

7/21/2016



July 21, 2016

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

Re: CHPRC SAF X16-037  
Work Order: 400141  
SDG: GEL400141

Dear Mr. Fitzgerald:

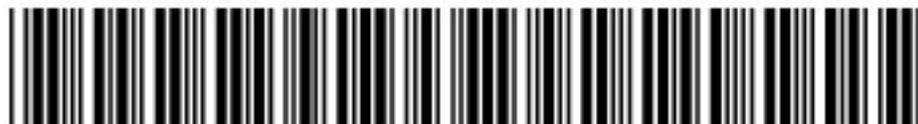
GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 25, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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: 300071 - 7H  
Chain of Custody: X16-037-073, X16-037-074 and X16-037-075  
Enclosures



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# Case Narrative

**General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF X16-037  
SDG: GEL400141**

**July 21, 2016**

**Laboratory Identification:**

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

**Summary**

**Sample receipt**

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 25, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

**Sample Identification**

The laboratory received the following samples:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
400141001	B35MK4
400141002	B35MJ8
400141003	B35MJ9
400141004	B35MK5
400141005	B35ML6
400141006	B35ML9

**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: GC/MS Volatile, General Chemistry, 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.

  
Brielle Luthman for  
Heather Shaffer  
Project Manager

**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL400141**  
**Work Order #: 400141**

## 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

#### **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
1203575155 (B35M74PS)	2-Butanone	62* (70%-130%)
	Acetone	48* (70%-130%)
1203575156 (B35M74PSD)	2-Butanone	67* (70%-130%)
	Acetone	53* (70%-130%)

## 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.

## General Chemistry

### **Alkalinity**

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

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

The MBs (See Below) analyzed with this SDG met the acceptance criteria. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203574837 (MB)	Alkalinity, Total as CaCO <sub>3</sub> and Bicarbonate alkalinity (CaCO <sub>3</sub> )	1.52 * 10 > 3.54

**Radiochemistry****SRISO\_SEP\_PRECIP\_GPC: 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.

**C14\_LSC: 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.

**TRITIUM\_DIST\_LSC: 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.

**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**

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

X16-037-073

Page 1 of 1

400141

Collector	Juan Aguilera	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X16-037	Sampling Origin	Hanford Site	Purchase Order/Charge Code	304027
Project Title	100-KW Rebound Study, May 31, 2016	Logbook No.	HNF-N-506 79/28	Ice Chest No.	GWS-519
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7766 0488 4134
Protocol	CERCLA	Priority:	30 Days	Offsite Property No.	6774

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

**SPECIAL INSTRUCTIONS** Hold Time  No  Yes  
 N/A Special Handling: N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35MK4	Y	W	6-24-16	0837	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35MJ8	N	W			1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35MJ8	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35MJ8	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35MJ8	N	W			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35MJ8	N	W			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35MJ8	N	W	6-24-16	0837	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By	Juan Aguilera	Print	Juan Aguilera	Sign	Juan Aguilera	Received By	Janelle Zunker	Print	Janelle Zunker	Sign	Janelle Zunker	Date/Time	JUN 24 2016 1010
Relinquished By	Janelle Zunker	Print	Janelle Zunker	Sign	Janelle Zunker	Received By	FEDEX	Print	FEDEX	Sign	FEDEX	Date/Time	JUN 24 2016 1400
Relinquished By		Print		Sign		Received By	M. K. K. K.	Print	M. K. K. K.	Sign	M. K. K. K.	Date/Time	6-25-16 0835
Relinquished By		Print		Sign		Received By		Print		Sign		Date/Time	

**FINAL SAMPLE DISPOSITION**

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

Disposed By \_\_\_\_\_ Date/Time \_\_\_\_\_

**CH2MHill Plateau Remediation Company**  
**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 C.O.C.# **X16-037-074**  
 Page 1 of 1

**Collector:** Juan Aguilera **CHPRC**  
**SAF No.:** X16-037  
**Contact/Requester:** Karen Waters-Husted  
**Telephone No.:** 509-376-4650  
**Sampling Origin:** Hanford Site  
**Purchase Order/Charge Code:** 304027  
**Project Title:** 100-KW Rebound Study, May 31, 2016  
**Logbook No.:** HNF-N-506 79/28  
**Ice Chest No.:** GWS 519  
**Shipped To (Lab):** GEL Laboratories, LLC  
**Bill of Lading/Air Bill No.:** 177666 0488 4136  
**Method of Shipment:** Commercial Carrier  
**Offsite Property No.:** 67774  
**Priority:** 30 Days **PRIORITY**  
**Total Activity Exemption:** Yes  No

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35MJ9	N	W	6-24-16	0837	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35MJ9	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35MJ9	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35MJ9	N	W			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35MJ9	N	W			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35MJ9	N	W			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B35MK5	Y	W	6-24-16	0837	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

Relinquished By: Juan Aguilera CHPRC	Print	Sign	Date/Time
<i>Juan Aguilera</i>		<i>Juan Aguilera</i>	JUN 24 2016 1010
Received By: Janelle Zunker CHPRC	Print	Sign	Date/Time
<b>FEDEX</b>		<i>Janelle Zunker</i>	JUN 24 2016 1010
Relinquished By: Janelle Zunker CHPRC	Print	Sign	Date/Time
<i>Janelle Zunker</i>		<i>Janelle Zunker</i>	JUN 24 2016 1400
Received By: M. Boston	Print	Sign	Date/Time
<i>M. Boston</i>		<i>M. Boston</i>	6-25-16 0845
Relinquished By:	Print	Sign	Date/Time

87165

**CH2M Hill Plateau Remediation Company**  
**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 C.O.C.# **X16-037-075**  
 Page 1 of 1

