



July 06, 2016

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

Re: CHPRC SAF F16-043  
Work Order: 399710  
SDG: GEL399710

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 21, 2016. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This package was revised to include a SIR for the WA EPH QC issues.

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: 304070 - 8C  
Chain of Custody: F16-043-075 and F16-043-078  
Enclosures



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# Sample Issue Resolution

<b>SAMPLE ISSUE RESOLUTION</b>	<b>SIR NUM</b>	SIR16-459
	<b>REV NUM</b>	0
	<b>DATE INITIATED</b>	7/5/2016

**SAMPLE EVENT INFORMATION**

**SAF NUM(S)** F16-043  
**OPERABLE UNIT(S)** 100-NR-2  
**PROJECT(S)** 100-NR-2 GW  
**SAMPLE EVENT TITLE(S)** 100-NR-2 Well Drilling and Installation of Wells  
**LABORATORY** GEL Laboratories, LLC

**SAMPLING INFORMATION**

**NUMBER OF SAMPLES** 2  
**SAMPLE NUMBERS** B35YC8, B35YD1  
**SAMPLE MATRIX** SOIL  
**COLLECTION DATE** 6/20/2016 - 6/20/2016  
**SDG NUM** GEL399710

**ISSUE BACKGROUND**

**CLASS** Laboratory Issue

**TYPE** Quality Control Failure

**DESCRIPTION** The analyst believes there was a lab contamination of Aliphatic Hydrocarbons C8-C10 at concentration above the PQL. A Similar concentration was detected in the MB and all client samples. As a result, the LCS failed high for Hydrocarbons C8-C10 as well. The MS failed low for all spiked analytes and surrogate. The RPD between the MS and MSD failed due to low spike recovery in the MS. The holding expires on 7/4/16.

**DISPOSITION**

**DESCRIPTION** Proposed Resolution: Initiate SIR, report results and include a detailed comment in the case narrative.

**JUSTIFICATION** Final Disposition: Accept proposed resolution.

SUBMITTED BY: Heather Shaffer DATE: 07/01/2016  
ACCEPTED BY: Dave Todak DATE: 07/05/2016

# Case Narrative

This package was revised to include a SIR for the WA EPH QC issues.

**General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF F16-043  
SDG: GEL399710**

**July 06, 2016**

**Laboratory Identification:**

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

**Summary**

**Sample receipt**

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 21, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

**Sample Identification**

The laboratory received the following samples:

<b>Laboratory Identification</b>	<b>Sample Description</b>
399710001	B35YC8
399710002	B35YD1

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Diesel Range Organics, FID Flame Ionization Detector, GC/MS Semivolatile, General Chemistry and Radiochemistry.

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

*Heather Shaffer*

Heather Shaffer  
Project Manager

**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL399710**  
**Work Order #: 399710**

## **GC/MS Semivolatile**

### **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry**

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

## **FID Flame Ionization Detector**

### **Washington Method for the Determination of Extractable Petroleum Hydrocarbons**

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

### **Quality Control (QC) Information**

#### **Method Blank (MB) Statement**

Method blank (See Below) contained a hit for Aliphatic Hydrocarbons C8-C10. A similar concentration of Aliphatics Hydrocarbons C8-C10 was present in all client samples and other QC samples. The source of contamination was likely from impurities in one or more of the solvents used for the extractions. Detects in samples were B qualified and should be considered as false positives.

Sample	Analyte	Value
1203574377 (MB)	Aliphatic Hydrocarbons C8-C10	4560 * 10 > 4680

#### **Surrogate Recoveries**

MS (See Below) failed to meet acceptance criteria for one or more surrogate recoveries. The parent sample and MSD each met acceptance criteria for all surrogate recoveries. As the low surrogate recoveries were isolated to the MS, the failures were likely the result of a poor extraction. The data were reported.

Sample	Analyte	Value
1203574379 (B35YC8MS)	o-Terphenyl	54* (60%-140%)

#### **Laboratory Control Sample (LCS/LCSD) Recovery**

LCS (See Below) recovery for Aliphatic Hydrocarbons C8-C10 were not within the acceptance limits due to impurities in the one or more of the solvents used in the extraction that eluted during the retention time window. The recovery of n-Decane added as part of the spiking standard was itself within acceptance limits. The data were reported.

Sample	Analyte	Value
1203574378 (LCS)	Aliphatic Hydrocarbons C8-C10	151* (70%-130%)

#### Matrix Spike (MS) Recovery Statement

The MS recoveries for this SDG were not within the acceptance limits. The failures are attributed to lab error.

Sample	Analyte	Value
1203574379 (B35YC8MS)	Aliphatic Hydrocarbons >C10-C12	58* (70%-130%)
	Aliphatic Hydrocarbons >C12-C16	61* (70%-130%)
	Aliphatic Hydrocarbons >C16-C21	62* (70%-130%)
	Aliphatic Hydrocarbons C8-C10	37* (70%-130%)
	Aromatic Hydrocarbons >C10-C12	53* (70%-130%)
	Aromatic Hydrocarbons >C12-C16	60* (70%-130%)
	Aromatic Hydrocarbons >C16-C21	55* (70%-130%)
	Aromatic Hydrocarbons >C21-C34	51* (70%-130%)

#### MS/MSD Relative Percent Difference (RPD) Statement

The relative percent differences (RPD) between each MS and MSD were not within the required acceptance limits due to low spike recovery in the MS.

Sample	Analyte	Value
1203574379MS and 1203574380MSD (B35YC8)	Aliphatic Hydrocarbons >C10-C12	31* (0%-20%)
	Aliphatic Hydrocarbons >C12-C16	34* (0%-20%)
	Aliphatic Hydrocarbons >C16-C21	33* (0%-20%)
	Aliphatic Hydrocarbons C8-C10	31* (0%-20%)
	Aromatic Hydrocarbons >C10-C12, Aromatic Hydrocarbons >C12-C16, Aromatic Hydrocarbons >C16-C21 and Aromatic Hydrocarbons >C21-C34	200* (0%-20%)

## Diesel Range Organics

### Analysis of Diesel Range Organics by Flame Ionization Detector

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

**Calibration Information****Continuing Calibration Verification (CCV) Requirements**

The associated calibration verification standards (ICV or CCV) did not meet the acceptance criteria. The target analytes failed to meet the acceptance criteria with a positive bias in one of the standards analyzed for this batch of the samples. This non-compliance has no adverse effects on the data as the associated environmental samples were not detected with target analytes above the PQL.

