GEL Laboratories LLC
a member of The GEL Group INC

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June 29, 2018

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

Re: CHPRC SAF S18-005
Work Order: 451638
SDG: GEL451638

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 02, 2018. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: S18-005-228, S18-005-256, S18-005-258, S18-005-266, S18-005-267 and S18-005-303
Enclosures

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Sample Issue Resolution

SAMPLE ISSUE RESOLUTION (SIR) REPORT

SIR Number: SIR18-0730
Rev. Number: 0
Date Initiated: 06/11/2018

SAMPLE EVENT INFORMATION

SAF NUM(S): S18-005

LABORATORY: GEL

SAMPLING INFORMATION

NUMBER OF SAMPLES: 1

SAMPLE NUMBERS: B3J3P1

SAMPLE MATRIX: WATER

SDG NUM(S): GEL451638

ISSUE BACKGROUND

CLASS: Laboratory Issue

TYPE: Quality Control Failure

DESCRIPTION: The batch for DRO/Motor Oil/Kerosene had multiple QC failures: LCS DRO 67% (70-130%)LCS Kerosene 51% (70-130%) and surrogate 59% (60-140%), LCSD Kerosene 50% (70-130%) and surrogate 57% (60-140%), B3J3Mp surrogate 55% (60-140%), MS DRO 58% (70-130%) Motor Oil 68% (70-130%), MSD DRO 62% (70-130%). There were some hits and preliminary data is being sent. All limits pass GEL SPC limits, but fail client limits.

RESOLUTION

PROPOSED RESOLUTION: QC results meet QSM limits. Please narrate and report original QC results.

FINAL RESOLUTION: Accept proposed resolution.

SUBMITTED BY:

SHAFFER, H 06/11/2018

ACCEPTED BY:

CUTSFORTH, EC 06/11/2018

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S18-005
SDG: GEL451638

June 29, 2018

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 02, 2018, 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. Please see the enclosed SIR for QC issues..

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.

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
451638001	B3J0Y6
451638002	B3J0Y9
451638003	B3J270
451638004	B3J297
451638005	B3J2L1
451638006	B3J2L6
451638007	B3J2L5
451638008	B3J3P1

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/MS Semivolatile, GC/MS Volatile, Metals and Radiochemistry.

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

Heather Shaffer

Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451638
Work Order #: 451638

GC/MS Volatile

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

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

Calibration Information

Continuing Calibration Verification Requirements
The calibration verification standard requirements were not all met for sample 451638007 (B3J2L5). The daily CCV analyzed on 6/4/18 was biased high for Carbon tetrachloride at 23.3%D. The results are reported.

Quality Control (QC) Information

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

Sample	Analyte	Value
1204042612 (B3J228PS)	2-Butanone	57* (70%-130%)
	Acetone	47* (70%-130%)
1204042613 (B3J228PSD)	2-Butanone	54* (70%-130%)
	Acetone	44* (70%-130%)

GC/MS Semivolatile

Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry

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

Quality Control (QC) Information

Surrogate Recoveries
Sample (See Below) displayed failing surrogate recoveries. Because the recoveries were biased high and target analytes were not detected in the associated samples above the reporting limit, the data were reported.

Sample	Analyte	Value
1204042568 (MB)	p-Terphenyl-d14	141* (36%-121%)

Internal Standard (ISTD) Acceptance
The internal standard response for Perylene-d12 was outside of the acceptance criteria for sample 1204042568 (MB). Since Perylene-d12 was not used to quantitate the requested target analytes or surrogates for this batch, the data were not adversely impacted by the failure. The results are reported.

Diesel Range Organics

Analysis of Diesel Range Organics by Flame Ionization Detector

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

Calibration Information

Continuing Calibration Verification (CCV) Requirements
The calibration verification standards (ICV or CCV) failed to meet the acceptance criteria for Kerosene with positive bias. This non-compliance had no adverse effects on the data as Kerosene was not detected above the PQL in the associated environmental samples.

Quality Control (QC) Information

Surrogate Recoveries
QC samples (insert client id) did not meet the client requested recovery limits. However, the recoveries were within the lab's statistically generated limits.

Sample	Analyte	Value
1204044429 (MB)	o-Terphenyl	56* (60%-140%)
1204044433 (LCS)	o-Terphenyl	59* (60%-140%)
1204044434 (LCSD)	o-Terphenyl	57* (60%-140%)

Laboratory Control Sample (LCS/LCSD) Recovery
The LCS recoveries were not within the client requested limits. However, the recoveries were within the lab's statistically derived limits. The client was notified prior to reporting results.

Sample	Analyte	Value
1204044430 (LCS)	Diesel Range Organics	67* (70%-130%)
1204044433 (LCS)	Kerosene	51* (70%-130%)
1204044434 (LCSD)	Kerosene	50* (70%-130%)

Matrix Spike (MS/MSD) Recovery Statement
The MS/MSD recoveries were not within the client requested limits. However, the recoveries were within the

lab's statistically derived limits. The client was notified prior to reporting results.

Sample	Analyte	Value
1204044431 (Non SDG 451869001MS)	Diesel Range Organics	58* (70%-130%)
	Motor Oil	68* (70%-130%)
1204044432 (Non SDG 451869001MSD)	Diesel Range Organics	62* (70%-130%)

Miscellaneous Information

Manual Integrations
Samples 1204044430 (LCS), 1204044431 (Non SDG 451869001MS) and 1204044432 (Non SDG 451869001MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

Metals

Determination of Metals by ICP

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

Calibration Information

CRDL/PQL Requirements
The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of calcium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 451638008 (B3J3P1).

Quality Control (QC) Information

Method Blank (MB) Statement
The samples in this SDG contained analytes at concentrations more than ten times the negative value reported in the method blank, therefore the data was not adversely affected.

Sample	Analyte	Value
1204041827 (MB)	Potassium	See applicable report

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were negative values in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1204041827 (MB)	Zinc	See applicable report

Determination of Metals by ICP-MS

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

Radiochemistry

9310_ALPHABETA_GPC: ALPHA

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

Technical Information

Gross Alpha/Beta Preparation Information
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts
Sample 1204042189 (Non SDG 451351003DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1204042190 (Non SDG 451351003MS) and 1204042191 (Non SDG 451351003MSD), aliquots were reduced to conserve sample volume.

SRISO_SEP_PRECIP_GPC: COMMON

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

Technical Information

Recounts
Samples 1204042201 (B3J2L1DUP) and 451638005 (B3J2L1) were verified by recounting at least five days from the separation date. The recounts are reported.

TRITIUM_DIST_LSC: COMMON

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

Technical Information

Recounts
Sample 1204042522 (LCS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information

Additional Comments
The matrix spike, 1204042521 (Non SDG 451432004MS), aliquot was reduced to conserve sample volume.

C14_LSC: COMMON

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

Miscellaneous Information

Additional Comments
The matrix spike, 1204049553 (B3J270MS), aliquot was reduced to conserve sample volume.

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

451638

C.O.C. # S18-005-228

Page 1 of 1

Collector:	Daniel Klug CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	S18-005	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	SURV, May 2018	Logbook No.:	HNF-N-506 97/85	Ice Chest No.:	6005-730
Shipped To (Lab):	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	7723 7624 5701
Protocol	SURV	Priority:	30 Days	Offsite Property No.:	9507

POSSIBLE SAMPLE HAZARDS/REMARK

** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3J0Y6	N	W	JUN 01 2018	0917	1x1-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B3J0Y6	N	W			1x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B3J0Y9	Y	W			1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B3J0Y6	N	W	JUN 01 2018	0917	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2

Relinquished By	Print First and Last Name	Signature	Date/Time	Received By	Print First and Last Name	Signature	Date/Time
Daniel Klug CHPRC		D. Klug	JUN 01 2018 1000	Lesly Wall /CHPRC		Lesly Wall	JUN 01 2018 1000
Lesly Wall /CHPRC		Lesly Wall	JUN 01 2018 1400	FEDEX			
Fed Ex				Chakeris Tarplin/ GEL Laboratories	[redacted]		6/2/18 905

Matrix *

S = Soil	DS = Drum Solids
SE = Sediment	DL = Drum Liquid
SO = Solid	T = Tissue
SL = Sludge	WI = Wipe
W = Water	L = Liquid
O = Oil	V = Vegetation
A = Air	X = Other

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

Printed On 3/26/2018 FSR ID = FSR59030 A-6004-842 (REV 3)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 4511638	C.O.C. # S18-005-256 Page 1 of ~~1~~ 2

Collector:	Daniel Klug CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650 9/24/18
SAF No.:	S18-005	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	SURV, May 2018	Logbook No.:	HNF-N-506- 99/49	Ice Chest No.:	GWS-730
Shipped To (Lab):	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	7723 7624 5701
Protocol	SURV	Priority:	30 Days	Offsite Property No.:	9507

POSSIBLE SAMPLE HAZARDS/REMARK
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS
N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3J270	N	W	MAY 3 1 2018	1200	1x500-mL G/P	C14_LSC: COMMON	6 Months	None

