

July 26, 2016



a member of **The GEL Group** INC



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July 26, 2016

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

Re: CHPRC SAF X16-037
Work Order: 400269
SDG: GEL400269

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 29, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,


Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: X16-037-064 and X16-037-065
Enclosures



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Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X16-037
SDG: GEL400269

July 26, 2016

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 29, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER.

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
400269001	B35M32
400269002	B35M29
400269003	B35M51
400269004	B35M48

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 26, 2016

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile, 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
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400269
Work Order #: 400269

GC/MS Volatile

Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

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

Quality Control (QC) Information

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203576190 (B35M16PS)	2-Butanone	64* (70%-130%)
	Acetone	50* (70%-130%)
1203576191 (B35M16PSD)	2-Butanone	66* (70%-130%)
	Acetone	52* (70%-130%)

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 and sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 400269001 (B35M32), 400269002 (B35M29), 400269003 (B35M51) and 400269004 (B35M48).

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of sodium. In

instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203576403 (MB).

General Chemistry

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

SRISO_SEP_PRECIP_GPC: COMMON

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.

C14_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

Samples 400269002 (B35M29) and 400269004 (B35M48) were recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

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

Samples 400269002 (B35M29) and 400269004 (B35M48) were recounted to verify sample results. The recount results are similar to the original results. Original results are 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

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # X16-037-064

Page 1 of 1

Collector: Juan Aguilar *[Signature]* Telephone No. 509-376-4650
 SAF No. X16-037 Purchase Order/Charge Code 304027
 Project Title: 100-KW Rebound Study, May 31, 2016
 Shipped To (Lab): GEL Laboratories, LLC Logbook No. HNF-N-506 85 / 83
 Protocol: CERCLA Method of Shipment: Commercial Carrier
 Priority: 30 Days Ice Chest No. GWS-422 81.0 LBS
 Offsite Property No. 6781 Bill of Lading/Air-Bill No. 776628514209

Special Instructions: N/A
 SPECIAL INSTRUCTIONS: N/A
 Hold Time: Total Activity Exemption: Yes No
 Special Handling: N/A

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35M32	Y	W JUN 28 2016	1139	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35M29	N	W		1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35M29	N	W		1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35M29	N	W		4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35M29	N	W		1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35M29	N	W JUN 28 2016	1139	3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35M29	N	W JUN 28 2016	1139	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

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: Juan Aguilar *[Signature]* Date/Time: JUN 28 2016 1220 Sign: *[Signature]*
 Relinquished By: Dan Woehle *[Signature]* Date/Time: JUN 28 2016 1400 Sign: *[Signature]*
 Relinquished By: M. Kaslow *[Signature]* Date/Time: 6-29-16 0900 Sign: *[Signature]*
 Relinquished By: *[Signature]* Date/Time: *[Signature]* Sign: *[Signature]*

Received By: Dan Woehle *[Signature]* Date/Time: JUN 28 2016 Sign: *[Signature]*
 Received By: FEDEX Date/Time: *[Signature]*
 Received By: M. Kaslow *[Signature]* Date/Time: 6-29-16 0900 Sign: *[Signature]*

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: *[Signature]* Date/Time: *[Signature]*

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 400269
 C.O.C. # **X16-037-065**
 Page 1 of 1

Collector: *Susan Aguilera* Telephone No. 509-376-4650
 SAF No. X16-037 Purchase Order/Charge Code 304027
 Project Title: 100-KW Rebound Study, May 31, 2016 Ice Chest No. *SWS 422 81.0165*
 Shipped To (Lab): **GEL Laboratories, LLC** Bill of Lading/Air Bill No. *776628514209*
 Protocol: CERCLA Offsite Property No. *6781*

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 Handling: N/A
 SPECIAL INSTRUCTIONS: N/A
 Priority: 30 Days
 Hold Time: Total Activity Exemption: Yes No

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35M51	Y	JUN 28 2016	1031	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35M48	N			1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35M48	N			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35M48	N			4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35M48	N			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35M48	N			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35M48	N	JUN 28 2016	1031	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By: *Susan Aguilera* Date/Time: JUN 28 2016 1220 Sign: *[Signature]* Received By: Dan Woehle CHPRG Date/Time: JUN 28 2016 1220 Sign: *[Signature]*

Relinquished By: Dan Woehle CHPRG Date/Time: JUN 28 2016 1400 Sign: *[Signature]* Received By: FEDEX Date/Time: JUN 28 2016 0900 Sign: *[Signature]*

Relinquished By: *[Signature]* Date/Time: JUN 28 2016 1500 Sign: *[Signature]* Received By: *[Signature]* Date/Time: JUN 28 2016 0900 Sign: *[Signature]*

