

February 27, 2015



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

P 843.556.8171 F 843.766.1178

www.gel.com

February 26, 2015

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

Re: CHPRC SAF W15-001
Work Order: 366127
SDG: GEL366127

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 30, 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,

Heather Shaffer
Project Manager

Purchase Order: 300071
Chain of Custody: W15-001-079 and W15-001-080
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.....20

 Quality Control Summary.....23

 Miscellaneous.....29

Metals Analysis.....31

 Case Narrative.....32

 Sample Data Summary.....37

 Quality Control Summary.....42

General Chem Analysis.....48

 Case Narrative.....49

 Sample Data Summary.....62

 Quality Control Summary.....68

Case Narrative

February 27, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF W15-001
SDG: GEL366127

February 26, 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 January 30, 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:

<u>Laboratory Identification</u>	<u>Sample Description</u>
366127001	B2YW45
366127002	B2YWW1
366127003	B2YWV9
366127004	B2YW44
366127005	B2YWW0
366127006	B2YW46

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.

February 27, 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, General Chemistry and Metals.

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.



Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

86

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **W15-001-080**
Page 1 of 1

Collector: S.W. King/CHPRC
 SAF No.: W15-001
 Project Title: RCRA, JANUARY 2015
 Shipped To (Lab): GEL Laboratories, LLC
 Protocol: RCRA

Contact/Requester: Karen Waters-Husted
 Sampling Origin: Hanford Site
 Logbook No.: HNF-N-506/11159
 Method of Shipment: Commercial Carrier
 Priority: **30 Days PRIORITY**

Telephone No.: 509-376-4650
 Purchase Order/Charge Code: 300071
 Ice Chest No.: W15-086
 Bill of Lading/Air Bill No.: 772763238582
 Offsite Property No.: 5375

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.	Filler	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2YW45	N	JAN 29 2015	1254	1x250-mL G/P	9056_ANIONS_IC: COMMON	28 Days/48 Hours	Cool <=6C

Relinquished By S.W. King/CHPRC	Print 	Sign	Date/Time JAN 29 2015 1345	Receive CHRIS FULTON CHPRC	Print 	Sign	Date/Time JAN 29 2015 1345
Relinquished By CHRIS FULTON CHPRC	Print 	Sign	Date/Time JAN 29 2015 1400	Received By FEDEX	Print 	Sign	Date/Time JAN 29 2015 1345
Relinquished By	Print 	Sign	Date/Time 1-30-15 0855	Received By M. Kinslow	Print 	Sign	Date/Time 1-30-15 0855
Relinquished By	Print	Sign	Date/Time	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 _____

Collector: S.W. King/CHPRC
 Telephone No.: 509-376-4650
 Contact/Requester: Karen Waters-Husted
 Purchase Order/Charge Code: 300071
 SAF No.: W15-001
 Sampling Origin: Hanford Site
 Project Title: RCRA, JANUARY 2015
 Logbook No.: HNF-N-50671/59
 Shipped To (Lab): GEL Laboratories, LLC
 Method of Shipment: Commercial Carrier
 Ice Chest No.: CWS-086
 Bill of Lading/Air Bill No.: 772763238582
 Protocol: RCRA
 Priority: 30 Days
 Offsite Property No.: 5315
 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
B2YWW1	N	1254	JAN 29 2015	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2YWW1	N			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2YWW9	N			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2YWW9	N			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2YW44	N			1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B2YW44	N			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B2YW44	N			4x1-L aG	8270_PHENOLIC_GC: COMMON	7/40 Days	Cool <=6C
B2YW44	N			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2YW44	N			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2YWW0	N			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2YWW0	N			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2YW46	Y	1254	JAN 29 2015	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

Received By: **CHRIS FULTON** CHPRC
 Sign: *[Signature]*
 Date/Time: JAN 29 2015 1345

Received By: **PEDEX**
 Sign: *[Signature]*
 Date/Time: JAN 29 2015 1345

Received By: *M. Kingston*
 Sign: *[Signature]*
 Date/Time: 1-30-15 0858

Received By: *[Signature]*
 Sign: *[Signature]*
 Date/Time: 1-30-15 0858

8 of 73

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

Disposed By: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION

PRINTED O 12/9/2014 A-6004-842 (REV 2)

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>3106127</u>
Received By: <u>mk</u>		Date Received: <u>1-30-15</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 checked="" type="checkbox"/>	<input type="checkbox"/>

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <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>130531776</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 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:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 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:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 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

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 26 February 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
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122014-16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12

Semi-Volatile Analysis

Case Narrative

February 27, 2015
GC/MS Semivolatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL366127
Work Order #: 366127

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: 1454809

Prep Batch Number: 1454808

Sample Analysis

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

Sample ID	Client ID
366127004	B2YW44
1203256598	MB for batch 1454808
1203256599	Laboratory Control Sample (LCS)
1203256600	366127004(B2YW44) Matrix Spike (MS)
1203256601	366127004(B2YW44) 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.

