

May 21, 2015



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407

P 843.556.8171 F 843.766.1178

www.gel.com

May 18, 2015

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

Re: CHPRC SAF W15-004
Work Order: 371742
SDG: GEL371742

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 24, 2015. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

Chelsea Seagle
Chelsea Seagle for
Heather Shaffer
Project Manager

Purchase Order: 300071JDBA 7H
Chain of Custody: W15-004-046 and W15-004-047
Enclosures



Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....4

Data Review Qualifier Definitions.....8

Laboratory Certifications.....11

Semi-Volatile Analysis.....13

 Case Narrative.....14

 Sample Data Summary.....19

 Quality Control Summary.....21

General Chem Analysis.....28

 Case Narrative.....29

 Sample Data Summary.....39

 Quality Control Summary.....45

Case Narrative

May 21, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF W15-004
SDG: GEL371742

May 18, 2015

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on April 24, 2015, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
371742001	B30KY7
371742002	B30KY8
371742003	B30KC9
371742004	B30KD0
371742005	B30KY9

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.

May 21, 2015

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Semivolatile and General Chemistry.

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

Chelsea Seagle
Chelsea Seagle for
Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

W15-004-046

Page 1 of 1

Collector J.C. Fulton
SAF No. W15-004
Project Title RCRA, APRIL 2015
Shipped To (Lab) GEL Laboratories, LLC
Protocol RCRA

Contact/Requester Karen Waters-Husted
Sampling Origin Hanford Site
Logbook No. HNF-N-506 67192
Method of Shipment Commercial Carrier
Priority: 30 Days

Telephone No. 509-376-4650
Purchase Order/Charge Code 300071
Ice Chest No. GWS-411
Bill of Lading/Air Bill No. 7734 4439 0560
Offsite Property No. PTR 5589

PRIORITY

SPECIAL INSTRUCTIONS

Hold Time

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
B30KY7	N	W	4-23-15	1045	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30KY8	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30KC9	N	W			1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B30KC9	N	W			4x1-L aG	8270_PHENOLIC_GC: COMMON	7/40 Days	Cool <=6C
B30KC9	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30KY9	N	W	4-23-15	1045	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C

May 21, 2015

Relinquished By: J.C. Fulton (Signature) **Print** RA. Shepard/CHPRC **Sign** RA. Shepard/CHPRC **Date/Time** APR 23 2015 1140
Relinquished By: RA. Shepard/CHPRC (Signature) **Print** FEDER **Sign** FEDER **Date/Time** APR 23 2015 1400
Relinquished By: (Signature) **Print** M. Karslow (Signature) **Sign** M. Karslow (Signature) **Date/Time** 4-14-15 0850
Relinquished By: (Signature) **Print** (Signature) **Sign** (Signature) **Date/Time** (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 _____ Date/Time _____

PRINTED O 4/16/2015 A-6004-842 (REV 2)

May 21, 2015

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

W15-004-047

Page 1 of 1

Collector
J.C. Fulton
CHPRC

Contact/Requester
Karen Waters-Husted

Telephone No. 509-376-4650

Sampling Origin
Hanford Site

Purchase Order/Charge Code 300071

Project Title
RCRA, APRIL 2015

Ice Chest No. GNS-411

Shipped To (Lab)
GEL Laboratories, LLC

Bill of Lading/Air Bill No.

Protocol
RCRA

Method of Shipment
Commercial Carrier

Priority: 30 Days

PRIORITY

Offsite Property 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

Hold Time

Total Activity Exemption: Yes No

Sample No. B30KDO

Filler * N

Date W 4-23-15

No/Type Container 1x250-mL G/P

Sample Analysis 9056_ANIONS_IC: COMMON

Holding Time

28 Days/48 Hours

Preservative

Cool <=6C

Relinquished By J.C. Fulton CHPRC	Sign 	Date APR 23 2015	Time 1140	Received By R.A. Shepard/CHPRC	Print 	Sign 	Date/Time APR 23 2015 1140	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By R.A. Shepard/CHPRC	Sign 	Date APR 23 2015	Time 1400	Received By FEDEX	Print 	Sign 	Date/Time APR 23 2015 1400		
Relinquished By of	Sign 	Date APR 23 2015	Time 1400	Received By M. Kaslow	Print 	Sign 	Date/Time 4-24-15 0852		
Relinquished By of	Sign 	Date APR 23 2015	Time 1400	Received By	Print 	Sign 	Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)							Disposed By	Date/Time