**Quality Control (QC) Information****Surrogate Recoveries**

QC samples (See Below) failed to meet acceptance criteria for surrogate recovery. The data for all reported client samples in this batch met surrogate recovery acceptance criteria. The data are reported as is.

Sample	Analyte	Value
1203571154 (MB)	o-Terphenyl	27* (60%-140%)
1203571155 (LCS)	o-Terphenyl	56* (60%-140%)
1203571156 (B35YC8MS)	o-Terphenyl	50* (60%-140%)

**Matrix Spike (MS/MSD) Recovery Statement**

The MS and/or MSD (See Below) did not meet spike recovery acceptance limits. The failures were attributed to sample matrix interference as the MS and MSD displayed similar spike recovery.

Sample	Analyte	Value
1203571156 (B35YC8MS)	Diesel Range Organics	53* (70%-130%)
1203571157 (B35YC8MSD)	Diesel Range Organics	69* (70%-130%)

The MS and/or MSD (See Below) did not meet spike recovery acceptance limits. The associated MS or MSD did not confirm. The discrepancy in recoveries appears to be associated with the heterogeneous nature of the sample matrix. As the LCS passed spike recovery acceptance limits, the data were reported.

Sample	Analyte	Value
1203571156 (B35YC8MS)	Motor Oil	54* (70%-130%)

**MS/MSD Relative Percent Difference (RPD) Statement**

The MS and MSD (See Below) did not meet RPD acceptance limits. The discrepancy in recoveries appears to be associated with the heterogeneous nature of the sample matrix. As the LCS passed spike recovery acceptance limits, the data were reported.

Sample	Analyte	Value
1203571156MS and 1203571157MSD (B35YC8)	Diesel Range Organics	26* (0%-20%)
	Motor Oil	38* (0%-20%)

**Miscellaneous Information****Manual Integrations**

Samples 1203571155 (LCS), 1203571156 (B35YC8MS) and 1203571157 (B35YC8MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

## **General Chemistry**

### **pH**

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

### **Technical Information**

#### **Holding Times**

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203572158 (B35YC0DUP)	pH	Received 16-JUN-16, out of holding 14-JUN-16
399710001 (B35YC8)	pH	Received 21-JUN-16, out of holding 20-JUN-16
399710002 (B35YD1)	pH	Received 21-JUN-16, out of holding 20-JUN-16

## **Radiochemistry**

### **Dry Weight**

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

### **Certification Statement**

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

# **Chain of Custody and Supporting Documentation**







**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>CPBC</u>		SDG/AR/COC/Work Order: <u>399710</u>	
Received By: <u>Phuoc</u>		Date Received: <u>6/21/16</u>	
Suspected Hazard Information	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>21cpm</u>
Classified Radioactive II or III by RSO?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input type="checkbox"/>	<input checked="" 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"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>1°C</u>
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>201404337</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	VOA vials contain acid preservation?		<input checked="" type="checkbox"/>		(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
9	Are Encore containers present?		<input checked="" type="checkbox"/>		(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
13	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?		<input checked="" type="checkbox"/>		
15	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

16 Carrier and tracking number.

Circle Applicable:  
 FedEx Air     FedEx Ground     UPS     Field Services     Courier     Other

7765 6339 6338

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials NS Date 6/21/16 Page 1 of 1

# **Data Review Qualifier Definitions**

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

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is $\geq$ MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is $\geq$ EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is $\geq$ EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	

# Laboratory Certifications

**List of current GEL Certifications as of 06 July 2016**

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

# Semi-Volatile Analysis

# Case Narrative

**GC/MS Semivolatile  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL399710  
Work Order #: 399710**

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

**Analytical Method:** SW846 3541/8270D SIM PAH

**Analytical Procedure:** GL-OA-E-009 REV# 36

**Analytical Batch:** 1576509

**Preparation Method:** SW846 3541

**Preparation Procedure:** GL-OA-E-066 REV# 6

**Preparation Batch:** 1576507

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399710001	B35YC8
399710002	B35YD1
1203572507	Method Blank (MB)
1203572508	Laboratory Control Sample (LCS)
1203572509	399710001(B35YC8) Matrix Spike (MS)
1203572510	399710001(B35YC8) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

**Data Summary:**

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

**Certification Statement**

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

**GEL LABORATORIES LLC**

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

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL399710 GEL Work Order: 399710

**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: **30 JUN 2016**

Title: **Data Validator**

# Sample Data Summary

Semi-Volatile  
Certificate of Analysis  
Sample Summary

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SDG Number:	GEL399710	Date Collected:	06/20/2016 08:50	Matrix:	SOIL
Lab Sample ID:	399710001	Date Received:	06/21/2016 09:05	%Moisture:	3.5
Client ID:	B35YC8	Client:	CPRC001	Project:	CPRC0F16043
Batch ID:	1576509	Method:	SW846 3541/8270D SIM P.	SOP Ref:	GL-OA-E-009
Run Date:	06/24/2016 23:27	Inst:	MSD5.I	Dilution:	1
Prep Date:	06/23/2016 06:19	Analyst:	AGS1	Inj. Vol:	1 uL
Data File:	s062416.B\s5f2414.D	Aliquot:	30.026 g	Final Volume:	1 mL
		Column:	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
83-32-9	Acenaphthene	U	1.72	ug/kg	1.72	6.90
208-96-8	Acenaphthylene	U	1.72	ug/kg	1.72	6.90
120-12-7	Anthracene	U	1.72	ug/kg	1.72	6.90
56-55-3	Benzo(a)anthracene	U	1.72	ug/kg	1.72	6.90
50-32-8	Benzo(a)pyrene	U	1.72	ug/kg	1.72	6.90
205-99-2	Benzo(b)fluoranthene	U	1.72	ug/kg	1.72	6.90
191-24-2	Benzo(ghi)perylene	U	1.72	ug/kg	1.72	6.90
207-08-9	Benzo(k)fluoranthene	U	1.72	ug/kg	1.72	6.90
218-01-9	Chrysene	U	1.72	ug/kg	1.72	6.90
53-70-3	Dibenzo(a,h)anthracene	U	1.72	ug/kg	1.72	6.90
206-44-0	Fluoranthene	U	1.72	ug/kg	1.72	6.90
86-73-7	Fluorene	U	1.72	ug/kg	1.72	6.90
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.72	ug/kg	1.72	6.90
91-20-3	Naphthalene	U	1.03	ug/kg	1.03	6.90
85-01-8	Phenanthrene	U	1.72	ug/kg	1.72	6.90
129-00-0	Pyrene	U	1.72	ug/kg	1.72	6.90

