

July 11, 2017



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gel.com

July 10, 2017

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

Re: CHPRC SAF S17-006
Work Order: 425384
SDG: GEL425384

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 14, 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: 300071-7H
Chain of Custody: S17-006-199, S17-006-251, S17-006-259, S17-006-295, S17-006-489 and S17-006-617
Enclosures



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Case Narrative

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General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S17-006
SDG: GEL425384

July 10, 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 14, 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>
425384001	B39PH7
425384002	B39TT9
425384003	B39PH5
425384004	B39PH8
425384005	B39T51
425384006	B39TB7
425384007	B39TB9
425384008	B3B273
425384009	B3B274

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.

July 11, 2017

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.


Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL425384
Work Order #: 425384

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.

Calibration Information

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 425384003 (B39PH5), 425384004 (B39PH8), 425384008 (B3B273) and 425384009 (B3B274).

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203811406 (MB)	Calcium	51.9 betw (50 - 100)

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 acceptance criteria. However, where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203811432 (MB)	Molybdenum	.228 betw (.2 - .25)

General Chemistry

Ion Chromatography

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

The following samples 1203811141 (Non SDG 425385004DUP), 1203811142 (Non SDG 425385004PS), 425384001 (B39PH7) and 425384002 (B39TT9) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	425384	
	001	002
Chloride	10X	20X
Nitrate	10X	20X
Sulfate	10X	20X

Miscellaneous Information

Manual Integrations

Sample 425384001 (B39PH7) were manually integrated to correctly position the baseline as set in the calibration standards.

Alkalinity

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.

Radiochemistry

9310_ALPHABETA_GPC: COMMON

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

QC Information

The matrix spike and matrix spike duplicate, 1203825676 (Non SDG 426412007MS) and 1203825677 (Non SDG 426412007MSD) , did not meet the alpha relative percent difference requirement; however, they do meet the recovery requirement.

Technical Information

Sample Re-prep/Re-analysis

Sample 425384003 (B39PH5) was re-prepped due to low recovery. The re-analysis is being reported.

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

Samples 1203825676 (Non SDG 426412007MS) and 1203825677 (Non SDG 426412007MSD) were recounted due to high recovery. The recounts are reported. Sample 1203825675 (Non SDG 426412007DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203825676 (Non SDG 426412007MS) and 1203825677 (Non SDG 426412007MSD), aliquots were reduced to conserve sample volume.

TRITIUM_DIST_LSC: COMMON

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

Recounts

Sample 1203815893 (B39T96MS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike, 1203815893 (B39T96MS), aliquot was reduced to conserve sample volume.

TC99_EIE_LSC: COMMON

All sample data provided in this report met the acceptance criteria specified in the analytical methods and

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procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts

Sample 1203815897 (LCS) was recounted due to low recovery. The recount is reported.

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

July 11, 2017

CH2M Hill Plateau Remediation Company		C.O.C. # S17-006-295	
425384		Page 1 of 1	
Collector	Frank Hall /CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	S17-006	Telephone No.	509-376-4650
Project Title	SURV, JUNE 2017	Purchase Order/Charge Code	300071
Shipped To (Lab)	GEL Laboratories, LLC	Ice Chest No.	6005-6014
Protocol	SURV	Bill of Lading/Air Bill No.	7793 9372 8802
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		Priority:	30 Days
SPECIAL INSTRUCTIONS		Hold Time	
N/A		Offsite Property No.	8031
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Sample No.	B39PH7	Filter	N
		* Date	JUN 13 2017 0840
		Time	
		No/Type Container	1x125-mL G/P
		Sample Analysis	9056_ANIONS_IC: COMMON
		Holding Time	48 Hours
		Preservative	Cool <=6C

Relinquished By	Frank Hall /CHPRC	Print	<i>[Signature]</i>	Sign		Received By	Lesly Wall /CHPRC	Print	<i>[Signature]</i>	Sign		Date/Time	JUN 13 2017 1148
Relinquished By	Lesly Wall /CHPRC					Received By	FEDEX					Date/Time	JUN 13 2017 1400
Relinquished By						Received By	STACY BOONTS					Date/Time	6/14/17 9:20
Relinquished By						Received By						Date/Time	

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

July 11, 2017

CH2M Hill Plateau Remediation Company		C.O.C. # S17-006-489	
425384		Page 1 of 1	
CH2M Hill Plateau Remediation Company		S17-006-489	
Collector	Frank Hill /CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	S17-006	Telephone No.	509-376-4650
Project Title	SURV, JUNE 2017	Purchase Order/Charge Code	300071
Shipped To (Lab)	GEL Laboratories, LLC	Ice Chest No.	6005-6014
Protocol	SURV	Bill of Lading/Air Bill No.	7793372 8802
Priority:	30 Days	Offsite Property No.	8031
SPECIAL INSTRUCTIONS		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
N/A			
POSSIBLE SAMPLE HAZARDS/REMARKS		Hold Time	
** ** 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		48 Hours	
Sample No.	B39TT9	Sample Analysis	Preservative
Filter	N	9056_ANIONS_IC: COMMON	Cool <=6C
No./Type Container	1x125-mL G/P	Holding Time	
Date	JUN 13 2017 11:22		

Relinquished By	Frank Hill /CHPRC	Date/Time	JUN 13 2017 1148	Received By	Lesly Wall /CHPRC	Date/Time	JUN 13 2017 1148
Relinquished By	Lesly Wall /CHPRC	Date/Time	JUN 13 2017 1400	Received By	FEDEX	Date/Time	
Relinquished By	Lesly Wall /CHPRC	Date/Time	JUN 13 2017 1400	Received By	STACY BOONE	Date/Time	6/14/17 9:20
Relinquished By		Date/Time		Received By		Date/Time	

S	=	Soil	DS	=	Drum Solids
SE	=	Sediment	DL	=	Drum Liquids
SO	=	Solid	T	=	Tissue
SL	=	Sludge	WI	=	Wipe
W	=	Water	L	=	Liquid
O	=	Oil	V	=	Vegetation
A	=	Air	X	=	Other

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CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **S17-006-199**
 Page 1 of 1

426384
 Telephone No. 509-376-4650
 Purchase Order/Charge Code 300071
 Ice Chest No. 605-614
 Bill of Lading/Air Bill No. 7793 9372 8802
 Offsite Property No. 8031

Contact/Requester Karen Waters-Husted
 Sampling Origin Hanford Site
 Logbook No. HNF-N-506 931 52
 Method of Shipment Commercial Carrier
 Priority: 30 Days **PRIORITY**
 SPECIAL INSTRUCTIONS Hold Time
 N/A

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39PH5	N	JUN 13 2017	0840	1x250-mL GIP	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B39PH5	N			1x500-mL GIP	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B39PH5	N			1x1-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B39PH5	N			1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B39PH8	Y			1x500-mL GIP	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