February 27, 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 366127004 (B2YW44) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS and MSD, 1203256600 (B2YW44MS) and 1203256601 (B2YW44MSD), failed recovery for 4-Nitrophenol. Please see the QC Summary/Spike Recovery Report for the specific recovery. The MS and MSD exhibited similar recoveries, the failures were attributed to matrix interference. The LCS passed 4-Nitrophenol recovery. The data were reported.

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.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception report 1379494 was generated for the samples in this batch for this SDG.

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:

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
MSD5.I	Agilent 6890/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

February 27, 2015

MSD2.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.

February 27, 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: GEL366127 GEL Work Order: 366127

The Qualifiers in this report are defined as follows:

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: **Barbara Bailey**

Date: **26 FEB 2015**

Title: **Data Validator**

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 26, 2015

Client Sample ID:	B2YW44	Project:	CPRC0W15001
Sample ID:	366127004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<i>8270_PHENOLIC_GC: COMMON "As Received"</i>										
2,3,4,6-Tetrachlorophenol	U	0.00	3.00	10.0	ug/L	1	AGS1 02/05/15	0022	1454809	1
58-90-2										
2,4,5-Trichlorophenol	U	0.00	3.00	10.0	ug/L	1				
95-95-4										
2,4,6-Trichlorophenol	U	0.00	3.00	10.0	ug/L	1				
88-06-2										
2,4-Dichlorophenol	U	0.00	3.00	10.0	ug/L	1				
120-83-2										
2,4-Dimethylphenol	U	0.00	3.00	10.0	ug/L	1				
105-67-9										
2,4-Dinitrophenol	U	0.00	5.00	20.0	ug/L	1				
51-28-5										
2,6-Dichlorophenol	U	0.00	3.00	10.0	ug/L	1				
87-65-0										
2-Chlorophenol	U	0.00	3.00	10.0	ug/L	1				
95-57-8										
2-Methyl-4,6-dinitrophenol	U	0.00	3.00	10.0	ug/L	1				
534-52-1										
2-Nitrophenol	U	0.00	3.00	10.0	ug/L	1				
88-75-5										
4-Chloro-3-methylphenol	U	0.00	3.00	10.0	ug/L	1				
59-50-7										
4-Nitrophenol	TU	0.00	3.00	10.0	ug/L	1				
100-02-7										
Dinoseb	U	0.00	3.00	10.0	ug/L	1				
88-85-7										
Pentachlorophenol	U	0.00	3.00	10.0	ug/L	1				
87-86-5										
Phenol	U	0.00	3.00	10.0	ug/L	1				
108-95-2										
m,p-Cresols	U	0.00	3.70	10.0	ug/L	1				
65794-96-9										
o-Cresol	U	0.00	3.00	10.0	ug/L	1				
95-48-7										

Quality Control Summary

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Report Date: February 26, 2015

Page 1 of 5

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 366127

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1454809										
QC1203256599	LCS										
2,3,4,6-Tetrachlorophenol	50.0			39.4	ug/L		78.9	(48%-117%)	AGS1	02/04/15	21:53
2,4,5-Trichlorophenol	50.0			37.9	ug/L		75.8	(50%-113%)			
2,4,6-Trichlorophenol	50.0			39.7	ug/L		79.5	(48%-114%)			
2,4-Dichlorophenol	50.0			35.9	ug/L		71.8	(47%-107%)			
2,4-Dimethylphenol	50.0			34.2	ug/L		68.5	(43%-105%)			
2,4-Dinitrophenol	50.0			28.1	ug/L		56.2	(14%-126%)			
2,6-Dichlorophenol	50.0			37.7	ug/L		75.3	(50%-121%)			
2-Chlorophenol	50.0			35.8	ug/L		71.7	(44%-103%)			
2-Methyl-4,6-dinitrophenol	50.0			32.7	ug/L		65.3	(41%-123%)			
2-Nitrophenol	50.0			34.9	ug/L		69.8	(47%-110%)			
4-Chloro-3-methylphenol	50.0			37.2	ug/L		74.4	(47%-113%)			
4-Nitrophenol	50.0			23.1	ug/L		46.2	(15%-109%)			
Pentachlorophenol	50.0			33.2	ug/L		66.4	(33%-111%)			
Phenol	50.0			25.1	ug/L		50.3	(10%-114%)			
m,p-Cresols	50.0			36.7	ug/L		73.3	(34%-106%)			
o-Cresol	50.0			33.6	ug/L		67.1	(36%-99%)			
**2,4,6-Tribromophenol	100			89.3	ug/L		89.3	(33%-126%)			
**2-Fluorobiphenyl	50.0			32.9	ug/L		65.8	(35%-102%)			
**2-Fluorophenol	100			58.7	ug/L		58.7	(18%-84%)			
**Nitrobenzene-d5	50.0			32.0	ug/L		64	(38%-113%)			