A-6004-842 (REV 2)

PRINTED O 4/16/2015

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>371742</u>	
Received By: <u>ML</u>		Date Received: <u>4-24-15</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 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>afm</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
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 ≤ deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) all temperatures are recorded in Celsius			
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temperature Device Serial #: <u>130532776</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 (EPA 6850) have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample ID's and containers affected:			
7 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:			
8 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(If yes, immediately deliver to Volatiles laboratory)			
9 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ID's and tests affected:			
10 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:			
11 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample ID's affected:			
12 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample ID's affected:			
13 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 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>7734 4439 0560</u>			
Comments (Use Continuation Form if needed):			

Data Review Qualifier Definitions

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

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

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

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

Laboratory Certifications

List of current GEL Certifications as of 18 May 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-17
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Semi-Volatile Analysis

Case Narrative

May 21, 2015
GC/MS Semivolatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL371742
Work Order #: 371742

Method/Analysis Information

Procedure: Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry

Analytical Method: SW846 3510C/8270D

Prep Method: SW846 3510C

Analytical Batch Number: 1474658

Prep Batch Number: 1474657

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

Sample ID	Client ID
371742003	B30KC9
1203308188	Method Blank (MB)
1203308189	Laboratory Control Sample (LCS)
1203308192	371742003(B30KC9) Matrix Spike (MS)
1203308193	371742003(B30KC9) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 35.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

May 21, 2015

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

CCV Requirements

All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG in this batch met the acceptance criteria.

Surrogate Recoveries

All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 371742003 (B30KC9) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS and MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

Technical Information:

Holding Time Specifications

All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

Sample Dilutions

The samples in this SDG in this batch did not require dilutions.

Miscellaneous Information:

Data Exception (DER) Documentation

A data exception report (DER) was not required for sample 371742003 (B30KC9) in this batch.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

TIC Comment

Tentatively identified compounds (TIC) were not required for the samples in this SDG for this batch.

Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

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.

May 21, 2015

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL371742 GEL Work Order: 371742

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.

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: **Barbara Bailey**

Date: **20 MAY 2015**

Title: **Data Validator**

Sample Data Summary

May 21, 2015
Semi-Volatile

Page 1 of 1

Certificate of Analysis
Sample Summary

SDG Number:	GEL371742	Date Collected:	04/23/2015 10:45	Matrix:	WATER
Lab Sample ID:	371742003	Date Received:	04/24/2015 08:50	Client:	CPRC001
Client ID:	B30KC9	Method:	SW846 3510C/8270D	Project:	CPRC0W15004
Batch ID:	1474658	Inst:	MSD3.I	SOP Ref:	GL-OA-E-009
Run Date:	05/01/2015 12:07	Analyst:	JLD1	Dilution:	1
Prep Date:	04/29/2015 15:17	Aliquot:	1120 mL	Inj. Vol:	1 uL
Data File:	s050115.B\s3e0108.D	Column:	DB-5ms	Final Volume:	1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	U	2.68	ug/L	2.68	8.93
95-95-4	2,4,5-Trichlorophenol	U	2.68	ug/L	2.68	8.93
88-06-2	2,4,6-Trichlorophenol	U	2.68	ug/L	2.68	8.93
120-83-2	2,4-Dichlorophenol	U	2.68	ug/L	2.68	8.93
105-67-9	2,4-Dimethylphenol	U	2.68	ug/L	2.68	8.93
51-28-5	2,4-Dinitrophenol	U	4.46	ug/L	4.46	17.9
87-65-0	2,6-Dichlorophenol	U	2.68	ug/L	2.68	8.93
95-57-8	2-Chlorophenol	U	2.68	ug/L	2.68	8.93
534-52-1	2-Methyl-4,6-dinitrophenol	U	2.68	ug/L	2.68	8.93
88-75-5	2-Nitrophenol	U	2.68	ug/L	2.68	8.93
59-50-7	4-Chloro-3-methylphenol	U	2.68	ug/L	2.68	8.93
100-02-7	4-Nitrophenol	U	2.68	ug/L	2.68	8.93
88-85-7	Dinoseb	U	2.68	ug/L	2.68	8.93
87-86-5	Pentachlorophenol	U	2.68	ug/L	2.68	8.93
108-95-2	Phenol	U	2.68	ug/L	2.68	8.93
65794-96-9	m,p-Cresols	U	3.30	ug/L	3.30	8.93
95-48-7	o-Cresol	U	2.68	ug/L	2.68	8.93

