

April 17, 2015

Rev. 1 

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

April 17, 2015

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

Re: CHPRC SAF X15-007
Work Order: 365481
SDG: GEL365481

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 21, 2015. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. Per client P&D, this data package was revised to correct the 0.00.

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: 300071ES20 - 7H
Chain of Custody: X15-007-026, X15-007-027, X15-007-028 and X15-007-029
Enclosures



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Problem and Discrepancy Report

Problem and Discrepancy Report

GEL

SDG GEL365481

02/18/15

1. The data package has the following issues:

- The DRO and Motor Oil results for sample B2Y658 are reported as “0.00” U.
- The TPH-G results for B2Y658 and B2Y661 are reported as “0.00” U.

Resolution: *Provide correction.*

Lab Response:

The data package and EDD will be revised to correct the “0.00”.

Case Narrative

Per client P&D, this data package was revised to correct the 0.00.

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X15-007
SDG: GEL365481**

April 17, 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 21, 2015, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
365481001	B2Y659
365481002	B2Y662
365481003	B2Y658
365481004	B2Y661

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, GC Volatiles (GRO), GC/MS Semivolatile, GC/MS Volatile, 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 Manager (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

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # X15-007-027
Collector CHRIS FULTON CHPRC		Contact/Requester WATERS-HUSTED, K		Telephone No. 376-4650
SAF No. X15-007	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071ES20		Page 1 of 1
Project Title 100-N GW Sample Collection Supporting	Logbook No. HNF-N-506 7432	Ice Chest No. 5WS-152		
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 772643303895		
Protocol CERCLA	Priority: 30 Days	Offsite Property No. 5351		
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/JATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.				
SPECIAL INSTRUCTIONS ** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.		Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Sample No. B2Y659	Filter N	No/Type Container 1x250-mL G/P	Sample Analysis 9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 02	Holding Time 28 Days/48 Hours
	Date JAN 20 2015 1014			Preservative Cool <=6C

Relinquished By CHRIS FULTON CHPRC	Sign 	Print CHRIS FULTON	Date/Time JAN 20 2015 1042	Received By K.C. Patterson	Sign 	Print CHPRC	Date/Time JAN 20 2015 1042
Relinquished By CHRIS FULTON	Sign 	Print CHPRC	Date/Time JAN 20 2015 1130	Received By FEDEX	Sign 	Print FEDEX	Date/Time JAN 20 2015 1130
Relinquished By FED EX	Sign 	Print FED EX	Date/Time JAN 20 2015 1130	Received By M. Kenston	Sign 	Print M. Kenston	Date/Time 1-21-15 0845
Relinquished By CHRIS FULTON	Sign 	Print CHRIS FULTON	Date/Time JAN 20 2015 1130	Received By CHRIS FULTON	Sign 	Print CHRIS FULTON	Date/Time JAN 20 2015 1130

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
PRINTED O 9/30/2014	A-6004-842 (REV 2)		

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # X15-007-029
Collector CHRIS FULTON CHPRC		Contact/Requester WATERS-HUSTED, K	Telephone No.	376-4650		Page 1 of 1
SAF No.	X15-007	Sampling Origin Hanford Site	Purchase Order/Charge Code	300071ES20		
Project Title	100-N GW Sample Collection Supporting	Logbook No.	HNF-N-50674132	Ice Chest No.	5W5-184	
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	77264094 4960	
Protocol	CERCLA	Priority:	30 Days	Offsite Property No.	5358	
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>			
** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.						
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B2Y662	N	JAN 20 2015	12:10	1x250-mL G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 02	Cool <=6C

Relinquished By CHRIS FULTON CHPRC	Sign	Date/Time 1-20-15 1230	Received By K.C. Patterson CHPRC	Sign	Date/Time 1-20-15 1230	Matrix *
Relinquished By CHRIS FULTON CHPRC	Sign	Date/Time JAN 20 2015 1438	Received By PEDEX	Sign	Date/Time 1-21-15 0945	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By CHRIS FULTON CHPRC	Sign	Date/Time	Received By M. Krystow	Sign	Date/Time	
Relinquished By CHRIS FULTON CHPRC	Sign	Date/Time	Received By PEDEX	Sign	Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# X15-007-026
Page 1 of 1

Collector: CHRIS FULTON CHPRC
 SAF No.: X15-007
 Project Title: 100-N GW Sample Collection Supporting
 Shipped To (Lab): GEL Laboratories, LLC
 Protocol: CERCLA
 Contact/Requester: WATERS-HUSTED, K
 Sampling Origin: Hanford Site
 Logbook No.: HNF-N-506 74132
 Method of Shipment: Commercial Carrier
 Priority: 30 Days
 Telephone No.: 376-4650
 Purchase Order/Charge Code: 300071ES20
 Ice Chest No.: GWS-152
 Bill of Lading/Air Bill No.: 772643303895
 Offsite Property No.: 5351

POSSIBLE SAMPLE HAZARDS/REMARKS
 *Contains Radioactive Material at concentrations that are not be 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
 ** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2Y658	N	JAN 20 2015	1014	2x1-L G	1664A_OILGREASE: COMMON	28 Days	HCl to pH <2/Cool <=6C
B2Y658	N			3x1-L aG	WTPH_DIESEL: COMMON	14/40 Days	HCl to pH <2/Cool <=6C
B2Y658	N			4x40-mL aGs*	WTPH_GASOLINE: COMMON	14 Days	HCl to pH <2/Cool <=6C
B2Y658	N			3x1-L aG	WTPH_MOTOR OIL: COMMON	14/40 Days	HCl to pH <2/Cool <=6C
B2Y658	N			1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 07 (BIOREM)	6 Months	HNO3 to pH <2
B2Y658	N			4x1-L aG	8270_SVOA_GCMS_SIM: COMMON	7/40 Days	Cool <=6C
B2Y658	N			4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2Y658	N			1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C

Relinquished By: CHRIS FULTON CHPRC
 Date/Time: JAN 20 2015 1042
 Sign: [Signature]
 Received By: K.C. Patterson
 Date/Time: JAN 20 2015 1042
 Sign: [Signature]
 Relinquished By: K.C. Patterson
 Date/Time: JAN 20 2015 1130
 Sign: [Signature]
 Received By: FEDEX
 Date/Time: [Blank]
 Relinquished By: [Signature]
 Date/Time: [Blank]
 Received By: M. Kaslow
 Date/Time: 1-21-15 0835
 Sign: [Signature]
 Matrix *
 S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Oil, A = Air
 DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **X15-007-028**
 Page 1 of 1

Collector: **CHRIS FULTON**
 CHPRC
 Telephone No. **376-4650**
 Purchase Order/Charge Code **300071ES20**
 SAF No. **X15-007**
 Sampling Origin **Hanford Site**
 Project Title **100-N GW Sample Collection Supporting**
 Logbook No. **HNF-N-50674/32**
 Shipped To (Lab) **GEL Laboratories, LLC**
 Method of Shipment **Commercial Carrier**
 Protocol **CERCLA**
 Priority: **30 Days**
 Ice Chest No. **6WS-184**
 Bill of Lading/Air Bill No. **77264694 4960**
 Offsite Property No. **5352**

POSSIBLE SAMPLE HAZARDS/REMARKS
 *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/JATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.
SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 ** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2Y661	N	W JAN 20 2015	1210	2x1-L G	1664A_OILGREASE: COMMON	28 Days	HCl to pH <2/Cool <=6C
B2Y661	N	W		3x1-L aG	WTPH_DIESEL: COMMON	14/40 Days	HCl to pH <2/Cool <=6C
B2Y661	N	W		4x40-mL aGs*	WTPH_GASOLINE: COMMON	14 Days	HCl to pH <2/Cool <=6C
B2Y661	N	W		3x1-L aG	WTPH_MOTOR OIL: COMMON	14/40 Days	HCl to pH <2/Cool <=6C
B2Y661	N	W		1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 07 (BIOREM)	6 Months	HNO3 to pH <2
B2Y661	N	W		4x1-L aG	8270_SVOA_GCMS_SIM: COMMON	7/40 Days	Cool <=6C
B2Y661	N	W		4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2Y661	N	W		1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C

Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	Matrix *
CHRIS FULTON CHPRC		JAN 20 2015 1230	C. Patterson CHPRC		JAN 20 2015 1230	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
CHRIS FULTON CHPRC		JAN 20 2015 1430	FEDEX			DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
CHRIS FULTON CHPRC		JAN 21 2015 0845	Mr. Karslow		1-21-15 0845	

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time
 PRINTED ON 9/30/2014
 A-6004-842 (REV 2)

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>365481</u>
Received By: <u>MK</u>		Date Received: <u>1-21-15</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 checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<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 checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<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"/>	<input checked="" 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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130532776</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other 7726 3902 0350 2.1°C 7726 4330 3895 2.3°C 7726 4694 4960 1.9°C

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 $\geq 2X$ the MDA and, after corrections, result is \geq 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 \geq 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 \geq 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 17 April 2015

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

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL365481
Work Order #: 365481**

Method/Analysis Information

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

Analytical Method: SW846 8260C

Analytical Batch Number: 1451862

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
365481003	B2Y658
365481004	B2Y661
1203248767	Method Blank (MB)
1203248768	Laboratory Control Sample (LCS)
1203248770	365211002(B2YXK7) Post Spike (PS)
1203248771	365211002(B2YXK7) Post Spike Duplicate (PSD)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

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-038 REV# 21.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information**Blank (MB) Statement**

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 365211002 (B2YXK7) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement

The spike recoveries were not all within the acceptance limits.

Matrix Spike Duplicate (PSD) Recovery Statement

The spike duplicate recoveries were not all within the acceptance limits.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology, which 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. All samples in this SDG met the specified holding time.

Sample Preservation and Integrity

Samples 365481003 (B2Y658) and 365481004 (B2Y661) were pH 3 at the time of analysis. The samples were analyzed within seven days from collection.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information**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

The following DER was generated for this SDG: 1377452.