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1454809										
**Phenol-d5	100			51.2	ug/L		51.2	(10%-110%)	AGS1	02/04/15	21:53
**p-Terphenyl-d14	50.0			43.9	ug/L		87.7	(38%-123%)			
QC1203256598 MB											
2,3,4,6-Tetrachlorophenol			U	3.00	ug/L					02/04/15	21:20
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			72.8	ug/L		72.8	(33%-126%)			
**2-Fluorobiphenyl	50.0			34.3	ug/L		68.7	(35%-102%)			

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1454809										
**2-Fluorophenol	100			51.4	ug/L		51.4	(18%-84%)	AGS1	02/04/15	21:20
**Nitrobenzene-d5	50.0			29.9	ug/L		59.8	(38%-113%)			
**Phenol-d5	100			43.9	ug/L		43.9	(10%-110%)			
**p-Terphenyl-d14	50.0			44.5	ug/L		88.9	(38%-123%)			
QC1203256600 366127004 MS											
2,3,4,6-Tetrachlorophenol	100	U	3.00	55.0	ug/L		55	(34%-125%)		02/05/15	00:55
2,4,5-Trichlorophenol	100	U	3.00	56.0	ug/L		56	(37%-121%)			
2,4,6-Trichlorophenol	100	U	3.00	59.4	ug/L		59.4	(36%-120%)			
2,4-Dichlorophenol	100	U	3.00	55.2	ug/L		55.2	(35%-113%)			
2,4-Dimethylphenol	100	U	3.00	70.7	ug/L		70.7	(34%-109%)			
2,4-Dinitrophenol	100	U	5.00	42.8	ug/L		42.8	(10%-133%)			
2,6-Dichlorophenol	100	U	3.00	57.3	ug/L		57.3	(36%-126%)			
2-Chlorophenol	100	U	3.00	64.7	ug/L		64.7	(34%-108%)			
2-Methyl-4,6-dinitrophenol	100	U	3.00	42.9	ug/L		42.9	(28%-131%)			
2-Nitrophenol	100	U	3.00	48.0	ug/L		48	(35%-116%)			
4-Chloro-3-methylphenol	100	U	3.00	66.8	ug/L		66.8	(37%-119%)			
4-Nitrophenol	100	TU	3.00 TU	6.00	ug/L		0*	(10%-83%)			
Pentachlorophenol	100	U	3.00	43.2	ug/L		43.2	(24%-122%)			
Phenol	100	U	3.00	51.5	ug/L		51.5	(17%-77%)			
m,p-Cresols	100	U	3.70	81.3	ug/L		81.3	(31%-119%)			
o-Cresol	100	U	3.00	75.8	ug/L		75.8	(30%-108%)			
**2,4,6-Tribromophenol	200		78.3	124	ug/L		62.1	(33%-126%)			

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: **366127**

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1454809										
**2-Fluorobiphenyl	100		35.2		74.3	ug/L		74.3 (35%-102%)	AGS1	02/05/15	00:55
**2-Fluorophenol	200		43.7		116	ug/L		(18%-84%)			
**Nitrobenzene-d5	100		31.6		66.8	ug/L		(38%-113%)			
**Phenol-d5	200		26.4		94.4	ug/L		(10%-110%)			
**p-Terphenyl-d14	100		48.3		93.5	ug/L		(38%-123%)			
QC1203256601 366127004 MSD											
2,3,4,6-Tetrachlorophenol	100	U	3.00		51.6	ug/L	6.46	51.6 (0%-30%)		02/05/15	01:24
2,4,5-Trichlorophenol	100	U	3.00		53.2	ug/L	5.16	53.2 (0%-30%)			
2,4,6-Trichlorophenol	100	U	3.00		56.1	ug/L	5.61	56.1 (0%-30%)			
2,4-Dichlorophenol	100	U	3.00		54.3	ug/L	1.64	54.3 (0%-30%)			
2,4-Dimethylphenol	100	U	3.00		70.5	ug/L	0.283	70.5 (0%-30%)			
2,4-Dinitrophenol	100	U	5.00		41.8	ug/L	2.37	41.8 (0%-30%)			
2,6-Dichlorophenol	100	U	3.00		55.4	ug/L	3.26	55.4 (0%-30%)			
2-Chlorophenol	100	U	3.00		66.8	ug/L	3.07	66.8 (0%-30%)			
2-Methyl-4,6-dinitrophenol	100	U	3.00		41.3	ug/L	3.71	41.3 (0%-30%)			
2-Nitrophenol	100	U	3.00		47.0	ug/L	2.06	47 (0%-30%)			
4-Chloro-3-methylphenol	100	U	3.00		65.1	ug/L	2.49	65.1 (0%-30%)			
4-Nitrophenol	100	TU	3.00	TU	6.00	ug/L	N/A	0* (0%-30%)			
Pentachlorophenol	100	U	3.00		42.0	ug/L	2.82	42 (0%-30%)			
Phenol	100	U	3.00		54.4	ug/L	5.52	54.4 (0%-30%)			
m,p-Cresols	100	U	3.70		84.5	ug/L	3.93	84.5 (0%-30%)			
o-Cresol	100	U	3.00		79.0	ug/L	4.11	79 (0%-30%)			

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1454809										
**2,4,6-Tribromophenol	200	78.3		117	ug/L		58.5	(33%-126%)	AGS1	02/05/15	01:24
**2-Fluorobiphenyl	100	35.2		73.1	ug/L		73.1	(35%-102%)			
**2-Fluorophenol	200	43.7		122	ug/L		61	(18%-84%)			
**Nitrobenzene-d5	100	31.6		68.2	ug/L		68.2	(38%-113%)			
**Phenol-d5	200	26.4		100	ug/L		50.2	(10%-110%)			
**p-Terphenyl-d14	100	48.3		93.5	ug/L		93.5	(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.

