

February 19, 2015



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[www.gel.com](http://www.gel.com)

February 16, 2015

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

Re: CHPRC SAF S15-001  
Work Order: 365668  
SDG: GEL365668

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 23, 2015. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

Heather Shaffer  
Project Manager

Purchase Order: 300071

Chain of Custody: S15-001-176, S15-001-177, S15-001-178, S15-001-179, S15-001-326 and S15-001-328

Enclosures



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# Case Narrative

February 19, 2015

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF S15-001  
SDG: GEL365668

February 16, 2015

**Laboratory Identification:**

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

**Summary**

**Sample receipt**

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on January 23, 2015, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

**Sample Identification**

The laboratory received the following samples:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
365668001	B30150
365668002	B30160
365668003	B30148
365668004	B30151
365668005	B30161
365668006	B30158
365668007	B30156
365668008	B30154
365668009	B30164
365668010	B30166

**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.

February 19, 2015

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 Semivolatile, GC/MS Volatile, General Chemistry and Metals.

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



Heather Shaffer  
Project Manager

# **Chain of Custody and Supporting Documentation**

CH2MHill Plateau Remediation Company		C.O.C. # S15-001-177	
3026668		Page 1 of 1	
Collector	S.W. King/CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	S15-001	Telephone No.	509-376-4650
Project Title	SURV, JANUARY 2015	Purchase Order/Charge Code	300071
Shipped To (Lab)	GEL Laboratories, LLC	Ice Chest No.	GWS-180
Protocol	SURV	Bill of Lading/Air Bill No.	77267862-7759
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		Offsite Property No.	5360
721-22-15 0837		Priority:	30 Days
SPECIAL INSTRUCTIONS Hold Time		Total Activity Exemption:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No.	B30150	Method of Shipment	Commercial Carrier
Filter	N	Logbook No.	HNF-N-50671152
Date	JAN 22 2015	Method of Shipment	Commercial Carrier
Time	JAN 22 2015	Priority:	30 Days
No/Type Container	1x250-mL G/P	Special Instructions	Hold Time
Sample Analysis	9056_ANIONS_IC: COMMON	Sample Analysis	28 Days/48 Hours
Preservative	Cool <=6C	Sample Analysis	28 Days/48 Hours

Relinquished By	S.W. King/CHPRC	Print	[Signature]	Sign	[Signature]	Received By	R.A. Shepard/CHPRC	Print	[Signature]	Sign	[Signature]	Received By	FEDEX	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]
Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100	Date/Time	JAN 22 2015 1100
Relinquished By	R.A. Shepard/CHPRC	Print	[Signature]	Sign	[Signature]	Received By	FEDEX	Print	[Signature]	Sign	[Signature]	Received By	FEDEX	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]
Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400
Relinquished By	FEDEX	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]
Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400
Relinquished By	FEDEX	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]	Received By	Mr. Fastow	Print	[Signature]	Sign	[Signature]
Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400	Date/Time	JAN 22 2015 1400

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

Date/Time

Disposed By

FINAL SAMPLE DISPOSITION

February 19, 2015

CH2M Hill Plateau Remediation Company		C.O.C. # S15-001-179	
365668		Page 1 of 1	
Collector	S.W. King/CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	S15-001	Telephone No.	509-376-4650
Project Title	SURV, JANUARY 2015	Purchase Order/Charge Code	300071
Shipped To (Lab)	GEL Laboratories, LLC	Ice Chest No.	GWS-180
Protocol	SURV	Bill of Lading/Air Bill No.	77267862759
		Offsite Property No.	5360
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> *** 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 Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No.	Filter * Date Time	Sample Analysis	Preservative
B30160	N WJAN 2 2 2015 1045	9056_ANIONS_IC: COMMON	Cool <=6C

Relinquished By	Print Sign	Date/Time	Received By	Print Sign	Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge W = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
S.W. King/CHPRC	[Signature]	JAN 2 2 2015 1100	R.A. Shepard/CHPRC	[Signature]	JAN 2 2 2015 1100	
Relinquished By	Print Sign	Date/Time	Received By	Print Sign	Date/Time	
9 R.A. Shepard/CHPRC	[Signature]	ADO	FEDEX	[Signature]		
Relinquished By	Print Sign	Date/Time	Received By	Print Sign	Date/Time	
12 Fed Ex	[Signature]	JAN 2 2 2015	M. Kinshon	[Signature]	1-23-15 0855	
Relinquished By	Print Sign	Date/Time	Received By	Print Sign	Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Date/Time		

A-6004-842 (REV 2)

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February 19, 2015

**CH2MHill Plateau Remediation Company**  
**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 C.O.C. # **S15-001-176**  
 Page 1 of 1

**Collector** S.W. King/CHPRC  
**Contact/Requester** Karen Waters-Husted  
**Telephone No.** 509-376-4650  
**SAF No.** S15-001  
**Sampling Origin** Hanford Site  
**Purchase Order/Charge Code** 300071  
**Project Title** SURV, JANUARY 2015  
**Logbook No.** HNF-N-50671/52  
**Ice Chest No.** GWS-180  
**Shipped To (Lab)** GEL Laboratories, LLC  
**Method of Shipment** Commercial Carrier  
**Bill of Lading/Air Bill No.** 7726 7862 7759  
**Priority:** 30 Days  
**Offsite Property No.** 5260

**Protocol** SURV  
**PRIORITY**  
**SPECIAL INSTRUCTIONS**  
**Hold Time**  
**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
B30148	N	W	JAN 22 2015	0837	1x500-mL G/P	350.1_AMMONIA: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30148	N	W			1x500-mL G/P	410.4_COD: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30148	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2
B30148	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON; 8260_VOA_GCMS: GW 01	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30148	N	W			4x1-L aG	8270_SVOA_GCMS: 1,4 Dioxane (1)	7/40 Days	Cool <=6C
B30148	N	W			1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30151	Y	W	JAN 22 2015	0837	1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
S.W. King/CHPRC			JAN 22 2015 1100	R.A. Shepard/CHPRC			JAN 22 2015 1100	S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Oil, A = Air, DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other
R.A. Shepard/CHPRC			JAN 22 2015 1400	FEDEX			JAN 22 2015 1400	
R.A. Shepard/CHPRC			JAN 22 2015 1400	R.A. Shepard/CHPRC			JAN 22 2015 1400	
R.A. Shepard/CHPRC			JAN 22 2015 1400	R.A. Shepard/CHPRC			JAN 22 2015 1400	

