924	Method Blank (MB) ICP
1203579925	Laboratory Control Sample (LCS)
1203579928	400579001(B35X97L) Serial Dilution (SD)
1203579926	400579001(B35X97D) Sample Duplicate (DUP)
1203579927	400579001(B35X97S) Matrix Spike (MS)
1203581167	400579001(B35X97PS) Post Spike (PS)
1203579918	Method Blank (MB) ICP-MS
1203579919	Laboratory Control Sample (LCS)
1203579922	400579001(B35X97L) Serial Dilution (SD)
1203579920	400579001(B35X97D) Sample Duplicate (DUP)
1203579921	400579001(B35X97S) Matrix Spike (MS)
1203583458	400579001(B35X97PS) Post Spike (PS)

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

Data Summary:

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

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

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of zinc. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203579918 (MB)-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 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
1203579927 (B35X97MS)	Potassium	72* (75%-125%)

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

Sample	Analyte	Value
1203579921 (B35X97MS)	Cobalt	133* (75%-125%)
	Copper	27.3* (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. Not all the applicable analyte RPD values were within the acceptance criteria.

Sample	Analyte	Value
1203579926 (B35X97DUP)	Calcium	36.8* (0%-20%)
	Iron	32.3* (0%-20%)
	Magnesium	37.7* (0%-20%)
	Phosphorous	31.3* (0%-20%)
	Potassium	38* (0%-20%)
	Sodium	39.1* (0%-20%)

Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the PS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The PS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the presence of matrix interferences.

Sample	Analyte	Value
1203583458 (B35X97PS)	Copper	75.8* (80%-120%)

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
1203579922 (B35X97SDILT)	Copper	11.5 *(0%-10%)

Technical Information**Preparation/Analytical Method Verification**

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. Samples were 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. 400579001 (B35X97) and 400579002 (B35XB1)-ICP. Samples 400579001 (B35X97) and 400579002 (B35XB1)-ICP-MS were diluted to ensure that the analyte concentrations were within the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times. ICP-MS.

Analyte	400579	
	001	002
Several	5X 2X 10X 1X	5X 2X 10X 1X

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: GEL400579 GEL Work Order: 400579

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.

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: 15 JUL 2016

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400579

CONTRACT: CPRC0F16043

METHOD TYPE: SW846

SAMPLE ID:400579001

BASIS: Dry Weight

DATE COLLECTED 30-JUN-16

CLIENT ID: B35X97

LEVEL: Low

DATE RECEIVED 02-JUL-16

MATRIX: SOIL

%SOLIDS: 94.1

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	6060000	ug/kg	D	3040	10100	50	2	MS	PRB	07/14/16 19:38	160714-3	1579661
7440-36-0	Antimony	1740	ug/kg	UD	1740	5280	5280	5	P	HSC	07/11/16 09:57	071116-2	1579663
7440-38-2	Arsenic	521	ug/kg	BD	203	1010	10	2	MS	SKJ	07/12/16 20:55	160712-4	1579661
7440-39-3	Barium	61300	ug/kg	D	101	406	20	2	MS	PRB	07/14/16 19:38	160714-3	1579661
7440-43-9	Cadmium	307	ug/kg	D	20.3	203	5	2	MS	SKJ	07/12/16 20:55	160712-4	1579661
7440-70-2	Calcium	5610000	ug/kg	*	8450	26400	26400	1	P	HSC	07/08/16 16:27	070816-1	1579663
7440-47-3	Chromium	4000	ug/kg	D	203	608	10	2	MS	SKJ	07/12/16 20:55	160712-4	1579661
7440-48-4	Cobalt	9210	ug/kg	DN	60.8	203	20	2	MS	SKJ	07/12/16 20:55	160712-4	1579661
7440-50-8	Copper	19800	ug/kg	DMN	66.9	203	8	2	MS	PRB	07/14/16 19:38	160714-3	1579661
7439-89-6	Iron	25800000	ug/kg	*	8450	26400	26400	1	P	HSC	07/08/16 16:27	070816-1	1579663
7439-92-1	Lead	2010	ug/kg	D	101	406	15	2	MS	SKJ	07/12/16 20:55	160712-4	1579661
7439-95-4	Magnesium	3660000	ug/kg	*	8980	31700	31700	1	P	HSC	07/08/16 16:27	070816-1	1579663
7439-96-5	Manganese	282000	ug/kg	D	1010	5070	5	10	MS	PRB	07/14/16 20:00	160714-3	1579661
7439-98-7	Molybdenum	737	ug/kg	D	60.8	203	20	2	MS	PRB	07/14/16 19:38	160714-3	1579661
7440-02-0	Nickel	8250	ug/kg	D	101	406	40	2	MS	SKJ	07/12/16 20:55	160712-4	1579661
7723-14-0	Phosphorous	1260000	ug/kg	*	5280	15800	15800	1	P	HSC	07/08/16 16:27	070816-1	1579663
7440-09-7	Potassium	625000	ug/kg	*N	6760	26400	26400	1	P	HSC	07/08/16 16:27	070816-1	1579663
7782-49-2	Selenium	1520	ug/kg	D	335	1010	50	2	MS	PRB	07/14/16 19:38	160714-3	1579661
7440-22-4	Silver	369	ug/kg	B	106	528	528	1	P	HSC	07/08/16 16:27	070816-1	1579663
7440-23-5	Sodium	419000	ug/kg	*	7390	26400	26400	1	P	HSC	07/08/16 16:27	070816-1	1579663
7440-24-6	Strontium	31600	ug/kg	D	406	2030	10	2	MS	PRB	07/14/16 19:38	160714-3	1579661
7440-62-2	Vanadium	66000	ug/kg	D	304	1010	1010	2	MS	PRB	07/14/16 19:38	160714-3	1579661
7440-66-6	Zinc	39700	ug/kg	D	406	2030	25	2	MS	PRB	07/14/16 19:38	160714-3	1579661