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

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Frank Hill /CHPRC			JUN 13 2017 1148	Lesly West /CHPRC			JUN 13 2017 1148	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			JUN 13 2017 1400	Received By	FEDEX			
Relinquished By			F E D E X	Received By			6-14-17 9:20	
Relinquished By				Received By				

July 11, 2017

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **S17-006-251**
 Page 1 of 1

Collector: Juan Aguilar /CHPRC
Contact/Requester: Karen Waters-Husted
Telephone No.: 509-376-4650
SAF No.: S17-006
Sampling Origin: Hanford Site
Purchase Order/Charge Code: 300071
Project Title: SURV, JUNE 2017
Logbook No.: HNF-N-506 88 / 79
Ice Chest No.: 605-614
Method of Shipment: Commercial Carrier
Bill of Lading/Air Bill No.: 7793 9372 8802
Protocol: SURV
Priority: 30 Days **PRIORITY**
Offsite Property No.: 8031

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
B39T51	N	6-13-17	0906	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B39T51	N	6-13-17	0906	1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

SPECIAL INSTRUCTIONS Hold Time
 N/A

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Juan Aguilar /CHPRC			JUN 13 2017 1025	Leah Wald /CHPRC	Jenny Wald		JUN 13 2017 1025
Leah Wald /CHPRC			JUN 13 2017 1400	FEDEX			JUN 13 2017
Relinquished By			FEB 17	By B. STACY BOONE			6-14-17 9:20

Matrix *	S	Soil	DS	Drum Solids
SE	=	Sediment	DL	= Drum Liquids
SO	=	Solid	T	= Tissue
SL	=	Sludge	WI	= Wipe
W	=	Water	L	= Liquid
O	=	Oil	V	= Vegetation
A	=	Air	X	= Other

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time

July 11, 2017

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C. # **S17-006-259**
 Page 1 of 1

Collector: Juan Aguilar /CHPRC
 Contact/Requester: Karen Waters-Husted
 Telephone No. 509-376-4650
 SAF No. S17-006
 Sampling Origin: Hanford Site
 Purchase Order/Charge Code: 300071
 Project Title: SURV, JUNE 2017
 Logbook No. HNF-N-506 88/79
 Ice Chest No. GWS-614
 Shipped To (Lab): GEL Laboratories, LLC
 Method of Shipment: Commercial Carrier
 Bill of Lading/Air Bill No. 7793 9372 8902
 Protocol: SURV
 Priority: 30 Days
 SPECIAL INSTRUCTIONS: **PRIORITY**
 Hold Time: **8031**
 Offsite Property No. **8031**
 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
B39TB7	N	W	6-13-17	1045	1x500-mL G/P	6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B39TB7	N	W	↓	↓	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B39TB7	N	W	↓	↓	1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B39TB9	Y	W	6-13-17	1045	1x500-mL G/P	6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2

Relinquished By: Juan Aguilar /CHPRC	Print	Sign	Date/Time	Received By: Troy Bacon /CHPRC	Print	Sign	Date/Time	Matrix *
Relinquished By: Troy Bacon /CHPRC	Print	Sign	Date/Time	Received By: FEDEX	Print	Sign	Date/Time	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: Troy Bacon /CHPRC	Print	Sign	Date/Time	Received By: K. STA LYPOONE	Print	Sign	Date/Time	
Relinquished By: [Signature]	Print	Sign	Date/Time	Received By: [Signature]	Print	Sign	Date/Time	

15 JUN 13 2017 1125 JUN 13 2017 JUN 13 2017
 14 JUN 13 2017 1400 JUN 13 2017 9:20
 17 JUN 13 2017 1400 JUN 13 2017 9:20
 18 JUN 13 2017 1400 JUN 13 2017 9:20

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

Disposed By: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION

PRINTED ON 6/12/2017 FSR ID = FSR44368 A-6004-842 (REV 2)

July 11, 2017

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **S17-006-617**
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426384
 Collector: Frank Hill /CHPRC
 Contact/Requester: Karen Waters-Husted
 Telephone No. 509-376-4650
 SAF No. S17-006
 Sampling Origin: Hanford Site
 Purchase Order/Charge Code: 300071
 Project Title: SURV, JUNE 2017
 Logbook No. HNF-N-506 93/52
 Ice Chest No. 605-614
 Shipped To (Lab): GEL Laboratories, LLC
 Method of Shipment: Commercial Carrier
 Bill of Lading/Air Bill No. 77939372 8802
 Protocol: SURV
 Priority: 30 Days
 SPECIAL INSTRUCTIONS: **PRIORITY**
 Offsite Property No. 8831
 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
 SPECIAL INSTRUCTIONS: N/A
 Hold Time: _____
 Holding Time: _____
 Preservative: _____

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3B273	Y	W	JUN 13 2017	1122	1x500-mL GIP	6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B3B274	N	W			1x250-mL GIP	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B3B274	N	W			1x500-mL GIP	6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

Received By: *Joshy Wall* /CHPRC
 Date/Time: JUN 13 2017 148

Received By: **FEDEX**
 Date/Time: _____

Received By: *BY R STACY BOONE*
 Date/Time: 6-14-17 9:20

Received By: _____
 Date/Time: _____

Print: *Joshy Wall* Sign: _____
 Date/Time: JUN 13 2017 148

Print: *Joshy Wall* Sign: *FTD BK*
 Date/Time: JUN 13 2017 140

Matrix *
 S = Soil DS = Drum Solids
 SE = Sediment DL = Drum Liquids
 SO = Solid T = Tissue
 SL = Sludge WI = Wipe
 W = Water L = Liquid
 O = Oil V = Vegetation
 A = Air X = Other

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FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By: _____
 Date/Time: _____

PRINTED ON 5/1/2017
 FSR ID = FSR39180
 A-6004-842 (REV 2)

July 11, 2017



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC		SDG/AR/COC/Work Order: 425384	
Received By: STACY BOONE		Date Received: 6-14-17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 7793 9372 9728 - 1c 7793 9372 8802 - 1c	
Suspected Hazard Information		Yes	No
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked or classified as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is package, COC, and/or Samples marked HAZ?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample Receipt Criteria		Yes	No
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Comments (Use Continuation Form if needed):			

PM (or PMA) review: Initials

CS

Date

6/15/17

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GL-CHL-SR-001 Rev 5

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	

July 11, 2017

Laboratory Certifications

List of current GEL Certifications as of 10 July 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

July 11, 2017

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL425384

Work Order #: 425384

Product: Determination of Metals by ICP

Analytical Method: SW846 3005A/6010D

Analytical Procedure: GL-MA-E-013 REV# 28

Analytical Batch: 1674029

Product: Determination of Metals by ICP-MS

Analytical Method: SW846 3005A/6020B

Analytical Procedure: GL-MA-E-014 REV# 30

Analytical Batch: 1674039

Preparation Method: SW846 3005A

Preparation Procedure: GL-MA-E-006 REV# 13

Preparation Batches: 1674028 and 1674038

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425384003	B39PH5
425384004	B39PH8
425384006	B39TB7
425384007	B39TB9
425384008	B3B273
425384009	B3B274
1203811406	Method Blank (MB) ICP
1203811407	Laboratory Control Sample (LCS)
1203811410	425384003(B39PH5L) Serial Dilution (SD)
1203811408	425384003(B39PH5S) Matrix Spike (MS)
1203811409	425384003(B39PH5SD) Matrix Spike Duplicate (MSD)
1203811432	Method Blank (MB) ICP-MS
1203811433	Laboratory Control Sample (LCS)
1203811436	425384003(B39PH5L) Serial Dilution (SD)
1203811434	425384003(B39PH5S) Matrix Spike (MS)
1203811435	425384003(B39PH5SD) Matrix Spike Duplicate (MSD)

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.