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

February 19, 2015

**CH2M Hill Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

C.O.C.# **S15-001-178**

Page 1 of 1

Collector **S.W. King/CHPRC** Telephone No. **509-376-4650**

SAF No. **S15-001** Purchase Order/Charge Code **300071**

Project Title **SURV, JANUARY 2015** Ice Chest No. **GWS-345**

Shipped To (Lab) **GEL Laboratories, LLC** Bill of Lading/Air Bill No. **7726 7862 7910**

Protocol **SURV** Offsite Property No. **5360**

Priority: **30 Days** **PRIORITY**

**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** Total Activity Exemption: Yes  No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B30161	Y	W	JAN 2 2015	1645	1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2
B30158	N	W			1x500-mL G/P	350.1_AMMONIA: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30158	N	W			1x500-mL G/P	410.4_COD: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30158	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2
B30158	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON; 8260_VOA_GCMS: GW_01	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30158	N	W			4x1-L aG	8270_SVOA_GCMS: 1,4 Dioxane (1)	7/40 Days	Cool <=6C
B30158	N	W	JAN 2 2015	1045	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C

Relinquished By **S.W. King/CHPRC** Date/Time **JAN 2 2015 1100** Sign *[Signature]* Print **R.A. Shepard/CHPRC**

Relinquished By **R.A. Shepard/CHPRC** Date/Time **JAN 2 2015 400** Sign *[Signature]* Print **FEDER**

Relinquished By **FOR EX** Date/Time **JAN 2 2015** Sign *[Signature]* Print **M. Kinslow**

Relinquished By **FOR EX** Date/Time **1-23-15 0855** Sign *[Signature]* Print **M. Kinslow**

**FINAL SAMPLE DISPOSITION**

Disposal Method (e.g., Return to customer, per lab procedure, used in process) \_\_\_\_\_ Date/Time \_\_\_\_\_

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

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**CH2M Hill Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

C.O.C.# **S15-001-326**

Page 1 of 1

**Collector** S.W. King/CHPRG **Contact/Requester** Karen Waters-Husted **Telephone No.** 509-376-4650

**SAF No.** S15-001 **Sampling Origin** Hanford Site **Purchase Order/Charge Code** 300071

**Project Title** SURV, JANUARY 2015 **Logbook No.** HNF-N-50671/58 **Ice Chest No.** GWS-180

**Shipped To (Lab)** TestAmerica-St. Louis - GEL **Method of Shipment** Commercial Carrier **Bill of Lading/Air Bill No.** 7726 7862 7759

**Protocol** SURV **Priority:** 30 Days **PRIORITY** **Offsite Property No.** 5360

**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 **Total Activity Exemption:** Yes  No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B30156	Y	W	JAN 22 2015	0922	1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2
B30154	N	W			1x500-mL G/P	350.1_AMMONIA: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30154	N	W			1x500-mL G/P	410.4_COD: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30154	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2
B30154	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON; 8260_VOA_GCMS: GW 01	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30154	N	W			3x1-L aG	8270_SVOA_GCMS: 1,4 Dioxane (1)	7/40 Days	Cool <=6C
B30154	N	W	JAN 22 2015	0922	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
S.W. King/CHPRG			JAN 22 2015 1100	R.A. Shepard/CHPRG			JAN 22 2015 1100	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
R.A. Shepard/CHPRG			JAN 22 2015 1400	FEDER				
R.A. Shepard/CHPRG			JAN 22 2015 0922	M. Kinslow			1-23-15 0855	
R.A. Shepard/CHPRG								

February 19, 2015

**CH2M Hill Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

C.O.C.# **S15-001-328**  
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Telephone No. 509-376-4650  
Purchase Order/Charge Code 300071

Ice Chest No. 6W05-345  
Bill of Lading/Air Bill No. 7126 7862 7910  
Offsite Property No. 5360

Contact/Requester Karen Waters-Husted  
Sampling Origin Hanford Site  
Logbook No. HNF-N-506 7152  
Method of Shipment Commercial Carrier  
Priority: 30 Days **PRIORITY**

**SPECIAL INSTRUCTIONS** Hold Time  
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
B30164	N	W	JAN 22 2015	0955	1x500-mL GIP	350.1_AMMONIA: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30164	N	W			1x500-mL GIP	410.4_COD: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30164	N	W			1x500-mL GIP	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2
B30164	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON; 8260_VOA_GCMS: GW 01	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30164	N	W			3x1-L aG	8270_SVOA_GCMS: 1,4 Dioxane (1)	7/40 Days	Cool <=6C
B30164	N	W			1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30166	Y	W	JAN 22 2015	0955	1x500-mL GIP	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Antimony (1); 6020_METALS_ICPMS: Arsenic (1)	6 Months	HNO3 to pH <2

Relinquished By S.W. King/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 22 2015 1000	Received By R.A. Shepard/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 22 2015 10
Relinquished By R.A. Shepard/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 22 2015 1400	Received By FEDER	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 1-23-15 0855
Relinquished By R.A. Shepard/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 22 2015 1400	Received By M. Karlow mlk	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 1-23-15 0855
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

**30**  
**12**

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>3051608</u>
Received By: <u>MK</u>		Date Received: <u>1-23-15</u>
Suspected Hazard Information	Yes <input checked="" 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?		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u>
Classified Radioactive II or III by RSO?		If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		
Package, COC, and/or Samples marked as beryllium or asbestos containing?		If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		

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 checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: <u>ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>130532776</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" 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 checked="" 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 checked="" type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other  7726 7431 6298 2.2c 7726 7862 7910 2.3c 7726 7802 7759 1.9c

Comments (Use Continuation Form if needed):

# **Data Review Qualifier Definitions**

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

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol-condensation product	Y	Organics	Semi-Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H Hold Date In RAD replaces UI. Same usage as standard X as well.
N	Programmed	Spike Sample recovery is outside control limits.	Y			
*	Programmed	Duplicate analysis not within control limits	Y	Inorganics		
>	Programmed	Result greater than quantifiable range or greater than upper limit of the analysis range	Y	General Chemistry		
Z	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
B	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Y	Inorganics	Metals	Replaces J Estimated Value
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (Organics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely performed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is $\geq$ MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Y	General Chemistry		Replaces J Estimated Value
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is $\geq$ EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	Inorganics	Metals	Replaces B Blank Detection
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is $\geq$ EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	General Chemistry		Replaces B Blank Detection
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

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

<b>Code</b>	<b>Status</b>	<b>Qualifier Definition</b>	<b>CofA</b>	<b>Department</b>	<b>Fraction</b>	<b>Additional Comments</b>
UX	Manual	Gamma Spectroscopy--Uncertain identification	Y	Radiological		