Relinquished By: Daniel Klug CHPRC D. Klug MAY 3 1 2018 1230 (Print First and Last Name / Signature / Date/Time)		Received By: MR Ch MAY 3 1 2018 1230 (Print First and Last Name: Malcom Chunn CHPRC / Signature / Date/Time)	Matrix *
Relinquished By: Malcom Chunn CHPRC MR Ch MAY 3 1 2018 1250 (Print First and Last Name / Signature / Date/Time)		Received By: SSU-1 MAY 3 1 2018 1250 (Print First and Last Name / Signature / Date/Time)	S = Soil; SE = Sediment; SO = Solid; SL = Sludge; W = Water; O = Oil; A = Air; DS = Drum Solids; DL = Drum Liquid; T = Tissue; WI = Wipe; L = Liquid; V = Vegetation; X = Other
Relinquished By: SSU-1 JUN 0 1 2018 1020 (Print First and Last Name / Signature / Date/Time)		Received By: Janelle Zunker CHPRC JUN 0 1 2018 1020 (Print First and Last Name / Signature / Date/Time)	
Relinquished By: Janelle Zunker CHPRC JUN 0 1 2018 1400 (Print First and Last Name / Signature / Date/Time)		Received By: FEDEX (Print First and Last Name / Signature / Date/Time)	

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

Printed On 3/19/2018 FSR ID = FSR59073 A-6004-842 (REV 3)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. 518-005-256

Page 2 of 2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Fed Ex				Chakeris Tarplin GEL Laboratories			6/2/18 905
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

A-6003-962 (03/05)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 451638	C.O.C. # S18-005-258 Page 1 of 1

Collector: C.C. HOFFMAN/CHPRC	**Contact/Requester:** Karen Waters-Husted	**Telephone No.:** 509-376-4650
SAF No.: S18-005	**Sampling Origin:** Hanford Site	**Purchase Order/Charge Code:** 300071
Project Title: SURV, May 2018	**Logbook No.:** HNF-N-506 – 100	**Ice Chest No.:** GWS-140
Shipped To (Lab): GEL Laboratories, LLC	**Method of Shipment** Commercial Carrier	**Bill of Lading/Air Bill No.:** 7723706710910
Protocol SURV	**Priority:** 30 Days	**Offsite Property No.:** 9511

POSSIBLE SAMPLE HAZARDS/REMARK
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS
N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3J297	N	W	6/1/18	0920	5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3J297	N	W			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B3J297	N	W			1x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B3J297	N	W			1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By	Signature	Date/Time	Received By	Signature	Date/Time
C.C. HOFFMAN/CHPRC		JUN 0 1 2018 1250	Lesly Wall /CHPRC		JUN 0 1 2018 1250
Lesly Wall /CHPRC		JUN 0 1 2018 1400	FEDEX		
Fed Ex			Chakeris Tarplin/ GEL Laboratories		6/2/18 905

Matrix *

S = Soil	DS = Drum Solids
SE = Sediment	DL = Drum Liquid
SO = Solid	T = Tissue
SL = Sludge	WI = Wipe
W = Water	L = Liquid
O = Oil	V = Vegetation
A = Air	X = Other

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

Printed On 3/19/2018 FSR ID = FSR59078 A-6004-842 (REV 3)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 451638	C.O.C. # S18-005-266 Page 1 of 1

Collector:	CHRIS FULTON CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	S18-005	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	SURV, May 2018	Logbook No.:	HNF-N-506 -99-50	Ice Chest No.:	~~GWS-730~~ GWS-730
Shipped To (Lab):	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	7723 7624 5701
Protocol	SURV	Priority:	30 Days	Offsite Property No.:	9507

POSSIBLE SAMPLE HAZARDS/REMARK
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS
N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3J2L1	N	W	6-1-18	0812	1x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2

Relinquished By	Signature	Date/Time	Received By	Signature	Date/Time
CHRIS FULTON CHPRC		JUN 0 1 2018 1620	Jeff Lucas /CHPRC		JUN 0 1 2018 1620
Relinquished By: Jeff Lucas /CHPRC		JUN 0 1 2018 1400	Received By: FEDEX		
Relinquished By: Fed Ex			Received By: Chakeris Tarplin GEL Laboratories		6/2/18 905
Relinquished By:			Received By:		

Matrix *

S = Soil	DS = Drum Solids
SE = Sediment	DL = Drum Liquid
SO = Solid	T = Tissue
SL = Sludge	WI = Wipe
W = Water	L = Liquid
O = Oil	V = Vegetation
A = Air	X = Other

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

Printed On 3/19/2018 FSR ID = FSR59091 A-6004-842 (REV 3)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 451638	C.O.C. # S18-005-267 Page 1 of 1

Collector:	CHRIS FULTON CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	S18-005	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	SURV, May 2018	Logbook No.:	HNF-N-506 -99-50	Ice Chest No.:	GWS-730
Shipped To (Lab):	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	772376245701
Protocol	SURV	Priority:	30 Days	Offsite Property No.:	9507

POSSIBLE SAMPLE HAZARDS/REMARK
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS
N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3J2L6	Y	W	6-1-18	1050	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B3J2L5	N	W	6-1-18	1050	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B3J2L5	N	W	6-1-18	1050	5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2 / Cool <=6C

Relinquished By	Print First and Last Name	Signature	Date/Time	Received By	Print First and Last Name	Signature	Date/Time
CHRIS FULTON CHPRC			JUN 01 2018 1200	Janella Zunker CHPRC			JUN 01 2018 1200
Janella Zunker CHPRC			JUN 01 2018 1400				
Fed Ex				FEDEX			
				Chakeris Tarplin GEL Laboratories			6/2/18 905

Matrix *

S = Soil	DS = Drum Solids
SE = Sediment	DL = Drum Liquid
SO = Solid	T = Tissue
SL = Sludge	WI = Wipe
W = Water	L = Liquid
O = Oil	V = Vegetation
A = Air	X = Other

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

Printed On 3/19/2018 FSR ID = FSR58965 A-6004-842 (REV 3)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 451638	C.O.C. # S18-005-303 Page 1 of 1

Collector:	Daniel Klug CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	S18-005	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	SURV, May 2018	Logbook No.:	HNF-N-506 97/89	Ice Chest No.:	GWS-740
Shipped To (Lab):	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	7723766709 10
Protocol	SURV	Priority:	30 Days	Offsite Property No.:	9511

POSSIBLE SAMPLE HAZARDS/REMARK
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS
N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3J3P1	N	W	JUN 01 2018	1155	1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B3J3P1	N	W			4x1-L aG	8270_SVOA_GCMS: GW 01	7/40 Days	Cool <=6C
B3J3P1	N	W			1x1-L P	9310_ALPHABETA_GPC: Gross Alpha	6 Months	HNO3 to pH <2
B3J3P1	N	W	JUN 01 2018		4x1-L aG	WTPH_DIESEL: COMMON; WTPH_KEROSENE: COMMON; WTPH_MOTOR OIL: COMMON	14/40 Days	HCl to pH <2 / Cool <=6C

Relinquished By	Print First and Last Name	Signature	Date/Time	Received By	Print First and Last Name	Signature	Date/Time
Daniel Klug CHPRC		D. Klug	JUN 01 2018 1205	Lesly Wall /CHPRC		Lesly Wall	JUN 01 2018 1205
Lesly Wall /CHPRC		Lesly Wall	JUN 01 2018 1400	FEDEX			
Fed Ex				Chakeris Tarplin GEL Laboratories		Ch Tarplin	6/2/18 905

Matrix *

S = Soil	DS = Drum Solids
SE = Sediment	DL = Drum Liquid
SO = Solid	T = Tissue
SL = Sludge	WI = Wipe
W = Water	L = Liquid
O = Oil	V = Vegetation
A = Air	X = Other

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

Printed On 3/19/2018 FSR ID = FSR59141 A-6004-842 (REV 3)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC	SDG/AR/COC/Work Order: 451638
Received By: C. TARPLIN	Date Received: June 02 2018 HS
Carrier and Tracking Number	Circle Applicable: ~~FedEx Express~~ FedEx Ground UPS Field Services Courier Other 7723 7667 0910 7723 7624 5701

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?	X		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?		X	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	X			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: 1°C
4	Daily check performed and passed on IR temperature gun?	X			**Temperature Device Serial #:** IR4-17 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	X			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	X			If Yes, Are Encores or Soil Kits present? Yes___ No X (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes X No___ N/A___ (If unknown, select No) VOA vials free of headspace? Yes X No___ N/A___ Sample ID's and containers affected:
8	Samples received within holding time?	X			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11	Number of containers received match number indicated on COC?	X			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			X	
13	COC form is properly signed in relinquished/received sections?	X			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials RDS Date 6/4/18 Page 1 of 1

GL-CHL-SR-001 Rev 5

Data Review Qualifier Definitions

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 (843) 556−8171

Report Date: 29−JUN−18

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol−condensation product	Organics	Semi−Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (0rganics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post−digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The analyte was detected in the associated method blank >/= MDC or >5% sample activity.	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy−−Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 29 June 2018

State	Certification
Alaska	17−018
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA180011
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122018−1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R−158
Oklahoma	9904
Pennsylvania NELAP	68−00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−18−13
Utah NELAP	SC000122018−26
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451638
Work Order #: 451638

Product: **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method: SW846 8260C
Analytical Procedure: GL-OA-E-038 REV# 26
Analytical Batch: 1770551

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

GEL Sample ID#	Client Sample Identification
451638004	B3J297
451638007	B3J2L5
1204042610	Method Blank (MB)
1204042611	Laboratory Control Sample (LCS)
1204042612	451354001(B3J228) Post Spike (PS)
1204042613	451354001(B3J228) Post Spike Duplicate (PSD)

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

Data Summary:

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

Calibration Information

Continuing Calibration Verification Requirements
The calibration verification standard requirements were not all met for sample 451638007 (B3J2L5). The daily CCV analyzed on 6/4/18 was biased high for Carbon tetrachloride at 23.3%D. The results are reported.