Relinquished By: *[Signature]* Date/Time: JUN 28 2016 1031 Sign: *[Signature]* Received By: *[Signature]* Date/Time: JUN 28 2016 0900 Sign: *[Signature]*

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

PRINTED ON 5/19/2016 FSR ID = FSR5094 A-6004-842 (REV 2)

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>4002609</u>	
Received By: <u>ML</u>		Date Received: <u>6-29-16</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>gmo</u>	
		If yes, Were swipes taken of sample containers < action levels?	
		If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
		Hazard Class Shipped: UN#:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>13042962</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7766 2851 42 09</u>

Comments (Use Continuation Form if needed):

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 26 July 2016

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

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400269
Work Order #: 400269

Product: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW846 8260C

Analytical Procedure: GL-OA-E-038 REV# 22

Analytical Batch: 1578083

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400269002	B35M29
400269004	B35M48
1203576188	Method Blank (MB)
1203576189	Laboratory Control Sample (LCS)
1203576190	400183001(B35M16) Post Spike (PS)
1203576191	400183001(B35M16) Post Spike Duplicate (PSD)
1203578043	Method Blank (MB)
1203578044	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

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203576190 (B35M16PS)	2-Butanone	64* (70%-130%)
	Acetone	50* (70%-130%)
1203576191 (B35M16PSD)	2-Butanone	66* (70%-130%)
	Acetone	52* (70%-130%)

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: GEL400269 GEL Work Order: 400269

The Qualifiers in this report are defined as follows:

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

T Spike and/or spike duplicate 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.

DL Indicates that sample is diluted.

RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

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: Erin Haubert

Date: 22 JUL 2016

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number:	GEL400269	Date Collected:	06/28/2016 11:39	Matrix:	WATER
Lab Sample ID:	400269002	Date Received:	06/29/2016 09:00	Client:	CPRC001
Client ID:	B35M29	Method:	SW846 8260C	Project:	CPRC0X16037
Batch ID:	1578083	Inst:	VOA3.I	SOP Ref:	GL-OA-E-038
Run Date:	06/30/2016 10:31	Analyst:	CDS1	Dilution:	1
Prep Date:	06/30/2016 10:31	Column:	DB-624	Purge Vol:	5 mL
Data File:	063016V3\3P408.D				

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	4.48	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL400269	Date Collected: 06/28/2016 10:31	Matrix: WATER
Lab Sample ID: 400269004	Date Received: 06/29/2016 09:00	
Client ID: B35M48	Client: CPRC001	Project: CPRC0X16037
Batch ID: 1578083	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/30/2016 11:02	Inst: VOA3.I	Dilution: 1
Prep Date: 06/30/2016 11:02	Analyst: CDS1	Purge Vol: 5 mL
Data File: 063016V3\3P409.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	0.410	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	4.62	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Quality Control Summary

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 1, 2016

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400269

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1578083										
QC1203576189	LCS										
1,1,1-Trichloroethane	50.0			58.1	ug/L		116	(70%-130%)	CDS1	06/29/16	08:03
1,1,2-Trichloroethane	50.0			49.1	ug/L		98	(70%-130%)			
1,1-Dichloroethane	50.0			54.3	ug/L		109	(70%-130%)			
1,1-Dichloroethylene	50.0			57.2	ug/L		114	(70%-130%)			
1,2-Dichloroethane	50.0			48.7	ug/L		97	(70%-130%)			
2-Butanone	250			259	ug/L		104	(70%-130%)			
4-Methyl-2-pentanone	250			216	ug/L		86	(70%-130%)			
Acetone	250			251	ug/L		100	(70%-130%)			
Benzene	50.0			54.6	ug/L		109	(70%-130%)			
Carbon disulfide	250			271	ug/L		109	(70%-130%)			
Carbon tetrachloride	50.0			55.9	ug/L		112	(70%-130%)			
Chlorobenzene	50.0			52.8	ug/L		106	(70%-130%)			
Chloroform	50.0			53.3	ug/L		107	(70%-130%)			
Ethylbenzene	50.0			52.1	ug/L		104	(70%-130%)			
Methylene chloride	50.0			54.4	ug/L		109	(70%-130%)			
Tetrachloroethylene	50.0			53.5	ug/L		107	(70%-130%)			
Toluene	50.0			51.1	ug/L		102	(70%-130%)			
Trichloroethylene	50.0			54.9	ug/L		110	(70%-130%)			
Vinyl chloride	50.0			45.4	ug/L		91	(70%-130%)			
Xylenes (total)	150			155	ug/L		103	(70%-130%)			