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 05-FEB-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: SEMIVOA GC/MS	Test / Method: SW846 3510C/8270D, SW846 8270C	Matrix Type: Liquid	Client Code: CARE, CPRC, LLNL, OLAB
Batch ID: 1454809	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 366034,366127(GEL366127),366192(X501331),366211(EUI-9865)

Application Issues:

Failed Recovery for MS/MSD, or PS/PSD

Failed Recovery for PS/PSD

Specification and Requirements Exception Description:	DER Disposition:
<p>1. LLNL sample 366034001 was extracted out of holding.</p> <p>2. The MS(1203256600) and the MSD(1203256601) failed recovery for 4-Nitrophenol. Please see the QC Summary/Spike Recovery Report for the specific recovery.</p>	<p>1. The sample was collected on 01/22/15, received on 01/29/15 and extracted on 02/04/15.</p> <p>2. The MS and MSD exhibited similar recoveries, the failures are attributed to matrix interference. The LCS passed 4-Nitrophenol recovery. The data are reported.</p>

Originator's Name:

Anne Salter 05-FEB-15

Data Validator/Group Leader:

Herbert Maier 06-FEB-15

Metals Analysis

Case Narrative

February 27, 2015

Metals

Technical Case Narrative

CH2M Hill Plateau Remediation Company (CPRC)

SDG #: GEL366127

Work Order #: 366127

Sample ID	Client ID
366127004	B2YW44
366127006	B2YW46
1203255312	Method Blank (MB)ICP
1203255313	Laboratory Control Sample (LCS)
1203255316	366137003(B30135L) Serial Dilution (SD)
1203255314	366137003(B30135S) Matrix Spike (MS)
1203255315	366137003(B30135SD) Matrix Spike Duplicate (MSD)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1454332
Prep Batch :	1454331
Standard Operating Procedures:	GL-MA-E-013 REV# 23 and GL-MA-E-006 REV# 11
Analytical Method:	SW846 3005A/6010C
Prep Method :	SW846 3005A

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.

System Configuration

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

February 27, 2015

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the acceptance criteria. Chromium concentration was greater than the MDL in blank 1203255312 (MB). In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following sample was selected as the quality control (QC) sample for this SDG: 366137003 (B30135).

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD values between qualifying analyte results in the MS and MSD were within the acceptance limits.

Serial Dilution % Difference Statement

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. 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. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were not diluted and prepared according to the cited SOP.

Miscellaneous Information

February 27, 2015

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. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

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.

February 27, 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: GEL366127 GEL Work Order: 366127

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).

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.

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: Jamie Johnson

Date: 26 FEB 2015

Title: Group Leader

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 26, 2015

Client Sample ID:	B2YW44	Project:	CPRC0W15001
Sample ID:	366127004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Antimony 7440-36-0	U	-3.04	+/-1.32	3.50	10.0	ug/L	1	HSC	02/17/15	0941	1454332	1
Arsenic 7440-38-2	B	9.59	+/-2.54	5.00	30.0	ug/L	1					
Barium 7440-39-3		49.4	+/-9.88	1.00	5.00	ug/L	1					
Cadmium 7440-43-9	U	0.218	+/-0.336	1.00	5.00	ug/L	1					
Calcium 7440-70-2		66400	+/-13300	50.0	200	ug/L	1					
Chromium 7440-47-3	C	14.0	+/-2.82	1.00	5.00	ug/L	1					
Cobalt 7440-48-4	U	0.333	+/-0.340	1.00	5.00	ug/L	1					
Copper 7440-50-8		10.2	+/-2.28	3.00	10.0	ug/L	1					
Iron 7439-89-6	B	65.3	+/-16.4	30.0	100	ug/L	1					
Magnesium 7439-95-4		21700	+/-4340	110	300	ug/L	1					
Manganese 7439-96-5	U	0.450	+/-0.673	2.00	10.0	ug/L	1					
Nickel 7440-02-0	B	3.62	+/-0.880	1.50	5.00	ug/L	1					
Potassium 7440-09-7		8580	+/-1720	50.0	150	ug/L	1					
Silver 7440-22-4	U	-0.424	+/-0.344	1.00	5.00	ug/L	1					
Sodium 7440-23-5		41700	+/-8340	100	300	ug/L	1					
Vanadium 7440-62-2		16.9	+/-3.39	1.00	5.00	ug/L	1					
Zinc 7440-66-6	U	-1.46	+/-1.14	3.30	10.0	ug/L	1					