Quality Control (QC) Information

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

Sample	Analyte	Value
1204042612 (B3J228PS)	2-Butanone	57* (70%-130%)
	Acetone	47* (70%-130%)
1204042613 (B3J228PSD)	2-Butanone	54* (70%-130%)
	Acetone	44* (70%-130%)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL451638 GEL Work Order: 451638

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: Erin Haubert **Name: Erin Haubert**

Date: 28 JUN 2018 **Title: Data Validator**

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Date Collected:**	**06/01/2018 09:20**	**Matrix:**	**WATER**
Lab Sample ID:	**451638004**	**Date Received:**	**06/02/2018 09:05**		
		Client:	**CPRC001**	**Project:**	**CPRC0S18005**
Client ID:	**B3J297**	**Method:**	**SW846 8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1770551**	**Inst:**	**VOA3.I**	**Dilution:**	**1**
Run Date:	**06/04/2018 19:56**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**06/04/2018 19:56**				
Data File:	**060418V3\3K112.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	0.320	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	4.07	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Date Collected:**	**06/01/2018 10:50**	**Matrix:**	**WATER**
Lab Sample ID:	**451638007**	**Date Received:**	**06/02/2018 09:05**		
		Client:	**CPRC001**	**Project:**	**CPRC0S18005**
Client ID:	**B3J2L5**	**Method:**	**SW846 8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1770551**	**Inst:**	**VOA3.I**	**Dilution:**	**1**
Run Date:	**06/04/2018 20:27**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**06/04/2018 20:27**				
Data File:	**060418V3\3K113.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	0.750	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 5, 2018

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1770551											
QC1204042611 LCS											
1,1,1-Trichloroethane	50.0			57.3	ug/L		115	(70%-130%)	JP1	06/04/18	15:35
1,1,2-Trichloroethane	50.0			50.0	ug/L		100	(70%-130%)			
1,1-Dichloroethane	50.0			52.4	ug/L		105	(70%-130%)			
1,1-Dichloroethylene	50.0			51.5	ug/L		103	(70%-130%)			
1,2-Dichloroethane	50.0			55.3	ug/L		111	(70%-130%)			
2-Butanone	250			225	ug/L		90	(70%-130%)			
4-Methyl-2-pentanone	250			222	ug/L		89	(70%-130%)			
Acetone	250			232	ug/L		93	(70%-130%)			
Benzene	50.0			50.9	ug/L		102	(70%-130%)			
Carbon disulfide	250			260	ug/L		104	(70%-130%)			
Carbon tetrachloride	50.0			61.7	ug/L		123	(70%-130%)			
Chlorobenzene	50.0			49.5	ug/L		99	(70%-130%)			
Chloroform	50.0			55.1	ug/L		110	(70%-130%)			

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QC Summary

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1770551										
Ethylbenzene	50.0			48.2	ug/L		96	(70%-130%)	JP1	06/04/18 15:35
Methylene chloride	50.0			47.6	ug/L		95	(70%-130%)		
Tetrachloroethylene	50.0			50.2	ug/L		100	(70%-130%)		
Toluene	50.0			46.4	ug/L		93	(70%-130%)		
Trichloroethylene	50.0			53.7	ug/L		107	(70%-130%)		
Vinyl chloride	50.0			56.2	ug/L		112	(70%-130%)		
Xylenes (total)	150			139	ug/L		93	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			57.3	ug/L		115	(70%-130%)		
**Bromofluorobenzene	50.0			45.8	ug/L		92	(70%-130%)		
**Toluene-d8	50.0			48.4	ug/L		97	(70%-130%)		
QC1204042610 MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/04/18 17:08
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					

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QC Summary

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1770551											
2-Butanone			U	3.00	ug/L				JP1	06/04/18	17:08
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						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1770551											
**1,2-Dichloroethane-d4	50.0				56.1	ug/L		112	(70%-130%)	JP1	06/04/18 17:08
**Bromofluorobenzene	50.0				46.9	ug/L		94	(70%-130%)		
**Toluene-d8	50.0				49.6	ug/L		99	(70%-130%)		
QC1204042612 451354001 PS											
1,1,1-Trichloroethane	50.0	U	0.00		58.0	ug/L		116	(70%-130%)		06/04/18 21:29
1,1,2-Trichloroethane	50.0	U	0.00		48.9	ug/L		98	(70%-130%)		
1,1-Dichloroethane	50.0	U	0.00		51.3	ug/L		103	(70%-130%)		
1,1-Dichloroethylene	50.0	U	0.00		51.5	ug/L		103	(70%-130%)		
1,2-Dichloroethane	50.0	U	0.00		58.0	ug/L		116	(70%-130%)		
2-Butanone	250	TU	0.00	T	142	ug/L		57*	(70%-130%)		
4-Methyl-2-pentanone	250	U	0.00		217	ug/L		87	(70%-130%)		
Acetone	250	TU	2.85	T	120	ug/L		47*	(70%-130%)		
Benzene	50.0	U	0.00		47.6	ug/L		95	(70%-130%)		
Carbon disulfide	250	U	0.00		257	ug/L		103	(70%-130%)		
Carbon tetrachloride	50.0	U	0.00		61.4	ug/L		123	(70%-130%)		
Chlorobenzene	50.0	U	0.00		49.8	ug/L		100	(70%-130%)		

GEL LABORATORIES LLC
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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1770551											
Chloroform	50.0	U	0.00		56.2	ug/L		112	(70%-130%)	JP1	06/04/18 21:29
Ethylbenzene	50.0	U	0.00		48.0	ug/L		96	(70%-130%)		
Methylene chloride	50.0	U	0.00		50.2	ug/L		100	(70%-130%)		
Tetrachloroethylene	50.0	U	0.00		49.8	ug/L		100	(70%-130%)		
Toluene	50.0	U	0.00		48.4	ug/L		97	(70%-130%)		
Trichloroethylene	50.0	J	4.13		56.2	ug/L		104	(70%-130%)		
Vinyl chloride	50.0	U	0.00		55.1	ug/L		110	(70%-130%)		
Xylenes (total)	150	U	0.00		156	ug/L		104	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		60.7		58.4	ug/L		117	(70%-130%)		
**Bromofluorobenzene	50.0		47.0		45.7	ug/L		91	(70%-130%)		
**Toluene-d8	50.0		49.3		49.2	ug/L		98	(70%-130%)		
QC1204042613 451354001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		55.4	ug/L	5	111	(0%-20%)		06/04/18 22:01
1,1,2-Trichloroethane	50.0	U	0.00		47.7	ug/L	3	95	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		49.8	ug/L	3	100	(0%-20%)		
1,1-Dichloroethylene	50.0	U	0.00		49.8	ug/L	3	100	(0%-20%)		

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1770551											
1,2-Dichloroethane	50.0	U	0.00		56.7	ug/L	2	113	(0%-20%)	JP1	06/04/18 22:01
2-Butanone	250	TU	0.00	T	136	ug/L	5	54*	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		204	ug/L	6	82	(0%-20%)		
Acetone	250	TU	2.85	T	114	ug/L	5	44*	(0%-20%)		
Benzene	50.0	U	0.00		46.2	ug/L	3	92	(0%-20%)		
Carbon disulfide	250	U	0.00		240	ug/L	7	96	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		56.8	ug/L	8	114	(0%-20%)		
Chlorobenzene	50.0	U	0.00		43.6	ug/L	13	87	(0%-20%)		
Chloroform	50.0	U	0.00		53.7	ug/L	5	107	(0%-20%)		
Ethylbenzene	50.0	U	0.00		43.1	ug/L	11	86	(0%-20%)		
Methylene chloride	50.0	U	0.00		48.7	ug/L	3	97	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		43.7	ug/L	13	87	(0%-20%)		
Toluene	50.0	U	0.00		42.6	ug/L	13	85	(0%-20%)		
Trichloroethylene	50.0	J	4.13		51.9	ug/L	8	95	(0%-20%)		
Vinyl chloride	50.0	U	0.00		53.0	ug/L	4	106	(0%-20%)		

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS												
Batch 1770551												
Xylenes (total)	150	U	0.00		129	ug/L	19	86	(0%-20%)	JP1	06/04/18	22:01
**1,2-Dichloroethane-d4	50.0		60.7		59.1	ug/L		118	(70%-130%)			
**Bromofluorobenzene	50.0		47.0		44.2	ug/L		88	(70%-130%)			
**Toluene-d8	50.0		49.3		51.1	ug/L		102	(70%-130%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- 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 (0rganics 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.