Semi-Volatile  
Certificate of Analysis  
Sample Summary

Page 1 of 1

SDG Number:	GEL399710	Date Collected:	06/20/2016 11:25	Matrix:	SOIL
Lab Sample ID:	399710002	Date Received:	06/21/2016 09:05	%Moisture:	1.4
Client ID:	B35YD1	Client:	CPRC001	Project:	CPRC0F16043
Batch ID:	1576509	Method:	SW846 3541/8270D SIM P.	SOP Ref:	GL-OA-E-009
Run Date:	06/25/2016 01:01	Inst:	MSD5.I	Dilution:	1
Prep Date:	06/23/2016 06:19	Analyst:	AGS1	Inj. Vol:	1 uL
Data File:	s062416.B\s5f2417.D	Aliquot:	30.047 g	Final Volume:	1 mL
		Column:	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
83-32-9	Acenaphthene	U	1.69	ug/kg	1.69	6.75
208-96-8	Acenaphthylene	U	1.69	ug/kg	1.69	6.75
120-12-7	Anthracene	U	1.69	ug/kg	1.69	6.75
56-55-3	Benzo(a)anthracene	U	1.69	ug/kg	1.69	6.75
50-32-8	Benzo(a)pyrene	U	1.69	ug/kg	1.69	6.75
205-99-2	Benzo(b)fluoranthene	U	1.69	ug/kg	1.69	6.75
191-24-2	Benzo(ghi)perylene	U	1.69	ug/kg	1.69	6.75
207-08-9	Benzo(k)fluoranthene	U	1.69	ug/kg	1.69	6.75
218-01-9	Chrysene	U	1.69	ug/kg	1.69	6.75
53-70-3	Dibenzo(a,h)anthracene	U	1.69	ug/kg	1.69	6.75
206-44-0	Fluoranthene	U	1.69	ug/kg	1.69	6.75
86-73-7	Fluorene	U	1.69	ug/kg	1.69	6.75
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.69	ug/kg	1.69	6.75
91-20-3	Naphthalene	U	1.01	ug/kg	1.01	6.75
85-01-8	Phenanthrene	U	1.69	ug/kg	1.69	6.75
129-00-0	Pyrene	U	1.69	ug/kg	1.69	6.75

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 27, 2016

Page 1 of 4

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399710

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1576509										
QC1203572508	LCS										
Acenaphthene	333			267	ug/kg		80	(70%-130%)	AGS1	06/24/16	17:27
Acenaphthylene	333			259	ug/kg		78	(70%-130%)			
Anthracene	333			262	ug/kg		79	(70%-130%)			
Benzo(a)anthracene	333			285	ug/kg		85	(70%-130%)			
Benzo(a)pyrene	333			279	ug/kg		84	(70%-130%)			
Benzo(b)fluoranthene	333			281	ug/kg		84	(70%-130%)			
Benzo(ghi)perylene	333			297	ug/kg		89	(70%-130%)			
Benzo(k)fluoranthene	333			296	ug/kg		89	(70%-130%)			
Chrysene	333			293	ug/kg		88	(70%-130%)			
Dibenzo(a,h)anthracene	333			342	ug/kg		103	(70%-130%)			
Fluoranthene	333			262	ug/kg		78	(70%-130%)			
Fluorene	333			255	ug/kg		76	(70%-130%)			
Indeno(1,2,3-cd)pyrene	333			315	ug/kg		95	(70%-130%)			
Naphthalene	333			270	ug/kg		81	(70%-130%)			
Phenanthrene	333			253	ug/kg		76	(70%-130%)			
Pyrene	333			275	ug/kg		82	(70%-130%)			
**5-alpha-Androstane	167			126	ug/kg		76	(25%-129%)			
QC1203572507	MB										
Acenaphthene			U	1.67	ug/kg					06/24/16	16:55
Acenaphthylene			U	1.67	ug/kg						

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 399710

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1576509										
Anthracene			U	1.67	ug/kg						
Benzo(a)anthracene			U	1.67	ug/kg				AGS1	06/24/16	16:55
Benzo(a)pyrene			U	1.67	ug/kg						
Benzo(b)fluoranthene			U	1.67	ug/kg						
Benzo(ghi)perylene			U	1.67	ug/kg						
Benzo(k)fluoranthene			U	1.67	ug/kg						
Chrysene			U	1.67	ug/kg						
Dibenzo(a,h)anthracene			U	1.67	ug/kg						
Fluoranthene			U	1.67	ug/kg						
Fluorene			U	1.67	ug/kg						
Indeno(1,2,3-cd)pyrene			U	1.67	ug/kg						
Naphthalene			U	0.999	ug/kg						
Phenanthrene			U	1.67	ug/kg						
Pyrene			U	1.67	ug/kg						
**5-alpha-Androstane	167			146	ug/kg		87	(25%-129%)			
QC1203572509 399710001 MS											
Acenaphthene	345	U	1.72	290	ug/kg		84	(18%-115%)		06/24/16	23:58
Acenaphthylene	345	U	1.72	281	ug/kg		81	(19%-116%)			
Anthracene	345	U	1.72	279	ug/kg		81	(23%-115%)			
Benzo(a)anthracene	345	U	1.72	290	ug/kg		84	(23%-124%)			
Benzo(a)pyrene	345	U	1.72	286	ug/kg		83	(20%-130%)			
Benzo(b)fluoranthene	345	U	1.72	294	ug/kg		85	(20%-134%)			
Benzo(ghi)perylene	345	U	1.72	251	ug/kg		73	(18%-118%)			