Manual Integrations

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment

Tentatively identified compounds (TIC) were not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA2.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890N/HP5975C	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

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: GEL365481 GEL Work Order: 365481

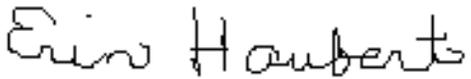
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 11 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 X15-007**

Report Date: February 11, 2015

Client Sample ID:	B2Y658	Project:	CPRC0X15007
Sample ID:	365481003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 10:14		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics										
<i>8260VOA_GCMS: COMMON "As Received"</i>										
1,1,1-Trichloroethane 71-55-6	U	0.00	0.300	5.00	ug/L	1	CDS1 01/23/15	1542	1451862	1
1,1,2-Trichloroethane 79-00-5	U	0.00	0.300	5.00	ug/L	1				
1,1-Dichloroethane 75-34-3	U	0.00	0.300	10.0	ug/L	1				
1,1-Dichloroethylene 75-35-4	U	0.00	0.300	10.0	ug/L	1				
1,2-Dichloroethane 107-06-2	U	0.00	0.300	5.00	ug/L	1				
2-Butanone 78-93-3	TU	0.00	3.00	10.0	ug/L	1				
4-Methyl-2-pentanone 108-10-1	U	0.00	3.00	10.0	ug/L	1				
Acetone 67-64-1	TU	2.76	3.00	20.0	ug/L	1				
Benzene 71-43-2	U	0.00	0.300	5.00	ug/L	1				
Carbon disulfide 75-15-0	U	0.00	1.60	10.0	ug/L	1				
Carbon tetrachloride 56-23-5	U	0.00	0.300	5.00	ug/L	1				
Chlorobenzene 108-90-7	U	0.00	0.300	5.00	ug/L	1				
Chloroform 67-66-3	J	1.55	0.300	5.00	ug/L	1				
Ethylbenzene 100-41-4	U	0.00	0.300	5.00	ug/L	1				
Methylene chloride 75-09-2	U	1.05	1.60	5.00	ug/L	1				
Tetrachloroethylene 127-18-4	U	0.00	0.300	5.00	ug/L	1				
Toluene 108-88-3	U	0.00	0.300	5.00	ug/L	1				
Trichloroethylene 79-01-6	U	0.00	0.300	5.00	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 X15-007**

Report Date: February 11, 2015

Client Sample ID:	B2Y658	Project:	CPRC0X15007
Sample ID:	365481003	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
<i>8260VOA_GCMS: COMMON "As Received"</i>											
Vinyl chloride 75-01-4	U	0.00	0.300	10.0	ug/L	1					
Xylenes (total) 1330-20-7	U	0.00	0.300	10.0	ug/L	1					

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260C	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260VOA_GCMS: COMMON "As Received"	49.3 ug/L	50.0	98.6	(77%-123%)
Bromofluorobenzene	8260VOA_GCMS: COMMON "As Received"	51.2 ug/L	50.0	102	(80%-120%)
Toluene-d8	8260VOA_GCMS: COMMON "As Received"	48.5 ug/L	50.0	97.1	(80%-120%)

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 X15-007**

Report Date: February 11, 2015

Client Sample ID:	B2Y661	Project:	CPRC0X15007
Sample ID:	365481004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 12:10		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics										
<i>8260VOA_GCMS: COMMON "As Received"</i>										
1,1,1-Trichloroethane 71-55-6	U	0.00	0.300	5.00	ug/L	1	CDS1 01/23/15	1612	1451862	1
1,1,2-Trichloroethane 79-00-5	U	0.00	0.300	5.00	ug/L	1				
1,1-Dichloroethane 75-34-3	U	0.00	0.300	10.0	ug/L	1				
1,1-Dichloroethylene 75-35-4	U	0.00	0.300	10.0	ug/L	1				
1,2-Dichloroethane 107-06-2	U	0.00	0.300	5.00	ug/L	1				
2-Butanone 78-93-3	TU	0.00	3.00	10.0	ug/L	1				
4-Methyl-2-pentanone 108-10-1	U	0.00	3.00	10.0	ug/L	1				
Acetone 67-64-1	JT	3.06	3.00	20.0	ug/L	1				
Benzene 71-43-2	U	0.00	0.300	5.00	ug/L	1				
Carbon disulfide 75-15-0	U	0.00	1.60	10.0	ug/L	1				
Carbon tetrachloride 56-23-5	U	0.00	0.300	5.00	ug/L	1				
Chlorobenzene 108-90-7	U	0.00	0.300	5.00	ug/L	1				
Chloroform 67-66-3	J	1.45	0.300	5.00	ug/L	1				
Ethylbenzene 100-41-4	U	0.00	0.300	5.00	ug/L	1				
Methylene chloride 75-09-2	U	1.00	1.60	5.00	ug/L	1				
Tetrachloroethylene 127-18-4	J	0.350	0.300	5.00	ug/L	1				
Toluene 108-88-3	U	0.00	0.300	5.00	ug/L	1				
Trichloroethylene 79-01-6	U	0.00	0.300	5.00	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 X15-007**

Report Date: February 11, 2015

Client Sample ID:	B2Y661	Project:	CPRC0X15007
Sample ID:	365481004	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
<i>8260VOA_GCMS: COMMON "As Received"</i>											
Vinyl chloride 75-01-4	U	0.00	0.300	10.0	ug/L	1					
Xylenes (total) 1330-20-7	U	0.00	0.300	10.0	ug/L	1					

The following Analytical Methods were performed

Method	Description	Analyst	Comments
1	SW846 8260C		

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260VOA_GCMS: COMMON "As Received"	50.0 ug/L	50.0	100	(77%-123%)
Bromofluorobenzene	8260VOA_GCMS: COMMON "As Received"	52.2 ug/L	50.0	104	(80%-120%)
Toluene-d8	8260VOA_GCMS: COMMON "As Received"	48.0 ug/L	50.0	95.9	(80%-120%)

Quality Control Summary

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QC Summary

Report Date: February 11, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365481

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS										
Batch	1451862									
QC1203248768	LCS									
1,1,1-Trichloroethane	50.0		58.3	ug/L		117	(70%-130%)	CDS1	01/23/15	07:36
1,1,2-Trichloroethane	50.0		51.2	ug/L		102	(70%-130%)			
1,1-Dichloroethane	50.0		51.4	ug/L		103	(70%-130%)			
1,1-Dichloroethylene	50.0		51.6	ug/L		103	(70%-130%)			
1,2-Dichloroethane	50.0		53.5	ug/L		107	(70%-130%)			
2-Butanone	250		260	ug/L		104	(70%-130%)			
4-Methyl-2-pentanone	250		252	ug/L		101	(70%-130%)			
Acetone	250		273	ug/L		109	(70%-130%)			
Benzene	50.0		50.4	ug/L		101	(70%-130%)			
Carbon disulfide	250		253	ug/L		101	(70%-130%)			
Carbon tetrachloride	50.0		57.7	ug/L		115	(70%-130%)			
Chlorobenzene	50.0		51.4	ug/L		103	(70%-130%)			
Chloroform	50.0		53.3	ug/L		107	(70%-130%)			
Ethylbenzene	50.0		53.2	ug/L		106	(70%-130%)			
Methylene chloride	50.0		45.2	ug/L		90.4	(70%-130%)			
Tetrachloroethylene	50.0		54.2	ug/L		108	(70%-130%)			
Toluene	50.0		50.6	ug/L		101	(70%-130%)			
Trichloroethylene	50.0		53.2	ug/L		106	(70%-130%)			
Vinyl chloride	50.0		53.1	ug/L		106	(70%-130%)			
Xylenes (total)	150		160	ug/L		107	(70%-130%)			

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QC Summary

Workorder: 365481

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1451862										
**1,2-Dichloroethane-d4	50.0			50.6	ug/L		101	(77%-123%)	CDS1	01/23/15	07:36
**Bromofluorobenzene	50.0			50.1	ug/L		100	(80%-120%)			
**Toluene-d8	50.0			48.9	ug/L		97.8	(80%-120%)			
QC1203248767	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					01/23/15	08:39
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						

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QC Summary

Workorder: 365481

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1451862										
Vinyl chloride			U	0.300	ug/L				CDS1	01/23/15	08:39
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.1	ug/L		102	(77%-123%)			
**Bromofluorobenzene	50.0			49.5	ug/L		98.9	(80%-120%)			
**Toluene-d8	50.0			47.2	ug/L		94.5	(80%-120%)			
QC1203248770 365211002 PS											
1,1,1-Trichloroethane	50.0	U	0.00	56.7	ug/L		113	(70%-130%)		01/23/15	17:13
1,1,2-Trichloroethane	50.0	U	0.00	51.6	ug/L		103	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	54.5	ug/L		109	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	55.4	ug/L		111	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	52.9	ug/L		106	(70%-130%)			
2-Butanone	250	TU	0.00 T	165	ug/L		65.8*	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	245	ug/L		98	(70%-130%)			
Acetone	250	TU	0.00 T	114	ug/L		45.6*	(70%-130%)			
Benzene	50.0	U	0.00	54.0	ug/L		108	(70%-130%)			
Carbon disulfide	250	U	0.00	291	ug/L		117	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	57.8	ug/L		116	(70%-130%)			
Chlorobenzene	50.0	U	0.00	53.7	ug/L		107	(70%-130%)			
Chloroform	50.0	U	0.00	55.2	ug/L		110	(70%-130%)			
Ethylbenzene	50.0	U	0.00	56.3	ug/L		113	(70%-130%)			
Methylene chloride	50.0	U	0.00	48.5	ug/L		97	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	52.2	ug/L		104	(70%-130%)			