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1579661	1579660	SW846 3050B	0.524	g	50	mL	07/07/16	SXW1
1579663	1579662	SW846 3050B	0.503	g	50	mL	07/07/16	SXW1

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400579

CONTRACT: CPCR0F16043

METHOD TYPE: SW846

SAMPLE ID:400579002

BASIS: Dry Weight

DATE COLLECTED 30-JUN-16

CLIENT ID: B35XB1

LEVEL: Low

DATE RECEIVED 02-JUL-16

MATRIX: SOIL

%SOLIDS: 87

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	6430000	ug/kg	D	3260	10900	50	2	MS	PRB	07/14/16 19:50	160714-3	1579661
7440-36-0	Antimony	1810	ug/kg	UD	1810	5500	5500	5	P	HSC	07/11/16 09:54	071116-2	1579663
7440-38-2	Arsenic	1110	ug/kg	D	217	1090	10	2	MS	SKJ	07/12/16 21:15	160712-4	1579661
7440-39-3	Barium	63700	ug/kg	D	109	435	20	2	MS	PRB	07/14/16 19:50	160714-3	1579661
7440-43-9	Cadmium	175	ug/kg	BD	21.7	217	5	2	MS	SKJ	07/12/16 21:15	160712-4	1579661
7440-70-2	Calcium	3080000	ug/kg	*	8800	27500	27500	1	P	HSC	07/08/16 16:23	070816-1	1579663
7440-47-3	Chromium	12600	ug/kg	D	217	652	10	2	MS	SKJ	07/12/16 21:15	160712-4	1579661
7440-48-4	Cobalt	5940	ug/kg	DN	65.2	217	20	2	MS	SKJ	07/12/16 21:15	160712-4	1579661
7440-50-8	Copper	16000	ug/kg	DMN	71.7	217	8	2	MS	PRB	07/14/16 19:50	160714-3	1579661
7439-89-6	Iron	16400000	ug/kg	*	8800	27500	27500	1	P	HSC	07/08/16 16:23	070816-1	1579663
7439-92-1	Lead	3650	ug/kg	D	109	435	15	2	MS	SKJ	07/12/16 21:15	160712-4	1579661
7439-95-4	Magnesium	4400000	ug/kg	*	9350	33000	33000	1	P	HSC	07/08/16 16:23	070816-1	1579663
7439-96-5	Manganese	264000	ug/kg	D	1090	5440	5	10	MS	PRB	07/14/16 20:11	160714-3	1579661
7439-98-7	Molybdenum	929	ug/kg	D	65.2	217	20	2	MS	PRB	07/14/16 19:50	160714-3	1579661
7440-02-0	Nickel	15800	ug/kg	D	109	435	40	2	MS	SKJ	07/12/16 21:15	160712-4	1579661
7723-14-0	Phosphorous	547000	ug/kg	*	5500	16500	16500	1	P	HSC	07/08/16 16:23	070816-1	1579663
7440-09-7	Potassium	988000	ug/kg	*N	7040	27500	27500	1	P	HSC	07/08/16 16:23	070816-1	1579663
7782-49-2	Selenium	648	ug/kg	BD	359	1090	50	2	MS	PRB	07/14/16 19:50	160714-3	1579661
7440-22-4	Silver	374	ug/kg	B	110	550	550	1	P	HSC	07/08/16 16:23	070816-1	1579663
7440-23-5	Sodium	337000	ug/kg	*	7700	27500	27500	1	P	HSC	07/08/16 16:23	070816-1	1579663
7440-24-6	Strontium	26000	ug/kg	D	435	2170	10	2	MS	PRB	07/14/16 19:50	160714-3	1579661
7440-62-2	Vanadium	43200	ug/kg	D	326	1090	1090	2	MS	PRB	07/14/16 19:50	160714-3	1579661
7440-66-6	Zinc	32900	ug/kg	D	435	2170	25	2	MS	PRB	07/14/16 19:50	160714-3	1579661