# Laboratory Certifications

**List of current GEL Certifications as of 16 February 2015**

<b>State</b>	<b>Certification</b>
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122014-16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12

# **Volatile Analysis**

# Case Narrative

**February 19, 2015**  
**GC/MS Volatile**  
**Technical Case Narrative**  
**CH2M Hill Plateau Remediation Company (CPRC)**  
**SDG #: GEL365668**  
**Work Order #: 365668**

**Method/Analysis Information**

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

Analytical Method: SW846 8260C

Analytical Batch Number: 1452976

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
365668003	B30148
365668006	B30158
365668008	B30154
365668009	B30164
1203251575	Method Blank (MB)
1203251576	Laboratory Control Sample (LCS)
1203251577	Laboratory Control Sample (LCS)
1203251578	365749002(B30188) Post Spike (PS)
1203251579	365749002(B30188) Post Spike Duplicate (PSD)
1203251580	365749002(B30188) Post Spike (PS)
1203251581	365749002(B30188) Post Spike Duplicate (PSD)
1203254660	Method Blank (MB)
1203254661	Laboratory Control Sample (LCS)
1203254662	Laboratory Control Sample (LCS)

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

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

**Calibration Information**

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at

February 19, 2015

a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**

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

**Continuing Calibration Verification Requirements**

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

**Quality Control (QC) Information**

**Blank (MB) Statement**

The blanks analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**

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

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**

Sample 365749002 (B30188) was designated for spike analysis.

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

The spike and/or spike duplicate 1203251578 (B30188PS) and 1203251579 (B30188PSD) recoveries were not all within the acceptance limits.

**Relative Percent Difference (RPD) Statement**

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

**Internal Standard (ISTD) Acceptance**

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

**Technical Information**

**Holding Time Specifications**

All samples in this SDG met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Sample Preservation and Integrity**

The pH of samples 365668003 (B30148) and 365668006 (B30158) were above 2 at the time of analysis. The samples were analyzed within 7 days from collection.

**Sample Dilutions/Methanol Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**

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

**Miscellaneous Information**

**Electronic Packaging Comment**

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This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1377629.

**Manual Integrations**

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

**TIC Comment**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Residual Chlorine**

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

**System Configuration**

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

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

**Certification Statement**

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

February 19, 2015

**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: GEL365668 GEL Work Order: 365668

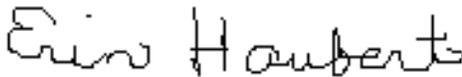
**The Qualifiers in this report are defined as follows:**

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

**Review/Validation**

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

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

Signature: 

Name: Erin Haubert

Date: 19 FEB 2015

Title: Data Validator

# Sample Data Summary

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID:	B30148	Project:	CPRC0S15001
Sample ID:	365668003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 08:37		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Volatile Organics</b>										
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>										
1,1,1-Trichloroethane 71-55-6	J	0.440	0.300	5.00	ug/L	1	CDS1 01/27/15	1308	1452976	1
1,1,2-Trichloroethane 79-00-5	U	0.00	0.300	5.00	ug/L	1				
1,1-Dichloroethane 75-34-3	U	0.00	0.300	10.0	ug/L	1				
1,1-Dichloroethylene 75-35-4	U	0.00	0.300	10.0	ug/L	1				
1,2-Dichloroethane 107-06-2	U	0.00	0.300	5.00	ug/L	1				
1,4-Dichlorobenzene 106-46-7	U	0.00	0.300	5.00	ug/L	1				
2-Butanone 78-93-3	TU	0.00	3.00	10.0	ug/L	1				
4-Methyl-2-pentanone 108-10-1	U	0.00	3.00	10.0	ug/L	1				
Acetone 67-64-1	TU	0.00	3.00	20.0	ug/L	1				
Benzene 71-43-2	U	0.00	0.300	5.00	ug/L	1				
Carbon disulfide 75-15-0	U	0.00	1.60	10.0	ug/L	1				
Carbon tetrachloride 56-23-5	U	0.00	0.300	5.00	ug/L	1				
Chlorobenzene 108-90-7	U	0.00	0.300	5.00	ug/L	1				
Chloroform 67-66-3	U	0.00	0.300	5.00	ug/L	1				
Ethylbenzene 100-41-4	U	0.00	0.300	5.00	ug/L	1				
Methylene chloride 75-09-2	U	0.00	1.60	5.00	ug/L	1				
Propionitrile 107-12-0	U	0.00	3.00	10.0	ug/L	1				
Tetrachloroethylene 127-18-4	J	0.500	0.300	5.00	ug/L	1				

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID: B30148      Project: CPRC0S15001  
 Sample ID: 365668003      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Volatile Organics</b>											
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>											
Tetrahydrofuran	U	0.00	1.50	50.0	ug/L	1					
109-99-9											
Toluene	U	0.00	0.300	5.00	ug/L	1					
108-88-3											
Trichloroethylene	J	0.360	0.300	5.00	ug/L	1					
79-01-6											
Vinyl chloride	U	0.00	0.300	10.0	ug/L	1					
75-01-4											
Xylenes (total)	U	0.00	0.300	10.0	ug/L	1					
1330-20-7											
cis-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-59-2											
n-Butyl alcohol	U	0.00	83.3	250	ug/L	1					
71-36-3											
trans-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-60-5											

**The following Analytical Methods were performed**

Method	Description	Analyst	Comments
1	SW846 8260C		

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260VOA_GCMS: COMMON + GW 01 "As Received"	50.6 ug/L	50.0	101	(77%-123%)
Bromofluorobenzene	8260VOA_GCMS: COMMON + GW 01 "As Received"	52.3 ug/L	50.0	105	(80%-120%)
Toluene-d8	8260VOA_GCMS: COMMON + GW 01 "As Received"	47.1 ug/L	50.0	94.3	(80%-120%)