Volatile

Surrogate Recovery Report

SDG Number: GEL451638

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1204042611	LCS for batch 1770551	115	97	92
1204042610	MB for batch 1770551	112	99	94
451638004	B3J297	125	97	96
451638007	B3J2L5	120	103	96
1204042612	B3J228PS	117	98	91
1204042613	B3J228PSD	118	102	88

Surrogate		Acceptance Limits
DCED4	= 1,2-Dichloroethane-d4	(70%-130%)
TOL	= Toluene-d8	(70%-130%)
BFB	= Bromofluorobenzene	(70%-130%)

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

Semi-Volatile Analysis

Case Narrative

GC/MS Semivolatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451638
Work Order #: 451638

Product: **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry**
Analytical Method: SW846 3510C/8270D
Analytical Procedure: GL-OA-E-009 REV# 40
Analytical Batch: 1770533

Preparation Method: SW846 3510C
Preparation Procedure: GL-OA-E-013 REV# 32
Preparation Batch: 1770532

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

GEL Sample ID#	Client Sample Identification
451638008	B3J3P1
1204042568	Method Blank (MB)
1204042569	Laboratory Control Sample (LCS)
1204042570	451638008(B3J3P1) Matrix Spike (MS)
1204042571	451638008(B3J3P1) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Quality Control (QC) Information

Surrogate Recoveries
Sample (See Below) displayed failing surrogate recoveries. Because the recoveries were biased high and target analytes were not detected in the associated samples above the reporting limit, the data were reported.

Sample	Analyte	Value
1204042568 (MB)	p-Terphenyl-d14	141* (36%-121%)

Internal Standard (ISTD) Acceptance
The internal standard response for Perylene-d12 was outside of the acceptance criteria for sample 1204042568 (MB). Since Perylene-d12 was not used to quantitate the requested target analytes or surrogates for this batch, the data were not adversely impacted by the failure. The results are reported.

Certification Statement

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

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL451638 GEL Work Order: 451638

The Qualifiers in this report are defined as follows:

E Concentration exceeds the calibration range of the instrument

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: Barbara Bailey **Name: Barbara Bailey**

Date: 27 JUN 2018 **Title: Data Validator**

Sample Data Summary

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Date Collected:**	**06/01/2018 11:55**	**Matrix:**	**WATER**
Lab Sample ID:	**451638008**	**Date Received:**	**06/02/2018 09:05**		
		Client:	**CPRC001**	**Project:**	**CPRC0S18005**
Client ID:	**B3J3P1**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1770533**	**Inst:**	**MSDA.I**	**Dilution:**	**1**
Run Date:	**06/05/2018 18:59**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**06/05/2018 07:45**	**Aliquot:**	**1110 mL**	**Final Volume:**	**1 mL**
Data File:	**060518.s\sAf0521.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
106-46-7	1,4-Dichlorobenzene	U	2.70	ug/L	2.70	9.01
109-06-8	2-Picoline	U	2.70	ug/L	2.70	9.01
1319-77-3	Cresols (total)	U	2.70	ug/L	2.70	18.0
126-73-8	Tributylphosphate	U	2.70	ug/L	2.70	9.01
65794-96-9	m,p-Cresols	U	3.33	ug/L	3.33	9.01

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: June 6, 2018

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch 1770533											
QC1204042569 LCS											
1,4-Dichlorobenzene	50.0			34.9	ug/L		70	(70%-130%)	JMB3	06/05/18	18:32
Tributylphosphate	50.0			49.4	ug/L		99	(70%-130%)			
m,p-Cresols	50.0			37.7	ug/L		75	(70%-130%)			
**2,4,6-Tribromophenol	100			94.7	ug/L		95	(32%-124%)			
**2-Fluorobiphenyl	50.0			42.1	ug/L		84	(32%-112%)			
**2-Fluorophenol	100			50.3	ug/L		50	(15%-88%)			
**Nitrobenzene-d5	50.0			43.1	ug/L		86	(36%-115%)			
**Phenol-d5	100			33.0	ug/L		33	(15%-91%)			
**p-Terphenyl-d14	50.0			53.9	ug/L		108	(36%-121%)			
QC1204042568 MB											
1,4-Dichlorobenzene			U	3.00	ug/L					06/05/18	18:05
2-Picoline			U	3.00	ug/L						
Cresols (total)			U	3.00	ug/L						
Tributylphosphate			U	3.00	ug/L						

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Semi-Volatile-GC/MS											
Batch 1770533											
m,p-Cresols				U	3.70	ug/L				JMB3	06/05/18 18:05
**2,4,6-Tribromophenol	100				83.8	ug/L		84	(32%-124%)		
**2-Fluorobiphenyl	50.0				40.0	ug/L		80	(32%-112%)		
**2-Fluorophenol	100				48.5	ug/L		48	(15%-88%)		
**Nitrobenzene-d5	50.0				41.2	ug/L		82	(36%-115%)		
**Phenol-d5	100				30.6	ug/L		31	(15%-91%)		
**p-Terphenyl-d14	50.0				70.5	ug/L		141*	(36%-121%)		
QC1204042570 451638008 MS											
1,4-Dichlorobenzene	100	U	2.70		68.8	ug/L		69	(25%-95%)		06/05/18 19:26
Tributylphosphate	100	U	2.70		97.3	ug/L		97	(44%-121%)		
m,p-Cresols	100	U	3.33		84.5	ug/L		85	(31%-118%)		
**2,4,6-Tribromophenol	200		86.7		188	ug/L		94	(32%-124%)		
**2-Fluorobiphenyl	100		38.0		84.5	ug/L		84	(32%-112%)		
**2-Fluorophenol	200		44.0		129	ug/L		64	(15%-88%)		
**Nitrobenzene-d5	100		39.5		86.6	ug/L		87	(36%-115%)		
**Phenol-d5	200		27.4		101	ug/L		51	(15%-91%)		

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS												
Batch 1770533												
**p-Terphenyl-d14	100		53.8		100	ug/L		100	(36%-121%)	JMB3	06/05/18	19:26
QC1204042571 451638008 MSD												
1,4-Dichlorobenzene	100	U	2.70		67.3	ug/L	2	67	(0%-20%)		06/05/18	19:52
Tributylphosphate	100	U	2.70		91.9	ug/L	6	92	(0%-20%)			
m,p-Cresols	100	U	3.33		80.8	ug/L	4	81	(0%-20%)			
**2,4,6-Tribromophenol	200		86.7		178	ug/L		89	(32%-124%)			
**2-Fluorobiphenyl	100		38.0		78.6	ug/L		79	(32%-112%)			
**2-Fluorophenol	200		44.0		125	ug/L		63	(15%-88%)			
**Nitrobenzene-d5	100		39.5		82.3	ug/L		82	(36%-115%)			
**Phenol-d5	200		27.4		98.9	ug/L		49	(15%-91%)			
**p-Terphenyl-d14	100		53.8		92.7	ug/L		93	(36%-121%)			

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.

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QC Summary

Workorder: **451638**

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

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 (0rganics only)

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

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

Semi-Volatile

Surrogate Recovery Report

SDG Number: GEL451638

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1204042568	MB for batch 1770532	48	31	82	80	84	141 *
1204042569	LCS for batch 1770532	50	33	86	84	95	108
451638008	B3J3P1	49	30	88	84	96	119
1204042570	B3J3P1MS	64	51	87	84	94	100
1204042571	B3J3P1MSD	63	49	82	79	89	93

Surrogate		Acceptance Limits
2FP	= 2-Fluorophenol	(15%-88%)
PHL	= Phenol-d5	(15%-91%)
NBZ	= Nitrobenzene-d5	(36%-115%)
FBP	= 2-Fluorobiphenyl	(32%-112%)
TBP	= 2,4,6-Tribromophenol	(32%-124%)
TPH	= p-Terphenyl-d14	(36%-121%)

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

FID Diesel Range Organics Analysis

Case Narrative

Diesel Range Organics
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451638
Work Order #: 451638

Product: **Analysis of Diesel Range Organics by Flame Ionization Detector**
Analytical Method: NWTPH-Dx
Analytical Procedure: GL-OA-E-003 REV# 30
Analytical Batch: 1771348

Preparation Method: SW846 3535A
Preparation Procedure: GL-OA-E-013 REV# 32
Preparation Batch: 1771347

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

GEL Sample ID#	Client Sample Identification
451638008	B3J3P1
1204044429	Method Blank (MB)
1204044430	Laboratory Control Sample (LCS)
1204044431	451869001(NonSDG) Matrix Spike (MS)
1204044432	451869001(NonSDG) Matrix Spike Duplicate (MSD)
1204044433	Laboratory Control Sample (LCS)
1204044434	Laboratory Control Sample Duplicate (LCSD)

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

Data Summary:

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

Calibration Information

Continuing Calibration Verification (CCV) Requirements
The calibration verification standards (ICV or CCV) failed to meet the acceptance criteria for Kerosene with positive bias. This non-compliance had no adverse effects on the data as Kerosene was not detected above the PQL in the associated environmental samples.