Collector: *Juan Aguilera* C.H. P22  
 Contact/Requester: Karen Waters-Husted  
 Telephone No. 509-376-4650  
 SAF No. X16-037  
 Purchase Order/Charge Code 304027  
 Project Title: 100-KW Rebound Study, May 31, 2016  
 Sampling Origin: Hanford Site  
 Shipped To (Lab): **GEL Laboratories, LLC**  
 Logbook No. HNF-N-506 79/28  
 Ice Chest No. *6WS-519*  
 Method of Shipment: Commercial Carrier  
 Bill of Lading/Air Bill No. *77666 0488 4134*  
 Priority: 30 Days  
 Offsite Property No. *6774*  
 Protocol: CERCLA

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35ML6	N	W	<i>6-24-16</i>	<i>0931</i>	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35ML6	N	W			1x500-mL G/P	6010_METALS_JCP: COMMON	6 Months	HNO3 to pH <2
B35ML6	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35ML6	N	W			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35ML6	N	W			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35ML6	N	W			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B35ML9	Y	W	<i>6-24-16</i>	<i>0931</i>	1x500-mL G/P	6010_METALS_JCP: COMMON	6 Months	HNO3 to pH <2

**SPECIAL INSTRUCTIONS**  
 Hold Time: \_\_\_\_\_  
 SPECIAL INSTRUCTIONS: \_\_\_\_\_  
 N/A  
 Special Handling: N/A  
 Total Activity Exemption: Yes  No

Received By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Janelle Zunker CHPRC	<i>Janelle Zunker</i>	<i>Janelle Zunker</i>	JUN 24 2016 1010	Janelle Zunker CHPRC	<i>Janelle Zunker</i>	<i>Janelle Zunker</i>	JUN 24 2016 1010
Received By	<b>FEDEX</b>		Date/Time	Received By			Date/Time
Received By	<i>M. Krawiec</i>	<i>M. Krawiec</i>	JUN 24 2016 1400	Received By	<i>M. Krawiec</i>	<i>M. Krawiec</i>	JUN 24 2016 1400
Relinquished By			Date/Time	Relinquished By			Date/Time
Relinquished By			Date/Time	Relinquished By			Date/Time

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

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>400141</u>
Received By: <u>mk</u>		Date Received: <u>6-25-16</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>Cyma</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2C</u>
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130461962</u> Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7	VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9	Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air <u>7766 0488</u> FedEx Ground 4136 2C 5062 2C 5246 2C UPS Field Services Courier Other

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 6/27/16 Page 1 of 1

# **Data Review Qualifier Definitions**

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

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

# Laboratory Certifications

## List of current GEL Certifications as of 21 July 2016

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	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Volatile Analysis**

# Case Narrative

**GC/MS Volatile  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL400141  
Work Order #: 400141**

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

**Analytical Method: SW846 8260C**

**Analytical Procedure: GL-OA-E-038 REV# 22**

**Analytical Batch: 1577534**

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
400141002	B35MJ8
400141003	B35MJ9
400141005	B35ML6
1203575153	Method Blank (MB)
1203575154	Laboratory Control Sample (LCS)
1203575155	400025001(B35M74) Post Spike (PS)
1203575156	400025001(B35M74) Post Spike Duplicate (PSD)

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

**Data Summary:**

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

**Quality Control (QC) Information**

**Matrix Spike/Matrix Spike Duplicate Recovery Statement**

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

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203575155 (B35M74PS)	2-Butanone	62* (70%-130%)
	Acetone	48* (70%-130%)
1203575156 (B35M74PSD)	2-Butanone	67* (70%-130%)
	Acetone	53* (70%-130%)

**Certification Statement**

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

**GEL LABORATORIES LLC**

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

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400141 GEL Work Order: 400141

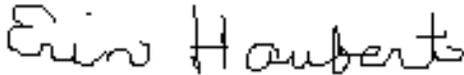
**The Qualifiers in this report are defined as follows:**

- 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: 20 JUL 2016

Title: Data Validator

# Sample Data Summary

Volatile  
Certificate of Analysis  
Sample Summary

Page 1 of 1

SDG Number: GEL400141	Date Collected: 06/24/2016 08:37	Matrix: WATER
Lab Sample ID: 400141002	Date Received: 06/25/2016 08:45	
Client ID: B35MJ8	Client: CPRC001	Project: CPRC0X16037
Batch ID: 1577534	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/27/2016 15:01	Inst: VOA3.I	Dilution: 1
Prep Date: 06/27/2016 15:01	Analyst: CDS1	Purge Vol: 5 mL
Data File: 062716V3\3P112.D	Column: DB-624	

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

Volatile  
Certificate of Analysis  
Sample Summary

Page 1 of 1

SDG Number: GEL400141	Date Collected: 06/24/2016 08:37	Matrix: WATER
Lab Sample ID: 400141003	Date Received: 06/25/2016 08:45	
Client ID: B35MJ9	Client: CPRC001	Project: CPRC0X16037
Batch ID: 1577534	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/27/2016 15:32	Inst: VOA3.I	Dilution: 1
Prep Date: 06/27/2016 15:32	Analyst: CDS1	Purge Vol: 5 mL
Data File: 062716V3\3P113.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	J	0.370	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Volatile  
Certificate of Analysis  
Sample Summary

Page 1 of 1

SDG Number: GEL400141	Date Collected: 06/24/2016 09:31	Matrix: WATER
Lab Sample ID: 400141005	Date Received: 06/25/2016 08:45	
Client ID: B35ML6	Client: CPRC001	Project: CPRC0X16037
Batch ID: 1577534	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/27/2016 16:02	Inst: VOA3.I	Dilution: 1
Prep Date: 06/27/2016 16:02	Analyst: CDS1	Purge Vol: 5 mL
Data File: 062716V3\3P114.D	Column: DB-624	

