



June 23, 2017

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

Re: CHPRC SAF F16-037
Work Order: 425970
SDG: GEL425970

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 02, 2017. 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: 300085 - 8C
Chain of Custody: F16-037-079, F16-037-080, F16-037-081, F16-037-082 and F16-037-106
Enclosures



Table of Contents

Sample Issue Resolution.....	1
Case Narrative.....	3
Chain of Custody and Supporting Documentation.....	7
Data Review Qualifier Definitions.....	13
Laboratory Certifications.....	15
Metals Analysis.....	17
Case Narrative.....	18
Sample Data Summary.....	22
Quality Control Summary.....	28

Sample Issue Resolution

SAMPLE ISSUE RESOLUTION	SIR NUM	SIR17-757
	REV NUM	0
	DATE INITIATED	6/20/2017

SAMPLE EVENT INFORMATION

SAF NUM(S) F10-284
OPERABLE UNIT(S) 100-KR-4
PROJECT(S) 100-KW P&T
SAMPLE EVENT TITLE(S) 100-KW Pump & Treat
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B3B364
SAMPLE MATRIX WATER
COLLECTION DATE 6/13/2017 - 6/13/2017
SDG NUM GEL425451

ISSUE BACKGROUND

CLASS Chain of Custody Issue (Field)
TYPE Sample Date/time is missing/incorrect/illegible
DESCRIPTION The chain of custody is missing the collection date for sample B3B364. The date on the container is 6/13 and this is the date the lab used.

DISPOSITION

DESCRIPTION Please confirm the collection date.
JUSTIFICATION Final Disposition: Field sampling documents indicated the sample was taken on 06/13/2017 at 08:50.
 SUBMITTED BY: Heather Shaffer DATE: 06/20/2017
 ACCEPTED BY: Sarah Nagel DATE: 06/12/2017

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F16-037
SDG: GEL425970**

June 23, 2017

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 02, 2017, 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.

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
425970001	B39HX1
425970002	B39HX2
425970003	B39HX3
425970004	B39HX4
425970005	B39K45

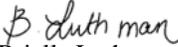
Case Narrative

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: Metals.

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.


Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL425970
Work Order #: 425970

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.

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. 425970001 (B39HX1), 425970002 (B39HX2) and 425970003 (B39HX3).

Analyte	425970		
	001	002	003
Antimony	5X	5X	5X

Radiochemistry

Dry Weight

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.

Miscellaneous Information

Additional Comments

These samples are re-logs. Data transferred from Batch# 1670534 and 1670577.

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

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F16-037-080	PAGE 1 OF 1
COLLECTOR Kevin Patterson CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9711, I-006	PROJECT DESIGNATION 100-KR-4 Long Term & Interim Action Monitoring - Soil	ACTUAL SAMPLE DEPTH 60.0 FT	SAF NO. F16-037	AIR QUALITY	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. 6WS-6016	FIELD LOGBOOK NO. HNF-N-6454 B89	OFFSITE PROPERTY NO. 7969	COA 300085		ORIGINAL
SHIPPED TO GEL Laboratories, LLC					
MATRIX* A=Air DL=Drum L=Liquid DS=Drum S=Sediment O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	PRESCRIPTION None	Cool <=6C None	None	None	None
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.	HOLDING TIME 6 Months	30 Days	6 Months	6 Months	6 Months
SPECIAL HANDLING AND/OR STORAGE MA-RADIOACTIVE-IE-101-839182-926-1-17	TYPE OF CONTAINER 1	8Gs	G	G/P	G/P
	NO. OF CONTAINER(S) 1	1	1	1	1
	VOLUME 250ml	125ml	125ml	60ml	60ml
	SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS	7195.096: COMMON;	TITANIUM DIST ICS: COMMON;	SRSTI SER_PR ICS: COMMON;	UISO, IE, PRECI P, ASA: COMMON;
SAMPLE NO. B39HX2	MATRIX*	SOIL			
	SAMPLE DATE JUN 01 2017 08:42				