Calibration Information

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of

July 11, 2017

potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 425384003 (B39PH5), 425384004 (B39PH8), 425384008 (B3B273) and 425384009 (B3B274)-ICP.

ICSA/ICSAB Statement

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203811406 (MB)	Calcium	51.9 betw (50 - 100)
1203811432 (MB)	Molybdenum	.228 betw (.2 - .25)

Certification Statement

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

July 11, 2017

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: GEL425384 GEL Work Order: 425384

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: 10 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425384

CONTRACT: CPRC0S17006

METHOD TYPE: SW846

SAMPLE ID: 425384003

BASIS: As Received

DATE COLLECTED 13-JUN-17

CLIENT ID: B39PH5

LEVEL: Low

DATE RECEIVED 14-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	37.6	ug/L	B	19.3	50	50	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	07/06/17 11:10	170706-4	1674039
7440-38-2	Arsenic	2.23	ug/L	B	2	5	5	1	MS	PRB	07/06/17 11:48	170706-5	1674039
7440-39-3	Barium	73.1	ug/L		0.67	2	2	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-42-8	Boron	74.9	ug/L		15	50	50	1	P	JWJ	06/22/17 22:44	062217-1	1674029
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-70-2	Calcium	76600	ug/L		50	200	200	1	P	JWJ	06/22/17 22:44	062217-1	1674029
7440-47-3	Chromium	138	ug/L		3	10	10	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-50-8	Copper	2.9	ug/L		0.3	1	1	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7439-89-6	Iron	43.5	ug/L	B	30	100	100	1	P	JWJ	06/22/17 22:44	062217-1	1674029
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	07/05/17 19:18	170705-3	1674039
7439-95-4	Magnesium	22600	ug/L		110	300	300	1	P	JWJ	06/22/17 22:44	062217-1	1674029
7439-96-5	Manganese	1.73	ug/L	B	1	5	5	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7439-98-7	Molybdenum	5.13	ug/L		0.2	0.5	0.5	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-02-0	Nickel	2.19	ug/L		0.6	2	2	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-09-7	Potassium	5400	ug/L		50	150	150	1	P	JWJ	06/22/17 22:44	062217-1	1674029
7782-49-2	Selenium	2.17	ug/L	B	2	5	5	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-23-5	Sodium	12800	ug/L		100	300	300	1	P	JWJ	06/22/17 22:44	062217-1	1674029
7440-24-6	Strontium	537	ug/L		2	10	10	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	07/05/17 19:18	170705-3	1674039
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	PRB	07/05/17 19:18	170705-3	1674039
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	PRB	07/05/17 18:04	170705-2	1674039
7440-61-1	Uranium	3.56	ug/L		0.067	0.2	0.2	1	MS	PRB	07/05/17 19:18	170705-3	1674039
7440-62-2	Vanadium	7.86	ug/L		1	5	5	1	P	JWJ	06/22/17 22:44	062217-1	1674029
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	PRB	07/05/17 18:04	170705-2	1674039

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674029	1674028	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674039	1674038	SW846 3005A	50	mL	50	mL	06/15/17	SXW1

***Analytical Methods:**

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

P SW846 3005A/6010D
MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425384

CONTRACT: CPRC0S17006

METHOD TYPE: SW846

SAMPLE ID: 425384004

BASIS: As Received

DATE COLLECTED 13-JUN-17

CLIENT ID: B39PH8

LEVEL: Low

DATE RECEIVED 14-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	07/06/17 11:17	170706-4	1674039
7440-38-2	Arsenic	2.69	ug/L	B	2	5	5	1	MS	PRB	07/06/17 11:57	170706-5	1674039
7440-39-3	Barium	73.2	ug/L		0.67	2	2	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-42-8	Boron	72.5	ug/L		15	50	50	1	P	JWJ	06/22/17 22:53	062217-1	1674029
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-70-2	Calcium	74600	ug/L		50	200	200	1	P	JWJ	06/22/17 22:53	062217-1	1674029
7440-47-3	Chromium	138	ug/L		3	10	10	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-50-8	Copper	1.88	ug/L		0.3	1	1	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	06/22/17 22:53	062217-1	1674029
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	07/05/17 19:33	170705-3	1674039
7439-95-4	Magnesium	21800	ug/L		110	300	300	1	P	JWJ	06/22/17 22:53	062217-1	1674029
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7439-98-7	Molybdenum	4.79	ug/L		0.2	0.5	0.5	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-02-0	Nickel	1.79	ug/L	B	0.6	2	2	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-09-7	Potassium	5180	ug/L		50	150	150	1	P	JWJ	06/22/17 22:53	062217-1	1674029
7782-49-2	Selenium	2.19	ug/L	B	2	5	5	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-23-5	Sodium	12500	ug/L		100	300	300	1	P	JWJ	06/22/17 22:53	062217-1	1674029
7440-24-6	Strontium	536	ug/L		2	10	10	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	07/05/17 19:33	170705-3	1674039
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	PRB	07/05/17 19:33	170705-3	1674039
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	PRB	07/05/17 18:19	170705-2	1674039
7440-61-1	Uranium	3.57	ug/L		0.067	0.2	0.2	1	MS	PRB	07/05/17 19:33	170705-3	1674039
7440-62-2	Vanadium	7.65	ug/L		1	5	5	1	P	JWJ	06/22/17 22:53	062217-1	1674029
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	PRB	07/05/17 18:19	170705-2	1674039

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674029	1674028	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674039	1674038	SW846 3005A	50	mL	50	mL	06/15/17	SXW1