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

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: July 19, 2016

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400141

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1577534										
QC1203575154	LCS										
1,1,1-Trichloroethane	50.0			50.7	ug/L		101	(70%-130%)	CDS1	06/27/16	10:28
1,1,2-Trichloroethane	50.0			49.4	ug/L		99	(70%-130%)			
1,1-Dichloroethane	50.0			50.3	ug/L		101	(70%-130%)			
1,1-Dichloroethylene	50.0			51.1	ug/L		102	(70%-130%)			
1,2-Dichloroethane	50.0			46.9	ug/L		94	(70%-130%)			
2-Butanone	250			247	ug/L		99	(70%-130%)			
4-Methyl-2-pentanone	250			217	ug/L		87	(70%-130%)			
Acetone	250			246	ug/L		99	(70%-130%)			
Benzene	50.0			49.0	ug/L		98	(70%-130%)			
Carbon disulfide	250			245	ug/L		98	(70%-130%)			
Carbon tetrachloride	50.0			48.7	ug/L		97	(70%-130%)			
Chlorobenzene	50.0			50.4	ug/L		101	(70%-130%)			
Chloroform	50.0			48.2	ug/L		96	(70%-130%)			
Ethylbenzene	50.0			49.0	ug/L		98	(70%-130%)			
Methylene chloride	50.0		B	53.8	ug/L		108	(70%-130%)			
Tetrachloroethylene	50.0			49.9	ug/L		100	(70%-130%)			
Toluene	50.0			49.5	ug/L		99	(70%-130%)			
Trichloroethylene	50.0			49.7	ug/L		99	(70%-130%)			
Vinyl chloride	50.0			48.7	ug/L		97	(70%-130%)			
Xylenes (total)	150			146	ug/L		97	(70%-130%)			

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**QC Summary**

Workorder: 400141

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1577534										
**1,2-Dichloroethane-d4	50.0			48.1	ug/L		96	(70%-130%)	CDS1	06/27/16	10:28
**Bromofluorobenzene	50.0			51.4	ug/L		103	(70%-130%)			
**Toluene-d8	50.0			49.9	ug/L		100	(70%-130%)			
QC1203575153	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/27/16	11:29
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			J	2.44	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						

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**QC Summary**

Workorder: 400141

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1577534										
Vinyl chloride			U	0.300	ug/L				CDS1	06/27/16	11:29
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.5	ug/L		103	(70%-130%)			
**Bromofluorobenzene	50.0			49.6	ug/L		99	(70%-130%)			
**Toluene-d8	50.0			51.6	ug/L		103	(70%-130%)			
QC1203575155 400025001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	51.7	ug/L		103	(70%-130%)		06/27/16	18:04
1,1,2-Trichloroethane	50.0	U	0.00	46.9	ug/L		94	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	48.1	ug/L		96	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	48.3	ug/L		97	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	46.2	ug/L		92	(70%-130%)			
2-Butanone	250	TU	0.00 T	155	ug/L		62 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	208	ug/L		83	(70%-130%)			
Acetone	250	TU	0.00 T	119	ug/L		48 *	(70%-130%)			
Benzene	50.0	U	0.00	48.4	ug/L		97	(70%-130%)			
Carbon disulfide	250	U	0.00	235	ug/L		94	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	48.4	ug/L		97	(70%-130%)			
Chlorobenzene	50.0	U	0.00	48.6	ug/L		97	(70%-130%)			
Chloroform	50.0	J	0.360	47.7	ug/L		95	(70%-130%)			
Ethylbenzene	50.0	U	0.00	48.0	ug/L		96	(70%-130%)			
Methylene chloride	50.0	U	0.00 B	49.2	ug/L		98	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	48.0	ug/L		96	(70%-130%)			

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 400141

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1577534										
Toluene	50.0	U	0.00	48.1	ug/L		96	(70%-130%)	CDS1	06/27/16	18:04
Trichloroethylene	50.0	J	4.47	51.6	ug/L		94	(70%-130%)			
Vinyl chloride	50.0	U	0.00	36.5	ug/L		73	(70%-130%)			
Xylenes (total)	150	U	0.00	141	ug/L		94	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		58.1	47.6	ug/L		95	(70%-130%)			
**Bromofluorobenzene	50.0		48.8	48.0	ug/L		96	(70%-130%)			
**Toluene-d8	50.0		55.8	48.9	ug/L		98	(70%-130%)			
QC1203575156 400025001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	55.5	ug/L	7	111	(0%-20%)		06/27/16	18:34
1,1,2-Trichloroethane	50.0	U	0.00	49.3	ug/L	5	99	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	51.6	ug/L	7	103	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	52.0	ug/L	8	104	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	47.1	ug/L	2	94	(0%-20%)			
2-Butanone	250	TU	0.00	T 168	ug/L	8	67*	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	220	ug/L	5	88	(0%-20%)			
Acetone	250	TU	0.00	T 132	ug/L	10	53*	(0%-20%)			
Benzene	50.0	U	0.00	51.7	ug/L	7	103	(0%-20%)			
Carbon disulfide	250	U	0.00	246	ug/L	4	98	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00	52.0	ug/L	7	104	(0%-20%)			
Chlorobenzene	50.0	U	0.00	51.1	ug/L	5	102	(0%-20%)			
Chloroform	50.0	J	0.360	50.0	ug/L	5	99	(0%-20%)			
Ethylbenzene	50.0	U	0.00	50.7	ug/L	6	101	(0%-20%)			

