

July 7, 2017



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July 07, 2017

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

Re: CHPRC SAF F17-043
Work Order: 426225
SDG: GEL426225

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 23, 2017. 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,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300058 - 8C
Chain of Custody: F17-043-002
Enclosures

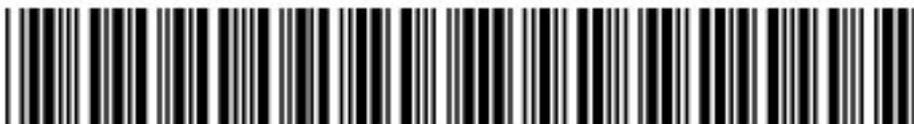


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Case Narrative

July 7, 2017

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F17-043
SDG: GEL426225

July 07, 2017

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 23, 2017, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following sample:

Laboratory Identification	Sample Description
426225001	B3BCR0

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.

July 7, 2017

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

July 7, 2017

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426225
Work Order #: 426225

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.

Quality Control (QC) Information

Blank (MB) Statement

Target analytes were detected in the blank 1203824849 (MB) below the reporting limit.

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
1203824958 (B3BCR0PS)	Acetone	133* (70%-130%)

The archon added 10mLs of water to sample 426225001 (B3BCR0), while the MS/MSD were hand injected with 5mLs of water each through the septum. The water was first added to the MS/MSD so they could be spiked. The archon added the remaining 5mLs of water to the MS/MSD.

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

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) spike recoveries were not within the acceptance limits. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1203821277 (LCS)	Several	See applicable report

Spike Recovery Statement

The MS or MSD (See Below) spike recoveries were not within the acceptance limits. The associated MS or MSD passed recoveries, as did the LCS. It appears that the low spike recoveries were isolated to the MS or MSD only and were the result of a poor extraction.

Sample	Analyte	Value
1203821278 (B3BCR0MS)	2,4-Dinitrophenol	0* (12.0%-112.0%)
	bis(2-Chloroethyl) ether	26* (27.0%-110.0%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD, (See Below), were not within the acceptance limits due to the large difference between the individual recoveries in each MS and MSD analyte pair. The failures may be attributed to an error in the extraction process.

Sample	Analyte	Value
1203821278MS and 1203821279MSD (B3BCR0)	Several	See applicable report

Miscellaneous Information

Manual Integrations

Samples 1203821278 (B3BCR0MS) and 1203821279 (B3BCR0MSD) required manual integration in order to properly identify one or more peaks and/or to correctly position the baseline as set in the calibration standard injections.

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) did not meet acceptance criteria with a positive bias. This non-compliance had no adverse effects on the data as there were no target analytes detected above the PQL in the associated environmental samples.

Miscellaneous Information

Manual Integrations

Samples 1203817497 (LCS), 1203817498 (Non SDG 425612003MS) and 1203817499 (Non SDG 425612003MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

Metals

Determination of Metals by ICP

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.

Determination of Metals by ICP-MS

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

Matrix Spike (MS/MSD) Recovery Statement

The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203818341 (B3BCR0MS)	Chromium	160* (75%-125%)

Duplicate Relative Percent Difference (RPD) Statement

Not all the applicable analyte RPD values were within the acceptance criteria.

Sample	Analyte	Value
1203818340 (B3BCR0DUP)	Chromium	abs(2270 - 4010)* (+/-659 ug/kg)
	Lead	abs(849 - 3040)* (+/-439 ug/kg)

Technical Information

Sample Dilutions

The ICPMS solid samples in this SDG were diluted the standard two times.

Analyte	426225
	001
Arsenic	2X
Barium	2X
Cadmium	2X
Chromium	2X
Lead	2X
Selenium	2X

Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

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

UIISO_IE_PRECIP_AEA: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 were recounted due to a suspected blank false positive. The recounts are reported.

AMCMISO_EIE_PRECIP_AEA: COMMON

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.

NP237_IE_PRECIP_AEA: COMMON

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.

PUISO_PRECIP_AEA: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

July 7, 2017

Recounts

Samples 1203820180 (MB) and 426225001 (B3BCR0) were recounted due to a peak shift. The recounts are reported.

Dry Weight

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

GAMMA_GS:COMMON

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.

SRTOT_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

Sample 426225001 (B3BCR0) was recounted due to a suspected false positive. The recount is reported.

NI63_LSC

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.

TC99_SEP_GPC

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.

July 7, 2017

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

Samples were recounted to verify sample results. Recounts 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.

Chain of Custody and Supporting Documentation

July 7, 2017

SAMPLE RECEIPT & REVIEW FORM

Client: <u>APRC</u>		SDG/AR/COC/Work Order: <u>426225</u>	
Received By: <u>M/K</u>		Date Received: <u>6-23-17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>7794</u> <u>7326</u> <u>7450</u> <u>1C</u> <u>8794</u> <u>7636</u> <u>1C</u> <u>6794</u> <u>7500</u> <u>1C</u> <u>7326</u> <u>7450</u> <u>1C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	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?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <input checked="" type="checkbox"/> Wet Ice <input checked="" type="checkbox"/> Ice Packs <input type="checkbox"/> Dry ice <input type="checkbox"/> None <input type="checkbox"/> Other: _____ *all temperatures are recorded in Celsius TEMP: <u>1C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>FR2-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes ___ No ___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes ___ No ___ N/A ___ (If unknown, select No) VOA vials free of headspace? Yes ___ No ___ N/A ___ Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 6/23/17 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

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Laboratory Certifications

List of current GEL Certifications as of 07 July 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

July 7, 2017

GC/MS Volatile

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL426225

Work Order #: 426225

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

Analytical Method: SW846 5035A/8260C

Analytical Procedure: GL-OA-E-038 REV# 26

Analytical Batch: 1679786

Preparation Method: SW846 5035A

Preparation Procedure: GL-OA-E-039 REV# 11

Preparation Batch: 1679785

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203824849	Method Blank (MB)
1203824850	Laboratory Control Sample (LCS)
1203824958	426225001(B3BCR0) Post Spike (PS)
1203824959	426225001(B3BCR0) Post Spike Duplicate (PSD)
1203825026	Laboratory Control Sample Duplicate (LCSD)

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

Data Summary:

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

Quality Control (QC) Information

Blank (MB) Statement

Target analytes were detected in the blank 1203824849 (MB) below the reporting limit.

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
1203824958 (B3BCR0PS)	Acetone	133* (70%-130%)

The archon added 10mLs of water to sample 426225001 (B3BCR0), while the MS/MSD were hand injected with 5mLs of water each through the septum. The water was first added to the MS/MSD so they could be spiked. The archon added the remaining 5mLs of water to the MS/MSD.

Certification Statement

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

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

July 7, 2017

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: GEL426225 GEL Work Order: 426225

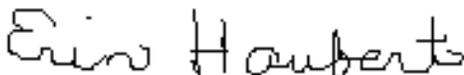
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 06 JUL 2017

Title: Data Validator

Sample Data Summary

July 7, 2017

Volatile

Certificate of Analysis
Sample Summary

SDG Number: GEL426225	Date Collected: 06/21/2017 13:55	Matrix: SOIL
Lab Sample ID: 426225001	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0	Client: CPRC001	Project: CPRC0F17043
Batch ID: 1679786	Method: SW846 5035A/8260C	SOP Ref: GL-OA-E-038
Run Date: 07/05/2017 15:52	Inst: VOA9.I	Dilution: 1
Prep Date: 07/05/2017 14:45	Analyst: RXY1	Purge Vol: 5 mL
Data File: 070517V9\9Z315.D	Aliquot: 6.8 g	Final Volume: 5 mL
	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
71-55-6	1,1,1-Trichloroethane	U	0.251	ug/kg	0.251	1.67
79-34-5	1,1,2,2-Tetrachloroethane	U	0.251	ug/kg	0.251	1.67
79-00-5	1,1,2-Trichloroethane	U	0.251	ug/kg	0.251	1.67
75-34-3	1,1-Dichloroethane	U	0.251	ug/kg	0.251	1.67
75-35-4	1,1-Dichloroethylene	U	0.251	ug/kg	0.251	1.67
107-06-2	1,2-Dichloroethane	U	0.251	ug/kg	0.251	1.67
540-59-0	1,2-Dichloroethylene (total)	U	0.251	ug/kg	0.251	3.34
78-87-5	1,2-Dichloropropane	U	0.251	ug/kg	0.251	1.67
78-93-3	2-Butanone	U	2.51	ug/kg	2.51	8.36
591-78-6	2-Hexanone	U	2.51	ug/kg	2.51	8.36
108-10-1	4-Methyl-2-pentanone	U	2.51	ug/kg	2.51	8.36
67-64-1	Acetone	T	9.74	ug/kg	2.51	8.36
71-43-2	Benzene	U	0.251	ug/kg	0.251	1.67
74-97-5	Bromochloromethane	U	0.251	ug/kg	0.251	1.67
75-25-2	Bromoform	U	0.251	ug/kg	0.251	1.67
74-83-9	Bromomethane	U	0.251	ug/kg	0.251	1.67
75-15-0	Carbon disulfide	U	1.34	ug/kg	1.34	8.36
56-23-5	Carbon tetrachloride	U	0.251	ug/kg	0.251	1.67
108-90-7	Chlorobenzene	U	0.251	ug/kg	0.251	1.67
75-00-3	Chloroethane	U	0.251	ug/kg	0.251	1.67
67-66-3	Chloroform	U	0.251	ug/kg	0.251	1.67
74-87-3	Chloromethane	U	0.251	ug/kg	0.251	1.67
124-48-1	Dibromochloromethane	U	0.251	ug/kg	0.251	1.67
100-41-4	Ethylbenzene	U	0.251	ug/kg	0.251	1.67
75-09-2	Methylene chloride	J	3.04	ug/kg	1.34	4.18
100-42-5	Styrene	U	0.251	ug/kg	0.251	1.67
127-18-4	Tetrachloroethylene	U	0.251	ug/kg	0.251	1.67
108-88-3	Toluene	U	0.251	ug/kg	0.251	1.67
79-01-6	Trichloroethylene	U	0.251	ug/kg	0.251	1.67
75-01-4	Vinyl chloride	U	0.251	ug/kg	0.251	1.67
1330-20-7	Xylenes (total)	U	0.251	ug/kg	0.251	5.02
10061-01-5	cis-1,3-Dichloropropylene	U	0.251	ug/kg	0.251	1.67
10061-02-6	trans-1,3-Dichloropropylene	U	0.251	ug/kg	0.251	1.67