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID:	B30158	Project:	CPRC0S15001
Sample ID:	365668006	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 10:45		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Volatile Organics</b>											
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>											
1,1,1-Trichloroethane 71-55-6	J	0.330	0.300	5.00	ug/L	1	CDS1	01/27/15	1338	1452976	1
1,1,2-Trichloroethane 79-00-5	U	0.00	0.300	5.00	ug/L	1					
1,1-Dichloroethane 75-34-3	U	0.00	0.300	10.0	ug/L	1					
1,1-Dichloroethylene 75-35-4	U	0.00	0.300	10.0	ug/L	1					
1,2-Dichloroethane 107-06-2	U	0.00	0.300	5.00	ug/L	1					
1,4-Dichlorobenzene 106-46-7	U	0.00	0.300	5.00	ug/L	1					
2-Butanone 78-93-3	TU	0.00	3.00	10.0	ug/L	1					
4-Methyl-2-pentanone 108-10-1	U	0.00	3.00	10.0	ug/L	1					
Acetone 67-64-1	TU	0.00	3.00	20.0	ug/L	1					
Benzene 71-43-2	U	0.00	0.300	5.00	ug/L	1					
Carbon disulfide 75-15-0	U	0.00	1.60	10.0	ug/L	1					
Carbon tetrachloride 56-23-5	U	0.00	0.300	5.00	ug/L	1					
Chlorobenzene 108-90-7	U	0.00	0.300	5.00	ug/L	1					
Chloroform 67-66-3	U	0.00	0.300	5.00	ug/L	1					
Ethylbenzene 100-41-4	U	0.00	0.300	5.00	ug/L	1					
Methylene chloride 75-09-2	U	0.00	1.60	5.00	ug/L	1					
Propionitrile 107-12-0	U	0.00	3.00	10.0	ug/L	1					
Tetrachloroethylene 127-18-4	J	0.850	0.300	5.00	ug/L	1					

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID: B30158      Project: CPRC0S15001  
 Sample ID: 365668006      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Volatile Organics</b>											
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>											
Tetrahydrofuran	U	0.00	1.50	50.0	ug/L	1					
109-99-9											
Toluene	U	0.00	0.300	5.00	ug/L	1					
108-88-3											
Trichloroethylene	J	0.470	0.300	5.00	ug/L	1					
79-01-6											
Vinyl chloride	U	0.00	0.300	10.0	ug/L	1					
75-01-4											
Xylenes (total)	U	0.00	0.300	10.0	ug/L	1					
1330-20-7											
cis-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-59-2											
n-Butyl alcohol	U	0.00	83.3	250	ug/L	1					
71-36-3											
trans-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-60-5											

**The following Analytical Methods were performed**

Method	Description	Analyst	Comments
1	SW846 8260C		

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260VOA_GCMS: COMMON + GW 01 "As Received"	49.6 ug/L	50.0	99.2	(77%-123%)
Bromofluorobenzene	8260VOA_GCMS: COMMON + GW 01 "As Received"	52.9 ug/L	50.0	106	(80%-120%)
Toluene-d8	8260VOA_GCMS: COMMON + GW 01 "As Received"	46.6 ug/L	50.0	93.2	(80%-120%)

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID:	B30154	Project:	CPRC0S15001
Sample ID:	365668008	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:22		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Volatile Organics</b>										
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>										
1,1,1-Trichloroethane 71-55-6	J	0.370	0.300	5.00	ug/L	1	CDS1 01/27/15	1408	1452976	1
1,1,2-Trichloroethane 79-00-5	U	0.00	0.300	5.00	ug/L	1				
1,1-Dichloroethane 75-34-3	U	0.00	0.300	10.0	ug/L	1				
1,1-Dichloroethylene 75-35-4	U	0.00	0.300	10.0	ug/L	1				
1,2-Dichloroethane 107-06-2	U	0.00	0.300	5.00	ug/L	1				
1,4-Dichlorobenzene 106-46-7	U	0.00	0.300	5.00	ug/L	1				
2-Butanone 78-93-3	TU	0.00	3.00	10.0	ug/L	1				
4-Methyl-2-pentanone 108-10-1	U	0.00	3.00	10.0	ug/L	1				
Acetone 67-64-1	TU	0.00	3.00	20.0	ug/L	1				
Benzene 71-43-2	U	0.00	0.300	5.00	ug/L	1				
Carbon disulfide 75-15-0	U	0.00	1.60	10.0	ug/L	1				
Carbon tetrachloride 56-23-5	U	0.00	0.300	5.00	ug/L	1				
Chlorobenzene 108-90-7	U	0.00	0.300	5.00	ug/L	1				
Chloroform 67-66-3	U	0.00	0.300	5.00	ug/L	1				
Ethylbenzene 100-41-4	U	0.00	0.300	5.00	ug/L	1				
Methylene chloride 75-09-2	U	0.00	1.60	5.00	ug/L	1				
Propionitrile 107-12-0	U	0.00	3.00	10.0	ug/L	1				
Tetrachloroethylene 127-18-4	J	0.470	0.300	5.00	ug/L	1				

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID: B30154      Project: CPRC0S15001  
 Sample ID: 365668008      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Volatile Organics</b>											
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>											
Tetrahydrofuran	U	0.00	1.50	50.0	ug/L	1					
109-99-9											
Toluene	U	0.00	0.300	5.00	ug/L	1					
108-88-3											
Trichloroethylene	J	0.450	0.300	5.00	ug/L	1					
79-01-6											
Vinyl chloride	U	0.00	0.300	10.0	ug/L	1					
75-01-4											
Xylenes (total)	U	0.00	0.300	10.0	ug/L	1					
1330-20-7											
cis-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-59-2											
n-Butyl alcohol	U	0.00	83.3	250	ug/L	1					
71-36-3											
trans-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-60-5											

**The following Analytical Methods were performed**

Method	Description	Analyst	Comments
1	SW846 8260C		

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260VOA_GCMS: COMMON + GW 01 "As Received"	51.7 ug/L	50.0	103	(77%-123%)
Bromofluorobenzene	8260VOA_GCMS: COMMON + GW 01 "As Received"	52.0 ug/L	50.0	104	(80%-120%)
Toluene-d8	8260VOA_GCMS: COMMON + GW 01 "As Received"	47.2 ug/L	50.0	94.3	(80%-120%)

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID:	B30164	Project:	CPRC0S15001
Sample ID:	365668009	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:55		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Volatile Organics</b>										
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>										
1,1,1-Trichloroethane 71-55-6	J	0.320	0.300	5.00	ug/L	1	CDS1 01/27/15	1438	1452976	1
1,1,2-Trichloroethane 79-00-5	U	0.00	0.300	5.00	ug/L	1				
1,1-Dichloroethane 75-34-3	U	0.00	0.300	10.0	ug/L	1				
1,1-Dichloroethylene 75-35-4	U	0.00	0.300	10.0	ug/L	1				
1,2-Dichloroethane 107-06-2	U	0.00	0.300	5.00	ug/L	1				
1,4-Dichlorobenzene 106-46-7	U	0.00	0.300	5.00	ug/L	1				
2-Butanone 78-93-3	TU	0.00	3.00	10.0	ug/L	1				
4-Methyl-2-pentanone 108-10-1	U	0.00	3.00	10.0	ug/L	1				
Acetone 67-64-1	TU	0.00	3.00	20.0	ug/L	1				
Benzene 71-43-2	U	0.00	0.300	5.00	ug/L	1				
Carbon disulfide 75-15-0	U	0.00	1.60	10.0	ug/L	1				
Carbon tetrachloride 56-23-5	U	0.00	0.300	5.00	ug/L	1				
Chlorobenzene 108-90-7	U	0.00	0.300	5.00	ug/L	1				
Chloroform 67-66-3	U	0.00	0.300	5.00	ug/L	1				
Ethylbenzene 100-41-4	U	0.00	0.300	5.00	ug/L	1				
Methylene chloride 75-09-2	U	0.00	1.60	5.00	ug/L	1				
Propionitrile 107-12-0	U	0.00	3.00	10.0	ug/L	1				
Tetrachloroethylene 127-18-4	J	0.670	0.300	5.00	ug/L	1				