Quality Control Summary

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Report Date: May 20, 2015

Page 1 of 5

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 371742

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1474658										
QC1203308189	LCS										
2,3,4,6-Tetrachlorophenol	50.0			49.0	ug/L		98	(48%-117%)	JLD1	05/01/15	11:37
2,4,5-Trichlorophenol	50.0			45.4	ug/L		90.8	(50%-113%)			
2,4,6-Trichlorophenol	50.0			44.4	ug/L		88.8	(48%-114%)			
2,4-Dichlorophenol	50.0			42.5	ug/L		85	(47%-107%)			
2,4-Dimethylphenol	50.0			42.7	ug/L		85.4	(43%-105%)			
2,4-Dinitrophenol	50.0			46.2	ug/L		92.4	(14%-126%)			
2,6-Dichlorophenol	50.0			41.2	ug/L		82.4	(50%-121%)			
2-Chlorophenol	50.0			37.5	ug/L		75	(44%-103%)			
2-Methyl-4,6-dinitrophenol	50.0			47.4	ug/L		94.8	(41%-123%)			
2-Nitrophenol	50.0			45.2	ug/L		90.4	(47%-110%)			
4-Chloro-3-methylphenol	50.0			48.0	ug/L		96	(47%-113%)			
4-Nitrophenol	50.0			18.2	ug/L		36.5	(15%-109%)			
Pentachlorophenol	50.0			45.0	ug/L		90	(33%-111%)			
Phenol	50.0			16.4	ug/L		32.8	(10%-114%)			
m,p-Cresols	50.0			39.3	ug/L		78.7	(34%-106%)			
o-Cresol	50.0			35.9	ug/L		71.8	(36%-99%)			
**2,4,6-Tribromophenol	100			85.1	ug/L		85.1	(33%-126%)			
**2-Fluorobiphenyl	50.0			36.1	ug/L		72.1	(35%-102%)			
**2-Fluorophenol	100			47.3	ug/L		47.3	(18%-84%)			
**Nitrobenzene-d5	50.0			39.6	ug/L		79.2	(38%-113%)			

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 371742

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1474658										
**Phenol-d5	100			31.0	ug/L		31	(10%-110%)	JLD1	05/01/15	11:37
**p-Terphenyl-d14	50.0			51.0	ug/L		102	(38%-123%)			
QC1203308188 MB											
2,3,4,6-Tetrachlorophenol			U	3.00	ug/L					05/01/15	11:06
2,4,5-Trichlorophenol			U	3.00	ug/L						
2,4,6-Trichlorophenol			U	3.00	ug/L						
2,4-Dichlorophenol			U	3.00	ug/L						
2,4-Dimethylphenol			U	3.00	ug/L						
2,4-Dinitrophenol			U	5.00	ug/L						
2,6-Dichlorophenol			U	3.00	ug/L						
2-Chlorophenol			U	3.00	ug/L						
2-Methyl-4,6-dinitrophenol			U	3.00	ug/L						
2-Nitrophenol			U	3.00	ug/L						
4-Chloro-3-methylphenol			U	3.00	ug/L						
4-Nitrophenol			U	3.00	ug/L						
Dinoseb			U	3.00	ug/L						
Pentachlorophenol			U	3.00	ug/L						
Phenol			U	3.00	ug/L						
m,p-Cresols			U	3.70	ug/L						
o-Cresol			U	3.00	ug/L						
**2,4,6-Tribromophenol	100			79.7	ug/L		79.7	(33%-126%)			
**2-Fluorobiphenyl	50.0			35.6	ug/L		71.2	(35%-102%)			