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1451862										
Toluene	50.0	U	0.00	52.3	ug/L		105	(70%-130%)	CDS1	01/23/15	17:13
Trichloroethylene	50.0	U	0.00	55.3	ug/L		111	(70%-130%)			
Vinyl chloride	50.0	U	0.00	54.2	ug/L		108	(70%-130%)			
Xylenes (total)	150	U	0.00	167	ug/L		111	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		50.7	49.4	ug/L		98.9	(77%-123%)			
**Bromofluorobenzene	50.0		50.8	48.3	ug/L		96.6	(80%-120%)			
**Toluene-d8	50.0		48.8	47.7	ug/L		95.5	(80%-120%)			
QC1203248771 365211002 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	57.9	ug/L	1.95	116	(0%-20%)		01/23/15	17:43
1,1,2-Trichloroethane	50.0	U	0.00	52.2	ug/L	1.17	104	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	54.1	ug/L	0.829	108	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	55.1	ug/L	0.489	110	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	53.0	ug/L	0.208	106	(0%-20%)			
2-Butanone	250	TU	0.00	T 157	ug/L	4.57	62.9*	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	250	ug/L	1.88	99.8	(0%-20%)			
Acetone	250	TU	0.00	T 114	ug/L	0.184	45.6*	(0%-20%)			
Benzene	50.0	U	0.00	53.3	ug/L	1.23	107	(0%-20%)			
Carbon disulfide	250	U	0.00	282	ug/L	3.39	113	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00	58.7	ug/L	1.54	117	(0%-20%)			
Chlorobenzene	50.0	U	0.00	53.1	ug/L	1.03	106	(0%-20%)			
Chloroform	50.0	U	0.00	54.3	ug/L	1.61	109	(0%-20%)			
Ethylbenzene	50.0	U	0.00	55.6	ug/L	1.18	111	(0%-20%)			

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QC Summary

Workorder: 365481

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1451862										
Methylene chloride	50.0	U	0.00	48.3	ug/L	0.558	96.5	(0%-20%)	CDS1	01/23/15	17:43
Tetrachloroethylene	50.0	U	0.00	53.7	ug/L	2.74	107	(0%-20%)			
Toluene	50.0	U	0.00	52.7	ug/L	0.800	105	(0%-20%)			
Trichloroethylene	50.0	U	0.00	54.9	ug/L	0.581	110	(0%-20%)			
Vinyl chloride	50.0	U	0.00	52.3	ug/L	3.51	105	(0%-20%)			
Xylenes (total)	150	U	0.00	166	ug/L	0.619	111	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		50.7	49.6	ug/L		99.3	(77%-123%)			
**Bromofluorobenzene	50.0		50.8	48.4	ug/L		96.9	(80%-120%)			
**Toluene-d8	50.0		48.8	49.1	ug/L		98.2	(80%-120%)			

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)

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QC Summary

Workorder: 365481

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

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. 30-JAN-15	Division: Federal	Quality Criteria: SOP	Type: Process
Instrument Type: VOA GC/MS	Test / Method: 8260C	Matrix Type: Liquid	Client Code: CPRC001
Batch ID: 1451862	Sample Numbers: all		
<p>Potentially affected work order(s)(SDG): 365211(GEL365211),365390(GEL365390)</p> <p>Application Issues: Failed Recovery for MSD/PSD Failed Recovery for MS/PS</p>			
Specification and Requirements		DER Disposition:	
Exception Description:			
<p>1. The recoveries for Acetone and 2-Butanone were outside of acceptance limits in the MS and in the MSD performed on sample 36521102. The calculated relative percent differences between the MS and MSD were within acceptance limits for all client requested compounds.</p> <p>2. The percent drift for 2-Chloro-1,3-butadiene was outside of acceptance limits in the continuing calibration verification sample analyzed 01/23/15 AM tune with a high bias(+21.0%). The compound was not detected in the associated samples. The effected SDG's are GEL365211 and GEL365390.</p>		<p>1-2. Narrate and report data.</p>	

Originator's Name:
Crystal Stacey 30-JAN-15

Data Validator/Group Leader:
Erin Haubert 06-FEB-15

Semi-Volatile Analysis

Case Narrative

GC/MS Semivolatile
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL365481
 Work Order #: 365481

Method/Analysis Information

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

Analytical Method: SW846 3510C/8270D SIM PAH

Prep Method: SW846 3510C

Analytical Batch Number: 1452052

Prep Batch Number: 1452051

Sample Analysis

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

Sample ID	Client ID
365481003	B2Y658
365481004	B2Y661
1203249273	MB for batch 1452051
1203249274	Laboratory Control Sample (LCS)
1203249275	365481003(B2Y658) Matrix Spike (MS)
1203249276	365481003(B2Y658) 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.

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 standard(s) (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information**Method Blank (MB) Statement**

Target analytes were detected below the PQL in the 1203249273 (MB) associated with this SDG. These analytes were not detected above the PQL in the associated samples. The data are reported and qualified accordingly.

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 365481003 (B2Y658) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information:**Holding Time Specifications**

All samples in this SDG in this batch met the specified holding time.

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

The initial analysis for samples 1203249273 (MB), 1203249274 (LCS), 1203249275 (B2Y658MS), 1203249276 (B2Y658MSD) and 365481003 (B2Y658) was outside of the DFTPP TUNE window. The samples were

re-analyzed within a new DFTPP TUNE window. The data results are reported from the re-analysis.

Miscellaneous Information:

Data Exception (DER) Documentation

A data exception report (DER) was not generated for samples in this SDG in this batch. A data exception report (DER) was not generated 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:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
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.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365481 GEL Work Order: 365481

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
- 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: **13 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 X15-007**

Report Date: February 13, 2015

Client Sample ID:	B2Y658	Project:	CPRC0X15007
Sample ID:	365481003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 10:14		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatile-GC/MS											
<i>8270_SVOA_GCMS_SIM: COMMON "As Received"</i>											
Acenaphthene	U	0.00	0.0442	20.0	ug/L	1	JMB3	01/26/15	1332	1452052	1
83-32-9											
Acenaphthylene	U	0.00	0.0442	25.0	ug/L	1					
208-96-8											
Anthracene	U	0.00	0.0442	10.0	ug/L	1					
120-12-7											
Benzo(a)anthracene	U	0.00	0.0442	0.300	ug/L	1					
56-55-3											
Benzo(a)pyrene	U	0.00	0.0442	0.500	ug/L	1					
50-32-8											
Benzo(b)fluoranthene	U	0.00	0.0442	0.500	ug/L	1					
205-99-2											
Benzo(ghi)perylene	BJ	0.0442	0.0442	1.00	ug/L	1					
191-24-2											
Benzo(k)fluoranthene	U	0.00	0.0442	0.500	ug/L	1					
207-08-9											
Chrysene	U	0.00	0.0442	5.00	ug/L	1					
218-01-9											
Dibenzo(a,h)anthracene	BJ	0.0442	0.0442	1.00	ug/L	1					
53-70-3											
Fluoranthene	U	0.00	0.0442	5.00	ug/L	1					
206-44-0											
Fluorene	U	0.00	0.0442	3.00	ug/L	1					
86-73-7											
Indeno(1,2,3-cd)pyrene	U	0.00	0.0442	1.00	ug/L	1					
193-39-5											
Naphthalene	U	0.00	0.0442	20.0	ug/L	1					
91-20-3											
Phenanthrene	U	0.00	0.0442	10.0	ug/L	1					
85-01-8											
Pyrene	U	0.00	0.0442	20.0	ug/L	1					
129-00-0											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch

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 X15-007**

Report Date: February 13, 2015

Client Sample ID:	B2Y658	Project:	CPRC0X15007
Sample ID:	365481003	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
SW846 3510C	Prep Method 3510C for Liquid			RXC1	01/23/15	1020	1452051			

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3510C/8270D SIM PAH	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
5-alpha-Androstane	8270_SVOA_GCMS_SIM: COMMON "As Received"	3.70 ug/L	4.42	83.6	(35%-112%)

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 X15-007**

Report Date: February 13, 2015

Client Sample ID:	B2Y661	Project:	CPRC0X15007
Sample ID:	365481004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 12:10		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Semi-Volatile-GC/MS										
<i>8270_SVOA_GCMS_SIM: COMMON "As Received"</i>										
Acenaphthene	U	0.00	0.0472	20.0	ug/L	1	JMB3 01/26/15	1502	1452052	1
83-32-9										
Acenaphthylene	U	0.00	0.0472	25.0	ug/L	1				
208-96-8										
Anthracene	U	0.00	0.0472	10.0	ug/L	1				
120-12-7										
Benzo(a)anthracene	U	0.00	0.0472	0.300	ug/L	1				
56-55-3										
Benzo(a)pyrene	U	0.00	0.0472	0.500	ug/L	1				
50-32-8										
Benzo(b)fluoranthene	U	0.00	0.0472	0.500	ug/L	1				
205-99-2										
Benzo(ghi)perylene	U	0.00	0.0472	1.00	ug/L	1				
191-24-2										
Benzo(k)fluoranthene	U	0.00	0.0472	0.500	ug/L	1				
207-08-9										
Chrysene	U	0.00	0.0472	5.00	ug/L	1				
218-01-9										
Dibenzo(a,h)anthracene	U	0.00	0.0472	1.00	ug/L	1				
53-70-3										
Fluoranthene	U	0.00	0.0472	5.00	ug/L	1				
206-44-0										
Fluorene	U	0.00	0.0472	3.00	ug/L	1				
86-73-7										
Indeno(1,2,3-cd)pyrene	U	0.00	0.0472	1.00	ug/L	1				
193-39-5										
Naphthalene	U	0.00	0.0472	20.0	ug/L	1				
91-20-3										
Phenanthrene	U	0.00	0.0472	10.0	ug/L	1				
85-01-8										
Pyrene	U	0.00	0.0472	20.0	ug/L	1				
129-00-0										

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch

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 X15-007

Report Date: February 13, 2015

Client Sample ID: B2Y661
Sample ID: 365481004
Project: CPRC0X15007
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
SW846 3510C	Prep Method 3510C for Liquid			RXC1	01/23/15	1020	1452051			