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 18, 2015

Client Sample ID: B30164      Project: CPRC0S15001  
 Sample ID: 365668009      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Volatile Organics</b>											
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>											
Tetrahydrofuran	U	0.00	1.50	50.0	ug/L	1					
109-99-9											
Toluene	U	0.00	0.300	5.00	ug/L	1					
108-88-3											
Trichloroethylene	J	0.340	0.300	5.00	ug/L	1					
79-01-6											
Vinyl chloride	U	0.00	0.300	10.0	ug/L	1					
75-01-4											
Xylenes (total)	U	0.00	0.300	10.0	ug/L	1					
1330-20-7											
cis-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-59-2											
n-Butyl alcohol	U	0.00	83.3	250	ug/L	1					
71-36-3											
trans-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-60-5											

**The following Analytical Methods were performed**

Method	Description	Analyst	Comments
1	SW846 8260C		

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260VOA_GCMS: COMMON + GW 01 "As Received"	50.7 ug/L	50.0	101	(77%-123%)
Bromofluorobenzene	8260VOA_GCMS: COMMON + GW 01 "As Received"	52.9 ug/L	50.0	106	(80%-120%)
Toluene-d8	8260VOA_GCMS: COMMON + GW 01 "As Received"	46.9 ug/L	50.0	93.8	(80%-120%)

# Quality Control Summary

**February 19, 2015**  
**GEL LABORATORIES LLC**

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**QC Summary**

Report Date: February 18, 2015

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365668

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1452976										
QC1203251576	LCS										
1,1,1-Trichloroethane	50.0			58.5	ug/L		117	(70%-130%)	CDS1	01/27/15	07:04
1,1,2-Trichloroethane	50.0			50.6	ug/L		101	(70%-130%)			
1,1-Dichloroethane	50.0			55.1	ug/L		110	(70%-130%)			
1,1-Dichloroethylene	50.0			55.3	ug/L		111	(70%-130%)			
1,2-Dichloroethane	50.0			52.0	ug/L		104	(70%-130%)			
1,4-Dichlorobenzene	50.0			52.1	ug/L		104	(70%-130%)			
2-Butanone	250			257	ug/L		103	(70%-130%)			
4-Methyl-2-pentanone	250			250	ug/L		100	(70%-130%)			
Acetone	250			265	ug/L		106	(70%-130%)			
Benzene	50.0			54.2	ug/L		108	(70%-130%)			
Carbon disulfide	250			282	ug/L		113	(70%-130%)			
Carbon tetrachloride	50.0			58.8	ug/L		118	(70%-130%)			
Chlorobenzene	50.0			52.8	ug/L		106	(70%-130%)			
Chloroform	50.0			54.5	ug/L		109	(70%-130%)			
Ethylbenzene	50.0			55.9	ug/L		112	(70%-130%)			
Methylene chloride	50.0			48.3	ug/L		96.6	(70%-130%)			
Tetrachloroethylene	50.0			54.1	ug/L		108	(70%-130%)			
Toluene	50.0			52.8	ug/L		106	(70%-130%)			
Trichloroethylene	50.0			55.4	ug/L		111	(70%-130%)			
Vinyl chloride	50.0			46.6	ug/L		93.2	(70%-130%)			

**February 19, 2015**  
**GEL LABORATORIES LLC**

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<b>Parmname</b>	<b>NOM</b>	<b>Sample</b>	<b>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>
<b>Volatile-GC/MS</b>											
Batch	1452976										
Xylenes (total)	150			166	ug/L		111	(70%-130%)	CDS1	01/27/15	07:04
cis-1,2-Dichloroethylene	50.0			55.4	ug/L		111	(70%-130%)			
n-Butyl alcohol	5000			4660	ug/L		93.1	(70%-130%)			
trans-1,2-Dichloroethylene	50.0			55.1	ug/L		110	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			50.5	ug/L		101	(77%-123%)			
**Bromofluorobenzene	50.0			49.3	ug/L		98.7	(80%-120%)			
**Toluene-d8	50.0			49.0	ug/L		98.1	(80%-120%)			
QC1203251577	LCS										
Propionitrile	250			252	ug/L		101	(70%-130%)		01/27/15	07:38
Tetrahydrofuran	250			252	ug/L		101	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			51.7	ug/L		103	(77%-123%)			
**Bromofluorobenzene	50.0			53.0	ug/L		106	(80%-120%)			
**Toluene-d8	50.0			47.0	ug/L		94	(80%-120%)			
QC1203254661	LCS										
1,1,1-Trichloroethane	50.0			49.2	ug/L		98.5	(70%-130%)		01/28/15	09:29
1,1,2-Trichloroethane	50.0			48.1	ug/L		96.3	(70%-130%)			
1,1-Dichloroethane	50.0			44.7	ug/L		89.4	(70%-130%)			
1,1-Dichloroethylene	50.0			43.5	ug/L		86.9	(70%-130%)			
1,2-Dichloroethane	50.0			50.0	ug/L		100	(70%-130%)			
1,4-Dichlorobenzene	50.0			45.8	ug/L		91.7	(70%-130%)			
2-Butanone	250			267	ug/L		107	(70%-130%)			
4-Methyl-2-pentanone	250			249	ug/L		99.5	(70%-130%)			
Acetone	250			281	ug/L		112	(70%-130%)			