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 26, 2015

Client Sample ID: B2YW44 Project: CPRC0W15001
 Sample ID: 366127004 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
-----------	-----------	--------	----	----	-------	----	---------	------	------	-------	--------

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM5	02/02/15	0800	1454331

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	

~~February 27, 2015~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 26, 2015

Client Sample ID:	B2YW46	Project:	CPRC0W15001
Sample ID:	366127006	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Antimony 7440-36-0	U	-0.927	+/-1.18	3.50	10.0	ug/L	1	HSC	02/17/15	0944	1454332	1
Arsenic 7440-38-2	B	5.82	+/-2.03	5.00	30.0	ug/L	1					
Barium 7440-39-3		49.5	+/-9.91	1.00	5.00	ug/L	1					
Cadmium 7440-43-9	U	0.156	+/-0.335	1.00	5.00	ug/L	1					
Calcium 7440-70-2		65300	+/-13100	50.0	200	ug/L	1					
Chromium 7440-47-3	C	7.98	+/-1.63	1.00	5.00	ug/L	1					
Cobalt 7440-48-4	U	0.502	+/-0.348	1.00	5.00	ug/L	1					
Copper 7440-50-8	B	9.52	+/-2.15	3.00	10.0	ug/L	1					
Iron 7439-89-6	B	32.2	+/-11.9	30.0	100	ug/L	1					
Magnesium 7439-95-4		21400	+/-4280	110	300	ug/L	1					
Manganese 7439-96-5	U	0.315	+/-0.670	2.00	10.0	ug/L	1					
Nickel 7440-02-0	B	2.65	+/-0.728	1.50	5.00	ug/L	1					
Potassium 7440-09-7		8330	+/-1670	50.0	150	ug/L	1					
Silver 7440-22-4	U	-0.514	+/-0.349	1.00	5.00	ug/L	1					
Sodium 7440-23-5		41200	+/-8230	100	300	ug/L	1					
Vanadium 7440-62-2		16.2	+/-3.26	1.00	5.00	ug/L	1					
Zinc 7440-66-6	U	-1.02	+/-1.12	3.30	10.0	ug/L	1					

Quality Control Summary

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Report Date: February 26, 2015

Page 1 of 5

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 366127

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1454332										
QC1203255313	LCS										
Antimony	500			522	ug/L		104	(80%-120%)	HSC	02/17/15	09:23
Arsenic	500			517	ug/L		103	(80%-120%)			
Barium	500			514	ug/L		103	(80%-120%)			
Cadmium	500			505	ug/L		101	(80%-120%)			
Calcium	5000			5110	ug/L		102	(80%-120%)			
Chromium	500			509	ug/L		102	(80%-120%)			
Cobalt	500			523	ug/L		105	(80%-120%)			
Copper	500			514	ug/L		103	(80%-120%)			
Iron	5000			5090	ug/L		102	(80%-120%)			
Magnesium	5000			5140	ug/L		103	(80%-120%)			
Manganese	500			510	ug/L		102	(80%-120%)			
Nickel	500			516	ug/L		103	(80%-120%)			
Potassium	5000			5030	ug/L		101	(80%-120%)			
Silver	500			503	ug/L		101	(80%-120%)			
Sodium	5000			5060	ug/L		101	(80%-120%)			
Vanadium	500			527	ug/L		105	(80%-120%)			
Zinc	500			509	ug/L		102	(80%-120%)			
QC1203255312	MB										
Antimony			U	ND	ug/L					02/17/15	09:20
Arsenic			U	ND	ug/L						

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1454332										
Barium			U	ND	ug/L						
Cadmium			U	ND	ug/L				HSC	02/17/15	09:20
Calcium			U	ND	ug/L						
Chromium			B	1.25	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Manganese			U	ND	ug/L						
Nickel			U	ND	ug/L						
Potassium			U	ND	ug/L						
Silver			U	ND	ug/L						
Sodium			U	ND	ug/L						
Vanadium			U	ND	ug/L						
Zinc			U	ND	ug/L						
QC1203255314 366137003 MS											
Antimony	500	U	ND	536	ug/L		107	(75%-125%)		02/17/15	09:29
Arsenic	500	B	6.18	533	ug/L		105	(75%-125%)			
Barium	500		58.2	570	ug/L		102	(75%-125%)			
Cadmium	500	U	ND	500	ug/L		100	(75%-125%)			
Calcium	5000		73500	79400	ug/L		N/A	(75%-125%)			
Chromium	500	BC	3.70	514	ug/L		102	(75%-125%)			
Cobalt	500	U	ND	508	ug/L		101	(75%-125%)			