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 371742

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1474658										
**2-Fluorophenol	100			51.0	ug/L		51	(18%-84%)	JLD1	05/01/15	11:06
**Nitrobenzene-d5	50.0			41.7	ug/L		83.4	(38%-113%)			
**Phenol-d5	100			33.2	ug/L		33.2	(10%-110%)			
**p-Terphenyl-d14	50.0			56.4	ug/L		113	(38%-123%)			
QC1203308192 371742003 MS											
2,3,4,6-Tetrachlorophenol	100	U	2.68	99.9	ug/L		99.9	(34%-125%)		05/01/15	12:38
2,4,5-Trichlorophenol	100	U	2.68	90.4	ug/L		90.4	(37%-121%)			
2,4,6-Trichlorophenol	100	U	2.68	89.3	ug/L		89.3	(36%-120%)			
2,4-Dichlorophenol	100	U	2.68	85.6	ug/L		85.6	(35%-113%)			
2,4-Dimethylphenol	100	U	2.68	81.9	ug/L		81.9	(34%-109%)			
2,4-Dinitrophenol	100	U	4.46	94.6	ug/L		94.6	(10%-133%)			
2,6-Dichlorophenol	100	U	2.68	84.3	ug/L		84.3	(36%-126%)			
2-Chlorophenol	100	U	2.68	78.6	ug/L		78.6	(34%-108%)			
2-Methyl-4,6-dinitrophenol	100	U	2.68	95.1	ug/L		95.1	(28%-131%)			
2-Nitrophenol	100	U	2.68	92.9	ug/L		92.9	(35%-116%)			
4-Chloro-3-methylphenol	100	U	2.68	96.5	ug/L		96.5	(37%-119%)			
4-Nitrophenol	100	U	2.68	68.5	ug/L		68.5	(10%-83%)			
Pentachlorophenol	100	U	2.68	90.8	ug/L		90.8	(24%-122%)			
Phenol	100	U	2.68	53.1	ug/L		53.1	(17%-77%)			
m,p-Cresols	100	U	3.30	94.2	ug/L		94.2	(31%-119%)			
o-Cresol	100	U	2.68	81.3	ug/L		81.3	(30%-108%)			
**2,4,6-Tribromophenol	200		72.3	171	ug/L		85.6	(33%-126%)			

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 371742

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1474658										
**2-Fluorobiphenyl	100	34.3		71.3	ug/L		71.3	(35%-102%)	JLD1	05/01/15	12:38
**2-Fluorophenol	200	43.3		124	ug/L		62.2	(18%-84%)			
**Nitrobenzene-d5	100	37.5		80.0	ug/L		80	(38%-113%)			
**Phenol-d5	200	27.0		100	ug/L		50.1	(10%-110%)			
**p-Terphenyl-d14	100	49.6		94.3	ug/L		94.3	(38%-123%)			
QC1203308193 371742003 MSD											
2,3,4,6-Tetrachlorophenol	100	U	2.68	101	ug/L	1.39	101	(0%-30%)		05/01/15	13:08
2,4,5-Trichlorophenol	100	U	2.68	92.0	ug/L	1.75	92	(0%-30%)			
2,4,6-Trichlorophenol	100	U	2.68	88.0	ug/L	1.47	88	(0%-30%)			
2,4-Dichlorophenol	100	U	2.68	83.0	ug/L	3.09	83	(0%-30%)			
2,4-Dimethylphenol	100	U	2.68	77.6	ug/L	5.32	77.6	(0%-30%)			
2,4-Dinitrophenol	100	U	4.46	98.3	ug/L	3.77	98.3	(0%-30%)			
2,6-Dichlorophenol	100	U	2.68	80.5	ug/L	4.56	80.5	(0%-30%)			
2-Chlorophenol	100	U	2.68	75.7	ug/L	3.76	75.7	(0%-30%)			
2-Methyl-4,6-dinitrophenol	100	U	2.68	99.7	ug/L	4.72	99.7	(0%-30%)			
2-Nitrophenol	100	U	2.68	90.1	ug/L	3.06	90.1	(0%-30%)			
4-Chloro-3-methylphenol	100	U	2.68	94.5	ug/L	2.05	94.5	(0%-30%)			
4-Nitrophenol	100	U	2.68	65.5	ug/L	4.42	65.5	(0%-30%)			
Pentachlorophenol	100	U	2.68	92.6	ug/L	1.98	92.6	(0%-30%)			
Phenol	100	U	2.68	50.1	ug/L	5.89	50.1	(0%-30%)			
m,p-Cresols	100	U	3.30	88.6	ug/L	6.08	88.6	(0%-30%)			
o-Cresol	100	U	2.68	76.3	ug/L	6.32	76.3	(0%-30%)			