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3510C/8270D SIM PAH	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
5-alpha-Androstane	8270_SVOA_GCMS_SIM: COMMON "As Received"	4.06 ug/L	4.72	86.0	(35%-112%)

Quality Control Summary

April 17, 2015

Rev. 1

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QC Summary

Report Date: February 13, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365481

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1452052										
QC1203249274	LCS										
Acenaphthene	10.0		J	6.24	ug/L		62.4	(40%-107%)	JMB3	01/26/15	13:02
Acenaphthylene	10.0		J	6.36	ug/L		63.6	(37%-112%)			
Anthracene	10.0		J	6.62	ug/L		66.2	(44%-113%)			
Benzo(a)anthracene	10.0			6.53	ug/L		65.3	(47%-111%)			
Benzo(a)pyrene	10.0			6.69	ug/L		66.9	(46%-124%)			
Benzo(b)fluoranthene	10.0			7.61	ug/L		76.1	(48%-129%)			
Benzo(ghi)perylene	10.0		B	6.30	ug/L		63	(39%-124%)			
Benzo(k)fluoranthene	10.0			7.53	ug/L		75.3	(51%-125%)			
Chrysene	10.0			6.75	ug/L		67.5	(51%-117%)			
Dibenzo(a,h)anthracene	10.0		B	6.13	ug/L		61.3	(38%-128%)			
Fluoranthene	10.0			7.03	ug/L		70.3	(40%-120%)			
Fluorene	10.0			6.41	ug/L		64.1	(41%-113%)			
Indeno(1,2,3-cd)pyrene	10.0			6.49	ug/L		64.9	(39%-128%)			
Naphthalene	10.0		J	6.15	ug/L		61.5	(33%-102%)			
Phenanthrene	10.0		J	6.41	ug/L		64.1	(45%-111%)			
Pyrene	10.0		J	6.67	ug/L		66.7	(42%-123%)			
**5-alpha-Androstane	5.00			3.58	ug/L		71.6	(35%-112%)			
QC1203249273	MB										
Acenaphthene			U	0.050	ug/L					01/26/15	12:31
Acenaphthylene			U	0.050	ug/L						

April 17, 2015

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QC Summary

Workorder: 365481

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1452052										
Anthracene			U	0.050	ug/L						
Benzo(a)anthracene			U	0.050	ug/L				JMB3	01/26/15	12:31
Benzo(a)pyrene			U	0.050	ug/L						
Benzo(b)fluoranthene			U	0.050	ug/L						
Benzo(ghi)perylene			J	0.060	ug/L						
Benzo(k)fluoranthene			U	0.050	ug/L						
Chrysene			U	0.050	ug/L						
Dibenzo(a,h)anthracene			J	0.060	ug/L						
Fluoranthene			U	0.050	ug/L						
Fluorene			U	0.050	ug/L						
Indeno(1,2,3-cd)pyrene			U	0.050	ug/L						
Naphthalene			U	0.050	ug/L						
Phenanthrene			U	0.050	ug/L						
Pyrene			U	0.050	ug/L						
**5-alpha-Androstane	5.00			3.84	ug/L		76.8	(35%-112%)			
QC1203249275 365481003 MS											
Acenaphthene	20.0	U	0.0442	J	12.4	ug/L	61.9	(38%-103%)		01/26/15	14:02
Acenaphthylene	20.0	U	0.0442	J	12.7	ug/L	63.6	(36%-104%)			
Anthracene	20.0	U	0.0442		13.3	ug/L	66.4	(28%-113%)			
Benzo(a)anthracene	20.0	U	0.0442		13.8	ug/L	68.9	(43%-103%)			
Benzo(a)pyrene	20.0	U	0.0442		14.0	ug/L	69.9	(28%-121%)			
Benzo(b)fluoranthene	20.0	U	0.0442		15.5	ug/L	77.7	(33%-123%)			
Benzo(ghi)perylene	20.0	BJ	0.0442	B	13.0	ug/L	64.8	(39%-124%)			

April 17, 2015

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QC Summary

Workorder: 365481

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1452052										
Benzo(k)fluoranthene	20.0	U	0.0442		15.1	ug/L	75.6	(39%-119%)	JMB3	01/26/15	14:02
Chrysene	20.0	U	0.0442		13.7	ug/L	68.5	(51%-117%)			
Dibenzo(a,h)anthracene	20.0	BJ	0.0442	B	12.0	ug/L	59.7	(30%-119%)			
Fluoranthene	20.0	U	0.0442		15.3	ug/L	76.3	(36%-120%)			
Fluorene	20.0	U	0.0442		13.1	ug/L	65.7	(41%-113%)			
Indeno(1,2,3-cd)pyrene	20.0	U	0.0442		13.6	ug/L	68.2	(39%-128%)			
Naphthalene	20.0	U	0.0442	J	12.1	ug/L	60.4	(33%-102%)			
Phenanthrene	20.0	U	0.0442		13.1	ug/L	65.5	(39%-107%)			
Pyrene	20.0	U	0.0442	J	13.8	ug/L	69.1	(28%-125%)			
**5-alpha-Androstane	10.0		3.70		8.48	ug/L	84.8	(35%-112%)			
QC1203249276 365481003 MSD											
Acenaphthene	20.0	U	0.0442	J	12.7	ug/L	2.39	63.4	(0%-20%)	01/26/15	14:32
Acenaphthylene	20.0	U	0.0442	J	13.2	ug/L	3.70	66	(0%-20%)		
Anthracene	20.0	U	0.0442		13.5	ug/L	1.79	67.6	(0%-20%)		
Benzo(a)anthracene	20.0	U	0.0442		13.8	ug/L	0.434	69.2	(0%-20%)		
Benzo(a)pyrene	20.0	U	0.0442		14.2	ug/L	1.56	71	(0%-26%)		
Benzo(b)fluoranthene	20.0	U	0.0442		15.6	ug/L	0.129	77.8	(0%-20%)		
Benzo(ghi)perylene	20.0	BJ	0.0442	B	12.9	ug/L	0.617	64.4	(0%-20%)		
Benzo(k)fluoranthene	20.0	U	0.0442		15.2	ug/L	0.396	75.9	(0%-20%)		
Chrysene	20.0	U	0.0442		13.8	ug/L	0.437	68.8	(0%-20%)		
Dibenzo(a,h)anthracene	20.0	BJ	0.0442	B	12.5	ug/L	4.57	62.5	(0%-20%)		
Fluoranthene	20.0	U	0.0442		15.0	ug/L	1.85	74.9	(0%-20%)		

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QC Summary

Workorder: 365481

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1452052										
Fluorene	20.0	U	0.0442		13.4	ug/L	1.81	66.9	(0%-20%)	JMB3	01/26/15 14:32
Indeno(1,2,3-cd)pyrene	20.0	U	0.0442		13.8	ug/L	1.17	69	(0%-20%)		
Naphthalene	20.0	U	0.0442	J	12.7	ug/L	4.69	63.3	(0%-20%)		
Phenanthrene	20.0	U	0.0442		13.2	ug/L	0.457	65.8	(0%-20%)		
Pyrene	20.0	U	0.0442	J	13.7	ug/L	1.16	68.3	(0%-20%)		
*5-alpha-Androstane	10.0		3.70		8.22	ug/L		82.2	(35%-112%)		

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.

FID Diesel Range Organics Analysis

Case Narrative

FID Diesel Range Organics
CH2MHill Plateau Remediation Company (CPRC)
SDG GEL365481

Method/Analysis Information

Procedure: Analysis of Diesel Range Organics by Flame Ionization Detector

Analytical Method: NWTPH-Dx

Prep Method: SW846 3535A

Analytical Batch Number: 1452783

Prep Batch Number: 1452781

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx:

Sample ID	Client ID
365481003	B2Y658
365481004	B2Y661
1203251112	MB for batch 1452781
1203251113	Laboratory Control Sample (LCS)
1203251114	365481004(B2Y661) Matrix Spike (MS)
1203251115	365481004(B2Y661) 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-003 REV# 25.

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

Calibration Information**Initial Calibration**

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

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 365481004 (B2Y661) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recovery was within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of 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. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information**Electronic Package Comment**

This 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. The data validator will always sign and date the case narrative.

Data Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for this SDG in this batch.

Manual Integrations

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

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 additional comments were not required.

System Configuration

The Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

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

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365481 GEL Work Order: 365481

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

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.

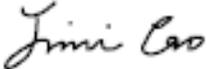
RA Indicates that sample is re-analyzed without re-extraction.

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: 29 JAN 2015

Title: Data Validator

Sample Data Summary

April 17, 2015
 FID Diesel Range Organics

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 Rev 1

Certificate of Analysis

Sample Summary

SDG Number: GEL365481	Date Collected: 01/20/2015 10:14	Matrix: WATER
Lab Sample ID: 365481003	Date Received: 01/21/2015 08:45	
Client ID: B2Y658	Client: CPRC001	Project: CPRC0X15007
Batch ID: 1452783	Method: NWTPH-Dx	SOP Ref: GL-OA-E-003
Run Date: 01/27/2015 17:22	Inst: FID7.I	Dilution: 1
Prep Date: 01/27/2015 10:15	Analyst: BYT1	Inj. Vol: 1 uL
Data File: 012715NW\7a2715.D	Aliquot: 1050 mL	Final Volume: 1 mL
	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
DRO	Diesel Range Organics	J	103	ug/L	47.6	190
	Motor Oil		221	ug/L	47.6	190

April 17, 2015
 FID Diesel Range Organics

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 Rev 1

Certificate of Analysis

Sample Summary

SDG Number: GEL365481	Date Collected: 01/20/2015 12:10	Matrix: WATER
Lab Sample ID: 365481004	Date Received: 01/21/2015 08:45	
Client ID: B2Y661	Client: CPRC001	Project: CPRC0X15007
Batch ID: 1452783	Method: NWTPH-Dx	SOP Ref: GL-OA-E-003
Run Date: 01/27/2015 18:01	Inst: FID7.I	Dilution: 1
Prep Date: 01/27/2015 10:15	Analyst: BYT1	Inj. Vol: 1 uL
Data File: 012715NW\7a2716.D	Aliquot: 1050 mL	Final Volume: 1 mL
	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
DRO	Diesel Range Organics	U	47.6	ug/L	47.6	190
	Motor Oil	U	47.6	ug/L	47.6	190