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1579661	1579660	SW846 3050B	0.528	g	50	mL	07/07/16	SXW1
1579663	1579662	SW846 3050B	0.522	g	50	mL	07/07/16	SXW1

***Analytical Methods:**

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 15, 2016

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400579

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1579661										
QC1203579920 400579001 DUP											
Aluminum	D	6060000	D	5710000	ug/kg	6.01		(0%-20%)	PRB	07/14/16	19:40
Arsenic	BD	521	BD	439	ug/kg	17.2	^	(+/-1030)	SKJ	07/12/16	20:59
Barium	D	61300	D	74000	ug/kg	18.8		(0%-20%)	PRB	07/14/16	19:40
Cadmium	D	307	D	328	ug/kg	6.62	^	(+/-206)	SKJ	07/12/16	20:59
Chromium	D	4000	D	3960	ug/kg	0.884		(0%-20%)			
Cobalt	DN	9210	D	8920	ug/kg	3.13		(0%-20%)			
Copper	DMN	19800	D	18900	ug/kg	4.72		(0%-20%)	PRB	07/14/16	19:40
Lead	D	2010	D	2160	ug/kg	7.11	^	(+/-413)	SKJ	07/12/16	20:59
Manganese	D	282000	D	280000	ug/kg	0.414		(0%-20%)	PRB	07/14/16	20:03
Molybdenum	D	737	D	765	ug/kg	3.75	^	(+/-206)		07/14/16	19:40
Nickel	D	8250	D	7600	ug/kg	8.19		(0%-20%)	SKJ	07/12/16	20:59
Selenium	D	1520	D	1330	ug/kg	13.2	^	(+/-1030)	PRB	07/14/16	19:40
Strontium	D	31600	D	30300	ug/kg	4.38		(0%-20%)			
Vanadium	D	66000	D	61700	ug/kg	6.85		(0%-20%)			
Zinc	D	39700	D	35700	ug/kg	10.8		(0%-20%)			
QC1203579919 LCS											
Aluminum		188000	D	192000	ug/kg			(80%-120%)		07/14/16	19:35
Arsenic		4710	D	4160	ug/kg			(80%-120%)	SKJ	07/12/16	20:43
Barium		4710	D	5000	ug/kg			(80%-120%)	PRB	07/14/16	19:35
Cadmium		4710	D	4480	ug/kg			(80%-120%)	SKJ	07/12/16	20:43