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1454332										
Copper	500	B	9.18	532	ug/L		105	(75%-125%)	HSC	02/17/15	09:29
Iron	5000	B	32.5	5090	ug/L		101	(75%-125%)			
Magnesium	5000		18700	23700	ug/L		98.9	(75%-125%)			
Manganese	500	U	ND	503	ug/L		100	(75%-125%)			
Nickel	500	U	ND	497	ug/L		99.4	(75%-125%)			
Potassium	5000		5900	11300	ug/L		108	(75%-125%)			
Silver	500	U	ND	511	ug/L		102	(75%-125%)			
Sodium	5000		15400	20600	ug/L		104	(75%-125%)			
Vanadium	500		14.6	549	ug/L		107	(75%-125%)			
Zinc	500		17.7	498	ug/L		96	(75%-125%)			
QC1203255315 366137003 MSD											
Antimony	500	U	ND	536	ug/L	0.0467	107	(0%-20%)		02/17/15	09:31
Arsenic	500	B	6.18	538	ug/L	0.902	106	(0%-20%)			
Barium	500		58.2	575	ug/L	0.716	103	(0%-20%)			
Cadmium	500	U	ND	503	ug/L	0.568	101	(0%-20%)			
Calcium	5000		73500	78900	ug/L	0.729	N/A	(0%-20%)			
Chromium	500	BC	3.70	513	ug/L	0.175	102	(0%-20%)			
Cobalt	500	U	ND	514	ug/L	1.17	103	(0%-20%)			
Copper	500	B	9.18	534	ug/L	0.444	105	(0%-20%)			
Iron	5000	B	32.5	5060	ug/L	0.510	101	(0%-20%)			
Magnesium	5000		18700	23500	ug/L	0.585	96.1	(0%-20%)			
Manganese	500	U	ND	504	ug/L	0.226	101	(0%-20%)			

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1454332										
Nickel	500	U	ND	503	ug/L	1.21	101	(0%-20%)	HSC	02/17/15	09:31
Potassium	5000		5900	11200	ug/L	1.00	106	(0%-20%)			
Silver	500	U	ND	513	ug/L	0.359	103	(0%-20%)			
Sodium	5000		15400	20300	ug/L	1.42	97.8	(0%-20%)			
Vanadium	500		14.6	549	ug/L	0.0565	107	(0%-20%)			
Zinc	500		17.7	503	ug/L	0.995	97	(0%-20%)			
QC1203255316 366137003 SDILT											
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/17/15	09:33
Arsenic		B	6.18 DU	ND	ug/L	N/A		(0%-10%)			
Barium			58.2 D	11.6	ug/L	.012		(0%-10%)			
Cadmium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Calcium			73500 D	14500	ug/L	1		(0%-10%)			
Chromium		BC	3.70 DU	ND	ug/L	N/A		(0%-10%)			
Cobalt		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Copper		B	9.18 DU	ND	ug/L	N/A		(0%-10%)			
Iron		B	32.5 DU	ND	ug/L	N/A		(0%-10%)			
Magnesium			18700 D	3800	ug/L	1.54		(0%-10%)			
Manganese		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Nickel		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Potassium			5900 D	1130	ug/L	4.41		(0%-10%)			
Silver		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Sodium			15400 D	3030	ug/L	1.75		(0%-10%)			

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1454332										
Vanadium		14.6	D	3.24	ug/L	11.1		(0%-10%)	HSC	02/17/15	09:33
Zinc		17.7	D	4.53	ug/L	27.9		(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

February 27, 2015

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL366127
Work Order #: 366127**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1454360

Method: 9060_TOC: COMMON

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060A:

Sample ID	Client ID
366127002	B2YWW1
366127003	B2YWV9
366127004	B2YW44
366127005	B2YWW0
1203255395	Method Blank (MB)
1203255396	Laboratory Control Sample (LCS)
1203255397	366127002(B2YWW1) Sample Duplicate (DUP)
1203255399	366127002(B2YWW1) 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-093 REV# 12.

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 Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

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

Sample366127002 (B2YWW1) 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 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an

February 27, 2015

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: Total Organic Halogens (TOX)
Analytical Batch: 1455052 **Method:** 9020_TOX: COMMON

Sample Analysis

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

Sample ID	Client ID
366127002	B2YWW1
366127003	B2YVV9
366127004	B2YW44
366127005	B2YWW0
1203257342	Method Blank (MB)
1203257343	Laboratory Control Sample (LCS)
1203257344	366127002(B2YWW1) Sample Duplicate (DUP)
1203257345	366127002(B2YWW1) 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

Sample366127002 (B2YWW1) 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: 1454349 **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
366127001	B2YW45
1203255359	Method Blank (MB)
1203255360	Laboratory Control Sample (LCS)
1203255361	366140002(B2YXM4) Sample Duplicate (DUP)
1203255362	366140002(B2YXM4) 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# 23.

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

Sample366140002 (B2YXM4) 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. 1203255361 (Non SDG 366140002DUP), 1203255362 (Non SDG 366140002PS) and 366127001 (B2YW45). Samples 1203255361 (Non SDG 366140002DUP), 1203255362 (Non SDG 366140002PS) and 366127001 (B2YW45) were diluted based on historical data.