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 399710

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1576509										
Benzo(k)fluoranthene	345	U	1.72	312	ug/kg		91	(23%-128%)	AGS1	06/24/16	23:58
Chrysene	345	U	1.72	296	ug/kg		86	(18%-121%)			
Dibenzo(a,h)anthracene	345	U	1.72	315	ug/kg		91	(12%-132%)			
Fluoranthene	345	U	1.72	263	ug/kg		76	(21%-124%)			
Fluorene	345	U	1.72	273	ug/kg		79	(21%-118%)			
Indeno(1,2,3-cd)pyrene	345	U	1.72	283	ug/kg		82	(11%-130%)			
Naphthalene	345	U	1.03	297	ug/kg		86	(14%-114%)			
Phenanthrene	345	U	1.72	270	ug/kg		78	(24%-106%)			
Pyrene	345	U	1.72	295	ug/kg		86	(16%-122%)			
**5-alpha-Androstane	173		124	125	ug/kg		72	(25%-129%)			
QC1203572510	399710001	MSD									
Acenaphthene	345	U	1.72	333	ug/kg	14	97	(0%-30%)		06/25/16	00:30
Acenaphthylene	345	U	1.72	322	ug/kg	14	93	(0%-30%)			
Anthracene	345	U	1.72	282	ug/kg	1	82	(0%-30%)			
Benzo(a)anthracene	345	U	1.72	290	ug/kg	0	84	(0%-30%)			
Benzo(a)pyrene	345	U	1.72	290	ug/kg	1	84	(0%-30%)			
Benzo(b)fluoranthene	345	U	1.72	308	ug/kg	5	89	(0%-30%)			
Benzo(ghi)perylene	345	U	1.72	221	ug/kg	13	64	(0%-30%)			
Benzo(k)fluoranthene	345	U	1.72	330	ug/kg	5	96	(0%-30%)			
Chrysene	345	U	1.72	296	ug/kg	0	86	(0%-30%)			
Dibenzo(a,h)anthracene	345	U	1.72	284	ug/kg	10	82	(0%-30%)			
Fluoranthene	345	U	1.72	262	ug/kg	0	76	(0%-30%)			

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 399710

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1576509										
Fluorene	345	U	1.72	314	ug/kg	14	91	(0%-30%)	AGS1	06/25/16	00:30
Indeno(1,2,3-cd)pyrene	345	U	1.72	257	ug/kg	10	75	(0%-30%)			
Naphthalene	345	U	1.03	312	ug/kg	5	90	(0%-30%)			
Phenanthrene	345	U	1.72	273	ug/kg	1	79	(0%-30%)			
Pyrene	345	U	1.72	303	ug/kg	3	88	(0%-30%)			
*5-alpha-Androstane	173		124	128	ug/kg		74	(25%-129%)			

**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.

## Surrogate Recovery Report

SDG Number: GEL399710

Matrix Type: SOLID

---

Sample ID	Client ID	5-alpha %REC
1203572507	MB for batch 1576507	87
1203572508	LCS for batch 1576507	76
399710001	B35YC8	72
1203572509	B35YC8MS	72
1203572510	B35YC8MSD	74
399710002	B35YD1	76

**Surrogate**

5-alpha- = 5-alpha-Androstane

**Acceptance Limits**

(25%-129%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

# **Flame Ionization Detector Analysis**

# Case Narrative

**FID Flame Ionization Detector**  
**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL399710**  
**Work Order #: 399710**

**Product:** Washington Method for the Determination of Extractable Petroleum Hydrocarbons

**Analytical Method:** WA EPH

**Analytical Procedure:** GL-OA-E-075 REV# 0

**Analytical Batches:** 1577215 and 1577213

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399710001	B35YC8
399710002	B35YD1
1203574377	Method Blank (MB)
1203574378	Laboratory Control Sample (LCS)
1203574379	399710001(B35YC8) Matrix Spike (MS)
1203574380	399710001(B35YC8) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

**Data Summary:**

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

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

Method blank (See Below) contained a hit for Aliphatic Hydrocarbons C8-C10. A similar concentration of Aliphatics Hydrocarbons C8-C10 was present in all client samples and other QC samples. The source of contamination was likely from impurities in one or more of the solvents used for the extractions. Detects in samples were B qualified and should be considered as false positives.

Sample	Analyte	Value
1203574377 (MB)	Aliphatic Hydrocarbons C8-C10	4560 * 10 > 4680

**Surrogate Recoveries**

MS (See Below) failed to meet acceptance criteria for one or more surrogate recoveries. The parent sample and MSD each met acceptance criteria for all surrogate recoveries. As the low surrogate recoveries were isolated to the MS, the failures were likely the result of a poor extraction. The data were reported.

Sample	Analyte	Value
1203574379 (B35YC8MS)	o-Terphenyl	54* (60%-140%)

**Laboratory Control Sample (LCS/LCSD) Recovery**

LCS (See Below) recovery for Aliphatic Hydrocarbons C8-C10 were not within the acceptance limits due to

impurities in the one or more of the solvents used in the extraction that eluted during the retention time window. The recovery of n-Decane added as part of the spiking standard was itself within acceptance limits. The data were reported.

Sample	Analyte	Value
1203574378 (LCS)	Aliphatic Hydrocarbons C8-C10	151* (70%-130%)

#### Matrix Spike (MS) Recovery Statement

The MS recoveries for this SDG were not within the acceptance limits. The failures are attributed to lab error.

Sample	Analyte	Value
1203574379 (B35YC8MS)	Aliphatic Hydrocarbons >C10-C12	58* (70%-130%)
	Aliphatic Hydrocarbons >C12-C16	61* (70%-130%)
	Aliphatic Hydrocarbons >C16-C21	62* (70%-130%)
	Aliphatic Hydrocarbons C8-C10	37* (70%-130%)
	Aromatic Hydrocarbons >C10-C12	53* (70%-130%)
	Aromatic Hydrocarbons >C12-C16	60* (70%-130%)
	Aromatic Hydrocarbons >C16-C21	55* (70%-130%)
	Aromatic Hydrocarbons >C21-C34	51* (70%-130%)

#### MS/MSD Relative Percent Difference (RPD) Statement

The relative percent differences (RPD) between each MS and MSD were not within the required acceptance limits due to low spike recovery in the MS.