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**QC Summary**

Workorder: 400141

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1577534										
Methylene chloride	50.0	U	0.00	B	48.7	ug/L	1	97	(0%-20%)	CDS1	06/27/16 18:34
Tetrachloroethylene	50.0	U	0.00		51.0	ug/L	6	102	(0%-20%)		
Toluene	50.0	U	0.00		50.3	ug/L	4	101	(0%-20%)		
Trichloroethylene	50.0	J	4.47		55.3	ug/L	7	102	(0%-20%)		
Vinyl chloride	50.0	U	0.00		38.2	ug/L	4	76	(0%-20%)		
Xylenes (total)	150	U	0.00		152	ug/L	7	101	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		58.1		50.3	ug/L		101	(70%-130%)		
**Bromofluorobenzene	50.0		48.8		53.9	ug/L		108	(70%-130%)		
**Toluene-d8	50.0		55.8		51.2	ug/L		102	(70%-130%)		

**Notes:**

The Qualifiers in this report are defined as follows:

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

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 400141

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

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

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

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

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

## Surrogate Recovery Report

SDG Number: GEL400141

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203575154	LCS for batch 1577534	96	100	103
1203575153	MB for batch 1577534	103	103	99
400141002	B35MJ8	105	101	89
400141003	B35MJ9	108	108	96
400141005	B35ML6	109	107	94
1203575155	B35M74PS	95	98	96
1203575156	B35M74PSD	101	102	108

**Surrogate****Acceptance Limits**

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

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

# Metals Analysis

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL400141**  
**Work Order #: 400141**

**Product: Determination of Metals by ICP****Analytical Method:** 6010\_METALS\_ICP**Analytical Procedure:** GL-MA-E-013 REV# 26**Analytical Batch:** 1577375**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 13**Preparation Batch:** 1577374

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
400141001	B35MK4
400141002	B35MJ8
400141003	B35MJ9
400141004	B35MK5
400141005	B35ML6
400141006	B35ML9
1203574642	Method Blank (MB)ICP
1203574643	Laboratory Control Sample (LCS)
1203574646	400138001(NonSDGL) Serial Dilution (SD)
1203574644	400138001(NonSDGS) Matrix Spike (MS)
1203574645	400138001(NonSDGSD) Matrix Spike Duplicate (MSD)

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

**Data Summary:**

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

**Certification Statement**

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

**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: GEL400141 GEL Work Order: 400141

**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.

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

**Review/Validation**

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

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

**Signature:** 

**Name: Jamie Johnson**

**Date: 20 JUL 2016**

**Title: Group Leader**

# Sample Data Summary

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL400141

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 400141001

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B35MK4

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-39-3	Barium	22.6	ug/L		1	5	5	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-70-2	Calcium	26000	ug/L		50	200	200	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-47-3	Chromium	1.59	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/06/16 11:46	070616-1	1577375
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/06/16 11:46	070616-1	1577375
7439-95-4	Magnesium	5700	ug/L		110	300	300	1	P	HSC	07/06/16 11:46	070616-1	1577375
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-09-7	Potassium	2270	ug/L		50	150	150	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-23-5	Sodium	3820	ug/L		100	300	300	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-62-2	Vanadium	5.9	ug/L		1	5	5	1	P	HSC	07/06/16 11:46	070616-1	1577375
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/06/16 11:46	070616-1	1577375

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

**\*Analytical Methods:**

P SW846 3005A/6010C

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL400141

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 400141002

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B35MJ8

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-39-3	Barium	25.1	ug/L		1	5	5	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-70-2	Calcium	25300	ug/L		50	200	200	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-47-3	Chromium	2.17	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/06/16 11:49	070616-1	1577375
7439-89-6	Iron	277	ug/L		30	100	100	1	P	HSC	07/06/16 11:49	070616-1	1577375
7439-95-4	Magnesium	5630	ug/L		110	300	300	1	P	HSC	07/06/16 11:49	070616-1	1577375
7439-96-5	Manganese	15.2	ug/L		2	10	10	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-09-7	Potassium	2220	ug/L		50	150	150	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-23-5	Sodium	3650	ug/L		100	300	300	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-62-2	Vanadium	6.21	ug/L		1	5	5	1	P	HSC	07/06/16 11:49	070616-1	1577375
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/06/16 11:49	070616-1	1577375

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

**\*Analytical Methods:**

P SW846 3005A/6010C

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL400141

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 400141003

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B35MJ9

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-39-3	Barium	24.3	ug/L		1	5	5	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-70-2	Calcium	26100	ug/L		50	200	200	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-47-3	Chromium	1.93	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/06/16 11:52	070616-1	1577375
7439-89-6	Iron	158	ug/L		30	100	100	1	P	HSC	07/06/16 11:52	070616-1	1577375
7439-95-4	Magnesium	5820	ug/L		110	300	300	1	P	HSC	07/06/16 11:52	070616-1	1577375
7439-96-5	Manganese	7.17	ug/L	B	2	10	10	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-02-0	Nickel	1.61	ug/L	B	1.5	5	5	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-09-7	Potassium	2260	ug/L		50	150	150	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-23-5	Sodium	4090	ug/L		100	300	300	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-62-2	Vanadium	6.08	ug/L		1	5	5	1	P	HSC	07/06/16 11:52	070616-1	1577375
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/06/16 11:52	070616-1	1577375

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

**\*Analytical Methods:**

P SW846 3005A/6010C

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL400141

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 400141004

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B35MK5

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-39-3	Barium	22.4	ug/L		1	5	5	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-70-2	Calcium	26000	ug/L		50	200	200	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-47-3	Chromium	1.56	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/06/16 11:56	070616-1	1577375
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/06/16 11:56	070616-1	1577375
7439-95-4	Magnesium	5680	ug/L		110	300	300	1	P	HSC	07/06/16 11:56	070616-1	1577375
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-09-7	Potassium	2260	ug/L		50	150	150	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-23-5	Sodium	3940	ug/L		100	300	300	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-62-2	Vanadium	5.77	ug/L		1	5	5	1	P	HSC	07/06/16 11:56	070616-1	1577375
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/06/16 11:56	070616-1	1577375