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July 26, 2016

GEL LABORATORIES LLC

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QC Summary

Workorder: 400269

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1578083										
**1,2-Dichloroethane-d4	50.0			46.3	ug/L		93	(70%-130%)	CDS1	06/29/16	08:03
**Bromofluorobenzene	50.0			50.4	ug/L		101	(70%-130%)			
**Toluene-d8	50.0			46.3	ug/L		93	(70%-130%)			
QC1203578044	LCS										
1,1,1-Trichloroethane	50.0			57.8	ug/L		116	(70%-130%)		06/30/16	07:59
1,1,2-Trichloroethane	50.0			50.4	ug/L		101	(70%-130%)			
1,1-Dichloroethane	50.0			56.5	ug/L		113	(70%-130%)			
1,1-Dichloroethylene	50.0			58.8	ug/L		118	(70%-130%)			
1,2-Dichloroethane	50.0			50.9	ug/L		102	(70%-130%)			
2-Butanone	250			256	ug/L		102	(70%-130%)			
4-Methyl-2-pentanone	250			216	ug/L		87	(70%-130%)			
Acetone	250			249	ug/L		100	(70%-130%)			
Benzene	50.0			55.7	ug/L		111	(70%-130%)			
Carbon disulfide	250			281	ug/L		112	(70%-130%)			
Carbon tetrachloride	50.0			55.9	ug/L		112	(70%-130%)			
Chlorobenzene	50.0			53.7	ug/L		107	(70%-130%)			
Chloroform	50.0			53.4	ug/L		107	(70%-130%)			
Ethylbenzene	50.0			53.2	ug/L		106	(70%-130%)			
Methylene chloride	50.0			56.4	ug/L		113	(70%-130%)			
Tetrachloroethylene	50.0			54.2	ug/L		108	(70%-130%)			
Toluene	50.0			53.8	ug/L		108	(70%-130%)			
Trichloroethylene	50.0			55.8	ug/L		112	(70%-130%)			

July 26, 2016

GEL LABORATORIES LLC

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QC Summary

Workorder: 400269

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1578083										
Vinyl chloride	50.0			39.9	ug/L		80	(70%-130%)	CDS1	06/30/16	07:59
Xylenes (total)	150			160	ug/L		107	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			47.3	ug/L		95	(70%-130%)			
**Bromofluorobenzene	50.0			49.8	ug/L		100	(70%-130%)			
**Toluene-d8	50.0			48.4	ug/L		97	(70%-130%)			
QC1203576188	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/29/16	09:04
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400269

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1578083										
Toluene			U	0.300	ug/L				CDS1	06/29/16	09:04
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.1	ug/L		102	(70%-130%)			
**Bromofluorobenzene	50.0			48.6	ug/L		97	(70%-130%)			
**Toluene-d8	50.0			50.9	ug/L		102	(70%-130%)			
QC1203578043 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					06/30/16	09:00
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						

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QC Summary

Workorder: 400269

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1578083										
Methylene chloride			U	1.60	ug/L				CDS1	06/30/16	09:00
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			52.5	ug/L		105	(70%-130%)			
**Bromofluorobenzene	50.0			47.2	ug/L		94	(70%-130%)			
**Toluene-d8	50.0			50.4	ug/L		101	(70%-130%)			
QC1203576190 400183001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	54.7	ug/L		109	(70%-130%)		06/29/16	16:09
1,1,2-Trichloroethane	50.0	U	0.00	48.9	ug/L		98	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	52.3	ug/L		105	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	49.9	ug/L		100	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	47.0	ug/L		94	(70%-130%)			
2-Butanone	250	TU	0.00 T	160	ug/L		64 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	215	ug/L		86	(70%-130%)			
Acetone	250	TU	0.00 T	124	ug/L		50 *	(70%-130%)			
Benzene	50.0	U	0.00	51.2	ug/L		102	(70%-130%)			
Carbon disulfide	250	U	0.00	248	ug/L		99	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	52.5	ug/L		105	(70%-130%)			
Chlorobenzene	50.0	U	0.00	50.4	ug/L		101	(70%-130%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1578083										
Chloroform	50.0	J	0.370	51.5	ug/L		102	(70%-130%)	CDS1	06/29/16	16:09
Ethylbenzene	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			
Methylene chloride	50.0	U	0.00	51.5	ug/L		103	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			
Toluene	50.0	U	0.00	51.7	ug/L		103	(70%-130%)			
Trichloroethylene	50.0	J	4.67	55.4	ug/L		101	(70%-130%)			
Vinyl chloride	50.0	U	0.00	40.8	ug/L		82	(70%-130%)			
Xylenes (total)	150	U	0.00	149	ug/L		100	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		52.7	47.6	ug/L		95	(70%-130%)			
**Bromofluorobenzene	50.0		46.9	50.3	ug/L		101	(70%-130%)			
**Toluene-d8	50.0		50.1	49.2	ug/L		98	(70%-130%)			
QC1203576191 400183001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	56.0	ug/L	2	112	(0%-20%)		06/29/16	16:39
1,1,2-Trichloroethane	50.0	U	0.00	46.7	ug/L	4	93	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	51.8	ug/L	1	104	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	52.8	ug/L	6	106	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	48.0	ug/L	2	96	(0%-20%)			
2-Butanone	250	TU	0.00	T 166	ug/L	3	66*	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	212	ug/L	1	85	(0%-20%)			
Acetone	250	TU	0.00	T 130	ug/L	5	52*	(0%-20%)			
Benzene	50.0	U	0.00	52.0	ug/L	2	104	(0%-20%)			
Carbon disulfide	250	U	0.00	251	ug/L	1	100	(0%-20%)			