Analyte	366127
	001
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 1203255361 (Non SDG 366140002DUP), 1203255362 (Non SDG 366140002PS) and 366127001 (B2YW45) 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: 1456716 **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
366127004	B2YW44
1203261913	Method Blank (MB)
1203261915	Laboratory Control Sample (LCS)
1203261917	366158003(B2YXL7) Sample Duplicate (DUP)
1203261919	366158003(B2YXL7) 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 366158003 (B2YXL7) 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

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.

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.

February 27, 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: GEL366127 GEL Work Order: 366127

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: 25 FEB 2015

Title: Data Validator

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 25, 2015

Client Sample ID:	B2YW45	Project:	CPRC0W15001
Sample ID:	366127001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography											
<i>9056_ANIONS_IC: COMMON "As Received"</i>											
Fluoride 16984-48-8	B	339	+/-15.8	33.0	500	ug/L	1	RXB5 01/30/15	1552	1454349	1
Nitrite-N 14797-65-0	U	0.00	+/-12.7	38.0	250	ug/L	1				
Chloride 16887-00-6	D	17200	+/-616	670	2000	ug/L	10	RXB5 01/30/15	1856	1454349	2
Nitrate-N 14797-55-8	D	25400	+/-854	330	1000	ug/L	10				
Sulfate 14808-79-8	D	110000	+/-3710	1330	4000	ug/L	10				

The following Analytical Methods were performed

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 25, 2015

Client Sample ID:	B2YWW1	Project:	CPRC0W15001
Sample ID:	366127002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Carbon Analysis										
<i>9060_TOX: COMMON "As Received"</i>										
Total Organic Carbon #1	B	634	330	1000	ug/L	1	TSM	02/02/15	2118	1454360 1
Total Organic Carbon #2	B	560	330	1000	ug/L	1				
Total Organic Carbon #3	B	577	330	1000	ug/L	1				
Total Organic Carbon #4	B	484	330	1000	ug/L	1				
Total Organic Carbon Average	B	564	330	1000	ug/L	1				
Halogen Analysis										
<i>9020_TOX: COMMON "As Received"</i>										
Total Organic Halogens	U	2.34	3.33	10.0	ug/L	1	RMJ	02/18/15	1638	1455052 2
59473-04-0										

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9060A	
2	SW846 9020B	

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 25, 2015

Client Sample ID:	B2YWV9	Project:	CPRC0W15001
Sample ID:	366127003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
<i>9060_TOX: COMMON "As Received"</i>											
Total Organic Carbon #1	B	515	330	1000	ug/L	1	TSM	02/02/15	2219	1454360	1
Total Organic Carbon #2	B	530	330	1000	ug/L	1					
Total Organic Carbon #3	B	486	330	1000	ug/L	1					
Total Organic Carbon #4	B	486	330	1000	ug/L	1					
Total Organic Carbon Average	B	504	330	1000	ug/L	1					
Halogen Analysis											
<i>9020_TOX: COMMON "As Received"</i>											
Total Organic Halogens	U	2.32	3.33	10.0	ug/L	1	RMJ	02/18/15	1817	1455052	2
59473-04-0											

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9060A	
2	SW846 9020B	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 25, 2015

Client Sample ID:	B2YW44	Project:	CPRC0W15001
Sample ID:	366127004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
<i>9060_TOX: COMMON "As Received"</i>											
Total Organic Carbon #1	B	536	330	1000	ug/L	1	TSM	02/02/15	2253	1454360	1
Total Organic Carbon #2	B	504	330	1000	ug/L	1					
Total Organic Carbon #3	B	496	330	1000	ug/L	1					
Total Organic Carbon #4	B	465	330	1000	ug/L	1					
Total Organic Carbon Average	B	500	330	1000	ug/L	1					

Halogen Analysis

9020_TOX: COMMON "As Received"

Total Organic Halogens	U	2.64	3.33	10.0	ug/L	1	RMJ	02/18/15	1910	1455052	2
------------------------	---	------	------	------	------	---	-----	----------	------	---------	---

59473-04-0

Titration and Ion Analysis

2320_ALKALINITY: GW 01 "As Received"

Alkalinity, Total as CaCO3		106000	725	1000	ug/L		PX01	02/10/15	1924	1456716	3
ALKALINITY											
Bicarbonate alkalinity (CaCO3)		106000	725	1000	ug/L						
71-52-3											
Carbonate alkalinity (CaCO3)	U	0.00	725	1000	ug/L						
CO3ALKALINITY											
Hydroxide alkalinity as CaCO3	U	0.00	725	1000	ug/L						
84625-61-6											

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9060A	
2	SW846 9020B	
3	SM 2320B	