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

**\*Analytical Methods:**

P SW846 3005A/6010C

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL400141

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 400141005

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B35ML6

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-39-3	Barium	55.6	ug/L		1	5	5	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-70-2	Calcium	22100	ug/L		50	200	200	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-47-3	Chromium	1.52	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-50-8	Copper	4.51	ug/L	B	3	10	10	1	P	HSC	07/06/16 11:59	070616-1	1577375
7439-89-6	Iron	973	ug/L		30	100	100	1	P	HSC	07/06/16 11:59	070616-1	1577375
7439-95-4	Magnesium	6720	ug/L		110	300	300	1	P	HSC	07/06/16 11:59	070616-1	1577375
7439-96-5	Manganese	51.3	ug/L		2	10	10	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-02-0	Nickel	1.54	ug/L	B	1.5	5	5	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-09-7	Potassium	982	ug/L		50	150	150	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-23-5	Sodium	2320	ug/L		100	300	300	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-62-2	Vanadium	3.94	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:59	070616-1	1577375
7440-66-6	Zinc	5.57	ug/L	B	3.3	10	10	1	P	HSC	07/06/16 11:59	070616-1	1577375

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

**\*Analytical Methods:**

P SW846 3005A/6010C

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL400141

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 400141006

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B35ML9

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-39-3	Barium	38	ug/L		1	5	5	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-70-2	Calcium	21900	ug/L		50	200	200	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-47-3	Chromium	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/06/16 12:03	070616-1	1577375
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/06/16 12:03	070616-1	1577375
7439-95-4	Magnesium	6860	ug/L		110	300	300	1	P	HSC	07/06/16 12:03	070616-1	1577375
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-09-7	Potassium	905	ug/L		50	150	150	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-23-5	Sodium	2150	ug/L		100	300	300	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-62-2	Vanadium	2.05	ug/L	B	1	5	5	1	P	HSC	07/06/16 12:03	070616-1	1577375
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/06/16 12:03	070616-1	1577375

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

**\*Analytical Methods:**

P SW846 3005A/6010C

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: July 21, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400141

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577375										
QC1203574643	LCS										
Antimony	500			503	ug/L		101	(80%-120%)	HSC	07/06/16	11:03
Arsenic	500			499	ug/L		99.8	(80%-120%)			
Barium	500			504	ug/L		101	(80%-120%)			
Cadmium	500			501	ug/L		100	(80%-120%)			
Calcium	5000			5230	ug/L		105	(80%-120%)			
Chromium	500			504	ug/L		101	(80%-120%)			
Cobalt	500			508	ug/L		102	(80%-120%)			
Copper	500			507	ug/L		101	(80%-120%)			
Iron	5000			5270	ug/L		105	(80%-120%)			
Magnesium	5000			5210	ug/L		104	(80%-120%)			
Manganese	500			493	ug/L		98.6	(80%-120%)			
Nickel	500			515	ug/L		103	(80%-120%)			
Potassium	5000			5020	ug/L		100	(80%-120%)			
Silver	500			496	ug/L		99.2	(80%-120%)			
Sodium	5000			5190	ug/L		104	(80%-120%)			
Vanadium	500			509	ug/L		102	(80%-120%)			
Zinc	500			488	ug/L		97.6	(80%-120%)			
QC1203574642	MB										
Antimony			U	3.50	ug/L					07/06/16	10:59
Arsenic			U	5.00	ug/L						

7/21/2016

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 400141

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577375										
Barium			U	1.00	ug/L						
Cadmium			U	1.00	ug/L				HSC	07/06/16	10:59
Calcium			U	50.0	ug/L						
Chromium			U	1.00	ug/L						
Cobalt			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Manganese			U	2.00	ug/L						
Nickel			U	1.50	ug/L						
Potassium			U	50.0	ug/L						
Silver			U	1.00	ug/L						
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L						
Zinc			U	3.30	ug/L						
QC1203574644 400138001 MS											
Antimony	500	U	3.50	495	ug/L		98.9	(75%-125%)		07/06/16	11:11
Arsenic	500	U	5.00	492	ug/L		98.2	(75%-125%)			
Barium	500	U	1.00	500	ug/L		99.9	(75%-125%)			
Cadmium	500	U	1.00	497	ug/L		99.3	(75%-125%)			
Calcium	5000	U	50.0	5230	ug/L		104	(75%-125%)			
Chromium	500	U	1.00	500	ug/L		100	(75%-125%)			
Cobalt	500	U	1.00	504	ug/L		101	(75%-125%)			

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**QC Summary**

Workorder: 400141

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577375										
Copper	500	U	3.00	503	ug/L		100	(75%-125%)	HSC	07/06/16	11:11
Iron	5000	U	30.0	5270	ug/L		105	(75%-125%)			
Magnesium	5000	U	110	5210	ug/L		104	(75%-125%)			
Manganese	500	U	2.00	495	ug/L		99	(75%-125%)			
Nickel	500	U	1.50	511	ug/L		102	(75%-125%)			
Potassium	5000	U	50.0	4980	ug/L		99.6	(75%-125%)			
Silver	500	U	1.00	488	ug/L		97.6	(75%-125%)			
Sodium	5000	U	100	5070	ug/L		101	(75%-125%)			
Vanadium	500	U	1.00	505	ug/L		101	(75%-125%)			
Zinc	500	U	3.30	484	ug/L		96.4	(75%-125%)			
QC1203574645 400138001 MSD											
Antimony	500	U	3.50	491	ug/L	0.816	98.1	(0%-20%)		07/06/16	11:14
Arsenic	500	U	5.00	488	ug/L	0.657	97.6	(0%-20%)			
Barium	500	U	1.00	498	ug/L	0.317	99.6	(0%-20%)			
Cadmium	500	U	1.00	495	ug/L	0.385	98.9	(0%-20%)			
Calcium	5000	U	50.0	5210	ug/L	0.32	104	(0%-20%)			
Chromium	500	U	1.00	497	ug/L	0.668	99.4	(0%-20%)			
Cobalt	500	U	1.00	502	ug/L	0.563	100	(0%-20%)			
Copper	500	U	3.00	499	ug/L	0.687	99.6	(0%-20%)			
Iron	5000	U	30.0	5340	ug/L	1.29	107	(0%-20%)			
Magnesium	5000	U	110	5270	ug/L	1.11	105	(0%-20%)			
Manganese	500	U	2.00	495	ug/L	0.0707	98.9	(0%-20%)			