Quality Control (QC) Information

Surrogate Recoveries
QC samples (insert client id) did not meet the client requested recovery limits. However, the recoveries were within the lab's statistically generated limits.

Sample	Analyte	Value
1204044429 (MB)	o-Terphenyl	56* (60%-140%)
1204044433 (LCS)	o-Terphenyl	59* (60%-140%)

1204044434 (LCSD)	o-Terphenyl	57* (60%-140%)

Laboratory Control Sample (LCS/LCSD) Recovery
The LCS recoveries were not within the client requested limits. However, the recoveries were within the lab's statistically derived limits. The client was notified prior to reporting results.

Sample	Analyte	Value
1204044430 (LCS)	Diesel Range Organics	67* (70%-130%)
1204044433 (LCS)	Kerosene	51* (70%-130%)
1204044434 (LCSD)	Kerosene	50* (70%-130%)

Matrix Spike (MS/MSD) Recovery Statement
The MS/MSD recoveries were not within the client requested limits. However, the recoveries were within the lab's statistically derived limits. The client was notified prior to reporting results.

Sample	Analyte	Value
1204044431 (Non SDG 451869001MS)	Diesel Range Organics	58* (70%-130%)
	Motor Oil	68* (70%-130%)
1204044432 (Non SDG 451869001MSD)	Diesel Range Organics	62* (70%-130%)

Miscellaneous Information

Manual Integrations
Samples 1204044430 (LCS), 1204044431 (Non SDG 451869001MS) and 1204044432 (Non SDG 451869001MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

Certification Statement

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

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL451638 GEL Work Order: 451638

The Qualifiers in this report are defined as follows:

T Spike and/or spike duplicate sample recovery is outside control limits.
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: Jimin Cao **Name: Jimin Cao**

Date: 29 JUN 2018 **Title: Data Validator**

Sample Data Summary

FID Diesel Range Organics
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Date Collected:**	**06/01/2018 11:55**	**Matrix:**	**WATER**
Lab Sample ID:	**451638008**	**Date Received:**	**06/02/2018 09:05**		
		Client:	**CPRC001**	**Project:**	**CPRC0S18005**
Client ID:	**B3J3P1**	**Method:**	**NWTPH-Dx**	**SOP Ref:**	**GL-OA-E-003**
Batch ID:	**1771348**	**Inst:**	**FID5.I**	**Dilution:**	**1**
Run Date:	**06/09/2018 09:17**	**Analyst:**	**LXA1**	**Inj. Vol:**	**1 uL**
Prep Date:	**06/08/2018 07:21**	**Aliquot:**	**1020 mL**	**Final Volume:**	**1 mL**
Data File:	**060818_DRO_MO\f5f0827.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
68334-30-5	Diesel Range Organics	TU	73.5	ug/L	73.5	196
	Motor Oil	TU	73.5	ug/L	73.5	196

FID Diesel Range Organics
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Date Collected:**	**06/01/2018 11:55**	**Matrix:**	**WATER**
Lab Sample ID:	**451638008**	**Date Received:**	**06/02/2018 09:05**		
		Client:	**CPRC001**	**Project:**	**CPRC0S18005**
Client ID:	**B3J3P1RA**	**Method:**	**NWTPH-Dx**	**SOP Ref:**	**GL-OA-E-003**
Batch ID:	**1771348**	**Inst:**	**FID7.I**	**Dilution:**	**1**
Run Date:	**06/09/2018 23:32**	**Analyst:**	**LXA1**	**Inj. Vol:**	**1 uL**
Prep Date:	**06/08/2018 07:21**	**Aliquot:**	**1020 mL**	**Final Volume:**	**1 mL**
Data File:	**060918-KERO-MO\f7F0924.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
8008-20-6	Kerosene	U	32.6	ug/L	32.6	196

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 29, 2018

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Diesel Range Organics										
Batch 1771348										
QC1204044430 LCS										
Diesel Range Organics	2000			1340	ug/L		67*	(70%-130%)	LXA1	06/09/18 08:37
Motor Oil	2000			1650	ug/L		82	(70%-130%)		
**o-Terphenyl	20.0			14.4	ug/L		72	(60%-140%)		
QC1204044433 LCS										
Kerosene	1000			506	ug/L		51*	(70%-130%)		06/09/18 22:14
**o-Terphenyl	20.0			11.8	ug/L		59*	(60%-140%)		
QC1204044434 LCSD										
Kerosene	1000			499	ug/L	1	50*	(0%-20%)		06/09/18 22:53
**o-Terphenyl	20.0			11.5	ug/L		57*	(60%-140%)		
QC1204044429 MB										
Diesel Range Organics			U	75.0	ug/L					06/09/18 07:58
Kerosene			U	33.3	ug/L					
Kerosene			U	33.3	ug/L					06/09/18 21:35
Motor Oil			U	75.0	ug/L					06/09/18 07:58
**o-Terphenyl	20.0			13.4	ug/L		67	(60%-140%)		

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics												
Batch 1771348												
QC1204044431 451869001 MS												
Diesel Range Organics	2000	JT	185	T	1340	ug/L		58*	(70%-130%)	LXA1	06/10/18	11:54
Motor Oil	2000	T	354	T	1710	ug/L		68*	(70%-130%)			
**o-Terphenyl	20.0		12.1		12.3	ug/L		61	(60%-140%)			
QC1204044432 451869001 MSD												
Diesel Range Organics	2000	JT	185	T	1420	ug/L	6	62*	(0%-20%)		06/10/18	12:35
Motor Oil	2000	T	354		1920	ug/L	12	78	(0%-20%)			
**o-Terphenyl	20.0		12.1		13.2	ug/L		66	(60%-140%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- 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 (0rganics only)

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QC Summary

Workorder: **451638**

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.

FID Diesel Range Organics

Surrogate Recovery Report

SDG Number: GEL451638

Matrix Type: LIQUID

Sample ID	Client ID	OTP %REC
1204044429	MB for batch 1771347	67
1204044430	LCS for batch 1771347	72
451638008	B3J3P1	63
1204044433	LCS for batch 1771347	59 *
1204044434	LCSD for batch 1771347	57 *
451638008	B3J3P1RA	60
1204044431	B3JLB6RAMS	61
1204044432	B3JLB6RAMSD	66

Surrogate	Acceptance Limits
OTP = o-Terphenyl	(60%-140%)

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451638
Work Order #: 451638

Product: **Determination of Metals by ICP**
Analytical Method: SW846 3005A/6010D
Analytical Procedure: GL-MA-E-013 REV# 30
Analytical Batch: 1770201

Product: **Determination of Metals by ICP-MS**
Analytical Method: SW846 3005A/6020B
Analytical Procedure: GL-MA-E-014 REV# 32
Analytical Batch: 1770196

Preparation Method: SW846 3005A
Preparation Procedure: GL-MA-E-006 REV# 14
Preparation Batches: 1770195 and 1770200

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

GEL Sample ID#	Client Sample Identification
451638001	B3J0Y6
451638002	B3J0Y9
451638006	B3J2L6
451638007	B3J2L5
451638008	B3J3P1
1204041827	Method Blank (MB)**ICP**
1204041828	Laboratory Control Sample (LCS)
1204041831	451638008(B3J3P1L) Serial Dilution (SD)
1204041829	451638008(B3J3P1S) Matrix Spike (MS)
1204041830	451638008(B3J3P1SD) Matrix Spike Duplicate (MSD)
1204041817	Method Blank (MB)**ICP-MS**
1204041818	Laboratory Control Sample (LCS)
1204041821	451638001(B3J0Y6L) Serial Dilution (SD)
1204041819	451638001(B3J0Y6S) Matrix Spike (MS)
1204041820	451638001(B3J0Y6SD) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Calibration Information

CRDL/PQL Requirements
The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of calcium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were

not adversely affected. 451638008 (B3J3P1)-ICP.

ICSA/ICSAB Statement
For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Quality Control (QC) Information

Method Blank (MB) Statement
The samples in this SDG contained analytes at concentrations more than ten times the negative value reported in the method blank, therefore the data was not adversely affected.

Sample	Analyte	Value
1204041827 (MB)	Potassium	See applicable report

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were negative values in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1204041827 (MB)	Zinc	See applicable report

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: GEL451638 GEL Work Order: 451638

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

N Spike Sample recovery is outside control limits.