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QC Summary

Workorder: 400269

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1578083										
Carbon tetrachloride	50.0	U	0.00	51.8	ug/L	1	104	(0%-20%)	CDS1	06/29/16	16:39
Chlorobenzene	50.0	U	0.00	48.8	ug/L	3	98	(0%-20%)			
Chloroform	50.0	J	0.370	49.9	ug/L	3	99	(0%-20%)			
Ethylbenzene	50.0	U	0.00	49.3	ug/L	3	99	(0%-20%)			
Methylene chloride	50.0	U	0.00	50.4	ug/L	2	101	(0%-20%)			
Tetrachloroethylene	50.0	U	0.00	49.1	ug/L	3	98	(0%-20%)			
Toluene	50.0	U	0.00	47.9	ug/L	8	96	(0%-20%)			
Trichloroethylene	50.0	J	4.67	54.6	ug/L	1	100	(0%-20%)			
Vinyl chloride	50.0	U	0.00	42.8	ug/L	5	86	(0%-20%)			
Xylenes (total)	150	U	0.00	144	ug/L	4	96	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		52.7	49.8	ug/L		100	(70%-130%)			
**Bromofluorobenzene	50.0		46.9	50.6	ug/L		101	(70%-130%)			
**Toluene-d8	50.0		50.1	48.5	ug/L		97	(70%-130%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- 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
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.

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QC Summary

Workorder: 400269

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
o	Analyte failed to recover within LCS limits (Organics only)										

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.

Surrogate Recovery Report

SDG Number: GEL400269

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203576189	LCS for batch 1578083	93	93	101
1203576188	MB for batch 1578083	102	102	97
1203576190	B35M16PS	95	98	101
1203576191	B35M16PSD	100	97	101
1203578044	LCS for batch 1578083	95	97	100
1203578043	MB for batch 1578083	105	101	94
400269002	B35M29	98	103	90
400269004	B35M48	104	106	94

Surrogate

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

Acceptance Limits

(70%-130%)

(70%-130%)

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400269
Work Order #: 400269

Product: Determination of Metals by ICP

Analytical Method: 6010_METALS_ICP

Analytical Procedure: GL-MA-E-013 REV# 26

Analytical Batch: 1578167

Preparation Method: SW846 3005A

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

Preparation Batch: 1578165

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400269001	B35M32
400269002	B35M29
400269003	B35M51
400269004	B35M48
1203576403	Method Blank (MB)ICP
1203576404	Laboratory Control Sample (LCS)
1203576407	400269001(B35M32L) Serial Dilution (SD)
1203576405	400269001(B35M32S) Matrix Spike (MS)
1203576406	400269001(B35M32SD) 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 potassium and sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 400269001 (B35M32), 400269002 (B35M29), 400269003 (B35M51) and 400269004 (B35M48).

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of sodium. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203576403 (MB).

Certification Statement

July 26, 2016

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

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400269 GEL Work Order: 400269

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: 26 JUL 2016

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400269

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID:400269001

BASIS: Filtered

DATE COLLECTED 28-JUN-16

CLIENT ID: B35M32

LEVEL: Low

DATE RECEIVED 29-JUN-16

MATRIX: WATER

Dissolved Metals

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-39-3	Barium	39.1	ug/L		1	5	5	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-70-2	Calcium	48200	ug/L		50	200	200	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-47-3	Chromium	2.05	ug/L	B	1	5	5	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7439-95-4	Magnesium	12200	ug/L		110	300	300	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-09-7	Potassium	6130	ug/L		50	150	150	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-23-5	Sodium	15900	ug/L		100	300	300	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-62-2	Vanadium	3.31	ug/L	B	1	5	5	1	P	HSC	07/12/16 20:55	071216A-1	1578167
7440-66-6	Zinc	15.8	ug/L		3.3	10	10	1	P	HSC	07/12/16 20:55	071216A-1	1578167