Quality Control Summary

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GEL LABORATORIES LLC

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QC Summary

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 426225

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
QC1203824850	LCS										
1,1,1-Trichloroethane	50.0			46.0	ug/kg		92	(70%-130%)	RXY1	07/05/17	11:09
1,1,2,2-Tetrachloroethane	50.0			53.7	ug/kg		107	(70%-130%)			
1,1,2-Trichloroethane	50.0			52.0	ug/kg		104	(70%-130%)			
1,1-Dichloroethane	50.0			48.0	ug/kg		96	(70%-130%)			
1,1-Dichloroethylene	50.0			45.7	ug/kg		91	(70%-130%)			
1,2-Dichloroethane	50.0			44.5	ug/kg		89	(70%-130%)			
1,2-Dichloroethylene (total)	100			95.4	ug/kg		95	(70%-130%)			
1,2-Dichloropropane	50.0			49.6	ug/kg		99	(70%-130%)			
2-Butanone	250			283	ug/kg		113	(70%-130%)			
2-Hexanone	250			267	ug/kg		107	(70%-130%)			
4-Methyl-2-pentanone	250			256	ug/kg		102	(70%-130%)			
Acetone	250			281	ug/kg		112	(70%-130%)			
Benzene	50.0			49.1	ug/kg		98	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
Bromochloromethane	50.0			51.0	ug/kg		102	(70%-130%)	RXY1	07/05/17	11:09
Bromoform	50.0			59.2	ug/kg		118	(70%-130%)			
Bromomethane	50.0			50.2	ug/kg		100	(70%-130%)			
Carbon disulfide	250			227	ug/kg		91	(70%-130%)			
Carbon tetrachloride	50.0			46.8	ug/kg		94	(70%-130%)			
Chlorobenzene	50.0			49.4	ug/kg		99	(70%-130%)			
Chloroethane	50.0			50.5	ug/kg		101	(70%-130%)			
Chloroform	50.0			46.6	ug/kg		93	(70%-130%)			
Chloromethane	50.0			49.4	ug/kg		99	(70%-130%)			
Dibromochloromethane	50.0			55.7	ug/kg		111	(70%-130%)			
Ethylbenzene	50.0			47.6	ug/kg		95	(70%-130%)			
Methylene chloride	50.0			49.6	ug/kg		99	(70%-130%)			
Styrene	50.0			50.3	ug/kg		101	(70%-130%)			
Tetrachloroethylene	50.0		B	48.0	ug/kg		96	(70%-130%)			
Toluene	50.0			48.6	ug/kg		97	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
Trichloroethylene	50.0			49.6	ug/kg		99	(70%-130%)	RXY1	07/05/17	11:09
Vinyl chloride	50.0			47.9	ug/kg		96	(70%-130%)			
Xylenes (total)	150			151	ug/kg		101	(70%-130%)			
cis-1,3-Dichloropropylene	50.0			52.3	ug/kg		105	(70%-130%)			
trans-1,3-Dichloropropylene	50.0			52.3	ug/kg		105	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			43.9	ug/L		88	(70%-130%)			
**Bromofluorobenzene	50.0			50.2	ug/L		100	(70%-130%)			
**Toluene-d8	50.0			49.5	ug/L		99	(70%-130%)			
QC1203825026 LCSD											
1,1,1-Trichloroethane	50.0			47.1	ug/kg	2	94	(0%-20%)		07/05/17	16:21
1,1,2,2-Tetrachloroethane	50.0			53.5	ug/kg	0	107	(0%-20%)			
1,1,2-Trichloroethane	50.0			51.0	ug/kg	2	102	(0%-20%)			
1,1-Dichloroethane	50.0			48.2	ug/kg	1	96	(0%-20%)			
1,1-Dichloroethylene	50.0			46.6	ug/kg	2	93	(0%-20%)			
1,2-Dichloroethane	50.0			44.5	ug/kg	0	89	(0%-20%)			
1,2-Dichloroethylene (total)	100			96.9	ug/kg	2	97	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
1,2-Dichloropropane	50.0			49.4	ug/kg	0	99	(0%-20%)	RXY1	07/05/17	16:21
2-Butanone	250			301	ug/kg	6	120	(0%-20%)			
2-Hexanone	250			296	ug/kg	10	118	(0%-20%)			
4-Methyl-2-pentanone	250			262	ug/kg	2	105	(0%-20%)			
Acetone	250			298	ug/kg	6	119	(0%-20%)			
Benzene	50.0			49.1	ug/kg	0	98	(0%-20%)			
Bromochloromethane	50.0			49.8	ug/kg	2	100	(0%-20%)			
Bromoform	50.0			59.0	ug/kg	0	118	(0%-20%)			
Bromomethane	50.0			48.3	ug/kg	4	97	(0%-20%)			
Carbon disulfide	250			232	ug/kg	2	93	(0%-20%)			
Carbon tetrachloride	50.0			47.9	ug/kg	2	96	(0%-20%)			
Chlorobenzene	50.0			50.0	ug/kg	1	100	(0%-20%)			
Chloroethane	50.0			51.8	ug/kg	3	104	(0%-20%)			
Chloroform	50.0			46.9	ug/kg	1	94	(0%-20%)			
Chloromethane	50.0			47.7	ug/kg	3	95	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
Dibromochloromethane	50.0			54.9	ug/kg	1	110	(0%-20%)	RXY1	07/05/17	16:21
Ethylbenzene	50.0			48.5	ug/kg	2	97	(0%-20%)			
Methylene chloride	50.0			49.9	ug/kg	1	100	(0%-20%)			
Styrene	50.0			51.5	ug/kg	2	103	(0%-20%)			
Tetrachloroethylene	50.0		B	47.8	ug/kg	0	96	(0%-20%)			
Toluene	50.0			48.3	ug/kg	0	97	(0%-20%)			
Trichloroethylene	50.0			50.0	ug/kg	1	100	(0%-20%)			
Vinyl chloride	50.0			46.9	ug/kg	2	94	(0%-20%)			
Xylenes (total)	150			153	ug/kg	1	102	(0%-20%)			
cis-1,3-Dichloropropylene	50.0			53.1	ug/kg	1	106	(0%-20%)			
trans-1,3-Dichloropropylene	50.0			51.4	ug/kg	2	103	(0%-20%)			
**1,2-Dichloroethane-d4	50.0			45.0	ug/L		90	(70%-130%)			
**Bromofluorobenzene	50.0			50.7	ug/L		101	(70%-130%)			
**Toluene-d8	50.0			48.7	ug/L		97	(70%-130%)			
QC1203824849 MB											
1,1,1-Trichloroethane			U	0.300	ug/kg					07/05/17	12:33

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
1,1,1,2-Tetrachloroethane			U	0.300	ug/kg				RXY1	07/05/17	12:33
1,1,2-Trichloroethane			U	0.300	ug/kg						
1,1-Dichloroethane			U	0.300	ug/kg						
1,1-Dichloroethylene			U	0.300	ug/kg						
1,2-Dichloroethane			U	0.300	ug/kg						
1,2-Dichloroethylene (total)			U	0.300	ug/kg						
1,2-Dichloropropane			U	0.300	ug/kg						
2-Butanone			U	3.00	ug/kg						
2-Hexanone			U	3.00	ug/kg						
4-Methyl-2-pentanone			U	3.00	ug/kg						
Acetone			U	3.00	ug/kg						
Benzene			U	0.300	ug/kg						
Bromochloromethane			U	0.300	ug/kg						
Bromoform			U	0.300	ug/kg						
Bromomethane			U	0.300	ug/kg						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
Carbon disulfide			U	1.60	ug/kg				RXY1	07/05/17	12:33
Carbon tetrachloride			U	0.300	ug/kg						
Chlorobenzene			U	0.300	ug/kg						
Chloroethane			U	0.300	ug/kg						
Chloroform			U	0.300	ug/kg						
Chloromethane			U	0.300	ug/kg						
Dibromochloromethane			U	0.300	ug/kg						
Ethylbenzene			U	0.300	ug/kg						
Methylene chloride			U	1.60	ug/kg						
Styrene			U	0.300	ug/kg						
Tetrachloroethylene			J	0.400	ug/kg						
Toluene			U	0.300	ug/kg						
Trichloroethylene			U	0.300	ug/kg						
Vinyl chloride			U	0.300	ug/kg						
Xylenes (total)			U	0.300	ug/kg						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
cis-1,3-Dichloropropylene			U	0.300	ug/kg				RXY1	07/05/17	12:33
trans-1,3-Dichloropropylene			U	0.300	ug/kg						
**1,2-Dichloroethane-d4	50.0			44.2	ug/L		88	(70%-130%)			
**Bromofluorobenzene	50.0			51.2	ug/L		102	(70%-130%)			
**Toluene-d8	50.0			49.3	ug/L		99	(70%-130%)			
QC1203824958 426225001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	43.2	ug/L		86	(70%-130%)		07/05/17	16:50
1,1,2,2-Tetrachloroethane	50.0	U	0.00	54.8	ug/L		110	(70%-130%)			
1,1,2-Trichloroethane	50.0	U	0.00	50.8	ug/L		102	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	45.9	ug/L		92	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	42.4	ug/L		85	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	43.6	ug/L		87	(70%-130%)			
1,2-Dichloroethylene (total)	100	U	0.00	90.3	ug/L		90	(70%-130%)			
1,2-Dichloropropane	50.0	U	0.00	47.1	ug/L		94	(70%-130%)			
2-Butanone	250	U	0.00	325	ug/L		130	(70%-130%)			
2-Hexanone	250	U	0.00	319	ug/L		127	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
4-Methyl-2-pentanone	250	U	2.85		291	ug/L	115	(70%-130%)	RXY1	07/05/17	16:50
Acetone	250	T	11.7	T	344	ug/L	133*	(70%-130%)			
Benzene	50.0	U	0.00		46.3	ug/L	93	(70%-130%)			
Bromochloromethane	50.0	U	0.00		49.0	ug/L	98	(70%-130%)			
Bromoform	50.0	U	0.00		59.9	ug/L	120	(70%-130%)			
Bromomethane	50.0	U	0.00		49.4	ug/L	99	(70%-130%)			
Carbon disulfide	250	U	0.00		214	ug/L	85	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00		44.0	ug/L	88	(70%-130%)			
Chlorobenzene	50.0	U	0.00		46.1	ug/L	92	(70%-130%)			
Chloroethane	50.0	U	0.00		49.4	ug/L	99	(70%-130%)			
Chloroform	50.0	U	0.00		45.0	ug/L	90	(70%-130%)			
Chloromethane	50.0	U	0.00		47.7	ug/L	95	(70%-130%)			
Dibromochloromethane	50.0	U	0.00		52.9	ug/L	106	(70%-130%)			
Ethylbenzene	50.0	U	0.00		43.6	ug/L	87	(70%-130%)			
Methylene chloride	50.0	J	3.63		51.4	ug/L	96	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
Styrene	50.0	U	0.00		46.8	ug/L	94	(70%-130%)	RXY1	07/05/17	16:50
Tetrachloroethylene	50.0	U	0.00	B	42.4	ug/L	85	(70%-130%)			
Toluene	50.0	U	0.00		45.6	ug/L	91	(70%-130%)			
Trichloroethylene	50.0	U	0.00		46.0	ug/L	92	(70%-130%)			
Vinyl chloride	50.0	U	0.00		47.0	ug/L	94	(70%-130%)			
Xylenes (total)	150	U	0.00		137	ug/L	92	(70%-130%)			
cis-1,3-Dichloropropylene	50.0	U	0.00		49.1	ug/L	98	(70%-130%)			
trans-1,3-Dichloropropylene	50.0	U	0.00		50.1	ug/L	100	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		48.9		45.2	ug/L	90	(70%-130%)			
**Bromofluorobenzene	50.0		52.5		51.4	ug/L	103	(70%-130%)			
**Toluene-d8	50.0		52.1		49.5	ug/L	99	(70%-130%)			
QC1203824959 426225001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		40.7	ug/L	6	81	(0%-20%)	07/05/17	17:18
1,1,2,2-Tetrachloroethane	50.0	U	0.00		51.4	ug/L	6	103	(0%-20%)		
1,1,2-Trichloroethane	50.0	U	0.00		48.2	ug/L	5	96	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		43.6	ug/L	5	87	(0%-20%)		

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
1,1-Dichloroethylene	50.0	U	0.00	40.2	ug/L	5	80	(0%-20%)	RXY1	07/05/17	17:18
1,2-Dichloroethane	50.0	U	0.00	41.8	ug/L	4	84	(0%-20%)			
1,2-Dichloroethylene (total)	100	U	0.00	85.4	ug/L	6	85	(0%-20%)			
1,2-Dichloropropane	50.0	U	0.00	44.9	ug/L	5	90	(0%-20%)			
2-Butanone	250	U	0.00	316	ug/L	3	126	(0%-20%)			
2-Hexanone	250	U	0.00	303	ug/L	5	121	(0%-20%)			
4-Methyl-2-pentanone	250	U	2.85	277	ug/L	5	110	(0%-20%)			
Acetone	250	T	11.7	322	ug/L	7	124	(0%-20%)			
Benzene	50.0	U	0.00	43.8	ug/L	6	88	(0%-20%)			
Bromochloromethane	50.0	U	0.00	46.7	ug/L	5	93	(0%-20%)			
Bromoform	50.0	U	0.00	55.5	ug/L	8	111	(0%-20%)			
Bromomethane	50.0	U	0.00	42.9	ug/L	14	86	(0%-20%)			
Carbon disulfide	250	U	0.00	199	ug/L	7	80	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00	40.7	ug/L	8	81	(0%-20%)			
Chlorobenzene	50.0	U	0.00	41.2	ug/L	11	82	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
Chloroethane	50.0	U	0.00		42.4	ug/L	15	85	(0%-20%)	RXY1	07/05/17 17:18
Chloroform	50.0	U	0.00		42.4	ug/L	6	85	(0%-20%)		
Chloromethane	50.0	U	0.00		40.5	ug/L	16	81	(0%-20%)		
Dibromochloromethane	50.0	U	0.00		50.3	ug/L	5	101	(0%-20%)		
Ethylbenzene	50.0	U	0.00		38.4	ug/L	13	77	(0%-20%)		
Methylene chloride	50.0	J	3.63		49.5	ug/L	4	92	(0%-20%)		
Styrene	50.0	U	0.00		41.5	ug/L	12	83	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00	B	37.9	ug/L	11	76	(0%-20%)		
Toluene	50.0	U	0.00		41.7	ug/L	9	83	(0%-20%)		
Trichloroethylene	50.0	U	0.00		42.9	ug/L	7	86	(0%-20%)		
Vinyl chloride	50.0	U	0.00		40.3	ug/L	15	81	(0%-20%)		
Xylenes (total)	150	U	0.00		121	ug/L	13	81	(0%-20%)		
cis-1,3-Dichloropropylene	50.0	U	0.00		45.9	ug/L	7	92	(0%-20%)		
trans-1,3-Dichloropropylene	50.0	U	0.00		46.8	ug/L	7	94	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		48.9		45.7	ug/L		91	(70%-130%)		