***Analytical Methods:**

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

P SW846 3005A/6010D
MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425384

CONTRACT: CPRC0S17006

METHOD TYPE: SW846

SAMPLE ID: 425384006

BASIS: As Received

DATE COLLECTED 13-JUN-17

CLIENT ID: B39TB7

LEVEL: Low

DATE RECEIVED 14-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	451	ug/L		19.3	50	50	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	07/06/17 11:19	170706-4	1674039
7440-38-2	Arsenic	2.5	ug/L	B	2	5	5	1	MS	PRB	07/06/17 11:59	170706-5	1674039
7440-39-3	Barium	19.3	ug/L		0.67	2	2	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-47-3	Chromium	18.2	ug/L		3	10	10	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-48-4	Cobalt	0.757	ug/L	B	0.3	1	1	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-50-8	Copper	1.4	ug/L		0.3	1	1	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	07/05/17 19:36	170705-3	1674039
7439-96-5	Manganese	68.9	ug/L		1	5	5	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7439-98-7	Molybdenum	9.14	ug/L		0.2	0.5	0.5	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-02-0	Nickel	18.5	ug/L		0.6	2	2	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-24-6	Strontium	64.8	ug/L		2	10	10	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	07/05/17 19:36	170705-3	1674039
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	PRB	07/05/17 19:36	170705-3	1674039
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	PRB	07/05/17 18:22	170705-2	1674039
7440-61-1	Uranium	1.98	ug/L		0.067	0.2	0.2	1	MS	PRB	07/05/17 19:36	170705-3	1674039
7440-66-6	Zinc	4.65	ug/L	B	3.3	10	10	1	MS	PRB	07/05/17 18:22	170705-2	1674039

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674039	1674038	SW846 3005A	50	mL	50	mL	06/15/17	SXW1

***Analytical Methods:**

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425384

CONTRACT: CPRC0S17006

METHOD TYPE: SW846

SAMPLE ID:425384007

BASIS: As Received

DATE COLLECTED 13-JUN-17

CLIENT ID: B39TB9

LEVEL: Low

DATE RECEIVED 14-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	71.2	ug/L		19.3	50	50	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	07/06/17 11:20	170706-4	1674039
7440-38-2	Arsenic	2.83	ug/L	B	2	5	5	1	MS	PRB	07/06/17 12:01	170706-5	1674039
7440-39-3	Barium	15.9	ug/L		0.67	2	2	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-47-3	Chromium	4.44	ug/L	B	3	10	10	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-48-4	Cobalt	0.355	ug/L	B	0.3	1	1	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-50-8	Copper	0.399	ug/L	B	0.3	1	1	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	07/05/17 19:39	170705-3	1674039
7439-96-5	Manganese	42.8	ug/L		1	5	5	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7439-98-7	Molybdenum	9.25	ug/L		0.2	0.5	0.5	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-02-0	Nickel	7.45	ug/L		0.6	2	2	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-24-6	Strontium	77.8	ug/L		2	10	10	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	07/05/17 19:39	170705-3	1674039
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	PRB	07/05/17 19:39	170705-3	1674039
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	PRB	07/05/17 18:26	170705-2	1674039
7440-61-1	Uranium	3.28	ug/L		0.067	0.2	0.2	1	MS	PRB	07/05/17 19:39	170705-3	1674039
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	PRB	07/05/17 18:26	170705-2	1674039

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674039	1674038	SW846 3005A	50	mL	50	mL	06/15/17	SXW1

***Analytical Methods:**

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425384

CONTRACT: CPRC0S17006

METHOD TYPE: SW846

SAMPLE ID:425384008

BASIS: As Received

DATE COLLECTED 13-JUN-17

CLIENT ID: B3B273

LEVEL: Low

DATE RECEIVED 14-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	16	ug/L	B	15	50	50	1	P	JWJ	06/22/17 22:56	062217-1	1674029
7440-70-2	Calcium	149000	ug/L		50	200	200	1	P	JWJ	06/22/17 22:56	062217-1	1674029
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	06/22/17 22:56	062217-1	1674029
7439-95-4	Magnesium	25700	ug/L		110	300	300	1	P	JWJ	06/22/17 22:56	062217-1	1674029
7440-09-7	Potassium	7430	ug/L		50	150	150	1	P	JWJ	06/22/17 22:56	062217-1	1674029
7440-23-5	Sodium	89800	ug/L		100	300	300	1	P	JWJ	06/22/17 22:56	062217-1	1674029
7440-62-2	Vanadium	6.86	ug/L		1	5	5	1	P	JWJ	06/22/17 22:56	062217-1	1674029

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674029	1674028	SW846 3005A	50	mL	50	mL	06/15/17	SXW1

***Analytical Methods:**

P SW846 3005A/6010D

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL425384

CONTRACT: CPRC0S17006

METHOD TYPE: SW846

SAMPLE ID:425384009

BASIS: As Received

DATE COLLECTED 13-JUN-17

CLIENT ID: B3B274

LEVEL: Low

DATE RECEIVED 14-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	16.3	ug/L	B	15	50	50	1	P	JWJ	06/22/17 22:59	062217-1	1674029
7440-70-2	Calcium	147000	ug/L		50	200	200	1	P	JWJ	06/22/17 22:59	062217-1	1674029
7439-89-6	Iron	52.1	ug/L	B	30	100	100	1	P	JWJ	06/22/17 22:59	062217-1	1674029
7439-95-4	Magnesium	25100	ug/L		110	300	300	1	P	JWJ	06/22/17 22:59	062217-1	1674029
7440-09-7	Potassium	7310	ug/L		50	150	150	1	P	JWJ	06/22/17 22:59	062217-1	1674029
7440-23-5	Sodium	87300	ug/L		100	300	300	1	P	JWJ	06/22/17 22:59	062217-1	1674029
7440-62-2	Vanadium	5.65	ug/L		1	5	5	1	P	JWJ	06/22/17 22:59	062217-1	1674029

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674029	1674028	SW846 3005A	50	mL	50	mL	06/15/17	SXW1

***Analytical Methods:**

P SW846 3005A/6010D

Quality Control Summary

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GEL LABORATORIES LLC

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

QC Summary

Report Date: July 10, 2017

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 425384

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1674039										
QC1203811433	LCS										
Aluminum	2000			2020	ug/L		101	(80%-120%)	PRB	07/05/17	18:00
Antimony	50.0			55.4	ug/L		111	(80%-120%)		07/06/17	11:08
Arsenic	50.0			51.9	ug/L		104	(80%-120%)		07/06/17	11:46
Barium	50.0			54.1	ug/L		108	(80%-120%)		07/05/17	18:00
Beryllium	50.0			60.0	ug/L		120	(80%-120%)			
Cadmium	50.0			52.0	ug/L		104	(80%-120%)			
Chromium	50.0			49.5	ug/L		99.1	(80%-120%)			
Cobalt	50.0			49.6	ug/L		99.1	(80%-120%)			
Copper	50.0			49.6	ug/L		99.1	(80%-120%)			
Lead	50.0			54.1	ug/L		108	(80%-120%)		07/05/17	19:15
Manganese	50.0			49.0	ug/L		98	(80%-120%)		07/05/17	18:00
Molybdenum	50.0			51.2	ug/L		102	(80%-120%)			
Nickel	50.0			50.2	ug/L		100	(80%-120%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1674039										
Selenium	50.0			52.7	ug/L		105	(80%-120%)	PRB	07/05/17	18:00
Silver	50.0			50.7	ug/L		101	(80%-120%)			
Strontium	50.0			50.6	ug/L		101	(80%-120%)			
Thallium	50.0			48.4	ug/L		96.8	(80%-120%)		07/05/17	19:15
Thorium	50.0			54.0	ug/L		108	(80%-120%)			
Tin	50.0			51.4	ug/L		103	(80%-120%)		07/05/17	18:00
Uranium	50.0			54.7	ug/L		109	(80%-120%)		07/05/17	19:15
Zinc	50.0			52.9	ug/L		106	(80%-120%)		07/05/17	18:00
QC1203811432	MB										
Aluminum			U	19.3	ug/L					07/05/17	17:57
Antimony			U	1.00	ug/L					07/06/17	11:06
Arsenic			U	2.00	ug/L					07/06/17	11:44
Barium			U	0.670	ug/L					07/05/17	17:57
Beryllium			U	0.200	ug/L						
Cadmium			U	0.300	ug/L						
Chromium			U	3.00	ug/L						