424521-15
6/21/17

425970

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kevin Patterson CHPRC	DATE/TIME JUN 01 2017 14:00	RECEIVED BY/STORED IN Janette Zunker CHPRC	DATE/TIME JUN 01 2017 10:00	TRVL-17-101 (1) 6020_METALS_ICPMS: COMMON {Chromium, Lead}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Nickel, Vanadium, Zinc};	
RELINQUISHED BY/REMOVED FROM Janette Zunker CHPRC	DATE/TIME JUN 01 2017 14:00	RECEIVED BY/STORED IN STACY BOONIS	DATE/TIME 6/2/17 9:10		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 3/30/2017	FSR ID = FSR43433	TRVL NUM = TRVL-17-101		A-6003-618 (REV 2)	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		PAGE 1 OF 1	
COLLECTOR Kevin Patterson CHPRC	COMPANY CONTACT TODAK, D 375-6427	PROJECT COORDINATOR TODAK, D	PROJECT NO. F16-037	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9711, I-006 DUP	PROJECT DESIGNATION 100-KR-4 Long Term & Interim Action Monitoring - Soil	ACTUAL SAMPLE DEPTH 60.0 ft	COA 300085	AIR QUALITY	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. GWS-614	FIELD LOGBOOK NO. HNF-N-475-4 8884	OFFSITE PROPERTY NO. 7969	BILL OF LADING/AIR BILL NO. 7792 7756 5454		
SHIPPED TO GEL Laboratories, LLC	PRESERVATION None	None	None	None	None
MATRIX* A=Air DL=Drum 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/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	6 Months	6 Months	6 Months	6 Months
SPECIAL HANDLING AND/OR STORAGE NA Radioactive material B3AKS3 02617	HOLDING TIME	30 Days	6 Months	6 Months	6 Months
	TYPE OF CONTAINER	G/P	G	G/P	G/P
	NO. OF CONTAINER(S)	1	1	1	1
	VOLUME	250mL	125mL	60mL	60mL
	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	TRITIUM_DIST LSC; COMMON;	SR09_SEP_P4 ECP; LSC; COMMON;	UISO_IE_PRCI P_LSC; COMMON;
SAMPLE NO. B39HX3	MATRIX*	SOIL			
	SAMPLE DATE	JUN 01 2017 0848			

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CHAIN OF POSSESSION		SIGN/PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kevin Patterson CHPRC	DATE/TIME JUN 01 2017 1000	RECEIVED BY/STORED IN Janette Zunker CHPRC	DATE/TIME JUN 01 2017	TRVL-17-101 (1) 6020_METALS_ICPMS: COMMON {Chromium, Lead}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Nickel, Vanadium, Zinc};	
RELINQUISHED BY/REMOVED FROM Janette Zunker CHPRC	DATE/TIME JUN 01 2017 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME JUN 01 2017		
RELINQUISHED BY/REMOVED FROM	DATE/TIME FEB 08	RECEIVED BY/STORED IN	DATE/TIME 6-2-17 9:10		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 3/30/2017		FSR ID = FSR43434		TRVL NUM = TRVL-17-101	
				A-6003-618 (REV 2)	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		PAGE 1 OF 1	
COLLECTOR Kevin Patterson CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9711, I-007	PROJECT DESIGNATION 100-KR-4 Long Term & Interim Action Monitoring - Soil	FIELD LOGBOOK NO. HNF-4 645-4 0984	SAF NO. F16-037	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. 605-616	ACTUAL SAMPLE DEPTH 65.0 FT	OFFSITE PROPERTY NO. 79109	COA 300085	BILL OF LADING/AIR BILL NO. 7792 7756 5456	
GEL Laboratories, LLC	PRESERVATION None	None	None	None	None
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	HOLDING TIME 6 Months	6 Months	6 Months	6 Months	6 Months
POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	TYPE OF CONTAINER aGs	G/P	G/P	G/P	G/P
SPECIAL HANDLING AND/OR STORAGE NA-RADIOACTIVE-FE-TO: 839KCS 926-1-17	NO. OF CONTAINER(S) 1	1	1	1	1
VOLUME 250mL	125mL	125mL	60mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	2196 CRG: COMMON;	TRITIUM, DIST LSC: COMMON;	SRTOT_SEP_PR ECP_GPC: COMMON;	UISO_IE_PREC P_AEA: COMMON;
SAMPLE NO. B39HX4	MATRIX* SOIL	SAMPLE DATE JUN 01 2017 0850	SAMPLE TIME		