Sample	Analyte	Value
1203574379MS and 1203574380MSD (B35YC8)	Aliphatic Hydrocarbons >C10-C12	31* (0%-20%)
	Aliphatic Hydrocarbons >C12-C16	34* (0%-20%)
	Aliphatic Hydrocarbons >C16-C21	33* (0%-20%)
	Aliphatic Hydrocarbons C8-C10	31* (0%-20%)
	Aromatic Hydrocarbons >C10-C12, Aromatic Hydrocarbons >C12-C16, Aromatic Hydrocarbons >C16-C21 and Aromatic Hydrocarbons >C21-C34	200* (0%-20%)

#### Certification Statement

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

**GEL LABORATORIES LLC**

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

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL399710 GEL Work Order: 399710

**The Qualifiers in this report are defined as follows:**

- B** The analyte was detected in both the associated QC blank and in the sample.  
**J** The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated  
**T** Spike and/or spike duplicate sample recovery is outside control limits.  
**U** Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
**DL** Indicates that sample is diluted.  
**RA** Indicates that sample is re-analyzed without re-extraction.  
**RE** Indicates that sample is re-extracted.

**Review/Validation**

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

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

**Signature:** 

**Name:** Jimin Cao

**Date:** 01 JUL 2016

**Title:** Data Validator

# Sample Data Summary

**Flame Ionization Detector  
Certificate of Analysis  
Sample Summary**

Page 1 of 2

<b>SDG Number:</b> GEL399710	<b>Date Collected:</b> 06/20/2016 08:50	<b>Matrix:</b> SOIL
<b>Lab Sample ID:</b> 399710001	<b>Date Received:</b> 06/21/2016 09:05	<b>%Moisture:</b> 3.5
<b>Client ID:</b> B35YC8	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0F16043
<b>Batch ID:</b> 1577215	<b>Method:</b> WA EPH	<b>SOP Ref:</b> GL-OA-E-075
<b>Run Date:</b> 06/30/2016 17:45	<b>Inst:</b> FID5.1	<b>Dilution:</b> 1
<b>Prep Date:</b> 06/28/2016 13:15	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Data File:</b> 063016_WA\F5F3019.D	<b>Aliquot:</b> 30.01 g	<b>Final Volume:</b> 2 mL
	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Aliphatic Hydrocarbons >C10-C12	TU	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons >C12-C16	TU	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons >C16-C21	TU	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons >C21-C34	U	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons C8-C10	BT	4690	ug/Kg	690	1380

Flame Ionization Detector  
Certificate of Analysis  
Sample Summary

Page 2 of 2

SDG Number: GEL399710  
Lab Sample ID: 399710001  
  
Client ID: B35YC8  
Batch ID: 1577215  
Run Date: 06/30/2016 18:15  
Prep Date: 06/28/2016 13:15  
Data File: 063016\_WA\F5F3020.D

Date Collected: 06/20/2016 08:50  
Date Received: 06/21/2016 09:05  
Client: CPRC001  
Method: WA EPH  
Inst: FID5.I  
Analyst: JMB3  
Aliquot: 30.01 g  
Column: DB-5ms

Matrix: SOIL  
%Moisture: 3.5  
Project: CPRC0F16043  
SOP Ref: GL-OA-E-075  
Dilution: 1  
Inj. Vol: 1 uL  
Final Volume: 2 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Aromatic Hydrocarbons >C10-C12	TU	690	ug/Kg	690	1380
	Aromatic Hydrocarbons >C12-C16	TU	690	ug/Kg	690	1380
	Aromatic Hydrocarbons >C16-C21	TU	690	ug/Kg	690	1380
	Aromatic Hydrocarbons >C21-C34	TU	690	ug/Kg	690	1380
	Aromatic Hydrocarbons C8-C10	U	690	ug/Kg	690	1380

**Flame Ionization Detector  
Certificate of Analysis  
Sample Summary**

Page 1 of 2

<b>SDG Number:</b> GEL399710	<b>Date Collected:</b> 06/20/2016 11:25	<b>Matrix:</b> SOIL
<b>Lab Sample ID:</b> 399710002	<b>Date Received:</b> 06/21/2016 09:05	<b>%Moisture:</b> 1.4
<b>Client ID:</b> B35YD1	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0F16043
<b>Batch ID:</b> 1577215	<b>Method:</b> WA EPH	<b>SOP Ref:</b> GL-OA-E-075
<b>Run Date:</b> 06/30/2016 20:42	<b>Inst:</b> FID5.1	<b>Dilution:</b> 1
<b>Prep Date:</b> 06/28/2016 13:15	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Data File:</b> 063016_WA\F5F3025.D	<b>Aliquot:</b> 30.17 g	<b>Final Volume:</b> 2 mL
	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Aliphatic Hydrocarbons >C10-C12	TU	673	ug/Kg	673	1350
	Aliphatic Hydrocarbons >C12-C16	TU	673	ug/Kg	673	1350
	Aliphatic Hydrocarbons >C16-C21	TU	673	ug/Kg	673	1350
	Aliphatic Hydrocarbons >C21-C34	J	907	ug/Kg	673	1350
	Aliphatic Hydrocarbons C8-C10	BT	4680	ug/Kg	673	1350

**Flame Ionization Detector  
Certificate of Analysis  
Sample Summary**

Page 2 of 2

SDG Number: GEL399710  
Lab Sample ID: 399710002  
  
Client ID: B35YD1  
Batch ID: 1577215  
Run Date: 06/30/2016 21:12  
Prep Date: 06/28/2016 13:15  
Data File: 063016\_WA\F5F3026.D

Date Collected: 06/20/2016 11:25  
Date Received: 06/21/2016 09:05  
Client: CPRC001  
Method: WA EPH  
Inst: FID5.1  
Analyst: JMB3  
Aliquot: 30.17 g  
Column: DB-5ms

Matrix: SOIL  
%Moisture: 1.4  
Project: CPRC0F16043  
SOP Ref: GL-OA-E-075  
Dilution: 1  
Inj. Vol: 1 uL  
Final Volume: 2 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Aromatic Hydrocarbons >C10-C12	TU	673	ug/Kg	673	1350
	Aromatic Hydrocarbons >C12-C16	TU	673	ug/Kg	673	1350
	Aromatic Hydrocarbons >C16-C21	TU	673	ug/Kg	673	1350
	Aromatic Hydrocarbons >C21-C34	TU	673	ug/Kg	673	1350
	Aromatic Hydrocarbons C8-C10	U	673	ug/Kg	673	1350

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: July 1, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399710