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1674039										
Cobalt			U	0.300	ug/L				PRB	07/05/17	17:57
Copper			U	0.300	ug/L						
Lead			U	0.500	ug/L					07/05/17	19:12
Manganese			U	1.00	ug/L					07/05/17	17:57
Molybdenum			B	0.228	ug/L						
Nickel			U	0.600	ug/L						
Selenium			U	2.00	ug/L						
Silver			U	0.300	ug/L						
Strontium			U	2.00	ug/L						
Thallium			U	0.600	ug/L					07/05/17	19:12
Thorium			U	0.700	ug/L						
Tin			U	1.00	ug/L					07/05/17	17:57
Uranium			U	0.067	ug/L					07/05/17	19:12
Zinc			U	3.30	ug/L					07/05/17	17:57
QC1203811434	425384003	MS									
Aluminum	2000	B	37.6	2020	ug/L		99.1	(75%-125%)		07/05/17	18:07

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1674039										
Antimony	50.0	U	1.00	50.2	ug/L		100	(75%-125%)	PRB	07/06/17	11:11
Arsenic	50.0	B	2.23	53.0	ug/L		102	(75%-125%)		07/06/17	11:50
Barium	50.0		73.1	123	ug/L		99.2	(75%-125%)		07/05/17	18:07
Beryllium	50.0	U	0.200	54.3	ug/L		108	(75%-125%)			
Cadmium	50.0	U	0.300	49.6	ug/L		99.2	(75%-125%)			
Chromium	50.0		138	185	ug/L		94.9	(75%-125%)			
Cobalt	50.0	U	0.300	48.3	ug/L		96.3	(75%-125%)			
Copper	50.0		2.90	49.7	ug/L		93.5	(75%-125%)			
Lead	50.0	U	0.500	49.1	ug/L		98.2	(75%-125%)		07/05/17	19:21
Manganese	50.0	B	1.73	49.7	ug/L		95.9	(75%-125%)		07/05/17	18:07
Molybdenum	50.0		5.13	55.7	ug/L		101	(75%-125%)			
Nickel	50.0		2.19	49.2	ug/L		93.9	(75%-125%)			
Selenium	50.0	B	2.17	50.1	ug/L		95.9	(75%-125%)			
Silver	50.0	U	0.300	48.3	ug/L		96.5	(75%-125%)			
Strontium	50.0		537	586	ug/L		N/A	(75%-125%)			

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GEL LABORATORIES LLC

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QC Summary

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Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS												
Batch	1674039											
Thallium	50.0	U	0.600		45.5	ug/L		90.8	(75%-125%)	PRB	07/05/17	19:21
Thorium	50.0	U	0.700		52.8	ug/L		106	(75%-125%)			
Tin	50.0	U	1.00		50.0	ug/L		99.5	(75%-125%)		07/05/17	18:07
Uranium	50.0		3.56		56.3	ug/L		105	(75%-125%)		07/05/17	19:21
Zinc	50.0	U	3.30		48.6	ug/L		95.1	(75%-125%)		07/05/17	18:07
QC1203811435 425384003 MSD												
Aluminum	2000	B	37.6		2000	ug/L	1.08	98	(0%-20%)		07/05/17	18:10
Antimony	50.0	U	1.00		51.5	ug/L	2.5	103	(0%-20%)		07/06/17	11:13
Arsenic	50.0	B	2.23		53.5	ug/L	0.99	103	(0%-20%)		07/06/17	11:52
Barium	50.0		73.1		124	ug/L	0.814	101	(0%-20%)		07/05/17	18:10
Beryllium	50.0	U	0.200		54.9	ug/L	1.13	110	(0%-20%)			
Cadmium	50.0	U	0.300		50.4	ug/L	1.55	101	(0%-20%)			
Chromium	50.0		138		189	ug/L	2.1	103	(0%-20%)			
Cobalt	50.0	U	0.300		49.1	ug/L	1.68	97.9	(0%-20%)			
Copper	50.0		2.90		50.1	ug/L	0.864	94.4	(0%-20%)			
Lead	50.0	U	0.500		50.3	ug/L	2.4	101	(0%-20%)		07/05/17	19:24

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1674039										
Manganese	50.0	B	1.73	49.9	ug/L	0.526	96.4	(0%-20%)	PRB	07/05/17	18:10
Molybdenum	50.0		5.13	56.6	ug/L	1.5	103	(0%-20%)			
Nickel	50.0		2.19	50.9	ug/L	3.58	97.5	(0%-20%)			
Selenium	50.0	B	2.17	54.6	ug/L	8.55	105	(0%-20%)			
Silver	50.0	U	0.300	48.8	ug/L	0.948	97.5	(0%-20%)			
Strontium	50.0		537	594	ug/L	1.35	N/A	(0%-20%)			
Thallium	50.0	U	0.600	46.0	ug/L	1.1	91.8	(0%-20%)		07/05/17	19:24
Thorium	50.0	U	0.700	54.1	ug/L	2.41	108	(0%-20%)			
Tin	50.0	U	1.00	50.4	ug/L	0.852	100	(0%-20%)		07/05/17	18:10
Uranium	50.0		3.56	57.7	ug/L	2.51	108	(0%-20%)		07/05/17	19:24
Zinc	50.0	U	3.30	48.5	ug/L	0.231	94.8	(0%-20%)		07/05/17	18:10
QC1203811436 425384003 SDILT											
Aluminum		B	37.6	DU	96.5	ug/L	N/A	(0%-20%)		07/05/17	18:16
Antimony		U	0.137	DU	5.00	ug/L	N/A	(0%-20%)		07/06/17	11:15
Arsenic		B	2.23	DU	10.0	ug/L	N/A	(0%-20%)		07/06/17	11:56
Barium			73.1	D	14.8	ug/L	1.24	(0%-20%)		07/05/17	18:16