Quality Control Summary

April 17, 2015

Rev. 1

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QC Summary

Report Date: January 28, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365481

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1452783										
QC1203251113	LCS										
Diesel Range Organics	2000			1740	ug/L		86.8	(70%-130%)	BYT1	01/27/15	16:43
Motor Oil	2000			2050	ug/L		103	(70%-130%)			
**o-Terphenyl	20.0			19.0	ug/L		95.2	(50%-150%)			
QC1203251112	MB										
Diesel Range Organics			U	50.0	ug/L					01/27/15	16:05
Motor Oil			U	50.0	ug/L						
**o-Terphenyl	20.0			15.0	ug/L		75.2	(50%-150%)			
QC1203251114	365481004	MS									
Diesel Range Organics	1900	U	47.6	1640	ug/L		85.8	(70%-130%)		01/27/15	18:40
Motor Oil	1900	U	47.6	1820	ug/L		95.4	(70%-130%)			
**o-Terphenyl	19.0		15.5	16.4	ug/L		86.1	(50%-150%)			
QC1203251115	365481004	MSD									
Diesel Range Organics	1900	U	47.6	1500	ug/L	8.43	78.9	(0%-20%)		01/27/15	19:18
Motor Oil	1900	U	47.6	1680	ug/L	7.61	88.4	(0%-20%)			
**o-Terphenyl	19.0		15.5	18.0	ug/L		94.5	(50%-150%)			

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: 365481

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.

GC Volatiles (GRO) Analysis

Case Narrative

GC Volatiles (GRO)
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL365481
Work Order #: 365481

Method/Analysis Information

Procedure: Volatile Total Petroleum Hydrocarbons by Flame Ionization Detector

Analytical Method: NWTPH-Gx

Analytical Batch Number: 1454683

Sample Analysis

The following client and quality control samples were analyzed to complete this sample delivery group/work order using the methods referenced in the Analysis Information section:

Sample ID	Client ID
365481003	B2Y658
365481004	B2Y661
1203256238	MB for batch 1454683
1203256239	Laboratory Control Sample (LCS)
1203256240	365553014(B2Y655) Post Spike (PS)
1203256241	365553014(B2Y655) Post Spike Duplicate (PSD)

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

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

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-004 REV# 25.

Calibration Information**Initial Calibration**

All initial calibration requirements have been met for this sample delivery group (SDG). See the calibration history report for a list of data files that were used to generate the initial calibration curve in the Standard Data Section of this data package.

CCV Requirements

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

Surrogate recoveries, in all samples and quality control samples, were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 365553014 (B2Y655) was selected for analysis as the matrix spike.

Spike Recovery Statement

The GRO recovery was within the acceptance limits.

Relative Percent Difference (RPD) Statement

The RPD between the matrix spike pair met the acceptance limits.

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of 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. All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information**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

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

Data files associated with the initial calibration, continuing calibration check(s), and samples may have been manually integrated to correct misidentification of peaks by the integration software.

Additional Comments

GRO was not detected above the PQL in any of the samples, therefore no additional analyses were analyzed.

System Configuration

The GRO Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOC4A.I	Agilent 6890N GC/FID w/ OI 4560/Archon Autosampler	HP6890N GC/FID	DB-624	0.53mm x 3.0u x 15m	OI #10

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: GEL365481 GEL Work Order: 365481

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.

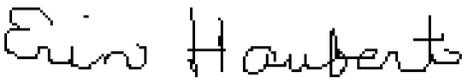
RA Indicates that sample is re-analyzed without re-extraction.

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: Erin Haubert

Date: 16 FEB 2015

Title: Data Validator

Sample Data Summary

April 17, 2015
GEL Volatiles (CPRC)Page 1 of 1
Rev 1Certificate of Analysis
Sample Summary

SDG Number:	GEL365481	Date Collected:	01/20/2015 10:14	Matrix:	WATER
Lab Sample ID:	365481003	Date Received:	01/21/2015 08:45	Client:	CPRC001
Client ID:	B2Y658	Method:	NWTPH-Gx	Project:	CPRC0X15007
Batch ID:	1454683	Inst:	VOC4A.I	SOP Ref:	GL-OA-E-004
Run Date:	02/02/2015 14:40	Analyst:	ACJ	Dilution:	1
Prep Date:	02/02/2015 14:40	Column:	DB-MTBE	Inj. Vol:	1 uL
Data File:	020215\4U105.D				

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Gasoline Range Organics	U	16.7	ug/L	16.7	50.0

April 17, 2015
GEL Volatiles (CPRC)Page 1 of 1
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Certificate of Analysis

Sample Summary

SDG Number:	GEL365481	Date Collected:	01/20/2015 12:10	Matrix:	WATER
Lab Sample ID:	365481004	Date Received:	01/21/2015 08:45	Client:	CPRC001
Client ID:	B2Y661	Method:	NWTPH-Gx	Project:	CPRC0X15007
Batch ID:	1454683	Inst:	VOC4A.I	SOP Ref:	GL-OA-E-004
Run Date:	02/02/2015 15:08	Analyst:	ACJ	Dilution:	1
Prep Date:	02/02/2015 15:08	Column:	DB-MTBE	Inj. Vol:	1 uL
Data File:	020215\4U106.D				

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Gasoline Range Organics	U	16.7	ug/L	16.7	50.0

Quality Control Summary

April 17, 2015

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Surrogate Recovery Report

SDG Number: GEL365481

Matrix Type: LIQUID

Sample ID	Client ID	BFB %REC
1203256239	LCS for batch 1454683	112
1203256238	MB for batch 1454683	103
365481003	B2Y658	102
365481004	B2Y661	102
1203256240	B2Y655PS	94
1203256241	B2Y655PSD	95

Surrogate

BFB = Bromofluorobenzene

Acceptance Limits

(50%-150%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 16, 2015

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365481

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatiles GRO Organics											
Batch	1454683										
QC1203256239	LCS										
Gasoline Range Organics	500			490	ug/L		98	(70%-130%)	ACJ	02/02/15	11:47
**Bromofluorobenzene	50.0			56.0	ug/L		112	(50%-150%)			
QC1203256238	MB										
Gasoline Range Organics			U	16.7	ug/L					02/02/15	12:15
**Bromofluorobenzene	50.0			51.5	ug/L		103	(50%-150%)			
QC1203256240	365553014	PS									
Gasoline Range Organics	500	U	13.9	473	ug/L		91.7	(70%-130%)		02/02/15	20:15
**Bromofluorobenzene	50.0		46.1	47.0	ug/L		93.9	(50%-150%)			
QC1203256241	365553014	PSD									
Gasoline Range Organics	500	U	13.9	452	ug/L	4.50	87.6	(0%-20%)		02/02/15	20:43
**Bromofluorobenzene	50.0		46.1	47.3	ug/L		94.7	(50%-150%)			

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

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QC Summary

Workorder: 365481

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

- 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.

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL365481
Work Order #: 365481

Sample ID	Client ID
365481003	B2Y658
365481004	B2Y661
1203248792	Method Blank (MB)ICP
1203248793	Laboratory Control Sample (LCS)
1203248796	365515001(B303W9L) Serial Dilution (SD)
1203248794	365515001(B303W9S) Matrix Spike (MS)
1203248795	365515001(B303W9SD) Matrix Spike Duplicate (MSD)
1203248809	Method Blank (MB)ICP-MS
1203248810	Laboratory Control Sample (LCS)
1203248813	365481003(B2Y658L) Serial Dilution (SD)
1203248811	365481003(B2Y658S) Matrix Spike (MS)
1203248812	365481003(B2Y658SD) Matrix Spike Duplicate (MSD)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1451875 and 1451882
Prep Batch :	1451874 and 1451881
Standard Operating Procedures:	GL-MA-E-013 REV# 23, GL-MA-E-006 REV# 11 and GL-MA-E-014 REV# 25
Analytical Method:	SW846 3005A/6010C and SW846 3005A/6020A
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.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium,

tantalum, and/or lutetium were utilized to cover the mass spectrum.

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C met the control limits with the exception of potassium listed below. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 365481003 (B2Y658) and 365481004 (B2Y661)-ICP.

ICSA/ICSAB Statement

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. The analyte concentration was greater than the MDL in blank. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. Molybdenum is flagged with a "B" flag. 1203248809 (MB)-ICP-MS.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 365515001 (B303W9)-ICP and 365481003 (B2Y658)-ICP-MS.