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578167	1578165	SW846 3005A	50	mL	50	mL	06/29/16	JP1

***Analytical Methods:**

P SW846 3005A/6010C

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400269

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID:400269002

BASIS: As Received

DATE COLLECTED 28-JUN-16

CLIENT ID: B35M29

LEVEL: Low

DATE RECEIVED 29-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-39-3	Barium	38.8	ug/L		1	5	5	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-70-2	Calcium	47800	ug/L		50	200	200	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-47-3	Chromium	2.18	ug/L	B	1	5	5	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7439-95-4	Magnesium	12100	ug/L		110	300	300	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-02-0	Nickel	1.6	ug/L	B	1.5	5	5	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-09-7	Potassium	6020	ug/L		50	150	150	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-23-5	Sodium	15700	ug/L		100	300	300	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-62-2	Vanadium	2.89	ug/L	B	1	5	5	1	P	HSC	07/12/16 20:46	071216A-1	1578167
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/12/16 20:46	071216A-1	1578167

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578167	1578165	SW846 3005A	50	mL	50	mL	06/29/16	JP1

***Analytical Methods:**

P SW846 3005A/6010C

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400269

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID:400269003

BASIS: Filtered

DATE COLLECTED 28-JUN-16

CLIENT ID: B35M51

LEVEL: Low

DATE RECEIVED 29-JUN-16

MATRIX: WATER

Dissolved Metals

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-39-3	Barium	43.5	ug/L		1	5	5	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-70-2	Calcium	48600	ug/L		50	200	200	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-47-3	Chromium	8.4	ug/L		1	5	5	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7439-95-4	Magnesium	12400	ug/L		110	300	300	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-09-7	Potassium	6170	ug/L		50	150	150	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-23-5	Sodium	15900	ug/L		100	300	300	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-62-2	Vanadium	6.14	ug/L		1	5	5	1	P	HSC	07/12/16 20:49	071216A-1	1578167
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/12/16 20:49	071216A-1	1578167

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578167	1578165	SW846 3005A	50	mL	50	mL	06/29/16	JP1

***Analytical Methods:**

P SW846 3005A/6010C

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400269

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID:400269004

BASIS: As Received

DATE COLLECTED 28-JUN-16

CLIENT ID: B35M48

LEVEL: Low

DATE RECEIVED 29-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-39-3	Barium	44.4	ug/L		1	5	5	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-70-2	Calcium	48400	ug/L		50	200	200	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-47-3	Chromium	10.9	ug/L		1	5	5	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7439-95-4	Magnesium	12100	ug/L		110	300	300	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7439-96-5	Manganese	2.36	ug/L	B	2	10	10	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-02-0	Nickel	2.76	ug/L	B	1.5	5	5	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-09-7	Potassium	6190	ug/L		50	150	150	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-23-5	Sodium	14700	ug/L		100	300	300	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-62-2	Vanadium	6.1	ug/L		1	5	5	1	P	HSC	07/12/16 20:52	071216A-1	1578167
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/12/16 20:52	071216A-1	1578167

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578167	1578165	SW846 3005A	50	mL	50	mL	06/29/16	JP1

***Analytical Methods:**

P SW846 3005A/6010C

Quality Control Summary

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 26, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400269

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1578167										
QC1203576404	LCS										
Antimony	500			473	ug/L		94.7	(80%-120%)	HSC	07/12/16	20:43
Arsenic	500			462	ug/L		92.3	(80%-120%)			
Barium	500			478	ug/L		95.5	(80%-120%)			
Cadmium	500			466	ug/L		93.1	(80%-120%)			
Calcium	5000			4840	ug/L		96.8	(80%-120%)			
Chromium	500			468	ug/L		93.7	(80%-120%)			
Cobalt	500			478	ug/L		95.5	(80%-120%)			
Copper	500			487	ug/L		97.5	(80%-120%)			
Iron	5000			4590	ug/L		91.9	(80%-120%)			
Magnesium	5000			4700	ug/L		94	(80%-120%)			
Manganese	500			471	ug/L		94.2	(80%-120%)			
Nickel	500			465	ug/L		93.1	(80%-120%)			
Potassium	5000			5240	ug/L		105	(80%-120%)			
Silver	500			479	ug/L		95.8	(80%-120%)			
Sodium	5000			5080	ug/L		102	(80%-120%)			
Vanadium	500			479	ug/L		95.9	(80%-120%)			
Zinc	500			453	ug/L		90.6	(80%-120%)			
QC1203576403	MB										
Antimony			U	3.50	ug/L					07/12/16	20:39
Arsenic			U	5.00	ug/L						