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1674039										
Beryllium	U	0.034	DU	1.00	ug/L	N/A		(0%-20%)	PRB	07/05/17	18:16
Cadmium	U	0.036	DU	1.50	ug/L	N/A		(0%-20%)			
Chromium		138	D	27.2	ug/L	1.34		(0%-20%)			
Cobalt	U	0.125	DU	1.50	ug/L	N/A		(0%-20%)			
Copper		2.90	BD	0.609	ug/L	4.89		(0%-20%)			
Lead	U	-0.004	DU	2.50	ug/L	N/A		(0%-20%)		07/05/17	19:30
Manganese	B	1.73	DU	5.00	ug/L	N/A		(0%-20%)		07/05/17	18:16
Molybdenum		5.13	D	1.10	ug/L	7.25		(0%-20%)			
Nickel		2.19	DU	3.00	ug/L	N/A		(0%-20%)			
Selenium	B	2.17	DU	10.0	ug/L	N/A		(0%-20%)			
Silver	U	0.037	DU	1.50	ug/L	N/A		(0%-20%)			
Strontium		537	D	105	ug/L	2.56		(0%-20%)			
Thallium	U	0.087	DU	3.00	ug/L	N/A		(0%-20%)		07/05/17	19:30
Thorium	U	0.062	DU	3.50	ug/L	N/A		(0%-20%)			
Tin	U	0.277	DU	5.00	ug/L	N/A		(0%-20%)		07/05/17	18:16

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1674039										
Uranium		3.56	D	0.698	ug/L	1.99		(0%-20%)	PRB	07/05/17	19:30
Zinc	U	1.10	DU	16.5	ug/L	N/A		(0%-20%)		07/05/17	18:16
Metals Analysis-ICP											
Batch	1674029										
QC1203811407	LCS										
Boron	500			488	ug/L		97.5	(80%-120%)	JWJ	06/22/17	22:41
Calcium	5000			5020	ug/L		100	(80%-120%)			
Iron	5000			5020	ug/L		100	(80%-120%)			
Magnesium	5000			5160	ug/L		103	(80%-120%)			
Potassium	5000			5340	ug/L		107	(80%-120%)			
Sodium	5000			5370	ug/L		107	(80%-120%)			
Vanadium	500			493	ug/L		98.5	(80%-120%)			
QC1203811406	MB										
Boron			U	15.0	ug/L					06/22/17	22:37
Calcium			B	51.9	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Potassium			U	50.0	ug/L						

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1674029										
Sodium			U	100	ug/L				JWJ	06/22/17	22:37
Vanadium			U	1.00	ug/L						
QC1203811408 425384003 MS											
Boron	500	74.9		547	ug/L		94.5	(75%-125%)		06/22/17	22:46
Calcium	5000	76600		77100	ug/L		N/A	(75%-125%)			
Iron	5000	B 43.5		4800	ug/L		95.2	(75%-125%)			
Magnesium	5000	22600		26800	ug/L		N/A	(75%-125%)			
Potassium	5000	5400		10200	ug/L		96	(75%-125%)			
Sodium	5000	12800		17200	ug/L		86.1	(75%-125%)			
Vanadium	500	7.86		490	ug/L		96.4	(75%-125%)			
QC1203811409 425384003 MSD											
Boron	500	74.9		560	ug/L	2.28	97	(0%-20%)		06/22/17	22:48
Calcium	5000	76600		76900	ug/L	0.221	N/A	(0%-20%)			
Iron	5000	B 43.5		4880	ug/L	1.62	96.8	(0%-20%)			
Magnesium	5000	22600		26800	ug/L	0.216	N/A	(0%-20%)			
Potassium	5000	5400		10200	ug/L	0.245	96.5	(0%-20%)			
Sodium	5000	12800		17100	ug/L	0.309	85.1	(0%-20%)			

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Table with columns: Parmname, NOM, Sample, Qual, QC, Units, RPD/D%, REC%, Range, Anlst, Date, Time. Rows include Metals Analysis-ICP, Vanadium, Boron, Calcium, Iron, Magnesium, Potassium, Sodium, Vanadium.

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

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
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 #: GEL425384
Work Order #: 425384

Product: Ion Chromatography

Analytical Method: 9056_ANIONS_IC

Analytical Procedure: GL-GC-E-086 REV# 25

Analytical Batch: 1673893

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425384001	B39PH7
425384002	B39TT9
1203811139	Method Blank (MB)
1203811140	Laboratory Control Sample (LCS)
1203811141	425385004(NonSDG) Sample Duplicate (DUP)
1203811142	425385004(NonSDG) Post Spike (PS)

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

Sample Dilutions

The following samples 1203811141 (Non SDG 425385004DUP), 1203811142 (Non SDG 425385004PS), 425384001 (B39PH7) and 425384002 (B39TT9) were diluted because target analyte concentrations exceeded the calibration range. 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.

Analyte	425384	
	001	002
Chloride	10X	20X
Nitrate	10X	20X
Sulfate	10X	20X

Miscellaneous Information

Manual Integrations

Sample 425384001 (B39PH7) were manually integrated to correctly position the baseline as set in the calibration standards.

Product: Alkalinity

Analytical Method: 2320_ALKALINITY

Analytical Procedure: GL-GC-E-033 REV# 13

Analytical Batch: 1676562

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425384003	B39PH5
425384009	B3B274
1203817292	Laboratory Control Sample (LCS)
1203817293	425279005(NonSDG) 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.

July 11, 2017

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: GEL425384 GEL Work Order: 425384

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: Kristen Mizzell

Date: 26 JUN 2017

Title: Analyst I

Sample Data Summary

Certificate of Analysis

Report Date: June 26, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S17-006

Client Sample ID: B39PH7	Project: CPRC0S17006
Sample ID: 425384001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 13-JUN-17 08:40	
Receive Date: 14-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	152	33.0	500	ug/L		1	MXL2	06/14/17	1156	1673893	1
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Chloride	D	15100	670	2000	ug/L		10	MXL2	06/14/17	1645	1673893	2
Nitrate-N	D	6290	330	1000	ug/L		10					
Sulfate	D	178000	1330	4000	ug/L		10					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: June 26, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S17-006

Client Sample ID: B39TT9	Project: CPRC0S17006
Sample ID: 425384002	Client ID: CPRC001
Matrix: WATER	
Collect Date: 13-JUN-17 11:22	
Receive Date: 14-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	165	33.0	500	ug/L		1	MXL2	06/14/17	1224	1673893	1
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Chloride	D	92800	1340	4000	ug/L		20	MXL2	06/14/17	1714	1673893	2
Nitrate-N	D	13000	660	2000	ug/L		20					
Sulfate	D	351000	2660	8000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: June 26, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S17-006