424521-15
6/21/17
425970

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kevin Patterson CHPRC	DATE/TIME JUN 01 2017	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME JUN 01 2017 1010	TRVL-17-101 (1) 6020_METALS_ICPMS: COMMON {Chromium, Lead}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Nickel, Vanadium, Zinc};	
RELINQUISHED BY/REMOVED FROM Janelle Zunker	DATE/TIME JUN 01 2017 1400	RECEIVED BY/STORED IN STACY BOONB	DATE/TIME 6/2/17 9:10		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 3/30/2017		FSR ID = FSR43435		TRVL NUM = TRVL-17-101	
				A-6003-618 (REV 2)	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F16-037-106	PAGE 1 OF 1
COLLECTOR	Roger Friesz Jr. CHPRC	COMPANY CONTACT	TODAK, D	PROJECT COORDINATOR	TODAK, D
SAMPLING LOCATION	C9713, F-004	PROJECT DESIGNATION	100-KR-4 Long Term & Interim Action Monitoring - Soil	PRICE CODE	8C
ICE CHEST NO.	6 was well	FIELD LOGBOOK NO.	HNF-N-645 2-51	AIR QUALITY	<input type="checkbox"/>
SHIPPED TO	GEL Laboratories, LLC	OFFSITE PROPERTY NO.	79069	METHOD OF SHIPMENT	ORIGINAL
				FEDERAL EXPRESS	
				COA	300085
				SAF NO.	F16-037
				TELEPHONE NO.	376-6427
				ACTUAL SAMPLE DEPTH	130.1 - 130.1 FT
				BILL OF LADING/AIR BILL NO.	7792 7756 5456

MATRIX*	A=Air DL=Drum L=Liquid DS=Drum S=Soil O=Oil S=Soil T=Tissue V=Vegetation W=Water X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	None	
		*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.	HOLDING TIME	30 Days	
			TYPE OF CONTAINER	G/P	
			NO. OF CONTAINER(S)	1	
			VOLUME	125mL	
			SAMPLE ANALYSIS	7195 CGS: COMMON; 6020 METALS, UGANS: COMMON (Chromium);	
SPECIAL HANDLING AND/OR STORAGE	NA				
SAMPLE NO.	B39K45	MATRIX*	SOIL		
		SAMPLE DATE	MAY 31 2017	SAMPLE TIME	0948

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6/1/17

425970

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-17-103	
Roger Friesz Jr. CHPRC	MAY 31 2017 1345	SSU-1	MAY 31 2017 1345		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
Janella Zumbado CHPRC	JUN 01 2017 0730	Janella Zumbado CHPRC	JUN 01 2017 0730		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
Janella Zumbado CHPRC	JUN 01 2017 1400	STACY BOONE	6-2-17 9:10		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME		

FRS ID = FSR43532

TRVL NUM = TRVL-17-103

PRINTED ON 4/26/2017

A-6003-618 (REV 2)

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 23 June 2017

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	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
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	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL425970
Work Order #: 425970

Product: Determination of Metals by ICP**Analytical Method:** SW846 3050B/6010D**Analytical Procedure:** GL-MA-E-013 REV# 28**Analytical Batch:** 1676195**Preparation Method:** SW846 3050B**Preparation Procedure:** GL-MA-E-009 REV# 26**Preparation Batch:** 1676194

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425970001	B39HX1
425970002	B39HX2
425970003	B39HX3
425970004	B39HX4
425970005	B39K45
1203816529	Method Blank (MB)ICP
1203816530	Laboratory Control Sample (LCS)
1203816533	425970001(B39HX1L) Serial Dilution (SD)
1203816531	425970001(B39HX1D) Sample Duplicate (DUP)
1203816532	425970001(B39HX1S) Matrix Spike (MS)

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.