7/15/2016

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QC Summary

Workorder: 400579

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1579661										
Chromium	4710		D	4640	ug/kg		98.4	(80%-120%)			
Cobalt	4710		D	4710	ug/kg		100	(80%-120%)	SKJ	07/12/16	20:43
Copper	4710		D	4910	ug/kg		104	(80%-120%)	PRB	07/14/16	19:35
Lead	4710		D	4890	ug/kg		104	(80%-120%)	SKJ	07/12/16	20:43
Manganese	4710		D	4890	ug/kg		104	(80%-120%)	PRB	07/14/16	19:35
Molybdenum	4710		D	4900	ug/kg		104	(80%-120%)			
Nickel	4710		D	4770	ug/kg		101	(80%-120%)	SKJ	07/12/16	20:43
Selenium	4710		D	3810	ug/kg		80.9	(80%-120%)	PRB	07/14/16	19:35
Strontium	4710		D	5060	ug/kg		108	(80%-120%)			
Vanadium	4710		D	4800	ug/kg		102	(80%-120%)			
Zinc	4710		D	4820	ug/kg		102	(80%-120%)			
QC1203579918 MB											
Aluminum			DU	2920	ug/kg					07/14/16	19:33
Arsenic			DU	195	ug/kg				SKJ	07/12/16	20:39
Barium			DU	97.5	ug/kg				PRB	07/14/16	19:33
Cadmium			DU	19.5	ug/kg				SKJ	07/12/16	20:39
Chromium			DU	195	ug/kg						
Cobalt			DU	58.5	ug/kg						
Copper			DU	64.3	ug/kg				PRB	07/14/16	19:33
Lead			DU	97.5	ug/kg				SKJ	07/12/16	20:39
Manganese			DU	195	ug/kg				PRB	07/14/16	19:33
Molybdenum			DU	58.5	ug/kg						
Nickel			DU	97.5	ug/kg				SKJ	07/12/16	20:39

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QC Summary

Workorder: 400579

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1579661										
Selenium			DU	322	ug/kg				PRB	07/14/16	19:33
Strontium			DU	390	ug/kg						
Vanadium			DU	292	ug/kg						
Zinc			BD	1050	ug/kg						
QC1203579921 400579001 MS											
Aluminum	211000	D	6060000	D	6910000	ug/kg	N/A	(75%-125%)		07/14/16	19:43
Arsenic	5270	BD	521	D	5610	ug/kg	96.6	(75%-125%)	SKJ	07/12/16	21:03
Barium	5270	D	61300	D	94200	ug/kg	N/A	(75%-125%)	PRB	07/14/16	19:43
Cadmium	5270	D	307	D	5330	ug/kg	95.2	(75%-125%)	SKJ	07/12/16	21:03
Chromium	5270	D	4000	D	9480	ug/kg	104	(75%-125%)			
Cobalt	5270	DN	9210	DN	16200	ug/kg	133*	(75%-125%)			
Copper	5270	DMN	19800	DN	21300	ug/kg	27.3*	(75%-125%)	PRB	07/14/16	19:43
Lead	5270	D	2010	D	7830	ug/kg	110	(75%-125%)	SKJ	07/12/16	21:03
Manganese	5270	D	282000	D	370000	ug/kg	N/A	(75%-125%)	PRB	07/14/16	20:05
Molybdenum	5270	D	737	D	6240	ug/kg	104	(75%-125%)		07/14/16	19:43
Nickel	5270	D	8250	D	12800	ug/kg	85.7	(75%-125%)	SKJ	07/12/16	21:03
Selenium	5270	D	1520	D	5490	ug/kg	75.4	(75%-125%)	PRB	07/14/16	19:43
Strontium	5270	D	31600	D	42700	ug/kg	N/A	(75%-125%)			
Vanadium	5270	D	66000	D	74700	ug/kg	N/A	(75%-125%)			
Zinc	5270	D	39700	D	50000	ug/kg	N/A	(75%-125%)			
QC1203583458 400579001 PS											
Cobalt	25.0	DN	45.4	D	68.5	ug/L	92.4	(80%-120%)	SKJ	07/12/16	21:07
Copper	25.0	DMN	97.7	D	117	ug/L	75.8*	(80%-120%)	PRB	07/14/16	19:45