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

Review/Validation

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

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

Signature: **Name: Edmund Frampton**

Date: 21 JUN 2018 **Title: Team Leader**

Sample Data Summary

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451638 **CONTRACT:** CPRC0S18005 **METHOD TYPE:** SW846

SAMPLE ID: 451638001 **BASIS:** As Received **DATE COLLECTED** 01−JUN−18

CLIENT ID: B3J0Y6 **LEVEL:** Low **DATE RECEIVED** 02−JUN−18

MATRIX: WATER **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−47−3	Chromium	26.9	ug/L		3	10	10	1	MS	PRB	06/04/18 18:14	180604−3	1770196

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1770196	1770195	SW846 3005A	50	mL	50	mL	06/04/18	SXW1

***Analytical Methods:**

MS **SW846 3005A/6020B**

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451638 **CONTRACT:** CPRC0S18005 **METHOD TYPE:** SW846

SAMPLE ID: 451638002 **BASIS:** Filtered **DATE COLLECTED** 01−JUN−18

CLIENT ID: B3J0Y9 **LEVEL:** Low **DATE RECEIVED** 02−JUN−18

MATRIX: WATER **Dissolved Metals** **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−47−3	Chromium	26.7	ug/L		3	10	10	1	MS	PRB	06/04/18 18:37	180604−3	1770196

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1770196	1770195	SW846 3005A	50	mL	50	mL	06/04/18	SXW1

***Analytical Methods:**

MS **SW846 3005A/6020B**

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451638 **CONTRACT:** CPRC0S18005 **METHOD TYPE:** SW846

SAMPLE ID: 451638006 **BASIS:** Filtered **DATE COLLECTED** 01−JUN−18

CLIENT ID: B3J2L6 **LEVEL:** Low **DATE RECEIVED** 02−JUN−18

MATRIX: WATER **Dissolved Metals** **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−47−3	Chromium	27.2	ug/L		3	10	10	1	MS	PRB	06/04/18 18:40	180604−3	1770196

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1770196	1770195	SW846 3005A	50	mL	50	mL	06/04/18	SXW1

***Analytical Methods:**

MS **SW846 3005A/6020B**

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451638 **CONTRACT:** CPRC0S18005 **METHOD TYPE:** SW846

SAMPLE ID: 451638007 **BASIS:** As Received **DATE COLLECTED** 01−JUN−18

CLIENT ID: B3J2L5 **LEVEL:** Low **DATE RECEIVED** 02−JUN−18

MATRIX: WATER **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−47−3	Chromium	28.1	ug/L		3	10	10	1	MS	PRB	06/04/18 18:43	180604−3	1770196

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1770196	1770195	SW846 3005A	50	mL	50	mL	06/04/18	SXW1

***Analytical Methods:**

MS **SW846 3005A/6020B**

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451638 **CONTRACT:** CPRC0S18005 **METHOD TYPE:** SW846

SAMPLE ID: 451638008 **BASIS:** As Received **DATE COLLECTED** 01−JUN−18

CLIENT ID: B3J3P1 **LEVEL:** Low **DATE RECEIVED** 02−JUN−18

MATRIX: WATER **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−36−0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	06/19/18 09:29	061918−2	1770201
7440−38−2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−39−3	Barium	66.4	ug/L		1	5	5	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−43−9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−70−2	Calcium	73700	ug/L		50	200	200	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−47−3	Chromium	4.3	ug/L	B	1	5	5	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−48−4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−50−8	Copper	3	ug/L	U	3	10	10	1	P	HSC	06/19/18 09:29	061918−2	1770201
7439−89−6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/15/18 19:05	061518−1	1770201
7439−95−4	Magnesium	18400	ug/L		110	300	300	1	P	HSC	06/15/18 19:05	061518−1	1770201
7439−96−5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−02−0	Nickel	5.83	ug/L		1.5	5	5	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−09−7	Potassium	7580	ug/L		50	150	150	1	P	HSC	06/19/18 09:29	061918−2	1770201
7440−22−4	Silver	1	ug/L	U	1	5	5	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−23−5	Sodium	23700	ug/L		100	300	300	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−61−1	Uranium	11.6	ug/L		0.067	0.2	15	1	MS	PRB	06/04/18 18:46	180604−3	1770196
7440−62−2	Vanadium	11	ug/L		1	5	5	1	P	HSC	06/15/18 19:05	061518−1	1770201
7440−66−6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	06/15/18 19:05	061518−1	1770201

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1770196	1770195	SW846 3005A	50	mL	50	mL	06/04/18	SXW1
1770201	1770200	SW846 3005A	50	mL	50	mL	06/04/18	SXW1

***Analytical Methods:**

P **SW846 3005A/6010D**

MS **SW846 3005A/6020B**

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: June 21, 2018

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1770196										
QC1204041818 LCS										
Chromium	50.0			50.5	ug/L		101	(80%-120%)	PRB	06/04/18 18:11
Uranium	50.0			52.2	ug/L		104	(80%-120%)		
QC1204041817 MB										
Chromium			U	3.00	ug/L					06/04/18 18:08
Uranium			U	0.067	ug/L					
QC1204041819 451638001 MS										
Chromium	50.0	26.9		75.4	ug/L		97.1	(75%-125%)		06/04/18 18:18
Uranium	50.0	3.53		53.4	ug/L		99.7	(75%-125%)		
QC1204041820 451638001 MSD										
Chromium	50.0	26.9		75.2	ug/L	0.353	96.6	(0%-20%)		06/04/18 18:21
Uranium	50.0	3.53		52.7	ug/L	1.19	98.4	(0%-20%)		
QC1204041821 451638001 SDILT										
Chromium		26.9	BD	5.26	ug/L	2.29		(0%-20%)		06/04/18 18:27
Uranium		3.53	D	0.703	ug/L	.284		(0%-20%)		
Metals Analysis-ICP										
Batch 1770201										
QC1204041828 LCS										
Antimony	500			478	ug/L		95.6	(80%-120%)	HSC	06/19/18 09:27

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QC Summary

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1770201										
Arsenic	500			453	ug/L		90.7	(80%-120%)	HSC	06/15/18 19:03
Barium	500			472	ug/L		94.3	(80%-120%)		
Cadmium	500			468	ug/L		93.7	(80%-120%)		
Calcium	5000			4770	ug/L		95.3	(80%-120%)		
Chromium	500			466	ug/L		93.2	(80%-120%)		
Cobalt	500			468	ug/L		93.7	(80%-120%)		
Copper	500			493	ug/L		98.6	(80%-120%)		06/19/18 09:27
Iron	5000			4630	ug/L		92.5	(80%-120%)		06/15/18 19:03
Magnesium	5000			4800	ug/L		96	(80%-120%)		
Manganese	500			470	ug/L		94	(80%-120%)		
Nickel	500			468	ug/L		93.5	(80%-120%)		
Potassium	5000			4870	ug/L		97.5	(80%-120%)		06/19/18 09:27
Silver	100			95.5	ug/L		95.5	(80%-120%)		06/15/18 19:03
Sodium	5000			4720	ug/L		94.3	(80%-120%)		
Vanadium	500			480	ug/L		96	(80%-120%)		

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QC Summary

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1770201										
Zinc	500			444	ug/L		88.7	(80%-120%)	HSC	06/15/18 19:03
QC1204041827 MB										
Antimony			U	3.50	ug/L					06/19/18 09:24
Arsenic			U	5.00	ug/L					06/15/18 18:59
Barium			U	1.00	ug/L					
Cadmium			U	1.00	ug/L					
Calcium			U	50.0	ug/L					
Chromium			U	1.00	ug/L					
Cobalt			U	1.00	ug/L					
Copper			U	3.00	ug/L					06/19/18 09:24
Iron			U	30.0	ug/L					06/15/18 18:59
Magnesium			U	110	ug/L					
Manganese			U	2.00	ug/L					
Nickel			U	1.50	ug/L					
Potassium			B	-61.9	ug/L					06/19/18 09:24
Silver			U	1.00	ug/L					06/15/18 18:59

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1770201											
Sodium				U	100	ug/L				HSC	06/15/18 18:59
Vanadium				U	1.00	ug/L					
Zinc				B	-3.45	ug/L					
QC1204041829 451638008 MS											
Antimony	500	U	3.50		475	ug/L		94.5	(75%-125%)		06/19/18 09:33
Arsenic	500	U	5.00		470	ug/L		92.9	(75%-125%)		06/15/18 19:08
Barium	500		66.4		534	ug/L		93.6	(75%-125%)		
Cadmium	500	U	1.00		464	ug/L		92.8	(75%-125%)		
Calcium	5000		73700		77400	ug/L		N/A	(75%-125%)		
Chromium	500	B	4.30		464	ug/L		91.9	(75%-125%)		
Cobalt	500	U	1.00		455	ug/L		91	(75%-125%)		
Copper	500	U	3.00		492	ug/L		98.5	(75%-125%)		06/19/18 09:33
Iron	5000	U	30.0		4600	ug/L		91.7	(75%-125%)		06/15/18 19:08
Magnesium	5000		18400		22800	ug/L		87.6	(75%-125%)		
Manganese	500	U	2.00		457	ug/L		91.3	(75%-125%)		
Nickel	500		5.83		457	ug/L		90.2	(75%-125%)		