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400269

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1578167										
Barium			U	1.00	ug/L						
Cadmium			U	1.00	ug/L				HSC	07/12/16	20:39
Calcium			U	50.0	ug/L						
Chromium			U	1.00	ug/L						
Cobalt			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Manganese			U	2.00	ug/L						
Nickel			U	1.50	ug/L						
Potassium			U	50.0	ug/L						
Silver			U	1.00	ug/L						
Sodium			B	147	ug/L						
Vanadium			U	1.00	ug/L						
Zinc			U	3.30	ug/L						
QC1203576405 400269001 MS											
Antimony	500	U	3.50	477	ug/L		95	(75%-125%)		07/12/16	20:59
Arsenic	500	U	5.00	468	ug/L		93.1	(75%-125%)			
Barium	500		39.1	505	ug/L		93.2	(75%-125%)			
Cadmium	500	U	1.00	449	ug/L		89.7	(75%-125%)			
Calcium	5000		48200	52500	ug/L		N/A	(75%-125%)			
Chromium	500	B	2.05	458	ug/L		91.2	(75%-125%)			
Cobalt	500	U	1.00	451	ug/L		90.2	(75%-125%)			

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400269

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1578167										
Copper	500	U	3.00	487	ug/L		97.4	(75%-125%)	HSC	07/12/16	20:59
Iron	5000	U	30.0	4490	ug/L		89.8	(75%-125%)			
Magnesium	5000		12200	16800	ug/L		90.8	(75%-125%)			
Manganese	500	U	2.00	457	ug/L		91.3	(75%-125%)			
Nickel	500	U	1.50	433	ug/L		86.4	(75%-125%)			
Potassium	5000		6130	11500	ug/L		107	(75%-125%)			
Silver	500	U	1.00	473	ug/L		94.6	(75%-125%)			
Sodium	5000		15900	20800	ug/L		97.2	(75%-125%)			
Vanadium	500	B	3.31	482	ug/L		95.8	(75%-125%)			
Zinc	500		15.8	441	ug/L		85	(75%-125%)			
QC1203576406 400269001 MSD											
Antimony	500	U	3.50	478	ug/L	0.119	95.1	(0%-20%)		07/12/16	21:02
Arsenic	500	U	5.00	468	ug/L	0.0214	93.1	(0%-20%)			
Barium	500		39.1	505	ug/L	0.0674	93.1	(0%-20%)			
Cadmium	500	U	1.00	447	ug/L	0.418	89.3	(0%-20%)			
Calcium	5000		48200	53300	ug/L	1.6	N/A	(0%-20%)			
Chromium	500	B	2.05	457	ug/L	0.249	91	(0%-20%)			
Cobalt	500	U	1.00	447	ug/L	0.77	89.5	(0%-20%)			
Copper	500	U	3.00	487	ug/L	0.076	97.4	(0%-20%)			
Iron	5000	U	30.0	4530	ug/L	0.86	90.6	(0%-20%)			
Magnesium	5000		12200	17000	ug/L	1.54	96	(0%-20%)			
Manganese	500	U	2.00	455	ug/L	0.314	91	(0%-20%)			

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400269

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1578167										
Nickel	500	U	1.50	434	ug/L	0.09	86.4	(0%-20%)	HSC	07/12/16	21:02
Potassium	5000		6130	11600	ug/L	0.849	109	(0%-20%)			
Silver	500	U	1.00	473	ug/L	0.0381	94.5	(0%-20%)			
Sodium	5000		15900	21900	ug/L	5	119	(0%-20%)			
Vanadium	500	B	3.31	481	ug/L	0.218	95.6	(0%-20%)			
Zinc	500		15.8	440	ug/L	0.2	84.8	(0%-20%)			
QC1203576407 400269001 SDILT											
Antimony		U	2.49	DU	17.5	ug/L	N/A	(0%-10%)		07/12/16	21:05
Arsenic		U	2.37	DU	25.0	ug/L	N/A	(0%-10%)			
Barium			39.1	D	8.56	ug/L	9.5	(0%-10%)			
Cadmium		U	0.116	DU	5.00	ug/L	N/A	(0%-10%)			
Calcium			48200	D	10500	ug/L	9.41	(0%-10%)			
Chromium		B	2.05	DU	5.00	ug/L	N/A	(0%-10%)			
Cobalt		U	-0.119	DU	5.00	ug/L	N/A	(0%-10%)			
Copper		U	-0.198	DU	15.0	ug/L	N/A	(0%-10%)			
Iron		U	-1.89	DU	150	ug/L	N/A	(0%-10%)			
Magnesium			12200	D	2690	ug/L	9.88	(0%-10%)			
Manganese		U	-0.0104	DU	10.0	ug/L	N/A	(0%-10%)			
Nickel		U	1.45	DU	7.50	ug/L	N/A	(0%-10%)			
Potassium			6130	D	1330	ug/L	8.45	(0%-10%)			
Silver		U	-0.372	DU	5.00	ug/L	N/A	(0%-10%)			
Sodium			15900	D	3430	ug/L	7.77	(0%-10%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400269