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**GEL LABORATORIES LLC**

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1452976										
Benzene	50.0			44.0	ug/L		88	(70%-130%)	CDS1	01/28/15	09:29
Carbon disulfide	250			220	ug/L		87.8	(70%-130%)			
Carbon tetrachloride	50.0			48.7	ug/L		97.3	(70%-130%)			
Chlorobenzene	50.0			45.3	ug/L		90.5	(70%-130%)			
Chloroform	50.0			47.0	ug/L		94	(70%-130%)			
Ethylbenzene	50.0			46.0	ug/L		92	(70%-130%)			
Methylene chloride	50.0			41.8	ug/L		83.6	(70%-130%)			
Tetrachloroethylene	50.0			43.7	ug/L		87.5	(70%-130%)			
Toluene	50.0			42.5	ug/L		85.1	(70%-130%)			
Trichloroethylene	50.0			45.2	ug/L		90.5	(70%-130%)			
Vinyl chloride	50.0			46.2	ug/L		92.4	(70%-130%)			
Xylenes (total)	150			139	ug/L		92.4	(70%-130%)			
cis-1,2-Dichloroethylene	50.0			45.7	ug/L		91.3	(70%-130%)			
n-Butyl alcohol	5000			5300	ug/L		106	(70%-130%)			
trans-1,2-Dichloroethylene	50.0			43.7	ug/L		87.4	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			51.2	ug/L		102	(77%-123%)			
**Bromofluorobenzene	50.0			49.7	ug/L		99.4	(80%-120%)			
**Toluene-d8	50.0			47.6	ug/L		95.1	(80%-120%)			
QC1203254662	LCS										
Propionitrile	250			237	ug/L		94.6	(70%-130%)		01/28/15	09:58
Tetrahydrofuran	250			235	ug/L		93.8	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			51.0	ug/L		102	(77%-123%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1452976										
**Bromofluorobenzene	50.0			52.1	ug/L		104	(80%-120%)	CDS1	01/28/15	09:58
**Toluene-d8	50.0			46.1	ug/L		92.2	(80%-120%)			
QC1203251575	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					01/27/15	08:08
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
1,4-Dichlorobenzene			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Propionitrile			U	3.00	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Tetrahydrofuran			U	1.50	ug/L						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1452976										
Toluene			U	0.300	ug/L				CDS1	01/27/15	08:08
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
cis-1,2-Dichloroethylene			U	0.300	ug/L						
n-Butyl alcohol			U	83.3	ug/L						
trans-1,2-Dichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			50.0	ug/L		99.9	(77%-123%)			
**Bromofluorobenzene	50.0			51.9	ug/L		104	(80%-120%)			
**Toluene-d8	50.0			47.0	ug/L		94	(80%-120%)			
QC1203254660 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					01/28/15	10:28
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						
1,4-Dichlorobenzene			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						

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**GEL LABORATORIES LLC**

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1452976										
Carbon tetrachloride			U	0.300	ug/L				CDS1	01/28/15	10:28
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Propionitrile			U	3.00	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Tetrahydrofuran			U	1.50	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
cis-1,2-Dichloroethylene			U	0.300	ug/L						
n-Butyl alcohol			U	83.3	ug/L						
trans-1,2-Dichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.0	ug/L		102	(77%-123%)			
**Bromofluorobenzene	50.0			52.9	ug/L		106	(80%-120%)			
**Toluene-d8	50.0			46.6	ug/L		93.3	(80%-120%)			
QC1203251578 365749002 PS											
1,1,1-Trichloroethane	50.0	U	0.00	59.1	ug/L		118	(70%-130%)		01/28/15	13:58
1,1,2-Trichloroethane	50.0	U	0.00	51.0	ug/L		102	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	55.0	ug/L		110	(70%-130%)			

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1452976										
1,1-Dichloroethylene	50.0	U	0.00		56.8	ug/L	114	(70%-130%)	CDS1	01/28/15	13:58
1,2-Dichloroethane	50.0	U	0.00		53.0	ug/L	106	(70%-130%)			
1,4-Dichlorobenzene	50.0	U	0.00		53.1	ug/L	106	(70%-130%)			
2-Butanone	250	TU	0.00	T	153	ug/L	61.3*	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00		232	ug/L	92.7	(70%-130%)			
Acetone	250	TU	0.00	T	107	ug/L	42.9*	(70%-130%)			
Benzene	50.0	U	0.00		54.5	ug/L	109	(70%-130%)			
Carbon disulfide	250	U	0.00		291	ug/L	116	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00		60.5	ug/L	121	(70%-130%)			
Chlorobenzene	50.0	U	0.00		54.1	ug/L	108	(70%-130%)			
Chloroform	50.0	U	0.00		54.4	ug/L	109	(70%-130%)			
Ethylbenzene	50.0	U	0.00		57.4	ug/L	115	(70%-130%)			
Methylene chloride	50.0	J	4.18		51.2	ug/L	94	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00		55.0	ug/L	110	(70%-130%)			
Toluene	50.0	U	0.00		52.6	ug/L	105	(70%-130%)			
Trichloroethylene	50.0	U	0.00		56.7	ug/L	113	(70%-130%)			
Vinyl chloride	50.0	U	0.00		49.7	ug/L	99.3	(70%-130%)			
Xylenes (total)	150	U	0.00		168	ug/L	112	(70%-130%)			
cis-1,2-Dichloroethylene	50.0	U	0.00		55.6	ug/L	111	(70%-130%)			
n-Butyl alcohol	5000	U	0.00		5390	ug/L	108	(70%-130%)			
trans-1,2-Dichloroethylene	50.0	U	0.00		55.9	ug/L	112	(70%-130%)			

**February 19, 2015**  
**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 365668

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1452976										
**1,2-Dichloroethane-d4	50.0	51.4		49.4	ug/L		98.7	(77%-123%)			
**Bromofluorobenzene	50.0	53.2		49.0	ug/L		98	(80%-120%)	CDS1	01/28/15	13:58
**Toluene-d8	50.0	46.5		47.7	ug/L		95.5	(80%-120%)			
QC1203251580 365749002 PS											
Propionitrile	250	U	0.00	244	ug/L		97.6	(70%-130%)		01/28/15	14:59
Tetrahydrofuran	250	U	0.00	238	ug/L		95.3	(70%-130%)			
**1,2-Dichloroethane-d4	50.0	51.4		50.0	ug/L		100	(77%-123%)			
**Bromofluorobenzene	50.0	53.2		54.0	ug/L		108	(80%-120%)			
**Toluene-d8	50.0	46.5		47.4	ug/L		94.8	(80%-120%)			
QC1203251579 365749002 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	59.3	ug/L	0.304	119	(0%-20%)		01/28/15	14:28
1,1,2-Trichloroethane	50.0	U	0.00	51.1	ug/L	0.274	102	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	54.3	ug/L	1.28	109	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	56.1	ug/L	1.24	112	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	53.1	ug/L	0.207	106	(0%-20%)			
1,4-Dichlorobenzene	50.0	U	0.00	52.1	ug/L	1.75	104	(0%-20%)			
2-Butanone	250	TU	0.00	T 153	ug/L	0.379	61.1 *	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	238	ug/L	2.44	95	(0%-20%)			
Acetone	250	TU	0.00	T 112	ug/L	4.23	44.8 *	(0%-20%)			
Benzene	50.0	U	0.00	53.0	ug/L	2.88	106	(0%-20%)			
Carbon disulfide	250	U	0.00	278	ug/L	4.57	111	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00	59.7	ug/L	1.30	119	(0%-20%)			
Chlorobenzene	50.0	U	0.00	52.9	ug/L	2.15	106	(0%-20%)			
Chloroform	50.0	U	0.00	54.4	ug/L	0.00	109	(0%-20%)			