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QC Summary

Workorder: 400579

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1579661										
QC1203579922	400579001	SDILT									
Aluminum	D	29900	D	6550	ug/L	9.54		(0%-10%)	PRB	07/14/16	19:48
Arsenic	BD	2.57	DU	1010	ug/L	N/A		(0%-10%)	SKJ	07/12/16	21:11
Barium	D	302	D	58.6	ug/L	3.02		(0%-10%)	PRB	07/14/16	19:48
Cadmium	D	1.52	BD	0.247	ug/L	18.5		(0%-10%)	SKJ	07/12/16	21:11
Chromium	D	19.7	BD	2.53	ug/L	35.9		(0%-10%)			
Cobalt	DN	45.4	D	9.45	ug/L	4.13		(0%-10%)			
Copper	DMN	97.7	DM	21.8	ug/L	11.5*		(0%-10%)	PRB	07/14/16	19:48
Lead	D	9.90	D	2.04	ug/L	2.97		(0%-10%)	SKJ	07/12/16	21:11
Manganese	D	278	D	57.0	ug/L	2.68		(0%-10%)	PRB	07/14/16	20:08
Molybdenum	D	3.63	BD	0.675	ug/L	7.1		(0%-10%)		07/14/16	19:48
Nickel	D	40.7	D	8.56	ug/L	5.25		(0%-10%)	SKJ	07/12/16	21:11
Selenium	D	7.48	DU	1670	ug/L	N/A		(0%-10%)	PRB	07/14/16	19:48
Strontium	D	156	D	31.9	ug/L	2.36		(0%-10%)			
Vanadium	D	326	D	67.0	ug/L	2.78		(0%-10%)			
Zinc	D	196	D	49.0	ug/L	24.9		(0%-10%)			

Metals Analysis-ICP

Batch 1579663

QC1203579926	400579001	DUP									
Antimony	DU	1740	DU	1750	ug/kg	N/A			HSC	07/11/16	10:01
Calcium	*	5610000	*	3860000	ug/kg	36.8*		(0%-20%)		07/08/16	16:30
Iron	*	25800000	*	18600000	ug/kg	32.3*		(0%-20%)			
Magnesium	*	3660000	*	2500000	ug/kg	37.7*		(0%-20%)			

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QC Summary

Workorder: 400579

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1579663										
Phosphorous	*	1260000	*	917000	ug/kg	31.3*		(0%-20%)			
Potassium	*N	625000	*	426000	ug/kg	38*		(0%-20%)	HSC	07/08/16	16:30
Silver	B	369	B	327	ug/kg	12 ^		(+/-529)			
Sodium	*	419000	*	282000	ug/kg	39.1*		(0%-20%)			
QC1203579925	LCS										
Antimony	47900			46600	ug/kg		97.3	(80%-120%)		07/11/16	09:51
Calcium	479000			467000	ug/kg		97.5	(80%-120%)		07/08/16	16:20
Iron	479000			461000	ug/kg		96.3	(80%-120%)			
Magnesium	479000			471000	ug/kg		98.3	(80%-120%)			
Phosphorous	47900			46000	ug/kg		96.1	(80%-120%)			
Potassium	479000			498000	ug/kg		104	(80%-120%)			
Silver	47900			46200	ug/kg		96.4	(80%-120%)			
Sodium	479000			490000	ug/kg		102	(80%-120%)			
QC1203579924	MB										
Antimony			U	312	ug/kg					07/11/16	09:47
Calcium			U	7560	ug/kg					07/08/16	16:16
Iron			U	7560	ug/kg						
Magnesium			U	8030	ug/kg						
Phosphorous			U	4730	ug/kg						
Potassium			U	6050	ug/kg						
Silver			U	94.5	ug/kg						
Sodium			U	6620	ug/kg						
QC1203579927	400579001 MS										
Antimony	52900	DU	1740	D	48200	ug/kg		91.1	(75%-125%)	07/11/16	10:05

GEL LABORATORIES LLC

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QC Summary

Workorder: 400579

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1579663										
Calcium	529000	*	5610000		4310000	ug/kg	N/A	(75%-125%)		07/08/16	16:33
Iron	529000	*	25800000		16800000	ug/kg	N/A	(75%-125%)	HSC		
Magnesium	529000	*	3660000		3030000	ug/kg	N/A	(75%-125%)			
Phosphorous	52900	*	1260000		701000	ug/kg	N/A	(75%-125%)			
Potassium	529000	*N	625000	N	1010000	ug/kg	72 *	(75%-125%)			
Silver	52900	B	369		51200	ug/kg	96	(75%-125%)			
Sodium	529000	*	419000		916000	ug/kg	93.8	(75%-125%)			
QC1203581167 400579001 PS											
Potassium	5000	*N	5920		11300	ug/L	108	(80%-120%)		07/08/16	16:37
QC1203579928 400579001 SDILT											
Antimony		DU	-4.01	DU	8710	ug/L	N/A	(0%-10%)		07/11/16	10:11
Calcium		*	53100	D	11300	ug/L	5.99	(0%-10%)		07/08/16	16:40
Iron		*	244000	D	53000	ug/L	8.45	(0%-10%)			
Magnesium		*	34700	D	7360	ug/L	6.2	(0%-10%)			
Phosphorous		*	11900	D	2450	ug/L	3	(0%-10%)			
Potassium		*N	5920	D	1250	ug/L	5.64	(0%-10%)			
Silver		B	3.50	DU	528	ug/L	N/A	(0%-10%)			
Sodium		*	3970	D	792	ug/L	.179	(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 concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.