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 371742

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1474658										
**2,4,6-Tribromophenol	200	72.3		170	ug/L		85.1	(33%-126%)	JLD1	05/01/15	13:08
**2-Fluorobiphenyl	100	34.3		68.9	ug/L		68.9	(35%-102%)			
**2-Fluorophenol	200	43.3		118	ug/L		58.8	(18%-84%)			
**Nitrobenzene-d5	100	37.5		75.7	ug/L		75.7	(38%-113%)			
**Phenol-d5	200	27.0		93.9	ug/L		47	(10%-110%)			
**p-Terphenyl-d14	100	49.6		104	ug/L		104	(38%-123%)			

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.
- 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.

Semi-Volatile
May 21, 2015

Surrogate Recovery Report

SDG Number: GEL371742

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203308188	MB for batch 1474657	51	33	83	71	80	113
1203308189	LCS for batch 1474657	47	31	79	72	85	102
371742003	B30KC9	49	30	84	77	81	111
1203308192	B30KC9MS	62	50	80	71	86	94
1203308193	B30KC9MSD	59	47	76	69	85	104

Surrogate

Acceptance Limits

2FP	= 2-Fluorophenol	(18%-84%)
PHL	= Phenol-d5	(10%-110%)
NBZ	= Nitrobenzene-d5	(38%-113%)
FBP	= 2-Fluorobiphenyl	(35%-102%)
TBP	= 2,4,6-Tribromophenol	(33%-126%)
TPH	= p-Terphenyl-d14	(38%-123%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

General Chem Analysis

Case Narrative

May 21, 2015

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL371742
Work Order #: 371742**

Method/Analysis Information

Product: Total Organic Halogens (TOX)
Analytical Batch: 1475190 **Method:** 9020_TOX: COMMON

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9020B:

Sample ID	Client ID
371742001	B30KY7
371742002	B30KY8
371742003	B30KC9
371742005	B30KY9
1203309466	Method Blank (MB)
1203309467	Laboratory Control Sample (LCS)
1203309468	371742001(B30KY7) Sample Duplicate (DUP)
1203309469	371742001(B30KY7) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-007 REV# 14.

Preparation/Analytical Method Verification

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

Calibration Information

The Halogen analysis was performed on a Mitsubishi AOX-200.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample371742001 (B30KY7) was selected for QC analysis.

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

The MS/PS recovery for this sample set was within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

A pair of nitrate wash blanks is analyzed at the start of the batch. Although they are designated as ICB, they are performed for calculating purposes only. The value of the nitrate wash blanks are averaged and subtracted from all samples. Neither of these values should exceed 0.6 ug Cl. The PQL limit typically applied to ICB results does not apply in this application, since the results are used only to determine background concentrations and are subtracted from all calculated results.

Breakthrough effect

No breakthrough effects were observed for samples in this batch. Breakthrough effect: If the value for a sample is greater than the reporting limit (10 ug/L), the result for the second slug should not be greater than 25% of the combined value of the first and second slug. Results which do not meet these criteria are designated with a "Fail" comment in the Breakthrough effect column on the Logbook page; however, the "fail" designation is not applicable for samples with a result of less than 10 ug/L.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1473975 **Method:** 9056_ANIONS_IC: COMMON

Sample Analysis

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

Sample ID	Client ID
371742004	B30KD0
1203306395	Method Blank (MB)
1203306396	Laboratory Control Sample (LCS)
1203306397	371742004(B30KD0) Sample Duplicate (DUP)
1203306398	371742004(B30KD0) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 24.