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1679786										
**Bromofluorobenzene	50.0	52.5		51.2	ug/L		102	(70%-130%)	RXY1	07/05/17	17:18
**Toluene-d8	50.0	52.1		49.8	ug/L		100	(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 (Organics only)

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

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

July 7, 2017
Volatiles

Surrogate Recovery Report

SDG Number: GEL426225

Matrix Type: SOLID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203824850	LCS for batch 1679785	88	99	100
1203824849	MB for batch 1679785	88	99	102
426225001	B3BCR0	98	104	105
1203825026	LCSD for batch 1679785	90	97	101
1203824958	B3BCR0PS	90	99	103
1203824959	B3BCR0PSD	91	100	102

Surrogate

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

Acceptance Limits

(70%-130%)

(70%-130%)

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile Analysis

July 7, 2017

Case Narrative

July 7, 2017

GC/MS Semivolatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426225
Work Order #: 426225

Product: Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method: 8270_SVOA_GCMS
Analytical Procedure: GL-OA-E-009 REV# 39
Analytical Batch: 1678221

Preparation Method: SW846 3541
Preparation Procedure: GL-OA-E-066 REV# 8
Preparation Batch: 1678220

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203821276	Method Blank (MB)
1203821277	Laboratory Control Sample (LCS)
1203821278	426225001(B3BCR0) Matrix Spike (MS)
1203821279	426225001(B3BCR0) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) spike recoveries were not within the acceptance limits. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1203821277 (LCS)	Several	See applicable report

Spike Recovery Statement

The MS or MSD (See Below) spike recoveries were not within the acceptance limits. The associated MS or MSD passed recoveries, as did the LCS. It appears that the low spike recoveries were isolated to the MS or MSD only and were the result of a poor extraction.

Sample	Analyte	Value
1203821278 (B3BCR0MS)	2,4-Dinitrophenol	0* (12.0%-112.0%)
	bis(2-Chloroethyl) ether	26* (27.0%-110.0%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD, (See Below), were not within the acceptance limits due to the large difference between the individual recoveries in each MS and MSD analyte pair. The failures may be attributed to an error in the extraction process.

Sample	Analyte	Value
1203821278MS and 1203821279MSD (B3BCR0)	Several	See applicable report

Miscellaneous Information

Manual Integrations

Samples 1203821278 (B3BCR0MS) and 1203821279 (B3BCR0MSD) required manual integration in order to properly identify one or more peaks and/or 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.

July 7, 2017

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL426225 GEL Work Order: 426225

The Qualifiers in this report are defined as follows:

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

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

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

DL Indicates that sample is diluted.

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

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: **Barbara Bailey**

Date: **07 JUL 2017**

Title: **Data Validator**

Sample Data Summary

July 7 2017
Semi-VolatileCertificate of Analysis
Sample Summary

SDG Number:	GEL426225	Date Collected:	06/21/2017 13:55	Matrix:	SOIL
Lab Sample ID:	426225001	Date Received:	06/23/2017 09:20	%Moisture:	12.1
Client ID:	B3BCR0	Client:	CPRC001	Project:	CPRC0F17043
Batch ID:	1678221	Method:	8270_SVOA_GCMS	SOP Ref:	GL-OA-E-009
Run Date:	06/29/2017 18:13	Inst:	MSD4.I	Dilution:	1
Prep Date:	06/29/2017 09:24	Analyst:	JMB3	Inj. Vol:	1 uL
Data File:	s062917a.B\s4f2919.D	Aliquot:	30.35 g	Final Volume:	1 mL
		Column:	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
120-82-1	1,2,4-Trichlorobenzene	U	112	ug/kg	112	375
95-50-1	1,2-Dichlorobenzene	U	112	ug/kg	112	375
541-73-1	1,3-Dichlorobenzene	U	112	ug/kg	112	375
106-46-7	1,4-Dichlorobenzene	U	112	ug/kg	112	375
95-95-4	2,4,5-Trichlorophenol	U	112	ug/kg	112	375
120-83-2	2,4-Dichlorophenol	U	112	ug/kg	112	375
105-67-9	2,4-Dimethylphenol	U	112	ug/kg	112	375
51-28-5	2,4-Dinitrophenol	TU	112	ug/kg	112	749
121-14-2	2,4-Dinitrotoluene	U	112	ug/kg	112	375
606-20-2	2,6-Dinitrotoluene	U	112	ug/kg	112	375
91-58-7	2-Chloronaphthalene	U	11.2	ug/kg	11.2	37.5
95-57-8	2-Chlorophenol	U	112	ug/kg	112	375
534-52-1	2-Methyl-4,6-dinitrophenol	U	112	ug/kg	112	375
91-57-6	2-Methylnaphthalene	U	11.2	ug/kg	11.2	37.5
88-75-5	2-Nitrophenol	U	112	ug/kg	112	375
91-94-1	3,3'-Dichlorobenzidine	U	112	ug/kg	112	375
101-55-3	4-Bromophenylphenylether	U	112	ug/kg	112	375
59-50-7	4-Chloro-3-methylphenol	U	150	ug/kg	150	375
106-47-8	4-Chloroaniline	U	112	ug/kg	112	375
7005-72-3	4-Chlorophenylphenylether	U	112	ug/kg	112	375
100-02-7	4-Nitrophenol	U	112	ug/kg	112	375
83-32-9	Acenaphthene	U	11.2	ug/kg	11.2	37.5
208-96-8	Acenaphthylene	U	11.2	ug/kg	11.2	37.5
120-12-7	Anthracene	U	11.2	ug/kg	11.2	37.5
56-55-3	Benzo(a)anthracene	U	11.2	ug/kg	11.2	37.5
50-32-8	Benzo(a)pyrene	U	11.2	ug/kg	11.2	37.5
205-99-2	Benzo(b)fluoranthene	U	11.2	ug/kg	11.2	37.5
191-24-2	Benzo(ghi)perylene	U	11.2	ug/kg	11.2	37.5
207-08-9	Benzo(k)fluoranthene	U	11.2	ug/kg	11.2	37.5
85-68-7	Butylbenzylphthalate	U	112	ug/kg	112	375
86-74-8	Carbazole	U	11.2	ug/kg	11.2	37.5
218-01-9	Chrysene	U	11.2	ug/kg	11.2	37.5
84-74-2	Di-n-butylphthalate	U	112	ug/kg	112	375
117-84-0	Di-n-octylphthalate	U	112	ug/kg	112	375
53-70-3	Dibenzo(a,h)anthracene	U	11.2	ug/kg	11.2	37.5
132-64-9	Dibenzofuran	U	112	ug/kg	112	375
84-66-2	Diethylphthalate	U	112	ug/kg	112	375
131-11-3	Dimethylphthalate	U	112	ug/kg	112	375

July 7 2017
Semi-Volatile

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Certificate of Analysis
Sample Summary

SDG Number: GEL426225	Date Collected: 06/21/2017 13:55	Matrix: SOIL
Lab Sample ID: 426225001	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0	Client: CPRC001	Project: CPRC0F17043
Batch ID: 1678221	Method: 8270_SVOA_GCMS	SOP Ref: GL-OA-E-009
Run Date: 06/29/2017 18:13	Inst: MSD4.I	Dilution: 1
Prep Date: 06/29/2017 09:24	Analyst: JMB3	Inj. Vol: 1 uL
Data File: s062917a.B\s4f2919.D	Aliquot: 30.35 g	Final Volume: 1 mL
	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
206-44-0	Fluoranthene	U	11.2	ug/kg	11.2	37.5
86-73-7	Fluorene	U	11.2	ug/kg	11.2	37.5
118-74-1	Hexachlorobenzene	U	112	ug/kg	112	375
87-68-3	Hexachlorobutadiene	U	112	ug/kg	112	375
77-47-4	Hexachlorocyclopentadiene	U	112	ug/kg	112	375
67-72-1	Hexachloroethane	U	112	ug/kg	112	375
193-39-5	Indeno(1,2,3-cd)pyrene	U	11.2	ug/kg	11.2	37.5
78-59-1	Isophorone	U	112	ug/kg	112	375
621-64-7	N-Nitrosodipropylamine	U	112	ug/kg	112	375
91-20-3	Naphthalene	U	11.2	ug/kg	11.2	37.5
98-95-3	Nitrobenzene	U	112	ug/kg	112	375
87-86-5	Pentachlorophenol	U	112	ug/kg	112	375
85-01-8	Phenanthrene	U	11.2	ug/kg	11.2	37.5
108-95-2	Phenol	U	112	ug/kg	112	375
129-00-0	Pyrene	U	11.2	ug/kg	11.2	37.5
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	112	ug/kg	112	375
111-91-1	bis(2-Chloroethoxy)methane	U	112	ug/kg	112	375
111-44-4	bis(2-Chloroethyl) ether	TU	112	ug/kg	112	375
117-81-7	bis(2-Ethylhexyl)phthalate	U	112	ug/kg	112	375
99-09-2	m-Nitroaniline	U	112	ug/kg	112	375
95-48-7	o-Cresol	U	112	ug/kg	112	375
88-74-4	o-Nitroaniline	U	124	ug/kg	124	375
100-01-6	p-Nitroaniline	U	112	ug/kg	112	375

Quality Control Summary

July 7, 2017

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QC Summary

Report Date: July 3, 2017

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 426225

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
QC1203821277	LCS										
1,2,4-Trichlorobenzene	1650			1020	ug/kg		62 *	(70%-130%)	JMB3	06/29/17	16:49
1,2-Dichlorobenzene	1650			988	ug/kg		60 *	(70%-130%)			
1,3-Dichlorobenzene	1650			915	ug/kg		56 *	(70%-130%)			
1,4-Dichlorobenzene	1650			962	ug/kg		58 *	(70%-130%)			
2,4,5-Trichlorophenol	1650			1030	ug/kg		63 *	(70%-130%)			
2,4-Dichlorophenol	1650			1030	ug/kg		62 *	(70%-130%)			
2,4-Dimethylphenol	1650			904	ug/kg		55 *	(70%-130%)			
2,4-Dinitrophenol	1650		J	549	ug/kg		33 *	(70%-130%)			
2,4-Dinitrotoluene	1650			1180	ug/kg		72	(70%-130%)			
2,6-Dinitrotoluene	1650			1050	ug/kg		64 *	(70%-130%)			
2-Chloronaphthalene	1650			996	ug/kg		61 *	(70%-130%)			
2-Chlorophenol	1650			984	ug/kg		60 *	(70%-130%)			
2-Methyl-4,6-dinitrophenol	1650			636	ug/kg		39 *	(70%-130%)			

July 7, 2017

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
2-Methylnaphthalene	1650			1020	ug/kg		62 *	(70%-130%)	JMB3	06/29/17	16:49
2-Nitrophenol	1650			1010	ug/kg		61 *	(70%-130%)			
3,3'-Dichlorobenzidine	1650			961	ug/kg		58 *	(70%-130%)			
4-Bromophenylphenylether	1650			1070	ug/kg		65 *	(70%-130%)			
4-Chloro-3-methylphenol	1650			1010	ug/kg		61 *	(70%-130%)			
4-Chloroaniline	1650			1010	ug/kg		61 *	(70%-130%)			
4-Chlorophenylphenylether	1650			1140	ug/kg		70	(70%-130%)			
4-Nitrophenol	1650			724	ug/kg		44 *	(70%-130%)			
Acenaphthene	1650			1150	ug/kg		70	(70%-130%)			
Acenaphthylene	1650			1120	ug/kg		68 *	(70%-130%)			
Anthracene	1650			1150	ug/kg		70	(70%-130%)			
Benzo(a)anthracene	1650			1090	ug/kg		67 *	(70%-130%)			
Benzo(a)pyrene	1650			1090	ug/kg		66 *	(70%-130%)			
Benzo(b)fluoranthene	1650			1020	ug/kg		62 *	(70%-130%)			
Benzo(ghi)perylene	1650			1430	ug/kg		87	(70%-130%)			