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-001**

Report Date: February 25, 2015

Client Sample ID:	B2YWW0	Project:	CPRC0W15001
Sample ID:	366127005	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
<i>9060_TOX: COMMON "As Received"</i>											
Total Organic Carbon #1	B	503	330	1000	ug/L	1	TSM	02/02/15	2326	1454360	1
Total Organic Carbon #2	B	502	330	1000	ug/L	1					
Total Organic Carbon #3	B	458	330	1000	ug/L	1					
Total Organic Carbon #4	B	476	330	1000	ug/L	1					
Total Organic Carbon Average	B	485	330	1000	ug/L	1					

Halogen Analysis

9020_TOX: COMMON "As Received"

Total Organic Halogens	U	3.10	3.33	10.0	ug/L	1	RMJ	02/18/15	1958	1455052	2
------------------------	---	------	------	------	------	---	-----	----------	------	---------	---

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9060A	
2	SW846 9020B	

Quality Control Summary

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Report Date: February 25, 2015

Page 1 of 3

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 366127

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch 1454360											
QC1203255397 366127002 DUP											
Total Organic Carbon Average		B	564	B	537	ug/L	4.90 ^	(+/-1000)	TSM	02/02/15	21:51
QC1203255396 LCS											
Total Organic Carbon Average	10000				9890	ug/L		98.9 (85%-115%)		02/02/15	17:23
QC1203255395 MB											
Total Organic Carbon Average				U	330	ug/L				02/02/15	17:14
QC1203255399 366127002 PS											
Total Organic Carbon Average	10.0	B	0.564		10.4	mg/L		98.6 (65%-120%)		02/02/15	22:11
Halogen Analysis											
Batch 1455052											
QC1203257344 366127002 DUP											
Total Organic Halogens		U	3.33	U	3.33	ug/L	N/A		RMJ	02/18/15	16:56
QC1203257343 LCS											
Total Organic Halogens	100				101	ug/L		101 (75%-118%)		02/18/15	16:19
QC1203257342 MB											
Total Organic Halogens				U	3.33	ug/L				02/18/15	15:49
QC1203257345 366127002 PS											
Total Organic Halogens	100	U	2.34		105	ug/L		102 (45%-174%)		02/18/15	17:41
Ion Chromatography											
Batch 1454349											
QC1203255361 366140002 DUP											
Chloride		D	40000	D	40000	ug/L	0.0475	(0%-20%)	RXB5	01/30/15	21:31
Fluoride		B	311	B	304	ug/L	2.34 ^	(+/-500)		01/30/15	17:55
Nitrate-N		D	6400	D	6430	ug/L	0.468	(0%-20%)		01/30/15	21:31
Nitrite-N		U	38.0	U	38.0	ug/L	N/A			01/30/15	17:55
Sulfate		D	74300	D	73800	ug/L	0.563	(0%-20%)		01/30/15	21:31
QC1203255360 LCS											
Chloride	5000				4840	ug/L		96.8 (90%-110%)		01/30/15	23:04

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1454349										
Fluoride	2500			2500	ug/L		99.9	(90%-110%)			
Nitrate-N	2500			2500	ug/L		100	(90%-110%)	RXB5	01/30/15	23:04
Nitrite-N	2500			2560	ug/L		102	(90%-110%)			
Sulfate	10000			10200	ug/L		102	(90%-110%)			
QC1203255359 MB											
Chloride			U	67.0	ug/L					01/30/15	22:33
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L						
Sulfate			U	133	ug/L						
QC1203255362 366140002 PS											
Chloride	5.00	D	4.00	D	9.47	mg/L	109	(90%-110%)		01/30/15	22:02
Fluoride	2.50	B	0.311		2.74	mg/L	97	(90%-110%)		01/30/15	18:26
Nitrate-N	2.50	D	0.640	D	3.19	mg/L	102	(90%-110%)		01/30/15	22:02
Nitrite-N	2.50	U	0.00		2.50	mg/L	99.8	(90%-110%)		01/30/15	18:26
Sulfate	10.0	D	7.43	D	18.2	mg/L	108	(90%-110%)		01/30/15	22:02
Titration and Ion Analysis											
Batch	1456716										
QC1203261917 366158003 DUP											
Alkalinity, Total as CaCO3				76300	76300	ug/L	0.00	(0%-20%)	PXO1	02/10/15	19:29
Bicarbonate alkalinity (CaCO3)				76300	76300	ug/L	0.00	(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				
QC1203261915 LCS											
Alkalinity, Total as CaCO3	50000			48100	48100	ug/L	96.2	(90%-110%)		02/10/15	18:41
QC1203261913 MB											

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366127

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1456716										
Alkalinity, Total as CaCO3			U	725	ug/L					02/10/15	18:41
Bicarbonate alkalinity (CaCO3)			U	725	ug/L				PX01		
Carbonate alkalinity (CaCO3)			U	725	ug/L						
Hydroxide alkalinity as CaCO3			U	725	ug/L						
QC1203261919 366158003 MS											
Alkalinity, Total as CaCO3	50000	76300		124000	ug/L		96.2	(80%-120%)		02/10/15	19:31

Notes:

The Qualifiers in this report are defined as follows:

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

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

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