Matrix Spike (MS) 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.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance 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**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.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365481 GEL Work Order: 365481

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: Nik-Cole Elmore

Date: 16 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 X15-007**

Report Date: February 16, 2015

Client Sample ID:	B2Y658	Project:	CPRC0X15007
Sample ID:	365481003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 10:14		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: GW 07 (BIOREM) "As Received"</i>												
Boron	B	26.3	+/-7.26	15.0	50.0	ug/L	1	HSC	01/30/15	1344	1451875	1
7440-42-8												
Calcium		95000	+/-19000	50.0	200	ug/L	1					
7440-70-2												
Iron		213	+/-43.8	30.0	100	ug/L	1					
7439-89-6												
Magnesium		19700	+/-3930	110	300	ug/L	1					
7439-95-4												
Phosphorous	B	88.6	+/-26.7	60.0	150	ug/L	1					
7723-14-0												
Potassium		6070	+/-1210	50.0	150	ug/L	1					
7440-09-7												
Silicon		12000	+/-2390	25.0	100	ug/L	1					
7440-21-3												
Sodium		68300	+/-13700	100	300	ug/L	1					
7440-23-5												
Vanadium	B	4.44	+/-0.948	1.00	5.00	ug/L	1					
7440-62-2												
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>												
Aluminum		81.3	+/-17.0	15.0	50.0	ug/L	1	BAJ	01/30/15	2022	1451882	2
7429-90-5												
Antimony	U	0.200	+/-0.336	1.00	5.00	ug/L	1					
7440-36-0												
Arsenic	U	1.21	+/-0.616	1.70	5.00	ug/L	1					
7440-38-2												
Beryllium	U	0.009	+/-0.0667	0.200	2.00	ug/L	1					
7440-41-7												
Boron		28.4	+/-5.83	4.00	15.0	ug/L	1					
7440-42-8												
Cadmium	U	0.014	+/-0.0368	0.110	2.00	ug/L	1					
7440-43-9												
Chromium		10.1	+/-2.13	2.00	10.0	ug/L	1					
7440-47-3												
Cobalt	B	0.211	+/-0.0538	0.100	4.00	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 X15-007**

Report Date: February 16, 2015

Client Sample ID: B2Y658 Project: CPRC0X15007
 Sample ID: 365481003 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
7440-48-4											
Copper	B	0.539	+/-0.159	0.350	8.00	1					
7440-50-8											
Lead	U	0.116	+/-0.168	0.500	2.00	1					
7439-92-1											
Molybdenum	BC	1.30	+/-0.266	0.165	20.0	1					
7439-98-7											
Selenium	U	1.13	+/-0.549	1.50	5.00	1					
7782-49-2											
Silver	U	0.012	+/-0.0667	0.200	2.00	1					
7440-22-4											
Thallium	U	0.043	+/-0.150	0.450	2.00	1					
7440-28-0											
Thorium	U	0.119	+/-0.130	0.383	2.00	1					
7440-29-1											
Tin	U	0.111	+/-0.334	1.00	5.00	1					
7440-31-5											
Uranium		5.70	+/-1.14	0.067	0.200	1					
7440-61-1											
Zinc	B	5.19	+/-1.56	3.50	10.0	1					
7440-66-6											
Barium		69.4	+/-13.9	0.600	5.00	1	BAJ	01/30/15	1812	1451882	3
7440-39-3											
Nickel		3.89	+/-0.796	0.500	2.00	1					
7440-02-0											
Strontium		469	+/-93.9	2.00	10.0	1					
7440-24-6											
Manganese		22.2	+/-4.45	1.00	5.00	1	BAJ	02/03/15	1828	1451882	4
7439-96-5											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/22/15	0800	1451881
SW846 3005A	SW846 3005A for 6010C	JXM5	01/22/15	0800	1451874

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	

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 X15-007**

Report Date: February 16, 2015

Client Sample ID:	B2Y658	Project:	CPRC0X15007
Sample ID:	365481003	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
2	SW846 3005A/6020A									
3	SW846 3005A/6020A									
4	SW846 3005A/6020A									

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 X15-007**

Report Date: February 16, 2015

Client Sample ID:	B2Y661	Project:	CPRC0X15007
Sample ID:	365481004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 12:10		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: GW 07 (BIOREM) "As Received"</i>												
Boron 7440-42-8	B	26.8	+/-7.33	15.0	50.0	ug/L	1	HSC	01/30/15	1347	1451875	1
Calcium 7440-70-2		124000	+/-24800	50.0	200	ug/L	1					
Iron 7439-89-6		141	+/-29.8	30.0	100	ug/L	1					
Magnesium 7439-95-4		21600	+/-4320	110	300	ug/L	1					
Phosphorous 7723-14-0	B	69.9	+/-24.4	60.0	150	ug/L	1					
Potassium 7440-09-7		3740	+/-747	50.0	150	ug/L	1					
Silicon 7440-21-3		9890	+/-1980	25.0	100	ug/L	1					
Sodium 7440-23-5		21400	+/-4280	100	300	ug/L	1					
Vanadium 7440-62-2	B	2.09	+/-0.535	1.00	5.00	ug/L	1					
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>												
Aluminum 7429-90-5	U	12.1	+/-5.55	15.0	50.0	ug/L	1	BAJ	01/30/15	2032	1451882	2
Antimony 7440-36-0	U	0.104	+/-0.334	1.00	5.00	ug/L	1					
Arsenic 7440-38-2	U	0.328	+/-0.570	1.70	5.00	ug/L	1					
Beryllium 7440-41-7	U	0.017	+/-0.0668	0.200	2.00	ug/L	1					
Boron 7440-42-8		27.1	+/-5.58	4.00	15.0	ug/L	1					
Cadmium 7440-43-9	U	0.015	+/-0.0368	0.110	2.00	ug/L	1					
Chromium 7440-47-3		9.85	+/-2.08	2.00	10.0	ug/L	1					
Cobalt	B	0.108	+/-0.0397	0.100	4.00	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 X15-007**

Report Date: February 16, 2015

Client Sample ID: B2Y661 Project: CPRC0X15007
 Sample ID: 365481004 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7440-48-4											
Copper	B	0.461	+/-0.149	0.350	8.00	ug/L					
7440-50-8											
Lead	U	0.114	+/-0.168	0.500	2.00	ug/L					
7439-92-1											
Molybdenum	BC	0.478	+/-0.110	0.165	20.0	ug/L					
7439-98-7											
Selenium	U	1.03	+/-0.541	1.50	5.00	ug/L					
7782-49-2											
Silver	U	0.010	+/-0.0667	0.200	2.00	ug/L					
7440-22-4											
Thallium	U	0.00	+/-0.150	0.450	2.00	ug/L					
7440-28-0											
Thorium	U	0.030	+/-0.128	0.383	2.00	ug/L					
7440-29-1											
Tin	U	0.160	+/-0.335	1.00	5.00	ug/L					
7440-31-5											
Uranium		5.07	+/-1.01	0.067	0.200	ug/L					
7440-61-1											
Zinc		10.5	+/-2.40	3.50	10.0	ug/L					
7440-66-6											
Barium		124	+/-24.9	0.600	5.00	ug/L	1	BAJ	01/30/15	1824	1451882 3
7440-39-3											
Nickel		4.09	+/-0.835	0.500	2.00	ug/L					
7440-02-0											
Strontium		548	+/-110	2.00	10.0	ug/L					
7440-24-6											
Manganese	B	3.43	+/-0.763	1.00	5.00	ug/L	1	BAJ	02/03/15	1838	1451882 4
7439-96-5											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/22/15	0800	1451881
SW846 3005A	SW846 3005A for 6010C	JXM5	01/22/15	0800	1451874

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	

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 X15-007**

Report Date: February 16, 2015

Client Sample ID: B2Y661 Project: CPRC0X15007
Sample ID: 365481004 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
2	SW846	3005A/6020A								
3	SW846	3005A/6020A								
4	SW846	3005A/6020A								

Quality Control Summary

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QC Summary

Report Date: February 16, 2015

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365481

Parmname	NOM	Sample Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS										
Batch	1451882									
QC1203248810	LCS									
Aluminum	2000		2030	ug/L		101	(80%-120%)	BAJ	01/30/15	20:20
Antimony	50.0		50.1	ug/L		100	(80%-120%)			
Arsenic	50.0		41.7	ug/L		83.5	(80%-120%)			
Barium	50.0		49.5	ug/L		99	(80%-120%)		01/30/15	18:10
Beryllium	50.0		58.0	ug/L		116	(80%-120%)		01/30/15	20:20
Boron	100		106	ug/L		106	(80%-120%)			
Cadmium	50.0		51.1	ug/L		102	(80%-120%)			
Chromium	50.0		50.7	ug/L		101	(80%-120%)			
Cobalt	50.0		51.7	ug/L		103	(80%-120%)			
Copper	50.0		51.7	ug/L		103	(80%-120%)			
Lead	50.0		50.7	ug/L		101	(80%-120%)			
Manganese	50.0		52.4	ug/L		105	(80%-120%)		02/03/15	18:26
Molybdenum	50.0		50.2	ug/L		100	(80%-120%)		01/30/15	20:20
Nickel	50.0		51.1	ug/L		102	(80%-120%)		01/30/15	18:10
Selenium	50.0		50.3	ug/L		101	(80%-120%)		01/30/15	20:20
Silver	50.0		50.8	ug/L		102	(80%-120%)			
Strontium	50.0		51.5	ug/L		103	(80%-120%)		01/30/15	18:10
Thallium	50.0		50.6	ug/L		101	(80%-120%)		01/30/15	20:20
Thorium	50.0		50.8	ug/L		102	(80%-120%)			
Tin	50.0		51.1	ug/L		102	(80%-120%)			

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QC Summary

Workorder: 365481

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1451882										
Uranium	50.0			50.9	ug/L		102	(80%-120%)	BAJ	01/30/15	20:20
Zinc	50.0			51.5	ug/L		103	(80%-120%)			
QC1203248809	MB										
Aluminum			U	ND	ug/L					01/30/15	20:17
Antimony			U	ND	ug/L						
Arsenic			U	ND	ug/L						
Barium			U	ND	ug/L					01/30/15	18:08
Beryllium			U	ND	ug/L					01/30/15	20:17
Boron			U	ND	ug/L						
Cadmium			U	ND	ug/L						
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Lead			U	ND	ug/L						
Manganese			U	ND	ug/L					02/03/15	18:24
Molybdenum			B	0.228	ug/L					01/30/15	20:17
Nickel			U	ND	ug/L					01/30/15	18:08
Selenium			U	ND	ug/L					01/30/15	20:17
Silver			U	ND	ug/L						
Strontium			U	ND	ug/L					01/30/15	18:08
Thallium			U	ND	ug/L					01/30/15	20:17
Thorium			U	ND	ug/L						