July 7, 2017

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QC Summary

Workorder: 426225

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch 1678221											
Benzo(k)fluoranthene	1650			1060	ug/kg		64 *	(70%-130%)	JMB3	06/29/17	16:49
Butylbenzylphthalate	1650			989	ug/kg		60 *	(70%-130%)			
Carbazole	1650			1210	ug/kg		73	(70%-130%)			
Chrysene	1650			1130	ug/kg		69 *	(70%-130%)			
Di-n-butylphthalate	1650			1100	ug/kg		67 *	(70%-130%)			
Di-n-octylphthalate	1650			953	ug/kg		58 *	(70%-130%)			
Dibenzo(a,h)anthracene	1650			1480	ug/kg		90	(70%-130%)			
Dibenzofuran	1650			1090	ug/kg		66 *	(70%-130%)			
Diethylphthalate	1650			1090	ug/kg		66 *	(70%-130%)			
Dimethylphthalate	1650			1050	ug/kg		64 *	(70%-130%)			
Fluoranthene	1650			1220	ug/kg		74	(70%-130%)			
Fluorene	1650			1180	ug/kg		72	(70%-130%)			
Hexachlorobenzene	1650			1070	ug/kg		65 *	(70%-130%)			
Hexachlorobutadiene	1650			1030	ug/kg		63 *	(70%-130%)			
Hexachlorocyclopentadiene	1650			612	ug/kg		37 *	(70%-130%)			

July 7, 2017

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QC Summary

Workorder: 426225

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
Hexachloroethane	1650			990	ug/kg		60*	(70%-130%)	JMB3	06/29/17	16:49
Indeno(1,2,3-cd)pyrene	1650			1350	ug/kg		82	(70%-130%)			
Isophorone	1650			965	ug/kg		59*	(70%-130%)			
N-Nitrosodipropylamine	1650			1010	ug/kg		61*	(70%-130%)			
Naphthalene	1650			1050	ug/kg		64*	(70%-130%)			
Nitrobenzene	1650			1010	ug/kg		61*	(70%-130%)			
Pentachlorophenol	1650			786	ug/kg		48*	(70%-130%)			
Phenanthrene	1650			1170	ug/kg		71	(70%-130%)			
Phenol	1650			970	ug/kg		59*	(70%-130%)			
Pyrene	1650			969	ug/kg		59*	(70%-130%)			
bis(2-Chloro-1-methylethyl)ether	1650			993	ug/kg		60*	(70%-130%)			
bis(2-Chloroethoxy)methane	1650			1020	ug/kg		62*	(70%-130%)			
bis(2-Chloroethyl) ether	1650			966	ug/kg		59*	(70%-130%)			
bis(2-Ethylhexyl)phthalate	1650			960	ug/kg		58*	(70%-130%)			
m-Nitroaniline	1650			1180	ug/kg		72	(70%-130%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
o-Cresol	1650			924	ug/kg		56*	(70%-130%)	JMB3	06/29/17	16:49
o-Nitroaniline	1650			1080	ug/kg		66*	(70%-130%)			
p-Nitroaniline	1650			1240	ug/kg		76	(70%-130%)			
**2,4,6-Tribromophenol	3290			2100	ug/kg		64	(12%-129%)			
**2-Fluorobiphenyl	1650			999	ug/kg		61	(15%-110%)			
**2-Fluorophenol	3290			1820	ug/kg		55	(10%-115%)			
**Nitrobenzene-d5	1650			996	ug/kg		61	(13%-112%)			
**Phenol-d5	3290			1890	ug/kg		57	(15%-117%)			
**p-Terphenyl-d14	1650			962	ug/kg		58	(24%-141%)			
QC1203821276 MB											
1,2,4-Trichlorobenzene			U	100	ug/kg					06/29/17	16:21
1,2-Dichlorobenzene			U	100	ug/kg						
1,3-Dichlorobenzene			U	100	ug/kg						
1,4-Dichlorobenzene			U	100	ug/kg						
2,4,5-Trichlorophenol			U	100	ug/kg						
2,4-Dichlorophenol			U	100	ug/kg						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
2,4-Dimethylphenol			U	100	ug/kg				JMB3	06/29/17	16:21
2,4-Dinitrophenol			U	100	ug/kg						
2,4-Dinitrotoluene			U	100	ug/kg						
2,6-Dinitrotoluene			U	100	ug/kg						
2-Chloronaphthalene			U	10.0	ug/kg						
2-Chlorophenol			U	100	ug/kg						
2-Methyl-4,6-dinitrophenol			U	100	ug/kg						
2-Methylnaphthalene			U	10.0	ug/kg						
2-Nitrophenol			U	100	ug/kg						
3,3'-Dichlorobenzidine			U	100	ug/kg						
4-Bromophenylphenylether			U	100	ug/kg						
4-Chloro-3-methylphenol			U	133	ug/kg						
4-Chloroaniline			U	100	ug/kg						
4-Chlorophenylphenylether			U	100	ug/kg						
4-Nitrophenol			U	100	ug/kg						

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QC Summary

Workorder: 426225

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
Acenaphthene			U	10.0	ug/kg				JMB3	06/29/17	16:21
Acenaphthylene			U	10.0	ug/kg						
Anthracene			U	10.0	ug/kg						
Benzo(a)anthracene			U	10.0	ug/kg						
Benzo(a)pyrene			U	10.0	ug/kg						
Benzo(b)fluoranthene			U	10.0	ug/kg						
Benzo(ghi)perylene			U	10.0	ug/kg						
Benzo(k)fluoranthene			U	10.0	ug/kg						
Butylbenzylphthalate			U	100	ug/kg						
Carbazole			U	10.0	ug/kg						
Chrysene			U	10.0	ug/kg						
Di-n-butylphthalate			U	100	ug/kg						
Di-n-octylphthalate			U	100	ug/kg						
Dibenzo(a,h)anthracene			U	10.0	ug/kg						
Dibenzofuran			U	100	ug/kg						

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QC Summary

Workorder: 426225

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
Diethylphthalate			U	100	ug/kg				JMB3	06/29/17	16:21
Dimethylphthalate			U	100	ug/kg						
Fluoranthene			U	10.0	ug/kg						
Fluorene			U	10.0	ug/kg						
Hexachlorobenzene			U	100	ug/kg						
Hexachlorobutadiene			U	100	ug/kg						
Hexachlorocyclopentadiene			U	100	ug/kg						
Hexachloroethane			U	100	ug/kg						
Indeno(1,2,3-cd)pyrene			U	10.0	ug/kg						
Isophorone			U	100	ug/kg						
N-Nitrosodipropylamine			U	100	ug/kg						
Naphthalene			U	10.0	ug/kg						
Nitrobenzene			U	100	ug/kg						
Pentachlorophenol			U	100	ug/kg						
Phenanthrene			U	10.0	ug/kg						

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QC Summary

Workorder: 426225

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
Phenol			U	100	ug/kg				JMB3	06/29/17	16:21
Pyrene			U	10.0	ug/kg						
bis(2-Chloro-1-methylethyl)ether			U	100	ug/kg						
bis(2-Chloroethoxy)methane			U	100	ug/kg						
bis(2-Chloroethyl) ether			U	100	ug/kg						
bis(2-Ethylhexyl)phthalate			U	100	ug/kg						
m-Nitroaniline			U	100	ug/kg						
o-Cresol			U	100	ug/kg						
o-Nitroaniline			U	110	ug/kg						
p-Nitroaniline			U	100	ug/kg						
**2,4,6-Tribromophenol	3330			1840	ug/kg		55	(12%-129%)			
**2-Fluorobiphenyl	1670			1050	ug/kg		63	(15%-110%)			
**2-Fluorophenol	3330			1860	ug/kg		56	(10%-115%)			
**Nitrobenzene-d5	1670			1030	ug/kg		62	(13%-112%)			
**Phenol-d5	3330			1950	ug/kg		58	(15%-117%)			