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QC Summary

Workorder: **451638**

Parmname	NOM	Qual	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1770201											
Potassium	5000		7580		12300	ug/L		93.7	(75%-125%)	HSC	06/19/18 09:33
Silver	100	U	1.00		94.6	ug/L		94.6	(75%-125%)		06/15/18 19:08
Sodium	5000		23700		27700	ug/L		N/A	(75%-125%)		
Vanadium	500		11.0		492	ug/L		96.3	(75%-125%)		
Zinc	500	B	-4.47		438	ug/L		87.7	(75%-125%)		
QC1204041830 451638008 MSD											
Antimony	500	U	3.50		473	ug/L	0.454	94.1	(0%-20%)		06/19/18 09:35
Arsenic	500	U	5.00		462	ug/L	1.58	91.5	(0%-20%)		06/15/18 19:10
Barium	500		66.4		526	ug/L	1.54	92	(0%-20%)		
Cadmium	500	U	1.00		458	ug/L	1.34	91.6	(0%-20%)		
Calcium	5000		73700		75900	ug/L	1.94	N/A	(0%-20%)		
Chromium	500	B	4.30		459	ug/L	1.16	90.8	(0%-20%)		
Cobalt	500	U	1.00		447	ug/L	1.77	89.4	(0%-20%)		
Copper	500	U	3.00		490	ug/L	0.427	98.1	(0%-20%)		06/19/18 09:35
Iron	5000	U	30.0		4580	ug/L	0.285	91.5	(0%-20%)		06/15/18 19:10
Magnesium	5000		18400		22500	ug/L	1.15	82.3	(0%-20%)		

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QC Summary

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1770201											
Manganese	500	U	2.00		454	ug/L	0.687	90.7	(0%-20%)	HSC	06/15/18 19:10
Nickel	500		5.83		450	ug/L	1.39	88.9	(0%-20%)		
Potassium	5000		7580		12100	ug/L	1.16	90.9	(0%-20%)		06/19/18 09:35
Silver	100	U	1.00		93.2	ug/L	1.52	93.2	(0%-20%)		06/15/18 19:10
Sodium	5000		23700		27500	ug/L	0.953	N/A	(0%-20%)		
Vanadium	500		11.0		488	ug/L	0.814	95.5	(0%-20%)		
Zinc	500	B	-4.47		437	ug/L	0.219	87.5	(0%-20%)		
QC1204041831 451638008 SDILT											
Antimony		U	2.54	DU	17.5	ug/L	N/A		(0%-20%)		06/19/18 09:37
Arsenic		U	4.97	DU	25.0	ug/L	N/A		(0%-20%)		06/15/18 19:12
Barium			66.4	D	12.5	ug/L	6.13		(0%-20%)		
Cadmium		U	0.386	DU	5.00	ug/L	N/A		(0%-20%)		
Calcium			73700	D	13600	ug/L	7.4		(0%-20%)		
Chromium		B	4.30	DU	5.00	ug/L	N/A		(0%-20%)		
Cobalt		U	0.148	DU	5.00	ug/L	N/A		(0%-20%)		
Copper		U	-1.88	DU	15.0	ug/L	N/A		(0%-20%)		06/19/18 09:37

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QC Summary

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1770201										
Iron	U	9.48	DU	150	ug/L	N/A		(0%-20%)	HSC	06/15/18 19:12
Magnesium		18400	D	3460	ug/L	6		(0%-20%)		
Manganese	U	0.486	DU	10.0	ug/L	N/A		(0%-20%)		
Nickel		5.83	DU	7.50	ug/L	N/A		(0%-20%)		
Potassium		7580	D	1390	ug/L	8.18		(0%-20%)		06/19/18 09:37
Silver	U	-0.134	DU	5.00	ug/L	N/A		(0%-20%)		06/15/18 19:12
Sodium		23700	D	4580	ug/L	3.21		(0%-20%)		
Vanadium		11.0	BD	1.65	ug/L	25.1		(0%-20%)		
Zinc	B	-4.47	DU	16.5	ug/L	N/A		(0%-20%)		

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.

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QC Summary

Workorder: **451638**

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

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

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

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451638
Work Order #: 451638

Product: **9310_ALPHABETA_GPC: ALPHA**
Analytical Method: 9310_ALPHABETA_GPC
Analytical Procedure: GL-RAD-A-001 REV# 20
Analytical Batch: 1770366

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

GEL Sample ID#	Client Sample Identification
451638001	B3J0Y6
451638008	B3J3P1
1204042188	Method Blank (MB)
1204042189	451351003(NonSDG) Sample Duplicate (DUP)
1204042190	451351003(NonSDG) Matrix Spike (MS)
1204042191	451351003(NonSDG) Matrix Spike Duplicate (MSD)
1204042192	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Gross Alpha/Beta Preparation Information
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts
Sample 1204042189 (Non SDG 451351003DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1204042190 (Non SDG 451351003MS) and 1204042191 (Non SDG 451351003MSD), aliquots were reduced to conserve sample volume.

Product: **SRISO_SEP_PRECIP_GPC: COMMON**
Analytical Method: SRISO_SEP_PRECIP_GPC
Analytical Procedure: GL-RAD-A-004 REV# 19
Analytical Batch: 1770369

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

GEL Sample ID#	Client Sample Identification
451638001	B3J0Y6
451638004	B3J297
451638005	B3J2L1
1204042200	Method Blank (MB)
1204042201	451638005(B3J2L1) Sample Duplicate (DUP)
1204042202	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts
Samples 1204042201 (B3J2L1DUP) and 451638005 (B3J2L1) were verified by recounting at least five days from the separation date. The recounts are reported.

Product: **TRITIUM_DIST_LSC: COMMON**
Analytical Method: TRITIUM_DIST_LSC
Analytical Procedure: GL-RAD-A-002 REV# 22
Analytical Batch: 1770517

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

GEL Sample ID#	Client Sample Identification
451638004	B3J297
1204042519	Method Blank (MB)
1204042520	451432004(NonSDG) Sample Duplicate (DUP)
1204042521	451432004(NonSDG) Matrix Spike (MS)
1204042522	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts
Sample 1204042522 (LCS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information

Additional Comments
The matrix spike, 1204042521 (Non SDG 451432004MS), aliquot was reduced to conserve sample volume.

Product: **C14_LSC: COMMON**
Analytical Method: C14_LSC
Analytical Procedure: GL-RAD-A-003 REV# 16
Analytical Batch: 1773520

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

GEL Sample ID#	Client Sample Identification
451638003	B3J270
451638004	B3J297
1204049551	Method Blank (MB)
1204049552	451638003(B3J270) Sample Duplicate (DUP)
1204049553	451638003(B3J270) Matrix Spike (MS)
1204049554	Laboratory Control Sample (LCS)

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

Data Summary:

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

Miscellaneous Information

Additional Comments
The matrix spike, 1204049553 (B3J270MS), aliquot was reduced to conserve sample volume.

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: GEL451638 GEL Work Order: 451638

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: Heather M. McCarty **Name: Heather McCarty**

Date: 26 JUN 2018 **Title: Analyst II**

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638001**	**Date Collected:**	**06/01/2018 09:17**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J0Y6**			**Prep Basis:**	**"As Received"**
Batch ID:	**1770366**	**Method:**	**9310_ALPHABETA_GPC**	**SOP Ref:**	**GL-RAD-A-001**
Run Date:	**06/11/2018 10:10**	**Analyst:**	**JXK3**	**Instrument:**	**PIC13A**
Data File:	**AB1770366r1.xls**	**Aliquot:**	**150 mL**	**Count Time:**	**90 min**
Prep Batch:	**1770366**	**Prep Method:**	**EPA 900.0/SW846 9310**		
Prep Date:	**06/07/2018 08:49**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha *ALPHA*	U	2.47	pCi/L	+/-1.91	1.96	2.61	3.00
12587-47-2	Beta *BETA*		6.07	pCi/L	+/-1.62	1.90	1.84	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638001**	**Date Collected:**	**06/01/2018 09:17**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J0Y6**			**Prep Basis:**	**"As Received"**
Batch ID:	**1770369**	**Method:**	**SRISO_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**06/09/2018 13:37**	**Analyst:**	**KSD1**	**Instrument:**	**PIC13A**
Data File:	**S1770369r2.xls**	**Aliquot:**	**300 mL**	**Count Time:**	**60 min**
Prep Batch:	**1770369**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**		
Prep Date:	**06/06/2018 11:26**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.0847	pCi/L	+/-0.534	0.535	1.08	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	3.80	4.19	mg	90.7	(40%-110%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638003**	**Date Collected:**	**05/31/2018 12:00**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J270**			**Prep Basis:**	**"As Received"**
Batch ID:	**1773520**	**Method:**	**C14_LSC**	**SOP Ref:**	**GL-RAD-A-003**
Run Date:	**06/25/2018 11:19**	**Analyst:**	**BXM4**	**Instrument:**	**LSCBROWN**
Data File:	**C1773520.xls**	**Aliquot:**	**100 mL**	**Count Time:**	**15 min**
Prep Batch:	**1773520**	**Prep Method:**	**EPA EERF C-01 Modified**		
Prep Date:	**06/22/2018 13:27**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	4.42	pCi/L	+/-20.0	20.0	34.5	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638004**	**Date Collected:**	**06/01/2018 09:20**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J297**			**Prep Basis:**	**"As Received"**
Batch ID:	**1770369**	**Method:**	**SRISO_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**06/09/2018 13:37**	**Analyst:**	**KSD1**	**Instrument:**	**PIC13B**
Data File:	**S1770369r2.xls**	**Aliquot:**	**300 mL**	**Count Time:**	**60 min**
Prep Batch:	**1770369**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**		
Prep Date:	**06/06/2018 11:26**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.112	pCi/L	+/-0.414	0.414	0.882	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	4.00	4.19	mg	95.5	(40%-110%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638004**	**Date Collected:**	**06/01/2018 09:20**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J297**			**Prep Basis:**	**"As Received"**
Batch ID:	**1770517**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**06/06/2018 16:46**	**Analyst:**	**MXH8**	**Instrument:**	**LSCBROWN**
Data File:	**T1770517R.xls**	**Aliquot:**	**50 mL**	**Count Time:**	**50 min**
Prep Batch:	**1770517**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**06/06/2018 08:02**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1190	pCi/L	+/-233	328	323	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638004**	**Date Collected:**	**06/01/2018 09:20**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J297**			**Prep Basis:**	**"As Received"**
Batch ID:	**1773520**	**Method:**	**C14_LSC**	**SOP Ref:**	**GL-RAD-A-003**
Run Date:	**06/25/2018 11:36**	**Analyst:**	**BXM4**	**Instrument:**	**LSCBROWN**
Data File:	**C1773520.xls**	**Aliquot:**	**100 mL**	**Count Time:**	**15 min**
Prep Batch:	**1773520**	**Prep Method:**	**EPA EERF C-01 Modified**		
Prep Date:	**06/22/2018 13:27**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		85.3	pCi/L	+/-22.8	27.8	34.5	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638005**	**Date Collected:**	**06/01/2018 08:12**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J2L1**			**Prep Basis:**	**"As Received"**
Batch ID:	**1770369**	**Method:**	**SRISO_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**06/13/2018 07:46**	**Analyst:**	**KSD1**	**Instrument:**	**PIC13A**
Data File:	**S1770369r2.xls**	**Aliquot:**	**300 mL**	**Count Time:**	**60 min**
Prep Batch:	**1770369**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**		
Prep Date:	**06/06/2018 11:26**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		7.43	pCi/L	+/-1.05	1.57	0.716	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	3.90	4.19	mg	93.1	(40%-110%)