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>GC-FID</b>											
Batch	1577215										
QC1203574378	LCS										
Aliphatic Hydrocarbons >C10-C12	6660			5480	ug/Kg		82	(70%-130%)	JMB3	06/30/16	17:16
Aliphatic Hydrocarbons >C12-C16	6660			5590	ug/Kg		84	(70%-130%)			
Aliphatic Hydrocarbons >C16-C21	6660			5650	ug/Kg		85	(70%-130%)			
Aliphatic Hydrocarbons C8-C10	6660		B	10000	ug/Kg		151 *	(70%-130%)			
Aromatic Hydrocarbons >C10-C12	6660			5000	ug/Kg		75	(70%-130%)		06/30/16	14:47
Aromatic Hydrocarbons >C12-C16	6660			5660	ug/Kg		85	(70%-130%)			
Aromatic Hydrocarbons >C16-C21	13300			10600	ug/Kg		79	(70%-130%)			
Aromatic Hydrocarbons >C21-C34	13300			9750	ug/Kg		73	(70%-130%)			
**1-Chlorooctadecane	1330			1110	ug/Kg		83	(60%-140%)		06/30/16	17:16
**o-Terphenyl	1330			1030	ug/Kg		77	(60%-140%)		06/30/16	14:47
QC1203574377	MB										
Aliphatic Hydrocarbons >C10-C12			U	666	ug/Kg					06/30/16	16:46
Aliphatic Hydrocarbons >C12-C16			U	666	ug/Kg						
Aliphatic Hydrocarbons >C16-C21			U	666	ug/Kg						
Aliphatic Hydrocarbons >C21-C34			U	666	ug/Kg						
Aliphatic Hydrocarbons C8-C10				4560	ug/Kg						
Aromatic Hydrocarbons >C10-C12			U	666	ug/Kg					06/30/16	14:17
Aromatic Hydrocarbons >C12-C16			U	666	ug/Kg						
Aromatic Hydrocarbons >C16-C21			U	666	ug/Kg						
Aromatic Hydrocarbons >C21-C34			U	666	ug/Kg						

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 399710

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>GC-FID</b>											
Batch	1577215										
Aromatic Hydrocarbons C8-C10			U	666	ug/Kg						
**1-Chlorooctadecane	1330			1100	ug/Kg		83	(60%-140%)	JMB3	06/30/16	16:46
**o-Terphenyl	1330			1030	ug/Kg		78	(60%-140%)		06/30/16	14:17
QC1203574379 399710001 MS											
Aliphatic Hydrocarbons >C10-C12	6880	TU	690	T	3970	ug/Kg	58 *	(70%-130%)		06/30/16	18:44
Aliphatic Hydrocarbons >C12-C16	6880	TU	690	T	4180	ug/Kg	61 *	(70%-130%)			
Aliphatic Hydrocarbons >C16-C21	6880	TU	690	T	4250	ug/Kg	62 *	(70%-130%)			
Aliphatic Hydrocarbons C8-C10	6880	BT	4690	BT	7220	ug/Kg	37 *	(70%-130%)			
Aromatic Hydrocarbons >C10-C12	6880	TU	690	T	3620	ug/Kg	53 *	(70%-130%)		06/30/16	19:14
Aromatic Hydrocarbons >C12-C16	6880	TU	690	T	4120	ug/Kg	60 *	(70%-130%)			
Aromatic Hydrocarbons >C16-C21	13800	TU	690	T	7580	ug/Kg	55 *	(70%-130%)			
Aromatic Hydrocarbons >C21-C34	13800	TU	690	T	6980	ug/Kg	51 *	(70%-130%)			
**1-Chlorooctadecane	1380		921		823	ug/Kg	60	(60%-140%)		06/30/16	18:44
**o-Terphenyl	1380		1060		744	ug/Kg	54 *	(60%-140%)		06/30/16	19:14
QC1203574380 399710001 MSD											
Aliphatic Hydrocarbons >C10-C12	6890	TU	690		5440	ug/Kg	31 *	79	(0%-20%)	06/30/16	19:43
Aliphatic Hydrocarbons >C12-C16	6890	TU	690		5890	ug/Kg	34 *	85	(0%-20%)		
Aliphatic Hydrocarbons >C16-C21	6890	TU	690		5900	ug/Kg	33 *	86	(0%-20%)		
Aliphatic Hydrocarbons C8-C10	6890	BT	4690	B	9840	ug/Kg	31 *	75	(0%-20%)		
Aromatic Hydrocarbons >C10-C12	6890	TU	690		5020	ug/Kg	32 *	73	(0%-20%)	06/30/16	20:12
Aromatic Hydrocarbons >C12-C16	6890	TU	690		5730	ug/Kg	33 *	83	(0%-20%)		
Aromatic Hydrocarbons >C16-C21	13800	TU	690		10800	ug/Kg	35 *	78	(0%-20%)		
Aromatic Hydrocarbons >C21-C34	13800	TU	690		9600	ug/Kg	32 *	70	(0%-20%)		
**1-Chlorooctadecane	1380		921		1150	ug/Kg	84	(60%-140%)		06/30/16	19:43

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**QC Summary**

Workorder: 399710

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
GC-FID											
Batch	1577215										
**o-Terphenyl	1380	1060		1060	ug/Kg		77	(60%-140%)	JMB3	06/30/16	20:12

**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.

Flame Ionization Detector  
Surrogate Recovery Report

SDG Number: GEL399710

Matrix Type: SOLID

Sample ID	Client ID	COD %REC	OTP %REC
1203574377	MB for batch 1577213		78
1203574378	LCS for batch 1577213		77
1203574377	MB for batch 1577213	83	
1203574378	LCS for batch 1577213	83	
399710001	B35YC8	67	
399710001	B35YC8		77
1203574379	B35YC8MS	60	
1203574379	B35YC8MS		54 *
1203574380	B35YC8MSD	84	
1203574380	B35YC8MSD		77
399710002	B35YD1	77	
399710002	B35YD1		72

**Surrogate**

COD = 1-Chlorooctadecane

OTP = o-Terphenyl

**Acceptance Limits**

(60%-140%)

(60%-140%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

# **FID Diesel Range Organics Analysis**

# Case Narrative

**Diesel Range Organics  
Technical Case Narrative  
CH2M Hill Plateau Remediation Company (CPRC)  
SDG #: GEL399710  
Work Order #: 399710**