Preparation/Analytical Method Verification

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

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample371742004 (B30KD0) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203306397 (B30KD0DUP), 1203306398 (B30KD0PS) and 371742004 (B30KD0).

Analyte	371742
	004
Chloride	10X
Nitrate	10X
Sulfate	10X

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

Samples 1203306397 (B30KD0DUP), 1203306398 (B30KD0PS) and 371742004 (B30KD0) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Alkalinity
Analytical Batch: 1476387 **Method:** 2320_ALKALINITY: GW 01

Sample Analysis

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

Sample ID	Client ID
371742003	B30KC9
1203312482	Method Blank (MB)
1203312484	Laboratory Control Sample (LCS)
1203312487	371823007(B30P16) Sample Duplicate (DUP)
1203312491	371823007(B30P16) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 371823007 (B30P16) was selected for QC analysis.

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

The MS/PS recovery for this sample set was within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

50mL of sample was used due to limited quantity. 1203312487 (Non SDG 371823007DUP) and 1203312491 (Non SDG 371823007MS).

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

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

May 21, 2015

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL371742 GEL Work Order: 371742

The Qualifiers in this report are defined as follows:

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

D Results are reported from a diluted aliquot of sample.

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

Review/Validation

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

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

Signature:



Name: Thomas Lewis

Date: 21 MAY 2015

Title: Data Validator

Sample Data Summary

~~May 21, 2015~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: May 21, 2015

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF W15-004

Client Sample ID: B30KY7	Project: CPRCOW15004
Sample ID: 371742001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 23-APR-15 10:45	
Receive Date: 24-APR-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Halogen Analysis											
9020_TOX: COMMON "As Received"											
Total Organic Halogens	U	3.33	3.33	10.0	ug/L	1	RMJ	05/19/15	0038	1475190	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9020B	

Notes:

~~May 21, 2015~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: May 21, 2015

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF W15-004

Client Sample ID:	B30KY8	Project:	CPRCOW15004
Sample ID:	371742002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	23-APR-15 10:45		
Receive Date:	24-APR-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Halogen Analysis											
9020_TOX: COMMON "As Received"											
Total Organic Halogens	U	3.33	3.33	10.0	ug/L	1	RMJ	05/19/15	0249	1475190	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9020B	

Notes:

GEL LABORATORIES LLC

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

May 21, 2015

Certificate of Analysis

Report Date: May 21, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W15-004

Client Sample ID: B30KC9	Project: CPRCOW15004
Sample ID: 371742003	Client ID: CPRC001
Matrix: WATER	
Collect Date: 23-APR-15 10:45	
Receive Date: 24-APR-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Halogen Analysis											
9020_TOX: COMMON "As Received"											
Total Organic Halogens	U	3.33	3.33	10.0	ug/L	1	RMJ	05/19/15	0358	1475190	1
Titration and Ion Analysis											
2320_ALKALINITY: GW 01 "As Received"											
Alkalinity, Total as CaCO3		103000	725	1000	ug/L		PX01	05/05/15	1511	1476387	2
Bicarbonate alkalinity (CaCO3)		103000	725	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	725	725	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9020B	
2	SM 2320B	

Notes:

~~May 21, 2015~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: May 21, 2015

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF W15-004

Client Sample ID:	B30KDO	Project:	CPRCOW15004
Sample ID:	371742004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	23-APR-15 10:45		
Receive Date:	24-APR-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON "As Received"											
Fluoride	B	263	33.0	500	ug/L	1	MXL2	04/24/15	1529	1473975	1
Nitrite-N	U	38.0	38.0	250	ug/L	1					
Chloride	D	16000	670	2000	ug/L	10	MXL2	04/24/15	1707	1473975	2
Nitrate-N	D	7440	330	1000	ug/L	10					
Sulfate	D	62000	1330	4000	ug/L	10					

The following Analytical Methods were performed:

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

Notes:

~~May 21, 2015~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: May 21, 2015

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF W15-004

Client Sample ID:	B30KY9	Project:	CPRCOW15004
Sample ID:	371742005	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	23-APR-15 10:45		
Receive Date:	24-APR-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Halogen Analysis											
9020_TOX: COMMON "As Received"											
Total Organic Halogens	U	3.33	3.33	10.0	ug/L	1	RMJ	05/19/15	0440	1475190	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9020B	