Comments:

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

The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL451638**	**Client:**	**CPRC001**	**Project:**	**CPRC0S18005**
Lab Sample ID:	**451638008**	**Date Collected:**	**06/01/2018 11:55**	**Matrix:**	**WATER**
		Date Received:	**06/02/2018 09:05**		
Client ID:	**B3J3P1**			**Prep Basis:**	**"As Received"**
Batch ID:	**1770366**	**Method:**	**9310_ALPHABETA_GPC**	**SOP Ref:**	**GL-RAD-A-001**
Run Date:	**06/11/2018 10:11**	**Analyst:**	**JXK3**	**Instrument:**	**PIC14B**
Data File:	**AB1770366r1.xls**	**Aliquot:**	**150 mL**	**Count Time:**	**80 min**
Prep Batch:	**1770366**	**Prep Method:**	**EPA 900.0/SW846 9310**		
Prep Date:	**06/07/2018 08:49**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha *ALPHA*		9.77	pCi/L	+/-3.53	3.89	2.60	3.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: June 26, 2018
Page 1 of 3

Client : **CH2MHill Plateau Remediation Company**
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Contact: **Mr. Scot Fitzgerald**

Workorder: **451638**

Parmname	NOM		Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Gas Flow											
Batch 1770366											
QC1204042188 MB											
Alpha				U	0.129	pCi/L				JXK3	06/11/1810:04
Uncert:					+/-0.736						
TPU:					+/-0.737						
Beta				U	-0.983	pCi/L					
Uncert:					+/-1.23						
TPU:					+/-1.23						
QC1204042189 451351003 DUP											
Alpha		U	1.94		4.20	pCi/L					06/11/1813:33
Uncert:			+/-1.81		+/-2.10		RPD:	74	(0% - 100%)		
TPU:			+/-1.85		+/-2.22		RER:	1.53	(0-2)		
Beta			179		166	pCi/L					
Uncert:			+/-6.19		+/-5.89		RPD:	8	(0%-20%)		
TPU:			+/-29.7		+/-27.6		RER:	0.654	(0-2)		
QC1204042190 451351003 MS											
Alpha	302	U	1.94		292	pCi/L	REC:	97	(75%-125%)		06/11/1810:04
Uncert:			+/-1.81		+/-32.1						
TPU:			+/-1.85		+/-57.5						
Beta	1170		179		1480	pCi/L	REC:	111	(75%-125%)		
Uncert:			+/-6.19		+/-48.7						
TPU:			+/-29.7		+/-251						
QC1204042191 451351003 MSD											
Alpha	302	U	1.94		329	pCi/L	REC:	109	(75%-125%)		06/11/1810:05
Uncert:			+/-1.81		+/-33.0		RPD:	12	(0%-20%)		
TPU:			+/-1.85		+/-65.1		RER:	0.85	(0-2)		
Beta	1170		179		1440	pCi/L	REC:	108	(75%-125%)		
Uncert:			+/-6.19		+/-47.0		RPD:	2	(0%-20%)		
TPU:			+/-29.7		+/-239		RER:	0.198	(0-2)		
QC1204042192 LCS											
Alpha	80.5				82.5	pCi/L	REC:	103	(80%-120%)		06/11/1810:05
Uncert:					+/-7.78						
TPU:					+/-16.1						
Beta	312				353	pCi/L	REC:	113	(80%-120%)		
Uncert:					+/-12.1						
TPU:					+/-58.6						
Batch 1770369											
QC1204042200 MB											
Strontium-90				U	-0.322	pCi/L				KSD1	06/09/1814:52
Uncert:					+/-0.945						
TPU:					+/-0.945						
**Strontium Carrier	4.19				3.40	mg	REC:	81	(40%-110%)		
QC1204042201 451638005 DUP											
Strontium-90			7.43		6.73	pCi/L					06/13/1807:46
Uncert:			+/-1.05		+/-0.940		RPD:	10	(0%-20%)		
TPU:			+/-1.57		+/-1.42		RER:	0.655	(0-2)		

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QC Summary

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch 1770369									
**Strontium Carrier	4.19	3.90		4.40	mg	REC: 105	(40%-110%)		
QC1204042202 LCS									
Strontium-90	77.9			64.4	pCi/L	REC: 83	(80%-120%)		06/09/1814:52
	Uncert:			+/-3.77					
	TPU:			+/-11.4					
**Strontium Carrier	4.19			3.70	mg	REC: 88	(40%-110%)		
Rad Liquid Scintillation									
Batch 1770517									
QC1204042519 MB									
Tritium			U	-125	pCi/L			MXH8	06/06/1818:30
	Uncert:			+/-177					
	TPU:			+/-177					
QC1204042520 451432004 DUP									
Tritium	U	-195	U	-103	pCi/L				06/06/1819:22
	Uncert:	+/-174		+/-176		RPD: 0	N/A		
	TPU:	+/-174		+/-176		RER: 0.733	(0-2)		
QC1204042521 451432004 MS									
Tritium	5080 U	-195		4830	pCi/L	REC: 95	(75%-125%)		06/06/1820:14
	Uncert:	+/-174		+/-536					
	TPU:	+/-174		+/-1080					
QC1204042522 LCS									
Tritium	2540			2100	pCi/L	REC: 83	(80%-120%)		06/07/1810:41
	Uncert:			+/-459					
	TPU:			+/-613					
Batch 1773520									
QC1204049551 MB									
Carbon-14			U	-6.2	pCi/L			BXM4	06/25/1815:09
	Uncert:			+/-19.6					
	TPU:			+/-19.6					
QC1204049552 451638003 DUP									
Carbon-14	U	4.42	U	1.89	pCi/L				06/25/1815:25
	Uncert:	+/-20.0		+/-20.0		RPD: 0	N/A		
	TPU:	+/-20.0		+/-20.0		RER: 0.176	(0-2)		
QC1204049553 451638003 MS									
Carbon-14	3750 U	4.42		3730	pCi/L	REC: 99	(75%-125%)		06/25/1815:42
	Uncert:	+/-20.0		+/-195					
	TPU:	+/-20.0		+/-720					
QC1204049554 LCS									
Carbon-14	751			727	pCi/L	REC: 97	(80%-120%)		06/25/1815:58
	Uncert:			+/-38.5					
	TPU:			+/-140					

Notes:

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

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- A The TIC is a suspected aldol-condensation product

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QC Summary

Workorder: **451638**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time

B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
B	The analyte was detected in both the associated QC blank and in the sample.
B	The analyte was detected in the associated method blank >/= MDC or >5% sample activity.
C	Analyte has been confirmed by GC/MS analysis
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
D	Results are reported from a diluted aliquot of sample.
E	Concentration exceeds the calibration range of the instrument
E	Reported value is estimated due to interferences. See comment in narrative.
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
M	Duplicate precision not met.
N	Spike Sample recovery is outside control limits.
P	Aroclor target analyte with greater than 25% difference between column analyses.
S	Reported value determined by the Method of Standard Additions (MSA)
T	Spike and/or spike duplicate sample recovery is outside control limits.
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
UX	Gamma Spectroscopy--Uncertain identification
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
o	Analyte failed to recover within LCS limits (0rganics 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.
** Indicates analyte is a surrogate compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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