Client Sample ID: B39PH5	Project: CPRC0S17006
Sample ID: 425384003	Client ID: CPRC001
Matrix: WATER	
Collect Date: 13-JUN-17 08:40	
Receive Date: 14-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: GW 01 "As Received"												
Alkalinity, Total as CaCO3		101000	1450	4000	ug/L			RXB5	06/23/17	1439	1676562	1
Bicarbonate alkalinity (CaCO3)		101000	1450	4000	ug/L							
Carbonate alkalinity (CaCO3)	U	1450	1450	4000	ug/L							
Hydroxide alkalinity as CaCO3	U	1450	1450	4000	ug/L							

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	2320_ALKALINITY		

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: June 26, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S17-006

Client Sample ID: B3B274	Project: CPRC0S17006
Sample ID: 425384009	Client ID: CPRC001
Matrix: WATER	
Collect Date: 13-JUN-17 11:22	
Receive Date: 14-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: GW 01 "As Received"												
Alkalinity, Total as CaCO3		161000	1450	4000	ug/L			RXB5	06/23/17	1441	1676562	1
Bicarbonate alkalinity (CaCO3)		161000	1450	4000	ug/L							
Carbonate alkalinity (CaCO3)	U	1450	1450	4000	ug/L							
Hydroxide alkalinity as CaCO3	U	1450	1450	4000	ug/L							

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	2320_ALKALINITY		

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Quality Control Summary

July 11, 2017

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 26, 2017

Page 1 of 3

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 425384

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673893										
QC1203811141	425385004	DUP									
Chloride		8900		8870	ug/L	0.315		(0%-20%)	MXL2	06/14/17	14:49
Fluoride	B	460	B	457	ug/L	0.502	^	(+/-500)			
Nitrate-N	D	7470	D	7510	ug/L	0.547		(0%-20%)		06/14/17	19:09
Nitrite-N	U	33.0	U	33.0	ug/L	N/A				06/14/17	14:49
Sulfate		19000		18900	ug/L	0.353		(0%-20%)			
QC1203811140	LCS										
Chloride	5000			4800	ug/L		96	(80%-120%)		06/14/17	11:27
Fluoride	2500			2490	ug/L		99.8	(80%-120%)			
Nitrate-N	2500			2450	ug/L		97.9	(80%-120%)			
Nitrite-N	2500			2490	ug/L		99.6	(80%-120%)			
Sulfate	10000			10000	ug/L		100	(80%-120%)			
QC1203811139	MB										
Chloride			U	67.0	ug/L					06/14/17	10:58
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						

July 11, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425384

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673893										
Nitrite-N			U	33.0	ug/L				MXL2	06/14/17	10:58
Sulfate			U	133	ug/L						
QC1203811142 425385004 PS											
Chloride	5.00	8.90		14.7	mg/L		117	(75%-125%)		06/14/17	15:18
Fluoride	2.50	B 0.460		2.96	mg/L		99.9	(75%-125%)			
Nitrate-N	2.50	D 1.49	D	4.08	mg/L		104	(75%-125%)		06/14/17	19:38
Nitrite-N	2.50	U 0.00		2.45	mg/L		98.1	(75%-125%)		06/14/17	15:18
Sulfate	10.0	19.0		30.4	mg/L		114	(75%-125%)			

Titration and Ion Analysis

Batch	1676562										
QC1203817293 425279005 DUP											
Alkalinity, Total as CaCO3		95800		96000	ug/L	0.209		(0%-20%)	RXB5	06/23/17	12:41
QC1203817292 LCS											
Alkalinity, Total as CaCO3	100000			110000	ug/L		110	(80%-120%)		06/23/17	12:29

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

July 11, 2017

GEL LABORATORIES LLC

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QC Summary

Workorder: 425384

Page 3 of 3

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

July 11, 2017

Radiochemistry

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL425384

Work Order #: 425384

Product: 9310_ALPHABETA_GPC: COMMON

Analytical Method: 9310_ALPHABETA_GPC

Analytical Procedure: GL-RAD-A-001 REV# 19

Analytical Batch: 1680213

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425384003	B39PH5
1203825674	Method Blank (MB)
1203825675	426412007(NonSDG) Sample Duplicate (DUP)
1203825676	426412007(NonSDG) Matrix Spike (MS)
1203825677	426412007(NonSDG) Matrix Spike Duplicate (MSD)
1203825678	Laboratory Control Sample (LCS)

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.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The matrix spike and matrix spike duplicate, 1203825676 (Non SDG 426412007MS) and 1203825677 (Non SDG 426412007MSD), did not meet the alpha relative percent difference requirement; however, they do meet the relative error ratio and spike recovery requirements.

Technical Information

Sample Re-prep/Re-analysis

Sample 425384003 (B39PH5) was reprepared due to low recovery. The re-analysis is being reported.

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

Samples 1203825676 (Non SDG 426412007MS) and 1203825677 (Non SDG 426412007MSD) were recounted due to high recovery. The recounts are reported. Sample 1203825675 (Non SDG 426412007DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203825676 (Non SDG 426412007MS) and 1203825677 (Non SDG 426412007MSD), aliquots were reduced to conserve sample volume.

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 22

Analytical Batch: 1675960

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425384003	B39PH5
425384005	B39T51
425384006	B39TB7
1203815891	Method Blank (MB)
1203815892	425280008(B39T96) Sample Duplicate (DUP)
1203815893	425280008(B39T96) Matrix Spike (MS)
1203815894	Laboratory Control Sample (LCS)

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

Recounts

Sample 1203815893 (B39T96MS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike, 1203815893 (B39T96MS), aliquot was reduced to conserve sample volume.

Product: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 5

Analytical Batch: 1675961

July 11, 2017

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425384005	B39T51
425384006	B39TB7
1203815895	Method Blank (MB)
1203815896	425384006(B39TB7) Sample Duplicate (DUP)
1203815897	Laboratory Control Sample (LCS)

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

Recounts

Sample 1203815897 (LCS) was recounted due to low recovery. The recount is reported.

Certification Statement

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

July 11, 2017

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: GEL425384 GEL Work Order: 425384

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kate Gellatly

Date: 10 JUL 2017

Title: Analyst I

Sample Data Summary

July 11, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL425384
Lab Sample ID: 425384003

Client: CPRC001
Date Collected: 06/13/2017 08:40
Date Received: 06/14/2017 09:20

Project: CPRC0S17006
Matrix: WATER

Client ID: B39PH5
Batch ID: 1680213
Run Date: 07/08/2017 11:05
Data File: AB1680213r.xls
Prep Batch: 1680213
Prep Date: 07/07/2017 06:43

Method: 9310_ALPHABETA_GPC
Analyst: LXB3
Aliquot: 150 mL
Prep Method: EPA 900.0/SW846 9310

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-001
Instrument: LB4100A2
Count Time: 210 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha ALPHA		4.03	pCi/L	+/-2.06	2.17	2.78	3.00
12587-47-2	Beta BETA		5.96	pCi/L	+/-1.33	1.67	1.83	4.00

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

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

July 11, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL425384	Client: CPRC001	Project: CPRC0S17006
Lab Sample ID: 425384003	Date Collected: 06/13/2017 08:40	Matrix: WATER
	Date Received: 06/14/2017 09:20	
Client ID: B39PH5	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1675960	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 07/05/2017 19:56	Aliquot: 50 mL	Instrument: LSCGREEN
Data File: T1675960R.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1675960		
Prep Date: 07/05/2017 09:31		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1710	pCi/L	+/-279	432	358	400

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

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

July 11, 2017
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL425384	Client: CPRC001	Project: CPRC0S17006
Lab Sample ID: 425384005	Date Collected: 06/13/2017 09:06	Matrix: WATER
	Date Received: 06/14/2017 09:20	
Client ID: B39T51	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1675960	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 07/05/2017 20:43	Aliquot: 50 mL	Instrument: LSCGREEN
Data File: T1675960R.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1675960		
Prep Date: 07/05/2017 09:31		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	46.0	pCi/L	+/-203	203	353	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

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).
 The MDC is a sample specific MDC.