**Product:** Analysis of Diesel Range Organics by Flame Ionization Detector

**Analytical Method:** WTPH\_DIESEL

**Analytical Procedure:** GL-OA-E-003 REV# 26

**Analytical Batch:** 1575984

**Preparation Method:** SW846 3541

**Preparation Procedure:** GL-OA-E-010 REV# 25

**Preparation Batch:** 1575983

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399710001	B35YC8
399710002	B35YD1
1203571154	Method Blank (MB)
1203571155	Laboratory Control Sample (LCS)
1203571156	399710001(B35YC8) Matrix Spike (MS)
1203571157	399710001(B35YC8) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

**Data Summary:**

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

**Calibration Information**

**Continuing Calibration Verification (CCV) Requirements**

The associated calibration verification standards (ICV or CCV) did not meet the acceptance criteria. The target analytes failed to meet the acceptance criteria with a positive bias in one of the standards analyzed for this batch of the samples. This non-compliance has no adverse effects on the data as the associated environmental samples were not detected with target analytes above the PQL.

**Quality Control (QC) Information**

**Surrogate Recoveries**

QC samples (See Below) failed to meet acceptance criteria for surrogate recovery. The data for all reported client samples in this batch met surrogate recovery acceptance criteria. The data are reported as is.

Sample	Analyte	Value
1203571154 (MB)	o-Terphenyl	27* (60%-140%)
1203571155 (LCS)	o-Terphenyl	56* (60%-140%)

1203571156 (B35YC8MS)	o-Terphenyl	50* (60%-140%)
-----------------------	-------------	----------------

**Matrix Spike (MS/MSD) Recovery Statement**

The MS and/or MSD (See Below) did not meet spike recovery acceptance limits. The failures were attributed to sample matrix interference as the MS and MSD displayed similar spike recovery.

Sample	Analyte	Value
1203571156 (B35YC8MS)	Diesel Range Organics	53* (70%-130%)
1203571157 (B35YC8MSD)	Diesel Range Organics	69* (70%-130%)

The MS and/or MSD (See Below) did not meet spike recovery acceptance limits. The associated MS or MSD did not confirm. The discrepancy in recoveries appears to be associated with the heterogeneous nature of the sample matrix. As the LCS passed spike recovery acceptance limits, the data were reported.

Sample	Analyte	Value
1203571156 (B35YC8MS)	Motor Oil	54* (70%-130%)

**MS/MSD Relative Percent Difference (RPD) Statement**

The MS and MSD (See Below) did not meet RPD acceptance limits. The discrepancy in recoveries appears to be associated with the heterogeneous nature of the sample matrix. As the LCS passed spike recovery acceptance limits, the data were reported.

Sample	Analyte	Value
1203571156MS and 1203571157MSD (B35YC8)	Diesel Range Organics	26* (0%-20%)
	Motor Oil	38* (0%-20%)

**Miscellaneous Information****Manual Integrations**

Samples 1203571155 (LCS), 1203571156 (B35YC8MS) and 1203571157 (B35YC8MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

**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.

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL399710 GEL Work Order: 399710

**The Qualifiers in this report are defined as follows:**

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

T Spike and/or spike duplicate sample recovery is outside control limits.

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

DL Indicates that sample is diluted.

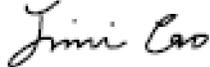
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

**Review/Validation**

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

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

**Signature:** **Name:** Jimin Cao**Date:** 23 JUN 2016**Title:** Data Validator

# Sample Data Summary

FID Diesel Range Organics  
Certificate of Analysis  
Sample Summary

SDG Number: GEL399710  
Lab Sample ID: 399710001  
  
Client ID: B35YC8  
Batch ID: 1575984  
Run Date: 06/21/2016 23:58  
Prep Date: 06/21/2016 12:10  
Data File: 062116DRO-MO\F7F2114.D

Date Collected: 06/20/2016 08:50  
Date Received: 06/21/2016 09:00  
Client: CPRC001  
Method: WTPH\_DIESEL  
Inst: FID7.I  
Analyst: JMB3  
Aliquot: 30.02 g  
Column: DB-5ms

Matrix: SOIL  
%Moisture: 3.5  
Project: CPRC0F16043  
SOP Ref: GL-OA-E-003  
Dilution: 1  
Inj. Vol: 1 uL  
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
68334-30-5	Diesel Range Organics	TU	2240	ug/kg	2240	6900
	Motor Oil	JT	3180	ug/kg	2240	6900

**FID Diesel Range Organics  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> GEL399710	<b>Date Collected:</b> 06/20/2016 11:25	<b>Matrix:</b> SOIL
<b>Lab Sample ID:</b> 399710002	<b>Date Received:</b> 06/21/2016 09:00	<b>%Moisture:</b> 1.4
<b>Client ID:</b> B35YD1	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0F16043
<b>Batch ID:</b> 1575984	<b>Method:</b> WTPH_DIESEL	<b>SOP Ref:</b> GL-OA-E-003
<b>Run Date:</b> 06/22/2016 01:55	<b>Inst:</b> FID7.1	<b>Dilution:</b> 1
<b>Prep Date:</b> 06/21/2016 12:10	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Data File:</b> 062116DRO-MO\F7F2117.D	<b>Aliquot:</b> 30 g	<b>Final Volume:</b> 1 mL
	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
68334-30-5	Diesel Range Organics	TU	2200	ug/kg	2200	6760
	Motor Oil	JT	5780	ug/kg	2200	6760

# Quality Control Summary

**GEL LABORATORIES LLC**

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**QC Summary**

Report Date: June 23, 2016

Page 1 of 1

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399710

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Diesel Range Organics</b>											
Batch	1575984										
QC1203571155	LCS										
Diesel Range Organics	66600			48200	ug/kg		72	(70%–130%)	JMB3	06/21/16	18
Motor Oil	66600			57200	ug/kg		86	(70%–130%)			
**o–Terphenyl	666			374	ug/kg		56 *	(60%–140%)			
QC1203571154	MB										
Diesel Range Organics			U	2170	ug/kg					06/21/16	17
Motor Oil			U	2170	ug/kg						
**o–Terphenyl	667			178	ug/kg		27 *	(60%–140%)			
QC1203571156	399710001 MS										
Diesel Range Organics	69100	TU	2240 T	36800	ug/kg		53 *	(70%–130%)		06/22/16	00
Motor Oil	69100	JT	3180 T	40400	ug/kg		54 *	(70%–130%)			
**o–Terphenyl	691		437	344	ug/kg		50 *	(60%–140%)			
QC1203571157	399710001 MSD										
Diesel Range Organics	69000	TU	2240 T	47700	ug/kg	26 *	69 *	(0%–20%)		06/22/16	01
Motor Oil	69000	JT	3180	59100	ug/kg	38 *	81	(0%–20%)			
**o–Terphenyl	690		437	478	ug/kg		69	(60%–140%)			