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**QC Summary**

**Workorder: 365668**

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<b>Parmname</b>	<b>NOM</b>	<b>Sample</b>	<b>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>
<b>Volatile-GC/MS</b>											
Batch	1452976										
Ethylbenzene	50.0	U	0.00	55.7	ug/L	3.04	111	(0%-20%)	CDS1	01/28/15	14:28
Methylene chloride	50.0	J	4.18	50.9	ug/L	0.549	93.4	(0%-20%)			
Tetrachloroethylene	50.0	U	0.00	54.1	ug/L	1.63	108	(0%-20%)			
Toluene	50.0	U	0.00	51.3	ug/L	2.64	103	(0%-20%)			
Trichloroethylene	50.0	U	0.00	55.1	ug/L	2.93	110	(0%-20%)			
Vinyl chloride	50.0	U	0.00	47.3	ug/L	4.97	94.5	(0%-20%)			
Xylenes (total)	150	U	0.00	164	ug/L	2.46	109	(0%-20%)			
cis-1,2-Dichloroethylene	50.0	U	0.00	55.3	ug/L	0.667	111	(0%-20%)			
n-Butyl alcohol	5000	U	0.00	5300	ug/L	1.78	106	(0%-20%)			
trans-1,2-Dichloroethylene	50.0	U	0.00	54.7	ug/L	2.21	109	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		51.4	50.6	ug/L		101	(77%-123%)			
**Bromofluorobenzene	50.0		53.2	50.5	ug/L		101	(80%-120%)			
**Toluene-d8	50.0		46.5	48.2	ug/L		96.4	(80%-120%)			
QC1203251581 365749002 PSD											
Propionitrile	250	U	0.00	247	ug/L	1.22	98.8	(0%-20%)		01/28/15	15:29
Tetrahydrofuran	250	U	0.00	241	ug/L	0.935	96.2	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		51.4	51.3	ug/L		103	(77%-123%)			
**Bromofluorobenzene	50.0		53.2	52.7	ug/L		105	(80%-120%)			
**Toluene-d8	50.0		46.5	46.8	ug/L		93.6	(80%-120%)			

**Notes:**

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product

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**QC Summary**

Workorder: 365668

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

# Miscellaneous

<b>DATA EXCEPTION REPORT</b>			
<b>Mo.Day Yr.</b> 30-JAN-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> VOA GC/MS	<b>Test / Method:</b> SW846 8260C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> CPRC
<b>Batch ID:</b> 1452976	<b>Sample Numbers:</b> See Below		
<p><b>Potentially affected work order(s)(SDG):</b> 365553(GEL365553),365663(GEL365663),365668(GEL365668),365700(GEL365700),365749(GEL365749),365755(GEL365755),365758(GEL365758),365759(GEL365759)</p> <p><b>Application Issues:</b></p> <p>Failed Recovery for PS/PSD Failed Recovery for MS/MSD, or PS/PSD</p>			
<b>Specification and Requirements</b> <b>Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. The recoveries for Acetone and 2-Butanone were outside of acceptance limits in the matrix spike and in the matrix spike duplicate performed on sample 365749002. The calculated relative percent differences between the MS and MSD were within acceptance limits for all client requested compounds.</p>		<p>1. Narrate and report data.</p>	

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

**Data Validator/Group Leader:**  
Erin Haubert      18-FEB-15

# Semi-Volatile Analysis

# Case Narrative

**February 19, 2015**  
**GC/MS Semivolatile**  
**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL365668**  
**Work Order #: 365668**

**Method/Analysis Information**

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

Analytical Method: SW846 3510C/8270D

Prep Method: SW846 3510C

Analytical Batch Number: 1453142

Prep Batch Number: 1453139

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
365668003	B30148
365668006	B30158
365668008	B30154
365668009	B30164
1203252088	MB for batch 1453139
1203252089	Laboratory Control Sample (LCS)
1203252092	365755001(B30168) Matrix Spike (MS)
1203252093	365755001(B30168) Matrix Spike Duplicate (MSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 35.

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

**Calibration Information**

February 19, 2015

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**

All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**

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

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**

Sample 365755001 (B30168) was selected for analysis as the matrix spike and matrix spike duplicate.

**Spike Recovery Statement**

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

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

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

**Internal Standard (ISTD) Acceptance**

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

**Technical Information:**

**Holding Time Specifications**

All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**

The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**

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

**Manual Integrations**

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**

Tentatively identified compounds (TIC) were not required for the samples in this SDG for this batch.

**Additional Comments**

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

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

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

February 19, 2015

**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.

February 19, 2015

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365668 GEL Work Order: 365668

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

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

DL Indicates that sample is diluted.

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

RE Indicates that sample is re-extracted.

**Review/Validation**

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

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

Signature: 

Name: **Barbara Bailey**

Date: **18 FEB 2015**

Title: **Data Validator**

# Sample Data Summary

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: January 29, 2015

Client Sample ID:	B30148	Project:	CPRC0S15001
Sample ID:	365668003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 08:37		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatile-GC/MS</b>											
<i>8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"</i>											
1,4-Dioxane	U	0.00	3.00	10.0	ug/L	1	JLD1	01/28/15	1905	1453142	1
123-91-1											

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C BNA Liq. Prep-8270 Analysis	SXS3	01/28/15	0630	1453139

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3510C/8270D	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	72.5 ug/L	100	72.5	(33%-126%)
2-Fluorophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	41.1 ug/L	100	41.1	(18%-84%)
Phenol-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	25.6 ug/L	100	25.6	(10%-110%)
2-Fluorobiphenyl	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	37.6 ug/L	50.0	75.2	(35%-102%)
Nitrobenzene-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	39.9 ug/L	50.0	79.8	(38%-113%)
p-Terphenyl-d14	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	49.0 ug/L	50.0	97.9	(38%-123%)