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QC Summary

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
**p-Terphenyl-d14	1670			1030	ug/kg		62	(24%-141%)	JMB3	06/29/17	16:21
QC1203821278 426225001 MS											
1,2,4-Trichlorobenzene	1870	U	112	732	ug/kg		39	(26%-104%)		06/29/17	18:42
1,2-Dichlorobenzene	1870	U	112	721	ug/kg		39	(26%-98%)			
1,3-Dichlorobenzene	1870	U	112	607	ug/kg		33	(27%-92%)			
1,4-Dichlorobenzene	1870	U	112	636	ug/kg		34	(27%-95%)			
2,4,5-Trichlorophenol	1870	U	112	777	ug/kg		42	(26%-120%)			
2,4-Dichlorophenol	1870	U	112	852	ug/kg		46	(21%-119%)			
2,4-Dimethylphenol	1870	U	112	752	ug/kg		40	(27%-111%)			
2,4-Dinitrophenol	1870	TU	112 TU	112	ug/kg		0*	(12%-112%)			
2,4-Dinitrotoluene	1870	U	112	927	ug/kg		50	(32%-118%)			
2,6-Dinitrotoluene	1870	U	112	719	ug/kg		39	(32%-114%)			
2-Chloronaphthalene	1870	U	11.2	916	ug/kg		49	(25%-111%)			
2-Chlorophenol	1870	U	112	761	ug/kg		41	(20%-114%)			
2-Methyl-4,6-dinitrophenol	1870	U	112	438	ug/kg		23	(17%-115%)			
2-Methylnaphthalene	1870	U	11.2	777	ug/kg		42	(25%-112%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
2-Nitrophenol	1870	U	112	745	ug/kg		40	(23%-115%)	JMB3	06/29/17	18:42
3,3'-Dichlorobenzidine	1870	U	112	1310	ug/kg		70	(21%-107%)			
4-Bromophenylphenylether	1870	U	112	1180	ug/kg		63	(29%-121%)			
4-Chloro-3-methylphenol	1870	U	150	607	ug/kg		33	(29%-119%)			
4-Chloroaniline	1870	U	112	595	ug/kg		32	(22%-120%)			
4-Chlorophenylphenylether	1870	U	112	1170	ug/kg		63	(29%-119%)			
4-Nitrophenol	1870	U	112	1200	ug/kg		65	(20%-120%)			
Acenaphthene	1870	U	11.2	1120	ug/kg		60	(27%-111%)			
Acenaphthylene	1870	U	11.2	1110	ug/kg		59	(26%-117%)			
Anthracene	1870	U	11.2	1200	ug/kg		65	(29%-118%)			
Benzo(a)anthracene	1870	U	11.2	1210	ug/kg		65	(25%-126%)			
Benzo(a)pyrene	1870	U	11.2	1250	ug/kg		67	(28%-122%)			
Benzo(b)fluoranthene	1870	U	11.2	1320	ug/kg		71	(28%-127%)			
Benzo(ghi)perylene	1870	U	11.2	1030	ug/kg		55	(22%-113%)			
Benzo(k)fluoranthene	1870	U	11.2	1400	ug/kg		75	(28%-131%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch 1678221											
Butylbenzylphthalate	1870	U	112	1290	ug/kg		69	(26%-133%)	JMB3	06/29/17	18:42
Carbazole	1870	U	11.2	1280	ug/kg		69	(27%-123%)			
Chrysene	1870	U	11.2	1250	ug/kg		67	(26%-122%)			
Di-n-butylphthalate	1870	U	112	1250	ug/kg		67	(26%-126%)			
Di-n-octylphthalate	1870	U	112	1220	ug/kg		66	(29%-130%)			
Dibenzo(a,h)anthracene	1870	U	11.2	1190	ug/kg		64	(19%-133%)			
Dibenzofuran	1870	U	112	1090	ug/kg		58	(30%-119%)			
Diethylphthalate	1870	U	112	906	ug/kg		49	(26%-124%)			
Dimethylphthalate	1870	U	112	820	ug/kg		44	(27%-120%)			
Fluoranthene	1870	U	11.2	1230	ug/kg		66	(24%-123%)			
Fluorene	1870	U	11.2	1220	ug/kg		66	(27%-117%)			
Hexachlorobenzene	1870	U	112	1130	ug/kg		60	(30%-113%)			
Hexachlorobutadiene	1870	U	112	600	ug/kg		32	(25%-109%)			
Hexachlorocyclopentadiene	1870	U	112	J 233	ug/kg		12	(10%-100%)			
Hexachloroethane	1870	U	112	617	ug/kg		33	(23%-98%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
Indeno(1,2,3-cd)pyrene	1870	U	11.2		1050	ug/kg	57	(21%-126%)	JMB3	06/29/17	18:42
Isophorone	1870	U	112		824	ug/kg	44	(29%-107%)			
N-Nitrosodipropylamine	1870	U	112		939	ug/kg	50	(25%-113%)			
Naphthalene	1870	U	11.2		783	ug/kg	42	(23%-111%)			
Nitrobenzene	1870	U	112		844	ug/kg	45	(26%-109%)			
Pentachlorophenol	1870	U	112		1010	ug/kg	54	(17%-119%)			
Phenanthrene	1870	U	11.2		1310	ug/kg	70	(26%-121%)			
Phenol	1870	U	112		804	ug/kg	43	(28%-111%)			
Pyrene	1870	U	11.2		1160	ug/kg	62	(23%-127%)			
bis(2-Chloro-1-methylethyl)ether	1870	U	112		854	ug/kg	46	(21%-116%)			
bis(2-Chloroethoxy)methane	1870	U	112		927	ug/kg	50	(30%-111%)			
bis(2-Chloroethyl) ether	1870	TU	112	T	488	ug/kg	26*	(27%-110%)			
bis(2-Ethylhexyl)phthalate	1870	U	112		1430	ug/kg	72	(27%-131%)			
m-Nitroaniline	1870	U	112		1120	ug/kg	60	(24%-137%)			
o-Cresol	1870	U	112		1020	ug/kg	55	(28%-114%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
o-Nitroaniline	1870	U	124	877	ug/kg		47	(27%-120%)	JMB3	06/29/17	18:42
p-Nitroaniline	1870	U	112	1240	ug/kg		66	(19%-140%)			
**2,4,6-Tribromophenol	3730		2150	1810	ug/kg		48	(12%-129%)			
**2-Fluorobiphenyl	1870		899	895	ug/kg		48	(15%-110%)			
**2-Fluorophenol	3730		1790	1900	ug/kg		51	(10%-115%)			
**Nitrobenzene-d5	1870		886	863	ug/kg		46	(13%-112%)			
**Phenol-d5	3730		1820	1490	ug/kg		40	(15%-117%)			
**p-Terphenyl-d14	1870		1220	1220	ug/kg		66	(24%-141%)			
QC1203821279 426225001 MSD											
1,2,4-Trichlorobenzene	1890	U	112	1380	ug/kg	61*	73	(0%-30%)		06/29/17	19:10
1,2-Dichlorobenzene	1890	U	112	1050	ug/kg	37*	56	(0%-30%)			
1,3-Dichlorobenzene	1890	U	112	877	ug/kg	36*	46	(0%-30%)			
1,4-Dichlorobenzene	1890	U	112	939	ug/kg	39*	50	(0%-30%)			
2,4,5-Trichlorophenol	1890	U	112	1550	ug/kg	66*	82	(0%-30%)			
2,4-Dichlorophenol	1890	U	112	1570	ug/kg	59*	83	(0%-30%)			
2,4-Dimethylphenol	1890	U	112	1400	ug/kg	60*	74	(0%-30%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
2,4-Dinitrophenol	1890	TU	112	J	641	ug/kg	200*	34	(0%-30%)	JMB3	06/29/17 19:10
2,4-Dinitrotoluene	1890	U	112		1690	ug/kg	58*	89	(0%-30%)		
2,6-Dinitrotoluene	1890	U	112		1480	ug/kg	69*	78	(0%-30%)		
2-Chloronaphthalene	1890	U	11.2		1250	ug/kg	31*	66	(0%-30%)		
2-Chlorophenol	1890	U	112		1450	ug/kg	63*	77	(0%-30%)		
2-Methyl-4,6-dinitrophenol	1890	U	112		750	ug/kg	53*	40	(0%-30%)		
2-Methylnaphthalene	1890	U	11.2		1590	ug/kg	69*	84	(0%-30%)		
2-Nitrophenol	1890	U	112		1570	ug/kg	71*	83	(0%-30%)		
3,3'-Dichlorobenzidine	1890	U	112		1670	ug/kg	24	89	(0%-30%)		
4-Bromophenylphenylether	1890	U	112		1670	ug/kg	35*	89	(0%-30%)		
4-Chloro-3-methylphenol	1890	U	150		1650	ug/kg	92*	87	(0%-30%)		
4-Chloroaniline	1890	U	112		1620	ug/kg	93*	86	(0%-30%)		
4-Chlorophenylphenylether	1890	U	112		1630	ug/kg	33*	86	(0%-30%)		
4-Nitrophenol	1890	U	112		1220	ug/kg	1	65	(0%-30%)		
Acenaphthene	1890	U	11.2		1490	ug/kg	29	79	(0%-30%)		

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch 1678221											
Acenaphthylene	1890	U	11.2	1500	ug/kg	30	79	(0%-30%)	JMB3	06/29/17	19:10
Anthracene	1890	U	11.2	1740	ug/kg	36*	92	(0%-30%)			
Benzo(a)anthracene	1890	U	11.2	1700	ug/kg	33*	90	(0%-30%)			
Benzo(a)pyrene	1890	U	11.2	1740	ug/kg	33*	92	(0%-30%)			
Benzo(b)fluoranthene	1890	U	11.2	1810	ug/kg	31*	96	(0%-30%)			
Benzo(ghi)perylene	1890	U	11.2	1800	ug/kg	54*	95	(0%-30%)			
Benzo(k)fluoranthene	1890	U	11.2	1820	ug/kg	26	96	(0%-30%)			
Butylbenzylphthalate	1890	U	112	1820	ug/kg	34*	96	(0%-30%)			
Carbazole	1890	U	11.2	1850	ug/kg	36*	98	(0%-30%)			
Chrysene	1890	U	11.2	1700	ug/kg	31*	90	(0%-30%)			
Di-n-butylphthalate	1890	U	112	1700	ug/kg	31*	90	(0%-30%)			
Di-n-octylphthalate	1890	U	112	1550	ug/kg	24	82	(0%-30%)			
Dibenzo(a,h)anthracene	1890	U	11.2	2010	ug/kg	51*	106	(0%-30%)			
Dibenzofuran	1890	U	112	1570	ug/kg	36*	83	(0%-30%)			
Diethylphthalate	1890	U	112	1560	ug/kg	53*	83	(0%-30%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch 1678221											
Dimethylphthalate	1890	U	112	1470	ug/kg	57*	78	(0%-30%)	JMB3	06/29/17	19:10
Fluoranthene	1890	U	11.2	1620	ug/kg	28	86	(0%-30%)			
Fluorene	1890	U	11.2	1720	ug/kg	34*	91	(0%-30%)			
Hexachlorobenzene	1890	U	112	1570	ug/kg	33*	83	(0%-30%)			
Hexachlorobutadiene	1890	U	112	1230	ug/kg	69*	65	(0%-30%)			
Hexachlorocyclopentadiene	1890	U	112	495	ug/kg	72*	26	(0%-30%)			
Hexachloroethane	1890	U	112	887	ug/kg	36*	47	(0%-30%)			
Indeno(1,2,3-cd)pyrene	1890	U	11.2	1770	ug/kg	51*	94	(0%-30%)			
Isophorone	1890	U	112	1340	ug/kg	48*	71	(0%-30%)			
N-Nitrosodipropylamine	1890	U	112	1220	ug/kg	26	65	(0%-30%)			
Naphthalene	1890	U	11.2	1290	ug/kg	49*	68	(0%-30%)			
Nitrobenzene	1890	U	112	1290	ug/kg	42*	68	(0%-30%)			
Pentachlorophenol	1890	U	112	1370	ug/kg	31*	73	(0%-30%)			
Phenanthrene	1890	U	11.2	1720	ug/kg	27	91	(0%-30%)			
Phenol	1890	U	112	1460	ug/kg	58*	77	(0%-30%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1678221										
Pyrene	1890	U	11.2	1720	ug/kg	39*	91	(0%-30%)	JMB3	06/29/17	19:10
bis(2-Chloro-1-methylethyl)ether	1890	U	112	1260	ug/kg	38*	67	(0%-30%)			
bis(2-Chloroethoxy)methane	1890	U	112	1470	ug/kg	45*	78	(0%-30%)			
bis(2-Chloroethyl) ether	1890	TU	112	1220	ug/kg	86*	64	(0%-30%)			
bis(2-Ethylhexyl)phthalate	1890	U	112	1860	ug/kg	26	94	(0%-30%)			
m-Nitroaniline	1890	U	112	1650	ug/kg	38*	87	(0%-30%)			
o-Cresol	1890	U	112	1230	ug/kg	19	65	(0%-30%)			
o-Nitroaniline	1890	U	124	1560	ug/kg	56*	83	(0%-30%)			
p-Nitroaniline	1890	U	112	1660	ug/kg	29	88	(0%-30%)			
**2,4,6-Tribromophenol	3780		2150	2910	ug/kg		77	(12%-129%)			
**2-Fluorobiphenyl	1890		899	1270	ug/kg		67	(15%-110%)			
**2-Fluorophenol	3780		1790	2570	ug/kg		68	(10%-115%)			
**Nitrobenzene-d5	1890		886	1410	ug/kg		75	(13%-112%)			
**Phenol-d5	3780		1820	2640	ug/kg		70	(15%-117%)			
**p-Terphenyl-d14	1890		1220	1580	ug/kg		84	(24%-141%)			

Notes:

July 7, 2017

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

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

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

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

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

July 7, 2017
Semi-Volatile

Surrogate Recovery Report

SDG Number: GEL426225

Matrix Type: SOLID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203821276	MB for batch 1678220	56	58	62	63	55	62
1203821277	LCS for batch 1678220	55	57	61	61	64	58
426225001	B3BCR0	48	49	47	48	57	65
1203821278	B3BCR0MS	51	40	46	48	48	66
1203821279	B3BCR0MSD	68	70	75	67	77	84

Surrogate

Acceptance Limits

2FP	= 2-Fluorophenol	(10%-115%)
PHL	= Phenol-d5	(15%-117%)
NBZ	= Nitrobenzene-d5	(13%-112%)
FBP	= 2-Fluorobiphenyl	(15%-110%)
TBP	= 2,4,6-Tribromophenol	(12%-129%)
TPH	= p-Terphenyl-d14	(24%-141%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

FID Diesel Range Organics Analysis

Case Narrative

July 7, 2017

Diesel Range Organics
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426225
Work Order #: 426225

Product: Analysis of Diesel Range Organics by Flame Ionization Detector

Analytical Method: WTPH_DIESEL

Analytical Procedure: GL-OA-E-003 REV# 29

Analytical Batch: 1676637

Preparation Method: SW846 3541

Preparation Procedure: GL-OA-E-010 REV# 26

Preparation Batch: 1676634

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203817496	Method Blank (MB)
1203817497	Laboratory Control Sample (LCS)
1203817498	425612003(NonSDG) Matrix Spike (MS)
1203817499	425612003(NonSDG) Matrix Spike Duplicate (MSD)
1203817599	Laboratory Control Sample (LCS)
1203817600	Laboratory Control Sample Duplicate (LCSD)

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

Data Summary:

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

Calibration Information

Continuing Calibration Verification (CCV) Requirements

The calibration verification standards (ICV or CCV) did not meet acceptance criteria with a positive bias. This non-compliance had no adverse effects on the data as there were no target analytes detected above the PQL in the associated environmental samples.

Miscellaneous Information

Manual Integrations

Samples 1203817497 (LCS), 1203817498 (Non SDG 425612003MS) and 1203817499 (Non SDG 425612003MSD) 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.

July 7, 2017

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL426225 GEL Work Order: 426225

The Qualifiers in this report are defined as follows:

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

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

DL Indicates that sample is diluted.