Notes:

Quality Control Summary

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Report Date: May 21, 2015

Page 1 of 3

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 371742

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

Halogen Analysis

Batch	1475190										
QC1203309468	371742001	DUP									
Total Organic Halogens	U	3.33	U	3.33	ug/L	N/A			RMJ	05/19/15	01:12
QC1203309467	LCS										
Total Organic Halogens	100			98.5	ug/L		98.5	(75%-118%)		05/18/15	13:33
QC1203309466	MB										
Total Organic Halogens			U	3.33	ug/L					05/18/15	14:16
QC1203309469	371742001	PS									
Total Organic Halogens	100	U	2.74	100	ug/L		97.7	(45%-174%)		05/19/15	02:06

Ion Chromatography

Batch	1473975										
QC1203306397	371742004	DUP									
Chloride	D	16000	D	16000	ug/L	0.150		(0%-20%)	MXL2	04/24/15	17:40
Fluoride	B	263	B	261	ug/L	0.765	^	(+/-500)		04/24/15	16:02
Nitrate-N	D	7440	D	7490	ug/L	0.710		(0%-20%)		04/24/15	17:40
Nitrite-N	U	38.0	U	38.0	ug/L	N/A				04/24/15	16:02
Sulfate	D	62000	D	62400	ug/L	0.531		(0%-20%)		04/24/15	17:40
QC1203306396	LCS										
Chloride	5000			4810	ug/L		96.2	(90%-110%)		04/24/15	14:56
Fluoride	2500			2450	ug/L		98	(90%-110%)			
Nitrate-N	2500			2430	ug/L		97.2	(90%-110%)			
Nitrite-N	2500			2460	ug/L		98.4	(90%-110%)			
Sulfate	10000			9720	ug/L		97.2	(90%-110%)			
QC1203306395	MB										
Chloride			U	67.0	ug/L					04/24/15	14:23
Fluoride			U	33.0	ug/L						

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 371742

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1473975										
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L				MXL2	04/24/15	14:23
Sulfate			U	133	ug/L						
QC1203306398 371742004 PS											
Chloride	5.00	D	1.60	D	6.58	mg/L	99.6	(90%-110%)		04/24/15	18:13
Fluoride	2.50	B	0.263		2.68	mg/L	96.8	(90%-110%)		04/24/15	16:34
Nitrate-N	2.50	D	0.744	D	3.22	mg/L	99.1	(90%-110%)		04/24/15	18:13
Nitrite-N	2.50	U	0.00		2.43	mg/L	97	(90%-110%)		04/24/15	16:34
Sulfate	10.0	D	6.20	D	16.5	mg/L	103	(90%-110%)		04/24/15	18:13
Titration and Ion Analysis											
Batch	1476387										
QC1203312487 371823007 DUP											
Alkalinity, Total as CaCO3				122000	120000	ug/L	0.866	(0%-20%)	PXO1	05/05/15	15:52
Bicarbonate alkalinity (CaCO3)				122000	120000	ug/L	0.866	(0%-20%)			
Carbonate alkalinity (CaCO3)		U	1450	U	1450	ug/L	N/A				
Hydroxide alkalinity as CaCO3		U	1450	U	1450	ug/L	N/A				
QC1203312484 LCS											
Alkalinity, Total as CaCO3	50000				51900	ug/L	104	(90%-110%)		05/05/15	14:54
QC1203312482 MB											
Alkalinity, Total as CaCO3			U		725	ug/L				05/05/15	14:54
Bicarbonate alkalinity (CaCO3)			U		725	ug/L					
Carbonate alkalinity (CaCO3)			U		725	ug/L					
Hydroxide alkalinity as CaCO3			U		725	ug/L					
QC1203312491 371823007 MS											
Alkalinity, Total as CaCO3	100000		122000		223000	ug/L	102	(80%-120%)		05/05/15	15:55

Notes:

May 21, 2015

GEL LABORATORIES LLC

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

QC Summary

Workorder: 371742

Page 3 of 3

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

The Qualifiers in this report are defined as follows:

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

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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