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**QC Summary**

Workorder: 400141

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577375										
Nickel	500	U	1.50	508	ug/L	0.532	102	(0%-20%)	HSC	07/06/16	11:14
Potassium	5000	U	50.0	4980	ug/L	0.0582	99.6	(0%-20%)			
Silver	500	U	1.00	487	ug/L	0.23	97.4	(0%-20%)			
Sodium	5000	U	100	5060	ug/L	0.0829	101	(0%-20%)			
Vanadium	500	U	1.00	502	ug/L	0.614	100	(0%-20%)			
Zinc	500	U	3.30	480	ug/L	0.791	95.7	(0%-20%)			
QC1203574646	400138001	SDILT									
Antimony		U	0.427	DU	17.5	ug/L	N/A	(0%-10%)		07/06/16	11:17
Arsenic		U	0.376	DU	25.0	ug/L	N/A	(0%-10%)			
Barium		U	0.0448	DU	5.00	ug/L	N/A	(0%-10%)			
Cadmium		U	0.481	DU	5.00	ug/L	N/A	(0%-10%)			
Calcium		U	24.3	DU	250	ug/L	N/A	(0%-10%)			
Chromium		U	0.314	DU	5.00	ug/L	N/A	(0%-10%)			
Cobalt		U	0.381	DU	5.00	ug/L	N/A	(0%-10%)			
Copper		U	1.31	DU	15.0	ug/L	N/A	(0%-10%)			
Iron		U	0.631	DU	150	ug/L	N/A	(0%-10%)			
Magnesium		U	-10.6	DU	550	ug/L	N/A	(0%-10%)			
Manganese		U	0.0871	DU	10.0	ug/L	N/A	(0%-10%)			
Nickel		U	0.407	DU	7.50	ug/L	N/A	(0%-10%)			
Potassium		U	-2.42	DU	250	ug/L	N/A	(0%-10%)			
Silver		U	0.331	DU	5.00	ug/L	N/A	(0%-10%)			
Sodium		U	-23.4	DU	500	ug/L	N/A	(0%-10%)			

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**QC Summary**

Workorder: 400141

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577375										
Vanadium	U	0.114	DU	5.00	ug/L	N/A		(0%-10%)	HSC	07/06/16	11:17
Zinc	U	1.65	DU	16.5	ug/L	N/A		(0%-10%)			

**Notes:**

The Qualifiers in this report are defined as follows:

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

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

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

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

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

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

# General Chem Analysis

# Case Narrative

**General Chemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL400141  
Work Order #: 400141**

**Product: Alkalinity****Analytical Method:** 2320\_ALKALINITY**Analytical Procedure:** GL-GC-E-033 REV# 12**Analytical Batch:** 1577434

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
400141002	B35MJ8
400141003	B35MJ9
400141005	B35ML6
1203574834	Laboratory Control Sample (LCS)
1203574837	Method Blank (MB)
1203574838	400025001(B35M74) Sample Duplicate (DUP)

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

**Data Summary:**

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

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

The MBs (See Below) analyzed with this SDG met the acceptance criteria. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203574837 (MB)	Alkalinity, Total as CaCO <sub>3</sub> and Bicarbonate alkalinity (CaCO <sub>3</sub> )	1.52 * 10 > 3.54

**Certification Statement**

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

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400141 GEL Work Order: 400141

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

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.

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: Aubrey Kingsbury

Date: 29 JUN 2016

Title: Analyst I

# Sample Data Summary

7/21/2016

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Report Date: June 29, 2016

Company : CH2MHill Plateau Remediation Company  
Address : MSIN R3-50 CHPRC  
PO Box 1600  
Richland, Washington 99352  
Contact: Mr. Scot Fitzgerald  
Project: CHPRC SAF X16-037

Client Sample ID: B35MJ8 Project: CPRC0X16037  
Sample ID: 400141002 Client ID: CPRC001  
Matrix: WATER  
Collect Date: 24-JUN-16 08:37  
Receive Date: 25-JUN-16  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis											
2320_ALKALINITY: GW 01 "As Received"											
Alkalinity, Total as CaCO3	C	84300	725	1000	ug/L		KLP1	06/27/16	1413	1577434	1
Bicarbonate alkalinity (CaCO3)	C	84300	725	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	725	725	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

7/21/2016

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: June 29, 2016

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF X16-037

Client Sample ID:	B35MJ9	Project:	CPRC0X16037
Sample ID:	400141003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	24-JUN-16 08:37		
Receive Date:	25-JUN-16		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis											
2320_ALKALINITY: GW 01 "As Received"											
Alkalinity, Total as CaCO3	C	84300	725	1000	ug/L		KLP1	06/27/16	1416	1577434	1
Bicarbonate alkalinity (CaCO3)	C	84300	725	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	725	725	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

7/21/2016

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Report Date: June 29, 2016

Company : CH2MHill Plateau Remediation Company  
Address : MSIN R3-50 CHPRC  
PO Box 1600  
Richland, Washington 99352  
Contact: Mr. Scot Fitzgerald  
Project: CHPRC SAF X16-037