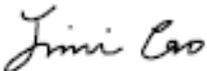
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Jimin Cao

Date: 07 JUL 2017

Title: Data Validator

Sample Data Summary

July 7, 2017
 FID Diesel Range Organics

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Certificate of Analysis

Sample Summary

SDG Number: GEL426225	Date Collected: 06/21/2017 13:55	Matrix: SOIL
Lab Sample ID: 426225001	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0	Client: CPRC001	Project: CPRC0F17043
Batch ID: 1676637	Method: WTPH_DIESEL	SOP Ref: GL-OA-E-003
Run Date: 07/02/2017 02:20	Inst: FID7.I	Dilution: 1
Prep Date: 06/27/2017 11:32	Analyst: LXA1	Inj. Vol: 1 uL
Data File: 070117-KERO-MO\F7G0120.D	Aliquot: 30.45 g	Final Volume: 1 mL
	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
68334-30-5	Diesel Range Organics	J	3340	UG/KG	2430	7470
8008-20-6	Kerosene	J	2470	UG/KG	1240	7470

Quality Control Summary

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GEL LABORATORIES LLC

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QC Summary

Report Date: July 3, 2017

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

Contact: Mr. Scot Fitzgerald

Workorder: 426225

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1676637										
QC1203817497	LCS										
Diesel Range Organics	66300			60600	UG/KG		91	(70%-130%)	LXA1	07/01/17	17:49
**o-Terphenyl	663			609	UG/KG		92	(60%-140%)			
QC1203817599	LCS										
Kerosene	33200			25100	UG/KG		76	(70%-130%)		07/01/17	18:28
**o-Terphenyl	664			586	UG/KG		88	(60%-140%)			
QC1203817600	LCSD										
Kerosene	33100			26800	UG/KG	6	81	(0%-30%)		07/01/17	19:08
**o-Terphenyl	662			608	UG/KG		92	(60%-140%)			
QC1203817496	MB										
Diesel Range Organics			U	2160	UG/KG					07/01/17	17:09
Kerosene			U	1100	UG/KG						
**o-Terphenyl	664			439	UG/KG		66	(60%-140%)			
QC1203817498	425612003	MS									
Diesel Range Organics	66800	J	2810	57200	UG/KG		81	(70%-130%)		07/01/17	22:25
**o-Terphenyl	668		587	516	UG/KG		77	(60%-140%)			
QC1203817499	425612003	MSD									
Diesel Range Organics	67100	J	2810	56400	UG/KG	1	80	(0%-30%)		07/01/17	23:04

July 7, 2017

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QC Summary

Workorder: 426225

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1676637										
**o-Terphenyl	671	587		543	UG/KG		81	(60%-140%)	LXA1	07/01/17	23:04

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

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

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

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

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

Surrogate Recovery Report

SDG Number: GEL426225

Matrix Type: SOLID

Sample ID	Client ID	OTP %REC
1203817496	MB for batch 1676634	66
1203817497	LCS for batch 1676634	92
1203817599	LCS for batch 1676634	88
1203817600	LCSD for batch 1676634	92
1203817498	B38JF8MS	77
1203817499	B38JF8MSD	81
426225001	B3BCR0	65

Surrogate

OTP = o-Terphenyl

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Acceptance Limits

(60%-140%)

Metals Analysis

July 7, 2017

Case Narrative

July 7, 2017

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL426225

Work Order #: 426225

Product: Determination of Metals by ICP

Analytical Method: SW846 3050B/6010D

Analytical Procedure: GL-MA-E-013 REV# 28

Analytical Batch: 1676935

Product: Determination of Metals by ICP-MS

Analytical Method: SW846 3050B/6020B

Analytical Procedure: GL-MA-E-014 REV# 30

Analytical Batch: 1676978

Product: Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

Analytical Method: 7471_HG_CVAA

Analytical Procedure: GL-MA-E-010 REV# 34

Analytical Batch: 1677580

Preparation Method: SW846 3050B

Preparation Procedure: GL-MA-E-009 REV# 26

Preparation Batches: 1676934 and 1676977

Preparation Method: SW846 7471B Prep

Preparation Procedure: GL-MA-E-010 REV# 34

Preparation Batch: 1677575

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203818228	Method Blank (MB) ICP
1203818229	Laboratory Control Sample (LCS)
1203818232	426225001(B3BCR0L) Serial Dilution (SD)
1203818230	426225001(B3BCR0D) Sample Duplicate (DUP)
1203818231	426225001(B3BCR0S) Matrix Spike (MS)
1203818338	Method Blank (MB) ICP-MS
1203818339	Laboratory Control Sample (LCS)
1203818342	426225001(B3BCR0L) Serial Dilution (SD)
1203818340	426225001(B3BCR0D) Sample Duplicate (DUP)
1203818341	426225001(B3BCR0S) Matrix Spike (MS)
1203821214	426225001(B3BCR0PS) Post Spike (PS)
1203819815	Method Blank (MB) CVAA
1203819816	Laboratory Control Sample (LCS)
1203819825	426225001(B3BCR0L) Serial Dilution (SD)
1203819823	426225001(B3BCR0D) Sample Duplicate (DUP)
1203819824	426225001(B3BCR0S) Matrix Spike (MS)

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

Data Summary:

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

Calibration Information

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

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analytes. The post spike recoveries were within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recoveries may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203818341 (B3BCR0MS)	Chromium	160* (75%-125%)

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. Not all the applicable analyte RPD values were within the acceptance criteria.

Sample	Analyte	Value
1203818340 (B3BCR0DUP)	Chromium	abs(2270 - 4010)* (+/-659 ug/kg)
	Lead	abs(849 - 3040)* (+/-439 ug/kg)

Technical Information

Preparation/Analytical Method Verification

Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions

Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range. The ICPMS solid samples in this SDG were diluted the standard two times. ICP-MS.

Analyte	426225
	001
Arsenic	2X

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Barium	2X
Cadmium	2X
Chromium	2X
Lead	2X
Selenium	2X

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.

July 7, 2017

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL426225 GEL Work Order: 426225

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: Nik-Cole Elmore

Date: 03 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL426225

CONTRACT: CPRC0F17043

METHOD TYPE: SW846

SAMPLE ID: 426225001

BASIS: Dry Weight

DATE COLLECTED 21-JUN-17

CLIENT ID: B3BCR0

LEVEL: Low

DATE RECEIVED 23-JUN-17

MATRIX: SOIL

%SOLIDS: 88

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-38-2	Arsenic	1120	ug/kg	D	363	1070	1070	2	MS	BAJ	06/28/17 18:11	170628-2	1676978
7440-39-3	Barium	96600	ug/kg	D	107	430	430	2	MS	BAJ	06/28/17 18:11	170628-2	1676978
7440-43-9	Cadmium	60.6	ug/kg	BD	21.5	215	215	2	MS	BAJ	06/28/17 18:11	170628-2	1676978
7440-47-3	Chromium	4010	ug/kg	D*N	215	645	645	2	MS	BAJ	06/28/17 18:11	170628-2	1676978
7439-92-1	Lead	3040	ug/kg	D*	107	430	430	2	MS	BAJ	06/28/17 18:11	170628-2	1676978
7439-97-6	Mercury	6.01	ug/kg	B	4.53	13.5	13.5	1	AV	MTM1	06/28/17 10:46	062817S1-3	1677580
7782-49-2	Selenium	1680	ug/kg	D	387	1070	1070	2	MS	BAJ	06/28/17 18:11	170628-2	1676978
7440-22-4	Silver	353	ug/kg	B	107	533	533	1	P	HSC	06/26/17 23:27	062617A-1	1676935

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1676935	1676934	SW846 3050B	0.533	g	50	mL	06/23/17	CXW4
1676978	1676977	SW846 3050B	0.529	g	50	mL	06/23/17	CXW4
1677580	1677575	SW846 7471B Prep	0.505	g	30	mL	06/27/17	AXS5

***Analytical Methods:**

AV **SW846 7471B**
P **SW846 3050B/6010D**
MS **SW846 3050B/6020B**

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Quality Control Summary

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QC Summary

Report Date: July 3, 2017

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 426225

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1676978										
QC1203818340 426225001 DUP											
Arsenic	D	1120	BD	843	ug/kg	28.1	^	(+/-1100)	BAJ	06/28/17	18:14
Barium	D	96600	D	80900	ug/kg	17.7		(0%-20%)			
Cadmium	BD	60.6	BD	51.1	ug/kg	16.9	^	(+/-220)			
Chromium	*DN	4010	*D	2270	ug/kg	55.2	*^	(+/-659)			
Lead	*D	3040	*D	849	ug/kg	113	*^	(+/-439)			
Selenium	D	1680	D	1490	ug/kg	11.6	^	(+/-1100)			
QC1203818339 LCS											
Arsenic		4660	D	4270	ug/kg			91.4 (80%-120%)		06/28/17	18:07
Barium		4660	D	4620	ug/kg			99.1 (80%-120%)			
Cadmium		4660	D	4410	ug/kg			94.5 (80%-120%)			
Chromium		4660	D	4680	ug/kg			100 (80%-120%)			
Lead		4660	D	4760	ug/kg			102 (80%-120%)			
Selenium		4660	D	4030	ug/kg			86.4 (80%-120%)			
QC1203818338 MB											
Arsenic			DU	317	ug/kg					06/28/17	18:04

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1676978										
Barium			DU	93.8	ug/kg				BAJ	06/28/17	18:04
Cadmium			DU	18.8	ug/kg						
Chromium			DU	188	ug/kg						
Lead			DU	93.8	ug/kg						
Selenium			DU	338	ug/kg						
QC1203818341	426225001 MS										
Arsenic	5460	D	1120 D	6080	ug/kg		91	(75%-125%)		06/28/17	18:17
Barium	5460	D	96600 D	146000	ug/kg		N/A	(75%-125%)			
Cadmium	5460	BD	60.6 D	5170	ug/kg		93.7	(75%-125%)			
Chromium	5460	*DN	4010 DN	12800	ug/kg		160*	(75%-125%)			
Lead	5460	*D	3040 D	8180	ug/kg		94.1	(75%-125%)			
Selenium	5460	D	1680 D	6640	ug/kg		91	(75%-125%)			
QC1203821214	426225001 PS										
Chromium	25.0	*DN	18.7 D	42.1	ug/L		93.9	(75%-125%)		06/28/17	18:20
QC1203818342	426225001 SDILT										
Arsenic		D	5.20 DU	1820	ug/L	N/A		(0%-20%)		06/28/17	18:23
Barium		D	449 D	90.5	ug/L	.723		(0%-20%)			

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QC Summary

Workorder: 426225

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1676978										
Cadmium	BD	0.282	DU	107	ug/L	N/A		(0%-20%)	BAJ	06/28/17	18:23
Chromium	*DN	18.7	D	4.02	ug/L	7.72		(0%-20%)			
Lead	*D	14.2	D	2.88	ug/L	1.67		(0%-20%)			
Selenium	D	7.80	DU	1930	ug/L	N/A		(0%-20%)			
Metals Analysis-ICP											
Batch	1676935										
QC1203818230	426225001	DUP									
Silver	B	353	B	184	ug/kg	62.9	^	(+/-526)	HSC	06/26/17	23:30
QC1203818229	LCS										
Silver		47300		44400	ug/kg	93.9		(80%-120%)		06/26/17	23:23
QC1203818228	MB										
Silver			U	96.7	ug/kg					06/26/17	23:20
QC1203818231	426225001	MS									
Silver	55600	B	353	53000	ug/kg	94.7		(75%-125%)		06/26/17	23:34
QC1203818232	426225001	SDILT									
Silver	B	3.31	DU	533	ug/L	N/A		(0%-20%)		06/26/17	23:41
Metals Analysis-Mercury											
Batch	1677580										
QC1203819823	426225001	DUP									
Mercury	B	6.01	B	5.18	ug/kg	14.9	^	(+/-12.9)	MTM1	06/28/17	10:51
QC1203819816	LCS										
Mercury	7100		D	6730	ug/kg	94.7		(80%-120%)		06/28/17	10:32

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GEL LABORATORIES LLC

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QC Summary

Workorder: 426225

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Table with columns: Parmname, NOM, Sample, Qual, QC, Units, RPD/D%, REC%, Range, Anlst, Date, Time. Rows include Metals Analysis-Mercury with various sample IDs and results.

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
+ Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
D Results are reported from a diluted aliquot of sample.
E Reported value is estimated due to interferences. See comment in narrative.
M Duplicate precision not met.
N Spike Sample recovery is outside control limits.
S Reported value determined by the Method of Standard Additions (MSA)
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

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

Radiological Analysis

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Case Narrative

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Radiochemistry

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL426225

Work Order #: 426225

Product: UIISO_IE_PRECIP_AEA:COMMON

Analytical Method: UIISO_IE_PRECIP_AEA

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1677478

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 21

Preparation Batch: 1676912

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203819595	Method Blank (MB)
1203819596	425896001(NonSDG) Sample Duplicate (DUP)
1203819597	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Samples were recounted due to a suspected blank false positive. The recounts are reported.