July 11, 2017
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL425384	Client: CPRC001	Project: CPRC0S17006
Lab Sample ID: 425384005	Date Collected: 06/13/2017 09:06	Matrix: WATER
	Date Received: 06/14/2017 09:20	
Client ID: B39T51	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1675961	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 07/04/2017 11:17	Aliquot: 100 mL	Instrument: LSCGREEN
Data File: E1675961R.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 20 min
Prep Batch: 1675961		
Prep Date: 06/29/2017 13:52		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	34.2	pCi/L	+/-22.4	22.8	36.8	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	32200	33500	CPM	96.1	(30%-105%)

Comments:

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

July 11, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL425384	Client: CPRC001	Project: CPRC0S17006
Lab Sample ID: 425384006	Date Collected: 06/13/2017 10:45	Matrix: WATER
	Date Received: 06/14/2017 09:20	
Client ID: B39TB7	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1675960	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 07/05/2017 21:30	Aliquot: 50 mL	Instrument: LSCGREEN
Data File: T1675960R.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1675960		
Prep Date: 07/05/2017 09:31		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		8020	pCi/L	+/-461	1620	357	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

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).
 The MDC is a sample specific MDC.

July 11, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL425384	Client: CPRC001	Project: CPRC0S17006
Lab Sample ID: 425384006	Date Collected: 06/13/2017 10:45	Matrix: WATER
	Date Received: 06/14/2017 09:20	
Client ID: B39TB7	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1675961	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 07/04/2017 11:38	Aliquot: 100 mL	Instrument: LSCGREEN
Data File: E1675961R.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 20 min
Prep Batch: 1675961		
Prep Date: 06/29/2017 13:52		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	17.5	pCi/L	+/-20.8	20.9	34.9	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	33400	33500	CPM	99.9	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 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 10, 2017
Page 1 of 3

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 425384

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1680213								
QC1203825674	MB								
Alpha			U	0.592	pCi/L			LXB3	07/08/1711:09
				Uncert: +/-1.12					
				TPU: +/-1.13					
Beta			U	1.75	pCi/L				
				Uncert: +/-1.60					
				TPU: +/-1.62					
QC1203825675	426412007	DUP							
Alpha		U	-0.378	U	-1.19	pCi/L			07/10/1711:55
			Uncert: +/-1.14		+/-1.13		RPD: 0	N/A	
			TPU: +/-1.15		+/-1.13		RER: 0.986	(0-2)	
Beta			529		540	pCi/L			
			Uncert: +/-11.6		+/-11.7		RPD: 2	(0% - 20%)	
			TPU: +/-87.0		+/-88.4		RER: 0.185	(0-2)	
QC1203825676	426412007	MS							
Alpha		242	U	-0.378		209	pCi/L	REC: 87	(75%-125%)
			Uncert: +/-1.14		+/-23.6				07/10/1710:10
			TPU: +/-1.15		+/-45.4				
Beta		874		529		1430	pCi/L	REC: 104	(75%-125%)
			Uncert: +/-11.6		+/-41.1				
			TPU: +/-87.0		+/-236				
QC1203825677	426412007	MSD							
Alpha		242	U	-0.378		280	pCi/L	REC: 116	(75%-125%)
			Uncert: +/-1.14		+/-25.6		RPD: 29*	(0%-20%)	07/10/1710:10
			TPU: +/-1.15		+/-52.8		RER: 1.99	(0-2)	
Beta		874		529		1590	pCi/L	REC: 122	(75%-125%)
			Uncert: +/-11.6		+/-45.0		RPD: 10	(0%-20%)	
			TPU: +/-87.0		+/-262		RER: 0.863	(0-2)	
QC1203825678	LCS								
Alpha		80.6				81.6	pCi/L	REC: 101	(80%-120%)
			Uncert: +/-7.55						07/08/1710:45
			TPU: +/-15.6						
Beta		291				323	pCi/L	REC: 111	(80%-120%)
			Uncert: +/-11.3						
			TPU: +/-53.6						
Rad Liquid Scintillation									
Batch	1675960								
QC1203815891	MB								
Tritium			U	66.7	pCi/L			BXM4	07/06/1708:59
			Uncert: +/-205						
			TPU: +/-206						
QC1203815892	425280008	DUP							
Tritium		9520		8980	pCi/L				07/06/1709:46
			Uncert: +/-495		+/-485		RPD: 6	(0% - 20%)	
			TPU: +/-1910		+/-1800		RER: 0.403	(0-2)	

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1675960								
QC1203815893	425280008	MS							
Tritium	4480	9520		13900	pCi/L	REC: 97	(75%-125%)		07/07/1706:22
	Uncert:	+/-495		+/-1500					
	TPU:	+/-1910		+/-3070					
QC1203815894	LCS								
Tritium	2230			2110	pCi/L	REC: 94	(80%-120%)		07/06/1710:48
	Uncert:			+/-470					
	TPU:			+/-622					
Batch	1675961								
QC1203815895	MB								
Technetium-99			U	-1.46	pCi/L			CXS7	07/04/1715:54
	Uncert:			+/-23.2					
	TPU:			+/-23.2					
**Technetium-99m Tracer	33500			29300	CPM	REC: 88	(30%-105%)		
QC1203815896	425384006	DUP							
Technetium-99		U	17.5	U	35.4				07/04/1716:16
	Uncert:		+/-20.8		+/-25.1	RPD: 0	N/A		
	TPU:		+/-20.9		+/-25.4	RER: 1.07	(0-2)		
**Technetium-99m Tracer	33500		33400		28900	CPM	REC: 86	(30%-105%)	
QC1203815897	LCS								
Technetium-99	861			713	pCi/L	REC: 83	(80%-120%)		07/05/1707:49
	Uncert:			+/-52.0					
	TPU:			+/-94.7					
**Technetium-99m Tracer	33500			26600	CPM	REC: 80	(30%-105%)		

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

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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.