Client Sample ID: B35ML6 Project: CPRC0X16037  
Sample ID: 400141005 Client ID: CPRC001  
Matrix: WATER  
Collect Date: 24-JUN-16 09:31  
Receive Date: 25-JUN-16  
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis											
2320_ALKALINITY: GW 01 "As Received"											
Alkalinity, Total as CaCO3	C	72700	725	1000	ug/L		KLP1	06/27/16	1420	1577434	1
Bicarbonate alkalinity (CaCO3)	C	72700	725	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	725	725	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 29, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400141

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1577434										
QC1203574838	400025001	DUP									
Alkalinity, Total as CaCO3	C	113000		116000	ug/L	2.21		(0%-20%)	KLP1	06/27/16	12:39
Bicarbonate alkalinity (CaCO3)	C	113000		116000	ug/L	2.21		(0%-20%)			
Carbonate alkalinity (CaCO3)	U	725	U	725	ug/L	N/A					
Hydroxide alkalinity as CaCO3	U	725	U	725	ug/L	N/A					
QC1203574834	LCS										
Alkalinity, Total as CaCO3	50000			49500	ug/L		99	(80%-120%)		06/27/16	12:30
QC1203574837	MB										
Alkalinity, Total as CaCO3				1520	ug/L					06/27/16	12:26
Bicarbonate alkalinity (CaCO3)				1520	ug/L						
Carbonate alkalinity (CaCO3)			U	725	ug/L						
Hydroxide alkalinity as CaCO3			U	725	ug/L						

**Notes:**

The Qualifiers in this report are defined as follows:

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

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 400141

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

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

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

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

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

# Radiological Analysis

# Case Narrative

**Radiochemistry**  
**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL400141**  
**Work Order #: 400141**

**Product:** SRISO\_SEP\_PRECIP\_GPC: COMMON

**Analytical Method:** SRISO\_SEP\_PRECIP\_GPC

**Analytical Procedure:** GL-RAD-A-004 REV# 17

**Analytical Batch:** 1579220

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
400141002	B35MJ8
400141003	B35MJ9
400141005	B35ML6
1203579106	Method Blank (MB)
1203579107	400141005(B35ML6) Sample Duplicate (DUP)
1203579108	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:** C14\_LSC: COMMON

**Analytical Method:** C14\_LSC

**Analytical Procedure:** GL-RAD-A-003 REV# 15

**Analytical Batch:** 1578295

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
400141002	B35MJ8
400141003	B35MJ9
400141005	B35ML6
1203576766	Method Blank (MB)
1203576767	400025001(B35M74) Sample Duplicate (DUP)
1203576768	400025001(B35M74) Matrix Spike (MS)
1203576769	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# 21

**Analytical Batch:** 1579141

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
400141002	B35MJ8
400141003	B35MJ9
400141005	B35ML6
1203578832	Method Blank (MB)
1203578833	400025001(B35M74) Sample Duplicate (DUP)
1203578834	400025001(B35M74) Matrix Spike (MS)
1203578835	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.

**Certification Statement**

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

**GEL LABORATORIES LLC**

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400141 GEL Work Order: 400141

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

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

**Review/Validation**

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

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

**Signature:** 

**Name:** Kate Gellatly

**Date:** 20 JUL 2016

**Title:** Analyst I

# Sample Data Summary

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141002	Date Collected: 06/24/2016 08:37	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35MJ8	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579220	Analyst: BXF1	SOP Ref: GL-RAD-A-004
Run Date: 07/13/2016 13:36	Aliquot: 300 mL	Instrument: PIC10B
Data File: S1579220r1.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1579220		
Prep Date: 07/12/2016 14:13		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	0.473	pCi/L	+/-0.799	0.802	1.40	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.90	7.37	mg	93.7	(40%-110%)

**Comments:**

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

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141002	Date Collected: 06/24/2016 08:37	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35MJ8	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1578295	Analyst: TXJ1	SOP Ref: GL-RAD-A-003
Run Date: 07/14/2016 18:45	Aliquot: 60 mL	Instrument: LSCBLUE
Data File: C1578295.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1578295		
Prep Date: 07/14/2016 09:05		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	8.29	pCi/L	+/-18.0	18.1	30.7	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

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

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141002	Date Collected: 06/24/2016 08:37	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35MJ8	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1579141	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/13/2016 19:14	Aliquot: 50 mL	Instrument: LSCBROWN
Data File: T1579141.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1579141		
Prep Date: 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-33.1	pCi/L	+/-189	189	335	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

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

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141003	Date Collected: 06/24/2016 08:37	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35MJ9	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579220	Analyst: BXF1	SOP Ref: GL-RAD-A-004
Run Date: 07/13/2016 13:36	Aliquot: 300 mL	Instrument: PIC10C
Data File: S1579220r1.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1579220		
Prep Date: 07/12/2016 14:13		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.691	pCi/L	+/-0.614	0.614	1.41	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.20	7.37	mg	97.8	(40%-110%)

**Comments:**

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

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141003	Date Collected: 06/24/2016 08:37	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35MJ9	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1578295	Analyst: TXJ1	SOP Ref: GL-RAD-A-003
Run Date: 07/14/2016 19:32	Aliquot: 60 mL	Instrument: LSCBLUE
Data File: C1578295.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1578295		
Prep Date: 07/14/2016 09:05		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	2.97	pCi/L	+/-17.8	17.8	30.5	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