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QC Summary

Workorder: 365481

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1451882										
Tin			U	ND	ug/L				BAJ	01/30/15	20:17
Uranium			U	ND	ug/L						
Zinc			U	ND	ug/L						
QC1203248811 365481003 MS											
Aluminum	2000			81.3	2090	ug/L	100	(75%-125%)		01/30/15	20:25
Antimony	50.0	U		ND	50.0	ug/L	99.7	(75%-125%)			
Arsenic	50.0	U		ND	43.4	ug/L	84.4	(75%-125%)			
Barium	50.0			69.4	118	ug/L	96.9	(75%-125%)		01/30/15	18:15
Beryllium	50.0	U		ND	56.8	ug/L	114	(75%-125%)		01/30/15	20:25
Boron	100			28.4	130	ug/L	102	(75%-125%)			
Cadmium	50.0	U		ND	48.8	ug/L	97.5	(75%-125%)			
Chromium	50.0			10.1	59.6	ug/L	99	(75%-125%)			
Cobalt	50.0	B		0.211	48.9	ug/L	97.3	(75%-125%)			
Copper	50.0	B		0.539	48.2	ug/L	95.4	(75%-125%)			
Lead	50.0	U		ND	47.0	ug/L	93.7	(75%-125%)			
Manganese	50.0			22.2	72.4	ug/L	100	(75%-125%)		02/03/15	18:31
Molybdenum	50.0	BC		1.30	52.2	ug/L	102	(75%-125%)		01/30/15	20:25
Nickel	50.0			3.89	53.5	ug/L	99.2	(75%-125%)		01/30/15	18:15
Selenium	50.0	U		ND	50.6	ug/L	99	(75%-125%)		01/30/15	20:25
Silver	50.0	U		ND	48.7	ug/L	97.3	(75%-125%)			
Strontium	50.0			469	532	ug/L	N/A	(75%-125%)		01/30/15	18:15
Thallium	50.0	U		ND	46.8	ug/L	93.5	(75%-125%)		01/30/15	20:25

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QC Summary

Workorder: 365481

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1451882										
Thorium	50.0	U	ND	49.6	ug/L		99	(75%-125%)	BAJ	01/30/15	20:25
Tin	50.0	U	ND	51.8	ug/L		103	(75%-125%)			
Uranium	50.0		5.70	55.3	ug/L		99.2	(75%-125%)			
Zinc	50.0	B	5.19	51.9	ug/L		93.5	(75%-125%)			
QC1203248812 365481003 MSD											
Aluminum	2000		81.3	2000	ug/L	4.44	95.8	(0%-20%)		01/30/15	20:27
Antimony	50.0	U	ND	49.0	ug/L	2.03	97.7	(0%-20%)			
Arsenic	50.0	U	ND	44.0	ug/L	1.36	85.6	(0%-20%)			
Barium	50.0		69.4	115	ug/L	2.17	91.8	(0%-20%)		01/30/15	18:17
Beryllium	50.0	U	ND	53.7	ug/L	5.58	107	(0%-20%)		01/30/15	20:27
Boron	100		28.4	131	ug/L	0.488	102	(0%-20%)			
Cadmium	50.0	U	ND	49.5	ug/L	1.53	99	(0%-20%)			
Chromium	50.0		10.1	60.1	ug/L	0.810	100	(0%-20%)			
Cobalt	50.0	B	0.211	47.9	ug/L	1.96	95.4	(0%-20%)			
Copper	50.0	B	0.539	46.6	ug/L	3.54	92	(0%-20%)			
Lead	50.0	U	ND	47.6	ug/L	1.38	95	(0%-20%)			
Manganese	50.0		22.2	71.9	ug/L	0.652	99.4	(0%-20%)		02/03/15	18:33
Molybdenum	50.0	BC	1.30	52.5	ug/L	0.491	102	(0%-20%)		01/30/15	20:27
Nickel	50.0		3.89	51.2	ug/L	4.31	94.7	(0%-20%)		01/30/15	18:17
Selenium	50.0	U	ND	51.6	ug/L	1.99	101	(0%-20%)		01/30/15	20:27
Silver	50.0	U	ND	48.0	ug/L	1.41	95.9	(0%-20%)			
Strontium	50.0		469	531	ug/L	0.159	N/A	(0%-20%)		01/30/15	18:17

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QC Summary

Workorder: 365481

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1451882										
Thallium	50.0	U	ND	48.6	ug/L	3.73	97	(0%-20%)	BAJ	01/30/15	20:27
Thorium	50.0	U	ND	50.8	ug/L	2.40	101	(0%-20%)			
Tin	50.0	U	ND	51.1	ug/L	1.39	102	(0%-20%)			
Uranium	50.0		5.70	56.5	ug/L	2.10	102	(0%-20%)			
Zinc	50.0	B	5.19	51.9	ug/L	0.100	93.4	(0%-20%)			
QC1203248813 365481003 SDILT											
Aluminum			81.3	D	16.9	ug/L	4	(0%-10%)		01/30/15	20:29
Antimony		U	ND	DU	ND	ug/L	N/A	(0%-10%)			
Arsenic		U	ND	DU	ND	ug/L	N/A	(0%-10%)			
Barium			69.4	D	14.1	ug/L	1.5	(0%-10%)		01/30/15	18:22
Beryllium		U	ND	DU	ND	ug/L	N/A	(0%-10%)		01/30/15	20:29
Boron			28.4	D	6.29	ug/L	10.9	(0%-10%)			
Cadmium		U	ND	DU	ND	ug/L	N/A	(0%-10%)			
Chromium			10.1	DU	ND	ug/L	N/A	(0%-10%)			
Cobalt		B	0.211	DU	ND	ug/L	N/A	(0%-10%)			
Copper		B	0.539	DU	ND	ug/L	N/A	(0%-10%)			
Lead		U	ND	DU	ND	ug/L	N/A	(0%-10%)			
Manganese			22.2	D	4.70	ug/L	5.97	(0%-10%)		02/03/15	18:36
Molybdenum		BC	1.30	D	0.306	ug/L	17.8	(0%-10%)		01/30/15	20:29
Nickel			3.89	D	0.915	ug/L	17.6	(0%-10%)		01/30/15	18:22
Selenium		U	ND	DU	ND	ug/L	N/A	(0%-10%)		01/30/15	20:29
Silver		U	ND	DU	ND	ug/L	N/A	(0%-10%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1451882										
Strontium		469	D	91.2	ug/L	2.88		(0%-10%)	BAJ	01/30/15	18:22
Thallium	U	ND	DU	ND	ug/L	N/A		(0%-10%)		01/30/15	20:29
Thorium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Tin	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Uranium		5.70	D	1.12	ug/L	1.72		(0%-10%)			
Zinc	B	5.19	DU	ND	ug/L	N/A		(0%-10%)			

Metals Analysis-ICP

Batch 1451875

QC1203248793	LCS										
Boron	500			485	ug/L		96.9	(80%-120%)	HSC	01/30/15	13:31
Calcium	5000			4950	ug/L		99	(80%-120%)			
Iron	5000			4930	ug/L		98.6	(80%-120%)			
Magnesium	5000			5010	ug/L		100	(80%-120%)			
Phosphorous	500			495	ug/L		99.1	(80%-120%)			
Potassium	5000			4740	ug/L		94.8	(80%-120%)			
Silicon	5000			4770	ug/L		95.4	(80%-120%)			
Sodium	5000			4910	ug/L		98.1	(80%-120%)			
Vanadium	500			513	ug/L		103	(80%-120%)			
QC1203248792	MB										
Boron			U	ND	ug/L					01/30/15	13:28
Calcium			U	ND	ug/L						
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						

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QC Summary

Workorder: 365481

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1451875										
Phosphorous			U	ND	ug/L						
Potassium			U	ND	ug/L				HSC	01/30/15	13:28
Silicon			U	ND	ug/L						
Sodium			U	ND	ug/L						
Vanadium			U	ND	ug/L						
QC1203248794 365515001 MS											
Boron	500	B	20.7	517	ug/L		99.3	(75%-125%)		01/30/15	13:37
Calcium	5000		44100	49900	ug/L		N/A	(75%-125%)			
Iron	5000	U	ND	4890	ug/L		97.4	(75%-125%)			
Magnesium	5000		13900	18700	ug/L		95.9	(75%-125%)			
Phosphorous	500	U	ND	516	ug/L		98.1	(75%-125%)			
Potassium	5000		3910	9050	ug/L		103	(75%-125%)			
Silicon	5000		20100	25200	ug/L		N/A	(75%-125%)			
Sodium	5000		20700	25800	ug/L		N/A	(75%-125%)			
Vanadium	500		24.8	543	ug/L		104	(75%-125%)			
QC1203248795 365515001 MSD											
Boron	500	B	20.7	516	ug/L	0.265	99	(0%-20%)		01/30/15	13:39
Calcium	5000		44100	49700	ug/L	0.522	N/A	(0%-20%)			
Iron	5000	U	ND	4840	ug/L	1.05	96.4	(0%-20%)			
Magnesium	5000		13900	18500	ug/L	1.05	92	(0%-20%)			
Phosphorous	500	U	ND	517	ug/L	0.209	98.3	(0%-20%)			
Potassium	5000		3910	8990	ug/L	0.608	102	(0%-20%)			
Silicon	5000		20100	25300	ug/L	0.238	N/A	(0%-20%)			
Sodium	5000		20700	25600	ug/L	0.762	N/A	(0%-20%)			

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QC Summary

Workorder: 365481

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1451875										
Vanadium	500	24.8		543	ug/L	0.105	104	(0%-20%)	HSC	01/30/15	13:39
QC1203248796	365515001	SDILT									
Boron	B	20.7	DU	ND	ug/L	N/A		(0%-10%)		01/30/15	13:41
Calcium		44100	D	8870	ug/L	.638		(0%-10%)			
Iron	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Magnesium		13900	D	2820	ug/L	1.89		(0%-10%)			
Phosphorous	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Potassium		3910	D	732	ug/L	6.4		(0%-10%)			
Silicon		20100	D	3930	ug/L	2.24		(0%-10%)			
Sodium		20700	D	4180	ug/L	.929		(0%-10%)			
Vanadium		24.8	D	4.82	ug/L	2.82		(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

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	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.