Product: AMCMISO_EIE_PRECIP_AEA: COMMON

Analytical Method: AMCMISO_EIE_PRECIP_AEA

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1677715

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 21

Preparation Batch: 1676912

July 7, 2017

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203820164	Method Blank (MB)
1203820165	426225001(B3BCR0) Sample Duplicate (DUP)
1203820166	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: NP237_IE_PRECIP_AEA: COMMON

Analytical Method: ASTM C 1475-00 Modified

Analytical Procedure: GL-RAD-A-032 REV# 21

Analytical Batch: 1677718

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 21

Preparation Batch: 1676912

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203820177	Method Blank (MB)
1203820178	426225001(B3BCR0) Sample Duplicate (DUP)
1203820179	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: PUISO_PRECIP_AEA:COMMON

Analytical Method: PUISO_PRECIP_AEA

Analytical Procedure: GL-RAD-A-011 REV# 26

July 7, 2017

Analytical Batch: 1677720

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 21

Preparation Batch: 1676912

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203820180	Method Blank (MB)
1203820181	426225001(B3BCR0) Sample Duplicate (DUP)
1203820182	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Samples 1203820180 (MB) and 426225001 (B3BCR0) were recounted due to a peak shift. The recounts are reported.

Product: Dry Weight

Analytical Method: Dry Soil Prep

Analytical Procedure: GL-OA-E-020 REV# 11

Analytical Batch: 1676912

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203818177	426075001(NonSDG) Sample Duplicate (DUP)

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

Data Summary:

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

Product: GAMMA_GS:COMMON
Analytical Method: GAMMA_GS
Analytical Procedure: GL-RAD-A-013 REV# 27
Analytical Batch: 1676952

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1676912

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

GEL Sample ID#	Client Sample Identification
426225001	B3BCR0
1203818275	Method Blank (MB)
1203818276	426225001(B3BCR0) Sample Duplicate (DUP)
1203818277	Laboratory Control Sample (LCS)

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

Data Summary:

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

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Results are considered a false positive due to interference.	Europium-155	426225001	B3BCR0
			1203818276	B3BCR0(426225001DUP)

Product: SRTOT_SEP_PRECIP_GPC: COMMON
Analytical Method: SRTOT_SEP_PRECIP_GPC
Analytical Procedure: GL-RAD-A-004 REV# 18
Analytical Batch: 1677258

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 21
Preparation Batch: 1676912

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

GEL Sample ID#	Client Sample Identification
-----------------------	-------------------------------------

July 7, 2017

426225001	B3BCR0
1203819061	Method Blank (MB)
1203819062	426225001(B3BCR0) Sample Duplicate (DUP)
1203819063	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Sample 426225001 (B3BCR0) was recounted due to a suspected false positive. The recount is reported.

Product: NI63_LSC

Analytical Method: NI63_LSC

Analytical Procedure: GL-RAD-A-022 REV# 18

Analytical Batch: 1677029

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 21

Preparation Batch: 1676912

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203818463	Method Blank (MB)
1203818464	426225001(B3BCR0) Sample Duplicate (DUP)
1203818465	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: TC99_SEP_GPC

Analytical Method: TC99_EIE_LSC

July 7, 2017

Analytical Procedure: GL-RAD-A-059 REV# 5

Analytical Batch: 1677039

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203818491	Method Blank (MB)
1203818492	425896001(NonSDG) Sample Duplicate (DUP)
1203818493	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 22

Analytical Batch: 1677059

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426225001	B3BCR0
1203818581	Method Blank (MB)
1203818582	425896001(NonSDG) Sample Duplicate (DUP)
1203818583	425896001(NonSDG) Matrix Spike (MS)
1203818584	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 were recounted to verify sample results. Recounts are reported.

July 7, 2017

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.

July 7, 2017

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL426225 GEL Work Order: 426225

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.

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

Review/Validation

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

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

Signature:



Name: Kate Gellatly

Date: 03 JUL 2017

Title: Analyst I

Sample Data Summary

July 7 2017 Rad

Certificate of Analysis
Sample Summary

SDG Number: GEL426225
Lab Sample ID: 426225001

Client: CPRC001
Date Collected: 06/21/2017 13:55
Date Received: 06/23/2017 09:20

Project: CPRC0F17043
Matrix: SOIL
%Moisture: 12.1

Client ID: B3BCR0
Batch ID: 1677478
Run Date: 06/30/2017 10:55
Data File: S0426225001_UU.2A.gcnf
Prep Batch: 1677478
Prep Date: 06/28/2017 00:00

Method: UIISO_IE_PRECIP_AEA
Analyst: BXA4
Aliquot: 0.106 g
Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-011
Instrument: 1118
Count Time: 118.9615 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234		1.03	pCi/g	+/-0.931	0.954	0.841	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.00	pCi/g	+/-0.437	0.439	0.664	1.00
7440-61-1	Uranium-238	U	-0.0426	pCi/g	+/-0.358	0.360	0.841	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	15.3	19.7	pCi/g	77.9	(30%-105%)

Comments:

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

July 7 2017 Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL426225	Client: CPRC001	Project: CPRC0F17043
Lab Sample ID: 426225001	Date Collected: 06/21/2017 13:55	Matrix: SOIL
	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0		Prep Basis: "Dry Weight Corrected"
Batch ID: 1677715	Method: AMCMISO_EIE_PREC_AEA	SOP Ref: GL-RAD-A-011
Run Date: 06/30/2017 09:21	Analyst: MXS2	Instrument: 1071
Data File: S0426225001_AM.1A.gcnf	Aliquot: 0.107 g	Count Time: 240 min
Prep Batch: 1677715	Prep Method: DOE EML HASL-300, Am-05	Prep SOP Ref: GL-RAD-A-021
Prep Date: 06/28/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.0887	pCi/g	+/-0.204	0.204	0.323	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	18.6	19.6	pCi/g	94.7	(30%-105%)

Comments:

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

July 7 2017 Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL426225
Lab Sample ID: 426225001

Client: CPRC001
Date Collected: 06/21/2017 13:55
Date Received: 06/23/2017 09:20

Project: CPRC0F17043
Matrix: SOIL
%Moisture: 12.1

Client ID: B3BCR0
Batch ID: 1677718
Run Date: 06/29/2017 13:58
Data File: S0426225001_NP.1A.gcnf
Prep Batch: 1677718
Prep Date: 06/28/2017 00:00

Method: ASTM C 1475-00 Modified
Analyst: MXS2
Aliquot: 0.112 g
Prep Method: ASTM C 1475-00 Modified

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-032
Instrument: 1179
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	0.0351	pCi/g	+/-0.195	0.195	0.374	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1820	1910	pCi/g	95.3	(30%-105%)

Comments:

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

July 7 2017 Rad

Certificate of Analysis
Sample Summary

SDG Number: GEL426225	Client: CPRC001	Project: CPRC0F17043
Lab Sample ID: 426225001	Date Collected: 06/21/2017 13:55	Matrix: SOIL
	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0	Method: PUIISO_PRECIP_AEA	Prep Basis: "Dry Weight Corrected"
Batch ID: 1677720	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 07/01/2017 10:56	Aliquot: 0.107 g	Instrument: 1084
Data File: S0426225001_PU.2A.gcnf	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 240 min
Prep Batch: 1677720		Prep SOP Ref: GL-RAD-A-021
Prep Date: 06/28/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	-0.0469	pCi/g	+/-0.142	0.142	0.398	1.00
OER-100-70	Plutonium-239/240	U	-0.177	pCi/g	+/-0.330	0.330	0.814	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	14.4	18.4	pCi/g	78	(30%-105%)

Comments:

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

July 7 2017 Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL426225	Client: CPRC001	Project: CPRC0F17043
Lab Sample ID: 426225001	Date Collected: 06/21/2017 13:55	Matrix: SOIL
	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0	Method: SRTOT_SEP_PRECIP_GPC	Prep Basis: "Dry Weight Corrected"
Batch ID: 1677258	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 07/01/2017 15:50	Aliquot: 0.355 g	Instrument: PIC5D
Data File: S1677258r2.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1677258		Prep SOP Ref: GL-RAD-A-021
Prep Date: 06/28/2017 14:56		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	-0.0104	pCi/g	+/-0.433	0.433	0.836	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.90	7.75	mg	89	(40%-110%)

Comments:

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

July 7 2017 Rad

Certificate of Analysis
Sample Summary

SDG Number: GEL426225
Lab Sample ID: 426225001

Client ID: B3BCR0
Batch ID: 1676952
Run Date: 06/27/2017 11:06
Data File: G426225001.CNF;1
Prep Batch: 1676952
Prep Date: 06/27/2017 00:00

Client: CPRC001
Date Collected: 06/21/2017 13:55
Date Received: 06/23/2017 09:20

Method: GAMMA_GS
Analyst: MXR1
Aliquot: 117.649 g
Prep Method: DOE HASL 300, 4.5.2.3/Ga-01

Project: CPRC0F17043
Matrix: SOIL
%Moisture: 12.1

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-013
Instrument: GAM03
Count Time: 120 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	0.00482	pCi/g	+/-0.025	0.0251	0.0469	0.100
10198-40-0	Cobalt-60	U	-0.0102	pCi/g	+/-0.024	0.0245	0.0432	0.100
14683-23-9	Europium-152	U	0.049	pCi/g	+/-0.064	0.0678	0.123	0.100
15585-10-1	Europium-154	U	0.0463	pCi/g	+/-0.0587	0.0625	0.138	0.100
14391-16-3	Europium-155	UX	0.00	pCi/g	+/-0.127	0.127	0.115	0.100

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Comments:

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

July 7 2017 Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL426225
Lab Sample ID: 426225001

Client: CPRC001
Date Collected: 06/21/2017 13:55
Date Received: 06/23/2017 09:20

Project: CPRC0F17043
Matrix: SOIL
%Moisture: 12.1

Client ID: B3BCR0
Batch ID: 1677029
Run Date: 06/30/2017 04:10
Data File: N1677029.xls
Prep Batch: 1677029
Prep Date: 06/27/2017 10:45

Method: NI63_LSC
Analyst: GXR1
Aliquot: 0.543 g
Prep Method: DOE RESL Ni-1, Modified

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-022
Instrument: LSCMOCHA
Count Time: 30 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	1.96	pCi/g	+/-4.55	4.57	7.77	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	17.0	25.2	mg	67.5	(40%-110%)

Comments:

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

July 7 2017 Rad

Certificate of Analysis
Sample Summary

SDG Number: GEL426225	Client: CPRC001	Project: CPRC0F17043
Lab Sample ID: 426225001	Date Collected: 06/21/2017 13:55	Matrix: SOIL
	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0		Prep Basis: "As Received"
Batch ID: 1677039	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 07/02/2017 07:16	Analyst: CXS7	Instrument: LSCBLUE
Data File: E1677039.xls	Aliquot: 1.32 g	Count Time: 15 min
Prep Batch: 1677039	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 06/28/2017 09:34		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-1.26	pCi/g	+/-2.13	2.13	3.81	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	38000	45000	CPM	84.5	(30%-105%)

Comments:

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

July 7 2017 Rad

Certificate of Analysis
Sample Summary

SDG Number: GEL426225	Client: CPRC001	Project: CPRC0F17043
Lab Sample ID: 426225001	Date Collected: 06/21/2017 13:55	Matrix: SOIL
	Date Received: 06/23/2017 09:20	%Moisture: 12.1
Client ID: B3BCR0		Prep Basis: "As Received"
Batch ID: 1677059	Method: TRITIUM_DIST_LSC	SOP Ref: GL-RAD-A-002
Run Date: 06/29/2017 08:51	Analyst: JXB7	Instrument: LSCBLUE
Data File: T1677059R.xls	Aliquot: 1.361 g	Count Time: 20 min
Prep Batch: 1677059	Prep Method: EPA 906.0 Modified	
Prep Date: 06/28/2017 09:19		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	15.8	pCi/g	+/-13.4	13.9	22.0	30.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Comments:

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

July 7, 2017

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: July 3, 2017
Page 1 of 6

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 426225

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1677478								
QC1203819595	MB								
Uranium-233/234			U	0.611	pCi/g			BXA4	06/30/1710:55
				Uncert: +/-0.765					
				TPU: +/-0.775					
Uranium-235/236			U	0.163	pCi/g				
				Uncert: +/-0.600					
				TPU: +/-0.601					
Uranium-238			U	0.652	pCi/g				
				Uncert: +/-0.763					
				TPU: +/-0.774					
**Uranium-232 Tracer	19.0			14.9	pCi/g	REC: 78	(30%-105%)		
				Uncert: +/-3.58					
				TPU: +/-5.26					
QC1203819596	425896001	DUP							
Uranium-233/234		1.03	U	0.295	pCi/g				06/30/1710:55
				Uncert: +/-0.861		RPD: 44	(0% - 100%)		
				TPU: +/-0.883		RER: 1.39	(0-2)		
Uranium-235/236		U -0.0227	U	-0.0229	pCi/g				
				Uncert: +/-0.380		RPD: 0	N/A		
				TPU: +/-0.382		RER: 0.000798	(0-2)		
Uranium-238		U 0.136	U	0.120	pCi/g				
				Uncert: +/-0.432		RPD: 0	N/A		
				TPU: +/-0.433		RER: 0.0521	(0-2)		
**Uranium-232 Tracer	20.3	16.9		20.3	pCi/g	REC: 100	(30%-105%)		
				Uncert: +/-3.38					
				TPU: +/-4.98					
QC1203819597	LCS								
Uranium-233/234				22.4	pCi/g				06/30/1710:55
				Uncert: +/-3.59					
				TPU: +/-5.56					
Uranium-235/236				0.919	pCi/g				
				Uncert: +/-0.883					
				TPU: +/-0.900					
Uranium-238	24.6			24.7	pCi/g	REC: 100	(80%-120%)		
				Uncert: +/-3.77					
				TPU: +/-6.01					
**Uranium-232 Tracer	19.0			17.6	pCi/g	REC: 93	(30%-105%)		
				Uncert: +/-3.31					
				TPU: +/-4.89					
Batch	1677715								
QC1203820164	MB								
Americium-241			U	0.0895	pCi/g			MXS2	06/30/1709:21
				Uncert: +/-0.236					
				TPU: +/-0.236					
						REC:			

GEL LABORATORIES LLC

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QC Summary

Workorder: 426225

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1677715								
**Americium-243 Tracer	19.6			19.1	pCi/g	98	(30%-105%)		
	Uncert:			+/-2.08					
	TPU:			+/-3.22					
QC1203820165 426225001 DUP									
Americium-241		U 0.0887	U	-0.05	pCi/g				06/30/1709:21
	Uncert:	+/-0.204		+/-0.151		RPD: 0	N/A		
	TPU:	+/-0.204		+/-0.151		RER: 1.07	(0-2)		
**Americium-243 Tracer	20.6	18.6		19.9	pCi/g	REC: 97	(30%-105%)		
	Uncert:	+/-2.09		+/-2.33					
	TPU:	+/-3.24		+/-3.58					
QC1203820166 LCS									
Americium-241	18.4			20.3	pCi/g	REC: 111	(80%-120%)		
	Uncert:			+/-2.32					
	TPU:			+/-3.58					
**Americium-243 Tracer	19.6			16.5	pCi/g	REC: 84	(30%-105%)		
	Uncert:			+/-2.27					
	TPU:			+/-3.47					
Batch	1677718								
QC1203820177 MB									
Neptunium-237			U	0.0577	pCi/g			MXS2	06/29/1713:58
	Uncert:			+/-0.216					
	TPU:			+/-0.217					
**Americium-243 Tracer	1910			1620	pCi/g	REC: 85	(30%-105%)		
QC1203820178 426225001 DUP									
Neptunium-237		U 0.0351	U	0.00305	pCi/g				06/29/1713:58
	Uncert:	+/-0.195		+/-0.226		RPD: 0	N/A		
	TPU:	+/-0.195		+/-0.226		RER: 0.21	(0-2)		
**Americium-243 Tracer	2020	1820		1770	pCi/g	REC: 88	(30%-105%)		
QC1203820179 LCS									
Neptunium-237	39.9			42.9	pCi/g	REC: 108	(80%-120%)		06/29/1713:58
	Uncert:			+/-3.55					
	TPU:			+/-5.84					
**Americium-243 Tracer	1910			1890	pCi/g	REC: 99	(30%-105%)		
Batch	1677720								
QC1203820180 MB									
Plutonium-238			U	0.0367	pCi/g			MXS2	07/01/1710:56
	Uncert:			+/-0.204					
	TPU:			+/-0.204					
Plutonium-239/240			U	-0.305	pCi/g				
	Uncert:			+/-0.200					
	TPU:			+/-0.200					
**Plutonium-242 Tracer	18.4			13.1	pCi/g	REC: 72	(30%-105%)		
	Uncert:			+/-2.25					
	TPU:			+/-3.35					
QC1203820181 426225001 DUP									
Plutonium-238		U -0.0469	U	-0.0413	pCi/g				06/29/1713:57
	Uncert:	+/-0.142		+/-0.183		RPD: 0	N/A		
	TPU:	+/-0.142		+/-0.183		RER: 0.0473	(0-2)		
Plutonium-239/240		U -0.177	U	0.158	pCi/g				
	Uncert:	+/-0.330		+/-0.399		RPD: 0	N/A		

QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch		1677720							
		TPU:	+/-0.330	+/-0.399					
**Plutonium-242 Tracer	19.3	14.4		16.4	pCi/g	RER: 1.27 REC: 85	(0-2) (30%-105%)		
		Uncert:	+/-2.16	+/-2.54					
		TPU:	+/-3.22	+/-3.77					
QC1203820182 LCS Plutonium-238			U	0.409	pCi/g				06/29/1713:58
		Uncert:		+/-0.482					
		TPU:		+/-0.487					
Plutonium-239/240	18.5			20.2	pCi/g	REC: 110	(80%-120%)		
		Uncert:		+/-2.92					
		TPU:		+/-4.39					
**Plutonium-242 Tracer	18.4			13.2	pCi/g	REC: 72	(30%-105%)		
		Uncert:		+/-2.79					
		TPU:		+/-4.08					
Rad Gamma Spec									
Batch		1676952							
QC1203818275 MB Cesium-137			U	0.00328	pCi/g			MXR1	06/27/1711:07
		Uncert:		+/-0.0178					
		TPU:		+/-0.0179					
Cobalt-60			U	0.00651	pCi/g				
		Uncert:		+/-0.0193					
		TPU:		+/-0.0196					
Europium-152			U	-0.00453	pCi/g				
		Uncert:		+/-0.0488					
		TPU:		+/-0.0489					
Europium-154			U	0.0114	pCi/g				
		Uncert:		+/-0.0448					
		TPU:		+/-0.0451					
Europium-155			U	-0.0451	pCi/g				
		Uncert:		+/-0.0407					
		TPU:		+/-0.0457					
QC1203818276 426225001 DUP Cesium-137		U 0.00482	U	0.0135	pCi/g				06/27/1714:13
		Uncert:	+/-0.025	+/-0.0197		RPD: 0	N/A		
		TPU:	+/-0.0251	+/-0.0206		RER: 0.522	(0-2)		
Cobalt-60		U -0.0102	U	0.0197	pCi/g				
		Uncert:	+/-0.024	+/-0.0233		RPD: 0	N/A		
		TPU:	+/-0.0245	+/-0.025		RER: 1.67	(0-2)		
Europium-152		U 0.049	U	0.0237	pCi/g				
		Uncert:	+/-0.064	+/-0.0532		RPD: 0	N/A		
		TPU:	+/-0.0678	+/-0.0543		RER: 0.57	(0-2)		
Europium-154		U 0.0463	U	0.00188	pCi/g				
		Uncert:	+/-0.0587	+/-0.0748		RPD: 0	N/A		
		TPU:	+/-0.0625	+/-0.0748		RER: 0.894	(0-2)		
Europium-155		UX 0.00	UX	0.00	pCi/g				
		Uncert:	+/-0.127	+/-0.0957		RPD: 20	N/A		
		TPU:	+/-0.127	+/-0.0962		RER: 0.284	(0-2)		

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1676952								
QC1203818277	LCS								
Americium-241	489			545	pCi/g	REC: 112 (80%-120%)			06/27/1714:00
	Uncert:			+/-6.77					
	TPU:			+/-42.1					
Cesium-137	176			183	pCi/g	REC: 104 (80%-120%)			
	Uncert:			+/-4.18					
	TPU:			+/-15.5					
Cobalt-60	146			141	pCi/g	REC: 96 (80%-120%)			
	Uncert:			+/-4.27					
	TPU:			+/-12.8					
Europium-152			U	0.136	pCi/g				
	Uncert:			+/-1.69					
	TPU:			+/-1.69					
Europium-154			U	-0.142	pCi/g				
	Uncert:			+/-1.06					
	TPU:			+/-1.06					
Europium-155			U	-0.578	pCi/g				
	Uncert:			+/-1.18					
	TPU:			+/-1.21					
Rad Gas Flow									
Batch	1677258								
QC1203819061	MB								
Total Strontium			U	0.826	pCi/g			KSD1	06/29/1716:33
	Uncert:			+/-0.888					
	TPU:			+/-0.913					
**Strontium Carrier	7.75			6.30	mg	REC: 81 (40%-110%)			
QC1203819062	426225001	DUP							
Total Strontium		U	-0.0104	U	0.205	pCi/g			06/29/1716:33
	Uncert:		+/-0.433		+/-0.739	RPD: 0	N/A		
	TPU:		+/-0.433		+/-0.741	RER: 0.493	(0-2)		
**Strontium Carrier	7.75		6.90		7.00	mg	REC: 90 (40%-110%)		
QC1203819063	LCS								
Total Strontium	61.6			66.8	pCi/g	REC: 109 (80%-120%)			06/29/1716:33
	Uncert:			+/-3.76					
	TPU:			+/-17.4					
**Strontium Carrier	7.75			7.00	mg	REC: 90 (40%-110%)			
Rad Liquid Scintillation									
Batch	1677029								
QC1203818463	MB								
Nickel-63			U	0.249	pCi/g			GXR1	06/30/1704:41
	Uncert:			+/-4.32					
	TPU:			+/-4.32					
**Nickel Carrier	25.2			18.0	mg	REC: 71 (40%-110%)			
QC1203818464	426225001	DUP							
Nickel-63		U	1.96	U	2.36	pCi/g			06/30/1705:12
	Uncert:		+/-4.55		+/-4.47	RPD: 0	N/A		
	TPU:		+/-4.57		+/-4.49	RER: 0.122	(0-2)		
**Nickel Carrier	25.2		17.0		18.2	mg	REC: 72 (40%-110%)		
QC1203818465	LCS								
						REC:			

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1677029								
Nickel-63	247			276	pCi/g	112	(80%-120%)		
	Uncert:			+/-10.2					
	TPU:			+/-51.9					
*Nickel Carrier	25.2			17.4	mg	REC: 69	(40%-110%)		
Batch	1677039								
QC1203818491	MB								
Technetium-99			U	0.523	pCi/g			CXS7	07/02/1707:32
	Uncert:			+/-1.76					
	TPU:			+/-1.76					
*Technetium-99m Tracer	45000			44700	CPM	REC: 99	(30%-105%)		
QC1203818492	425896001	DUP							
Technetium-99		U	0.227	U	-0.772				07/02/1707:49
	Uncert:		+/-1.90		+/-1.63	RPD: 0	N/A		
	TPU:		+/-1.90		+/-1.63	RER: 0.782	(0-2)		
*Technetium-99m Tracer	45000		44200	45800	CPM	REC: 102	(30%-105%)		
QC1203818493	LCS								
Technetium-99	65.0			53.4	pCi/g	REC: 82	(80%-120%)		07/02/1708:05
	Uncert:			+/-3.37					
	TPU:			+/-7.00					
*Technetium-99m Tracer	45000			44100	CPM	REC: 98	(30%-105%)		
Batch	1677059								
QC1203818581	MB								
Tritium			U	2.98	pCi/g			JXB7	06/29/1709:12
	Uncert:			+/-12.1					
	TPU:			+/-12.1					
QC1203818582	425896001	DUP							
Tritium			304	309	pCi/g				06/29/1709:34
	Uncert:		+/-27.4		+/-28.3	RPD: 2	(0% - 20%)		
	TPU:		+/-74.3		+/-75.6	RER: 0.0916	(0-2)		
QC1203818583	425896001	MS							
Tritium	80.0		304	377	pCi/g	REC: 92	(75%-125%)		06/29/1709:55
	Uncert:		+/-27.4		+/-29.2				
	TPU:		+/-74.3		+/-90.5				
QC1203818584	LCS								
Tritium	79.9			66.9	pCi/g	REC: 84	(80%-120%)		06/29/1710:17
	Uncert:			+/-16.3					
	TPU:			+/-22.3					

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
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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 (Organics only)				

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

** Indicates analyte is a surrogate compound.

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

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

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