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1578167										
Vanadium	B	3.31	DU	5.00	ug/L	N/A		(0%-10%)	HSC	07/12/16	21:05
Zinc		15.8	D	59.4	ug/L	1780		(0%-10%)			

Notes:

The Qualifiers in this report are defined as follows:

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

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

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

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

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

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

General Chem Analysis

Case Narrative

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400269
Work Order #: 400269

Product: Alkalinity

Analytical Method: 2320_ALKALINITY

Analytical Procedure: GL-GC-E-033 REV# 12

Analytical Batch: 1578405

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400269002	B35M29
400269004	B35M48
1203577068	Method Blank (MB)
1203577069	Laboratory Control Sample (LCS)
1203577072	400269002(B35M29) 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.

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: GEL400269 GEL Work Order: 400269

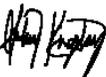
The Qualifiers in this report are defined as follows:

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: Aubrey Kingsbury

Date: 12 JUL 2016

Title: Analyst I

Sample Data Summary

July 26, 2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 12, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X16-037

Client Sample ID: B35M29 Project: CPRC0X16037
Sample ID: 400269002 Client ID: CPRC001
Matrix: WATER
Collect Date: 28-JUN-16 11:39
Receive Date: 29-JUN-16
Collector: Client

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time Batch, Method. Rows include Titration and Ion Analysis and Alkalinity measurements.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, 2320_ALKALINITY.

Notes:

July 26, 2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 12, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X16-037

Client Sample ID: B35M48
Sample ID: 400269004
Matrix: WATER
Collect Date: 28-JUN-16 10:31
Receive Date: 29-JUN-16
Collector: Client
Project: CPRC0X16037
Client ID: CPRC001

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time Batch, Method. Rows include Titration and Ion Analysis and Alkalinity data.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, 2320_ALKALINITY.

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 12, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400269

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1578405										
QC1203577072	400269002	DUP									
Alkalinity, Total as CaCO3		111000		112000	ug/L	0.905		(0%-20%)	RXB5	06/29/16	17:45
Bicarbonate alkalinity (CaCO3)		111000		112000	ug/L	0.905		(0%-20%)			
Carbonate alkalinity (CaCO3)	U	725	U	725	ug/L	N/A					
Hydroxide alkalinity as CaCO3	U	725	U	725	ug/L	N/A					
QC1203577069	LCS										
Alkalinity, Total as CaCO3	50000			52000	ug/L		104	(80%-120%)		06/29/16	17:22
QC1203577068	MB										
Alkalinity, Total as CaCO3			U	725	ug/L					06/29/16	17:17
Bicarbonate alkalinity (CaCO3)			U	725	ug/L						
Carbonate alkalinity (CaCO3)			U	725	ug/L						
Hydroxide alkalinity as CaCO3			U	725	ug/L						

Notes:

The Qualifiers in this report are defined as follows:

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

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400269

Page 2 of 2

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

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

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400269
Work Order #: 400269

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1579220

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400269002	B35M29
400269004	B35M48
1203579106	Method Blank (MB)
1203579107	400141005(B35ML6) Sample Duplicate (DUP)
1203579108	Laboratory Control Sample (LCS)

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.

Product: C14_LSC: COMMON

Analytical Method: C14_LSC

Analytical Procedure: GL-RAD-A-003 REV# 15

Analytical Batch: 1578295

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400269002	B35M29
400269004	B35M48
1203576766	Method Blank (MB)
1203576767	400025001(B35M74) Sample Duplicate (DUP)
1203576768	400025001(B35M74) Matrix Spike (MS)
1203576769	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

Samples 400269002 (B35M29) and 400269004 (B35M48) were recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1579141

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400269002	B35M29
400269004	B35M48
1203578832	Method Blank (MB)
1203578833	400025001(B35M74) Sample Duplicate (DUP)
1203578834	400025001(B35M74) Matrix Spike (MS)
1203578835	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

Samples 400269002 (B35M29) and 400269004 (B35M48) were recounted to verify sample results. The recount results are similar to the original results. Original results are 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.