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

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

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<b>SDG Number:</b> GEL400141	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0X16037
<b>Lab Sample ID:</b> 400141003	<b>Date Collected:</b> 06/24/2016 08:37	<b>Matrix:</b> WATER
	<b>Date Received:</b> 06/25/2016 08:45	
<b>Client ID:</b> B35MJ9	<b>Method:</b> TRITIUM_DIST_LSC	<b>Prep Basis:</b> "As Received"
<b>Batch ID:</b> 1579141	<b>Analyst:</b> TXJ1	<b>SOP Ref:</b> GL-RAD-A-002
<b>Run Date:</b> 07/13/2016 20:01	<b>Aliquot:</b> 50 mL	<b>Instrument:</b> LSCBROWN
<b>Data File:</b> T1579141.xls	<b>Prep Method:</b> EPA 906.0 Modified	<b>Count Time:</b> 45 min
<b>Prep Batch:</b> 1579141		
<b>Prep Date:</b> 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	32.3	pCi/L	+/-183	184	320	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

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

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141005	Date Collected: 06/24/2016 09:31	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35ML6		Prep Basis: "As Received"
Batch ID: 1579220	Method: SRISO_SEP_PRECIP_GPC	SOP Ref: GL-RAD-A-004
Run Date: 07/13/2016 13:40	Analyst: BXF1	Instrument: PIC11A
Data File: S1579220r1.xls	Aliquot: 300 mL	Count Time: 60 min
Prep Batch: 1579220	Prep Method: EPA 905.0 Modified/DOE RP5	
Prep Date: 07/12/2016 14:13		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.937	pCi/L	+/-0.740	0.740	1.64	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.90	7.37	mg	93.7	(40%-110%)

**Comments:**

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

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141005	Date Collected: 06/24/2016 09:31	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35ML6	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1578295	Analyst: TXJ1	SOP Ref: GL-RAD-A-003
Run Date: 07/14/2016 20:19	Aliquot: 60 mL	Instrument: LSCBLUE
Data File: C1578295.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1578295		
Prep Date: 07/14/2016 09:05		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-2.45	pCi/L	+/-17.7	17.7	30.6	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

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

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

SDG Number: GEL400141	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400141005	Date Collected: 06/24/2016 09:31	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B35ML6	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1579141	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/13/2016 20:48	Aliquot: 50 mL	Instrument: LSCBROWN
Data File: T1579141.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1579141		
Prep Date: 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	180	pCi/L	+/-197	200	331	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

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

# Quality Control Summary

7/21/2016

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: July 20, 2016  
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**Client :** CH2MHill Plateau Remediation Company  
MSIN R3-50 CHPRC  
PO Box 1600  
Richland, Washington 99352  
**Contact:** Mr. Scot Fitzgerald  
**Workorder:** 400141

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Gas Flow</b>									
Batch	1579220								
QC1203579106	MB								
Strontium-90			U	0.441	pCi/L			BXF1	07/13/1613:40
				Uncert: +/-0.786					
				TPU: +/-0.789					
**Strontium Carrier		7.37		5.90	mg	REC: 80	(40%-110%)		
QC1203579107	400141005	DUP							
Strontium-90		U	-0.937	U	-0.00283				07/13/1613:40
			Uncert: +/-0.740		+/-0.611	RPD: 0	N/A		
			TPU: +/-0.740		+/-0.611	RER: 1.91	(0-2)		
**Strontium Carrier		7.37	6.90		7.10	mg	REC: 96	(40%-110%)	
QC1203579108	LCS								
Strontium-90				72.9		77.0	pCi/L	REC: 106	(80%-120%)
				Uncert: +/-4.42					07/13/1613:32
				TPU: +/-12.8					
**Strontium Carrier		7.37			7.30	mg	REC: 99	(40%-110%)	
<b>Rad Liquid Scintillation</b>									
Batch	1578295								
QC1203576766	MB								
Carbon-14			U	-2.23	pCi/L			TXJ1	07/14/1623:27
				Uncert: +/-17.7					
				TPU: +/-17.7					
QC1203576767	400025001	DUP							
Carbon-14			424		423	pCi/L			07/15/1600:14
			Uncert: +/-26.8		+/-26.8	RPD: 0	(0% - 20%)		
			TPU: +/-83.1		+/-83.0	RER: 0.0117	(0-2)		
QC1203576768	400025001	MS							
Carbon-14		1260	424		1660	pCi/L	REC: 98	(75%-125%)	07/15/1601:01
			Uncert: +/-26.8		+/-43.4				
			TPU: +/-83.1		+/-311				
QC1203576769	LCS								
Carbon-14		1260			1260	pCi/L	REC: 100	(80%-120%)	07/15/1601:48
					Uncert: +/-38.8				
					TPU: +/-237				
Batch	1579141								
QC1203578832	MB								
Tritium			U	-4.81	pCi/L			TXJ1	07/14/1607:52
				Uncert: +/-190					
				TPU: +/-190					
QC1203578833	400025001	DUP							
Tritium			1460		1490	pCi/L			07/14/1608:39
			Uncert: +/-246		+/-248	RPD: 2	(0% - 100%)		
			TPU: +/-374		+/-380	RER: 0.109	(0-2)		
QC1203578834	400025001	MS							
Tritium		2330	1460		3380	pCi/L	REC: 82	(75%-125%)	07/14/1609:26

QC Summary

Workorder: 400141

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
<b>Rad Liquid Scintillation</b>										
Batch	1579141									
		Uncert:	+/-246			+/-316				
		TPU:	+/-374			+/-725				
QC1203578835	LCS									
Tritium	2320			1860	pCi/L	REC: 80 (80%-120%)			07/14/16	10:13
		Uncert:		+/-260						
		TPU:		+/-444						

**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
- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- A The TIC is a suspected aldol-condensation product
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result  $\geq 2X$  the MDA and, after corrections, result is  $\geq$  MDA for this sample
- C Analyte has been confirmed by GC/MS analysis
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is  $\geq$  EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- 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)

7/21/2016

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 400141

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

\*\* Indicates analyte is a surrogate compound.

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

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

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