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

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

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

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

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL365481
Work Order #: 365481**

Method/Analysis Information**Product:** Ion Chromatography**Analytical Batch:** 1451844 **Method:** 9056_ANIONS_IC: COMMON + GW 02**Sample Analysis**

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

Sample ID	Client ID
365481001	B2Y659
365481002	B2Y662
1203248713	Method Blank (MB)
1203248714	Laboratory Control Sample (LCS)
1203248715	365481001(B2Y659) Sample Duplicate (DUP)
1203248716	365481001(B2Y659) 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

Sample365481001 (B2Y659) was selected for QC analysis.

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

The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203248716 (B2Y659PS).

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

Samples1203248715 (B2Y659DUP), 1203248716 (B2Y659PS), 365481001 (B2Y659) and 365481002 (B2Y662) were diluted because target analyte concentrations exceeded the calibration range. Samples1203248715 (B2Y659DUP), 1203248716 (B2Y659PS), 365481001 (B2Y659) and 365481002 (B2Y662) in this sample group were diluted due to matrix interference. Samples 1203248715 (B2Y659DUP), 1203248716 (B2Y659PS), 365481001 (B2Y659) and 365481002 (B2Y662) were diluted based on historical data.

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 1203248715 (B2Y659DUP), 1203248716 (B2Y659PS), 365481001 (B2Y659) and 365481002 (B2Y662) 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:	n-Hexane Extractable Material		
Analytical Batch:	1455135	Method:	EPA 1664A n-Hexane Extractable Material (Oil and Grease)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 1664A/1664B:

Sample ID	Client ID
365481003	B2Y658
365481004	B2Y661
1203257537	Method Blank (MB)
1203257538	Laboratory Control Sample (LCS)
1203257542	365481003(B2Y658) 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-094 REV# 13.

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 Oil & Grease analysis was performed on a Sartorius Balance BAL745. Oil and Grease lab

Initial Calibration

All initial calibration requirements have been met for this SDG.

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

Sample365481003 (B2Y658) 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.

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.

Sample Aliquot

Per EPA methodology, the entire sample was used for the 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

The client provided volume in excess of 1 L for the oil and grease analysis. All of the volume must be used in the extraction process, thus resulting in a lower reporting and detection limit. 1203257542 (B2Y658MS), 365481003 (B2Y658) and 365481004 (B2Y661).

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: 1453934 **Method:** 2320_ALKALINITY: COMMON (Alkalinity only)

Sample Analysis

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

Sample ID	Client ID
365481003	B2Y658
365481004	B2Y661
1203254245	Method Blank (MB)
1203254247	Laboratory Control Sample (LCS)
1203254252	365484001(B30112) Sample Duplicate (DUP)
1203254254	365484001(B30112) 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 365484001 (B30112) 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.

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365481 GEL Work Order: 365481

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: 13 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 X15-007**

Report Date: February 13, 2015

Client Sample ID:	B2Y659	Project:	CPRC0X15007
Sample ID:	365481001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 10:14		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
<i>9056_ANIONS_IC: COMMON + GW 02 "As Received"</i>										
Bromide 24959-67-9	B	247	+/-23.8	67.0	250	ug/L	1	RXB5 01/21/15 1634	1451844	1
Fluoride 16984-48-8	B	144	+/-12.0	33.0	500	ug/L	1			
Nitrite-N 14797-65-0	U	36.5	+/-12.7	38.0	250	ug/L	1			
Phosphorus in phosphate PO4-P	U	0.00	+/-22.3	67.0	500	ug/L	1			
Chloride 16887-00-6	D	75500	+/-2530	670	2000	ug/L	10	RXB5 01/21/15 1940	1451844	2
Nitrate-N 14797-55-8	D	15300	+/-521	330	1000	ug/L	10			
Sulfate 14808-79-8	D	157000	+/-5270	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 X15-007**

Report Date: February 13, 2015

Client Sample ID:	B2Y662	Project:	CPRC0X15007
Sample ID:	365481002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 12:10		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
<i>9056_ANIONS_IC: COMMON + GW 02 "As Received"</i>										
Bromide 24959-67-9		309	+/-24.6	67.0	250	ug/L	1	RXB5 01/21/15 1603	1451844	1
Fluoride 16984-48-8	B	40.9	+/-11.1	33.0	500	ug/L	1			
Nitrite-N 14797-65-0	U	36.1	+/-12.7	38.0	250	ug/L	1			
Phosphorus in phosphate PO4-P	B	67.6	+/-22.4	67.0	500	ug/L	1			
Chloride 16887-00-6	D	27700	+/-951	670	2000	ug/L	10	RXB5 01/21/15 1909	1451844	2
Nitrate-N 14797-55-8	D	16000	+/-545	330	1000	ug/L	10			
Sulfate 14808-79-8	D	139000	+/-4650	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 X15-007**

Report Date: February 13, 2015

Client Sample ID:	B2Y658	Project:	CPRC0X15007
Sample ID:	365481003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 10:14		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Oil & Grease Analysis										
<i>EPA 1664A n-Hexane Extractable Material (Oil and Grease) "As Received"</i>										
Oil and Grease	U	1.07	1.37	4.88	mg/L		JXT1 02/04/15	0828	1455135	1
Titration and Ion Analysis										
<i>2320_ALKALINITY: COMMON (Alkalinity only) "As Received"</i>										
Alkalinity, Total as CaCO3		173000	725	1000	ug/L		PXO1 01/31/15	1942	1453934	2
ALKALINITY										

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 1664A/1664B	
2	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 X15-007**

Report Date: February 13, 2015

Client Sample ID:	B2Y661	Project:	CPRC0X15007
Sample ID:	365481004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	20-JAN-15 12:10		
Receive Date:	21-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Oil & Grease Analysis										
<i>EPA 1664A n-Hexane Extractable Material (Oil and Grease) "As Received"</i>										
Oil and Grease	B	1.48	1.38	4.93	mg/L		JXT1 02/04/15	0828	1455135	1
Titration and Ion Analysis										
<i>2320_ALKALINITY: COMMON (Alkalinity only) "As Received"</i>										
Alkalinity, Total as CaCO3		215000	725	1000	ug/L		PXO1 01/31/15	1945	1453934	2
ALKALINITY										

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 1664A/1664B	
2	SM 2320B	

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Report Date: February 13, 2015

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365481

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1451844										
QC1203248715	365481001	DUP									
Bromide	B	247	B	244	ug/L	1.30	^	(+/-250)	RXB5	01/21/15	17:05
Chloride	D	75500	D	76500	ug/L	1.26		(0%-20%)		01/21/15	20:11
Fluoride	B	144	B	144	ug/L	0.348	^	(+/-500)		01/21/15	17:05
Nitrate-N	D	15300	D	15300	ug/L	0.131		(0%-20%)		01/21/15	20:11
Nitrite-N	U	38.0	U	38.0	ug/L	N/A				01/21/15	17:05
Phosphorus in phosphate	U	67.0	U	67.0	ug/L	N/A					
Sulfate	D	157000	D	157000	ug/L	0.0508		(0%-20%)		01/21/15	20:11
QC1203248714	LCS										
Bromide	1250			1260	ug/L			101	(90%-110%)	01/21/15	21:44
Chloride	5000			4910	ug/L			98.1	(90%-110%)		
Fluoride	2500			2500	ug/L			100	(90%-110%)		
Nitrate-N	2500			2510	ug/L			100	(90%-110%)		
Nitrite-N	2500			2540	ug/L			101	(90%-110%)		
Phosphorus in phosphate	1250			1250	ug/L			100	(90%-110%)		
Sulfate	10000			10200	ug/L			102	(90%-110%)		
QC1203248713	MB										
Bromide			U	67.0	ug/L					01/21/15	21:13
Chloride			U	67.0	ug/L						
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L						

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QC Summary

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Ion Chromatography											
Batch	1451844										
Phosphorus in phosphate			U	67.0	ug/L				RXB5	01/21/15	21:13
Sulfate			U	133	ug/L						
QC1203248716	365481001	PS									
Bromide	1.25	B	0.247	1.51	mg/L		101	(90%-110%)		01/21/15	17:36
Chloride	5.00	D	7.55 D	13.4	mg/L		116*	(90%-110%)		01/21/15	20:42
Fluoride	2.50	B	0.144	2.50	mg/L		94.3	(90%-110%)		01/21/15	17:36
Nitrate-N	2.50	D	1.53 D	4.16	mg/L		105	(90%-110%)		01/21/15	20:42
Nitrite-N	2.50	U	0.0365	2.49	mg/L		98	(90%-110%)		01/21/15	17:36
Phosphorus in phosphate	1.25	U	0.00	1.16	mg/L		92.6	(90%-110%)			
Sulfate	10.0	D	15.7 D	27.1	mg/L		114*	(90%-110%)		01/21/15	20:42
Oil & Grease Analysis											
Batch	1455135										
QC1203257538	LCS										
Oil and Grease	40.0			38.3	mg/L		95.8	(77%-107%)	JXT1	02/04/15	08:28
QC1203257537	MB										
Oil and Grease			U	1.40	mg/L					02/04/15	08:28
QC1203257542	365481003	MS									
Oil and Grease	37.9	U	1.37	35.5	mg/L		90.9	(68%-105%)		02/04/15	08:28
Titration and Ion Analysis											
Batch	1453934										
QC1203254252	365484001	DUP									
Alkalinity, Total as CaCO3			102000	99600	ug/L	1.93		(0%-20%)	PXO1	01/31/15	19:52
QC1203254247	LCS										
Alkalinity, Total as CaCO3	50000			48100	ug/L		96.2	(90%-110%)		01/31/15	19:16
QC1203254245	MB										
Alkalinity, Total as CaCO3			U	725	ug/L					01/31/15	19:16
QC1203254254	365484001	MS									
Alkalinity, Total as CaCO3	50000		102000	148000	ug/L		92.3	(80%-120%)		01/31/15	19:54

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