**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

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**QC Summary**

Workorder: 399710

Page 2 of 2

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

FID Diesel Range Organics  
Surrogate Recovery Report

SDG Number: GEL399710

Matrix Type: SOLID

Sample ID	Client ID	OTP %REC
1203571154	MB for batch 1575983	27 *
1203571155	LCS for batch 1575983	56 *
399710001	B35YC8	63
1203571156	B35YC8MS	50 *
1203571157	B35YC8MSD	69
399710002	B35YD1	66

Surrogate

Acceptance Limits

OTP = o-Terphenyl

(60%–140%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

# General Chem Analysis

# Case Narrative

**General Chemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL399710  
Work Order #: 399710**

**Product: pH****Analytical Method:** SW846 9045D**Analytical Procedure:** GL-GC-E-008 REV# 21**Analytical Batch:** 1576381

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399710001	B35YC8
399710002	B35YD1
1203572155	Laboratory Control Sample (LCS)
1203572158	399481001(B35YC0) Sample Duplicate (DUP)

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

**Data Summary:**

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

**Technical Information****Holding Times**

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203572158 (B35YC0DUP)	pH	Received 16-JUN-16, out of holding 14-JUN-16
399710001 (B35YC8)	pH	Received 21-JUN-16, out of holding 20-JUN-16
399710002 (B35YD1)	pH	Received 21-JUN-16, out of holding 20-JUN-16

**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.

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL399710 GEL Work Order: 399710

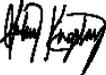
**The Qualifiers in this report are defined as follows:**

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

**Review/Validation**

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

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

Signature: 

Name: Aubrey Kingsbury

Date: 24 JUN 2016

Title: Analyst I

# Sample Data Summary





# Quality Control Summary

**GEL LABORATORIES LLC**

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**QC Summary**

Report Date: June 24, 2016

Page 1 of 1

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399710

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1576381										
QC1203572158	399481001	DUP									
pH	X	9.29	X	9.29	SU	0		(0%-30%)	KLP1	06/22/16	16:53
QC1203572155	LCS										
pH	7.00			7.00	SU		100	(70%-130%)		06/22/16	16:49

**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.

# Radiological Analysis

# Case Narrative

**Radiochemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL399710  
Work Order #: 399710**

**Product: Dry Weight**

**Analytical Method:** ASTM D 2216 (Modified)

**Analytical Procedure:** GL-OA-E-020 REV# 10

**Analytical Batch:** 1576163

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399710001	B35YC8
399710002	B35YD1
1203571585	399727001(NonSDG) Sample Duplicate (DUP)

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

**Data Summary:**

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

**Certification Statement**

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

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL399710 GEL Work Order: 399710

**The Qualifiers in this report are defined as follows:****Review/Validation**

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

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

**Signature:** **Name:** Theresa Austin**Date:** 23 JUN 2016**Title:** Group Leader

# Sample Data Summary

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> GEL399710	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0F16043
<b>Lab Sample ID:</b> 399710001	<b>Date Collected:</b> 06/20/2016 08:50	<b>Matrix:</b> SOIL
	<b>Date Received:</b> 06/21/2016 09:00	<b>%Moisture:</b> 3.5
<b>Client ID:</b> B35YC8	<b>Method:</b> ASTM D 2216 (Modified)	<b>Prep Basis:</b> "As Received"
<b>Batch ID:</b> 1576163	<b>Analyst:</b> CXC1	<b>SOP Ref:</b> GL-OA-E-020
<b>Run Date:</b> 06/21/2016 15:40		<b>Instrument:</b> SP-39020004
<b>Data File:</b>		<b>Count Time:</b>
<b>Prep Batch:</b> 1576163		
<b>Prep Date:</b> 06/21/2016 15:40		

CAS No.	Parmname	Qual	Result	Units	MDC	
	Moisture		3.46	percent +/-		
<b>Surrogate/Tracer recovery</b>		<b>Result</b>	<b>Nominal</b>	<b>Units</b>	<b>Recovery%</b>	<b>Acceptable Limits</b>

**Comments:**

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

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL399710	Client: CPRC001	Project: CPRC0F16043
Lab Sample ID: 399710002	Date Collected: 06/20/2016 11:25	Matrix: SOIL
	Date Received: 06/21/2016 09:00	%Moisture: 1.4
Client ID: B35YD1		Prep Basis: "As Received"
Batch ID: 1576163	Method: ASTM D 2216 (Modified)	SOP Ref: GL-OA-E-020
Run Date: 06/21/2016 15:40	Analyst: CXC1	Instrument: SP-39020004
Data File:		Count Time:
Prep Batch: 1576163		
Prep Date: 06/21/2016 15:40		

CAS No.	Parmname	Qual	Result	Units	Recovery%	Acceptable Limits	MDC
	Moisture		1.45	percent	+/-		
<b>Surrogate/Tracer recovery</b>							
			<b>Result</b>	<b>Nominal</b>	<b>Units</b>	<b>Recovery%</b>	<b>Acceptable Limits</b>

**Comments:**

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

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 23, 2016

Page 1 of 2

Client : CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 399710

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
<b>Gravimetric Solids</b>										
Batch	1576163									
QC1203571585	399727001	DUP								
Moisture		20.6		19.6	percent	RPD: 5	(0%-20%)	CXC1	06/21/16	15:40

**Notes:**

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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
- A The TIC is a suspected aldol-condensation product
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result  $\geq 2X$  the MDA and, after corrections, result is  $\geq$  MDA for this sample
- C Analyte has been confirmed by GC/MS analysis
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is  $\geq$  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.
- 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.
- UX Gamma Spectroscopy--Uncertain identification
- 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)

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**QC Summary**

Workorder: 399710

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

\*\* Indicates analyte is a surrogate compound.

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

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

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