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QC Summary

Workorder: 400579

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

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

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

* Indicates that a Quality Control parameter was not within specifications.

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

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

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400579
Work Order #: 400579**

Product: pH**Analytical Method:** SW846 9045D**Analytical Procedure:** GL-GC-E-008 REV# 21**Analytical Batch:** 1579024

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400579001	B35X97
400579002	B35XB1
1203578547	Laboratory Control Sample (LCS)
1203578549	400512001(B35VN2) Sample Duplicate (DUP)

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

Data Summary:

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

Technical Information**Holding Times**

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

Sample	Analyte	Value
1203578549 (B35VN2DUP)	pH	Received 01-JUL-16, out of holding 30-JUN-16
400579001 (B35X97)	pH	Received 02-JUL-16, out of holding 30-JUN-16
400579002 (B35XB1)	pH	Received 02-JUL-16, out of holding 30-JUN-16

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: GEL400579 GEL Work Order: 400579

The Qualifiers in this report are defined as follows:

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: Kristen Mizzell

Date: 08 JUL 2016

Title: Analyst I

Sample Data Summary

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 8, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400579

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1579024										
QC1203578549	400512001	DUP									
pH	X	9.25	X	9.37	SU	1.29		(0%-30%)	RXB5	07/06/16	18:23
QC1203578547	LCS										
pH	7.00			6.99	SU		99.9	(70%-130%)		07/06/16	18:08

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

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

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

* Indicates that a Quality Control parameter was not within specifications.

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400579
Work Order #: 400579

Product: Dry Weight

Analytical Method: ASTM D 2216 (Modified)

Analytical Procedure: GL-OA-E-020 REV# 10

Analytical Batch: 1579689

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400579001	B35X97
400579002	B35XB1
1203579963	400579001(B35X97) Sample Duplicate (DUP)

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

Data Summary:

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

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: GEL400579 GEL Work Order: 400579

The Qualifiers in this report are defined as follows:

Review/Validation

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

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

Signature: 

Name: Kate Gellatly

Date: 08 JUL 2016

Title: Analyst I

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400579	Client: CPRC001	Project: CPRC0F16043
Lab Sample ID: 400579001	Date Collected: 06/30/2016 12:20	Matrix: SOIL
	Date Received: 07/02/2016 08:45	%Moisture: 5.9
Client ID: B35X97		Prep Basis: "As Received"
Batch ID: 1579689	Method: ASTM D 2216 (Modified)	SOP Ref: GL-OA-E-020
Run Date: 07/06/2016 15:12	Analyst: CXC1	Instrument: SP-39020004
Data File:		Count Time:
Prep Batch: 1579689		
Prep Date: 07/06/2016 15:12		

CAS No.	Parmname	Qual	Result	Units	MDC	
	Moisture		5.88	percent +/-		
Surrogate/Tracer recovery		Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400579	Client: CPRC001	Project: CPRC0F16043
Lab Sample ID: 400579002	Date Collected: 06/30/2016 14:25	Matrix: SOIL
	Date Received: 07/02/2016 08:45	%Moisture: 12.9
Client ID: B35XB1		Prep Basis: "As Received"
Batch ID: 1579689	Method: ASTM D 2216 (Modified)	SOP Ref: GL-OA-E-020
Run Date: 07/06/2016 15:12	Analyst: CXC1	Instrument: SP-39020004
Data File:		Count Time:
Prep Batch: 1579689		
Prep Date: 07/06/2016 15:12		

CAS No.	Parmname	Qual	Result	Units	Recovery%	Acceptable Limits	MDC
	Moisture		12.9	percent	+/-		
Surrogate/Tracer recovery							

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 8, 2016

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Client : CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 400579

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Gravimetric Solids										
Batch	1579689									
QC1203579963	400579001	DUP								
Moisture		5.88		5.11	percent	RPD: 14	(0%-20%)	CXC1	07/06/1615:12	

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 $\geq 2X$ 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.