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 may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range. 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. 425970001 (B39HX1), 425970002 (B39HX2) and 425970003 (B39HX3).

Analyte	425970		
	001	002	003
Antimony	5X	5X	5X

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: GEL425970 GEL Work Order: 425970

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.

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: 23 JUN 2017****Title: Data Validator**

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425970

CONTRACT: CPRC0F16037

METHOD TYPE: SW846

SAMPLE ID:425970001

BASIS: Dry Weight

DATE COLLECTED 01-JUN-17

CLIENT ID: B39HX1

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: SOIL

%SOLIDS: 97.8

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	1660	ug/kg	UD	1660	5030	5030	5	P	HSC	06/23/17 07:15	062317-1	1676195

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1676195	1676194	SW846 3050B	0.508	g	50	mL	06/22/17	SXW1

***Analytical Methods:**

P SW846 3050B/6010D

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425970

CONTRACT: CPRC0F16037

METHOD TYPE: SW846

SAMPLE ID:425970002

BASIS: Dry Weight

DATE COLLECTED 01-JUN-17

CLIENT ID: B39HX2

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: SOIL

%SOLIDS: 97.5

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	1690	ug/kg	UD	1690	5110	5110	5	P	HSC	06/23/17 07:37	062317-1	1676195

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1676195	1676194	SW846 3050B	0.502	g	50	mL	06/22/17	SXW1

***Analytical Methods:**

P SW846 3050B/6010D

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425970

CONTRACT: CPRC0F16037

METHOD TYPE: SW846

SAMPLE ID:425970003

BASIS: Dry Weight

DATE COLLECTED 01-JUN-17

CLIENT ID: B39HX3

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: SOIL

%SOLIDS: 96.9

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	1680	ug/kg	UD	1680	5100	5100	5	P	HSC	06/23/17 07:40	062317-1	1676195

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1676195	1676194	SW846 3050B	0.506	g	50	mL	06/22/17	SXW1

***Analytical Methods:**

P SW846 3050B/6010D

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425970

CONTRACT: CPRC0F16037

METHOD TYPE: SW846

SAMPLE ID:425970004

BASIS: Dry Weight

DATE COLLECTED 01-JUN-17

CLIENT ID: B39HX4

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: SOIL

%SOLIDS: 94.3

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	522	ug/kg	B	346	1050	1050	1	P	HSC	06/23/17 07:43	062317-1	1676195

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1676195	1676194	SW846 3050B	0.506	g	50	mL	06/22/17	SXW1

***Analytical Methods:**

P SW846 3050B/6010D

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425970

CONTRACT: CPRC0F16037

METHOD TYPE: SW846

SAMPLE ID:425970005

BASIS: Dry Weight

DATE COLLECTED 31-MAY-17

CLIENT ID: B39K45

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: SOIL

%SOLIDS: 84

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	371	ug/kg	U	371	1120	1120	1	P	HSC	06/23/17 07:47	062317-1	1676195

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1676195	1676194	SW846 3050B	0.53	g	50	mL	06/22/17	SXW1

***Analytical Methods:**

P SW846 3050B/6010D

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 23, 2017

Page 1 of 2

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 425970

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1676195										
QC1203816531	425970001	DUP									
Antimony	DU	1660	BD	-2690	ug/kg	66.6 ^		(+/-5080)	HSC	06/23/17	07:18
QC1203816530	LCS										
Antimony	49500			45700	ug/kg		92.4	(80%-120%)		06/23/17	07:12
QC1203816529	MB										
Antimony			U	326	ug/kg					06/23/17	07:08
QC1203816532	425970001	MS									
Antimony	49400	DU	1660	D	41400	ug/kg	83.8	(75%-125%)		06/23/17	07:21
QC1203816533	425970001	SDILT									
Antimony	DU	-2.68	DU	8300	ug/L	N/A		(0%-20%)		06/23/17	07:24

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425970

Page 2 of 2

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