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: GEL400269 GEL Work Order: 400269

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: Theresa Austin

Date: 20 JUL 2016

Title: Group Leader

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400269	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400269002	Date Collected: 06/28/2016 11:39	Matrix: WATER
	Date Received: 06/29/2016 09:00	
Client ID: B35M29	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579220	Analyst: BXF1	SOP Ref: GL-RAD-A-004
Run Date: 07/13/2016 13:40	Aliquot: 300 mL	Instrument: PIC12B
Data File: S1579220r1.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1579220		
Prep Date: 07/12/2016 14:13		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-1.16	pCi/L	+/-0.844	0.844	1.85	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.70	7.37	mg	91	(40%-110%)

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.

Rad
 Certificate of Analysis
 Sample Summary

SDG Number: GEL400269	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400269002	Date Collected: 06/28/2016 11:39	Matrix: WATER
	Date Received: 06/29/2016 09:00	
Client ID: B35M29	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1578295	Analyst: TXJ1	SOP Ref: GL-RAD-A-003
Run Date: 07/14/2016 21:53	Aliquot: 60 mL	Instrument: LSCBLUE
Data File: C1578295.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1578295		
Prep Date: 07/14/2016 09:05		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		347	pCi/L	+/-25.4	69.2	30.5	50.0

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

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

Rad
 Certificate of Analysis
 Sample Summary

SDG Number: GEL400269	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400269002	Date Collected: 06/28/2016 11:39	Matrix: WATER
	Date Received: 06/29/2016 09:00	
Client ID: B35M29	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1579141	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/14/2016 02:41	Aliquot: 50 mL	Instrument: LSCBROWN
Data File: T1579141.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1579141		
Prep Date: 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1720	pCi/L	+/-256	420	320	400

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

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400269	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400269004	Date Collected: 06/28/2016 10:31	Matrix: WATER
	Date Received: 06/29/2016 09:00	
Client ID: B35M48	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579220	Analyst: BXF1	SOP Ref: GL-RAD-A-004
Run Date: 07/13/2016 13:41	Aliquot: 300 mL	Instrument: PIC12D
Data File: S1579220r1.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 80 min
Prep Batch: 1579220		
Prep Date: 07/12/2016 14:13		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	0.369	pCi/L	+/-1.03	1.03	1.82	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.70	7.37	mg	91	(40%-110%)

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.

Rad
 Certificate of Analysis
 Sample Summary

SDG Number: GEL400269	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400269004	Date Collected: 06/28/2016 10:31	Matrix: WATER
	Date Received: 06/29/2016 09:00	
Client ID: B35M48	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1578295	Analyst: TXJ1	SOP Ref: GL-RAD-A-003
Run Date: 07/14/2016 22:40	Aliquot: 60 mL	Instrument: LSCBLUE
Data File: C1578295.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1578295		
Prep Date: 07/14/2016 09:05		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		429	pCi/L	+/-27.0	84.1	30.8	50.0

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

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400269	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400269004	Date Collected: 06/28/2016 10:31	Matrix: WATER
	Date Received: 06/29/2016 09:00	
Client ID: B35M48	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1579141	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/14/2016 03:28	Aliquot: 50 mL	Instrument: LSCBROWN
Data File: T1579141.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1579141		
Prep Date: 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1130	pCi/L	+/-236	322	325	400

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

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

Quality Control Summary

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 19, 2016
Page 1 of 3

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 400269

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, QC Criteria, Range, Analyst, Date Time. Rows include Rad Gas Flow (Strontium-90) and Rad Liquid Scintillation (Carbon-14, Tritium) with various sample IDs and QC values.

QC Summary

Workorder: 400269

Page 2 of 3

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch	1579141									
		Uncert:	+/-246	+/-316						
		TPU:	+/-374	+/-725						
QC1203578835	LCS									
Tritium	2320			1860	pCi/L	REC: 80 (80%-120%)			07/14/16	10:13
		Uncert:		+/-260						
		TPU:		+/-444						

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
- A The TIC is a suspected aldol-condensation product
- 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 analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
- C Analyte has been confirmed by GC/MS analysis
- 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 Concentration exceeds the calibration range of the instrument
- E Reported value is estimated due to interferences. See comment in narrative.
- 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
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- S Reported value determined by the Method of Standard Additions (MSA)
- T Spike and/or spike duplicate 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.
- UX Gamma Spectroscopy--Uncertain identification
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

July 26, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400269

Page 3 of 3

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

** 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.