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: January 29, 2015

Client Sample ID:	B30158	Project:	CPRC0S15001
Sample ID:	365668006	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 10:45		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatile-GC/MS</b>											
<i>8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"</i>											
1,4-Dioxane	U	0.00	3.00	10.0	ug/L	1	JLD1	01/28/15	1934	1453142	1
123-91-1											

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C BNA Liq. Prep-8270 Analysis	SXS3	01/28/15	0630	1453139

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3510C/8270D	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	83.5 ug/L	100	83.5	(33%-126%)
2-Fluorophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	42.2 ug/L	100	42.2	(18%-84%)
Phenol-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	27.9 ug/L	100	27.9	(10%-110%)
2-Fluorobiphenyl	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	38.9 ug/L	50.0	77.8	(35%-102%)
Nitrobenzene-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	44.8 ug/L	50.0	89.5	(38%-113%)
p-Terphenyl-d14	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	51.4 ug/L	50.0	103	(38%-123%)

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: January 29, 2015

Client Sample ID:	B30154	Project:	CPRC0S15001
Sample ID:	365668008	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:22		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatile-GC/MS</b>											
<i>8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"</i>											
1,4-Dioxane	U	0.00	3.00	10.0	ug/L	1	JLD1	01/28/15	2004	1453142	1
123-91-1											

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C BNA Liq. Prep-8270 Analysis	SXS3	01/28/15	0630	1453139

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3510C/8270D	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	78.6 ug/L	100	78.6	(33%-126%)
2-Fluorophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	37.8 ug/L	100	37.8	(18%-84%)
Phenol-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	24.9 ug/L	100	24.9	(10%-110%)
2-Fluorobiphenyl	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	36.4 ug/L	50.0	72.8	(35%-102%)
Nitrobenzene-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	40.9 ug/L	50.0	81.8	(38%-113%)
p-Terphenyl-d14	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	49.2 ug/L	50.0	98.4	(38%-123%)

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: January 29, 2015

Client Sample ID:	B30164	Project:	CPRC0S15001
Sample ID:	365668009	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:55		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatile-GC/MS</b>											
<i>8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"</i>											
1,4-Dioxane	U	0.00	2.88	9.62	ug/L	1	JLD1	01/28/15	2033	1453142	1
123-91-1											

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C BNA Liq. Prep-8270 Analysis	SXS3	01/28/15	0630	1453139

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3510C/8270D	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2-Fluorobiphenyl	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	31.8 ug/L	48.1	66.1	(35%-102%)
Nitrobenzene-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	37.3 ug/L	48.1	77.6	(38%-113%)
p-Terphenyl-d14	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	41.4 ug/L	48.1	86.2	(38%-123%)
2,4,6-Tribromophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	64.0 ug/L	96.2	66.6	(33%-126%)
2-Fluorophenol	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	35.5 ug/L	96.2	36.9	(18%-84%)
Phenol-d5	8270_SVOA_GCMS: 1,4 Dioxane (1) "As Received"	23.4 ug/L	96.2	24.3	(10%-110%)

# Quality Control Summary

**February 19, 2015**  
**GEL LABORATORIES LLC**

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**QC Summary**

Report Date: January 29, 2015

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**CH2M Hill Plateau Remediation Company**

**MSIN R3-50 CHPRC**

**PO Box 1600**

**Richland, Washington**

**Contact: Mr. Scot Fitzgerald**

**Workorder: 365668**

<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
<b>Semi-Volatile-GC/MS</b>											
Batch	1453142										
QC1203252089	LCS										
1,4-Dioxane	50.0			26.5	ug/L		53	(29%-74%)	JLD1	01/28/15	15:08
**2,4,6-Tribromophenol	100			99.1	ug/L		99.1	(33%-126%)			
**2-Fluorobiphenyl	50.0			38.4	ug/L		76.9	(35%-102%)			
**2-Fluorophenol	100			46.8	ug/L		46.8	(18%-84%)			
**Nitrobenzene-d5	50.0			37.1	ug/L		74.1	(38%-113%)			
**Phenol-d5	100			30.5	ug/L		30.5	(10%-110%)			
**p-Terphenyl-d14	50.0			54.0	ug/L		108	(38%-123%)			
QC1203252088	MB										
1,4-Dioxane			U	3.00	ug/L					01/28/15	14:37
**2,4,6-Tribromophenol	100			90.8	ug/L		90.8	(33%-126%)			
**2-Fluorobiphenyl	50.0			40.9	ug/L		81.8	(35%-102%)			
**2-Fluorophenol	100			51.7	ug/L		51.7	(18%-84%)			
**Nitrobenzene-d5	50.0			45.4	ug/L		90.7	(38%-113%)			
**Phenol-d5	100			34.7	ug/L		34.7	(10%-110%)			
**p-Terphenyl-d14	50.0			52.8	ug/L		106	(38%-123%)			
QC1203252092	365755001	MS									
1,4-Dioxane	100	U	2.88	61.5	ug/L		61.5	(27%-94%)		01/28/15	21:32
**2,4,6-Tribromophenol	200		71.1	183	ug/L		91.6	(33%-126%)			
**2-Fluorobiphenyl	100		33.5	69.8	ug/L		69.8	(35%-102%)			
**2-Fluorophenol	200		39.2	119	ug/L		59.7	(18%-84%)			
**Nitrobenzene-d5	100		39.7	72.3	ug/L		72.3	(38%-113%)			

**February 19, 2015**  
**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 365668

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1453142										
**Phenol-d5	200	26.4		94.5	ug/L		47.3	(10%-110%)	JLD1	01/28/15	21:32
**p-Terphenyl-d14	100	40.7		89.7	ug/L		89.7	(38%-123%)			
QC1203252093 365755001 MSD											
1,4-Dioxane	100	U	2.88	60.8	ug/L	1.28	60.8	(0%-30%)		01/28/15	22:01
**2,4,6-Tribromophenol	200	71.1		193	ug/L		96.6	(33%-126%)			
**2-Fluorobiphenyl	100	33.5		74.6	ug/L		74.6	(35%-102%)			
**2-Fluorophenol	200	39.2		114	ug/L		57.2	(18%-84%)			
**Nitrobenzene-d5	100	39.7		76.7	ug/L		76.7	(38%-113%)			
**Phenol-d5	200	26.4		91.5	ug/L		45.8	(10%-110%)			
**p-Terphenyl-d14	100	40.7		106	ug/L		106	(38%-123%)			

**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)

February 19, 2015  
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**QC Summary**

Workorder: 365668

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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.

# Metals Analysis

# Case Narrative

February 19, 2015

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL365668

Work Order #: 365668

<b>Sample ID</b>	<b>Client ID</b>
365668003	B30148
365668004	B30151
365668005	B30161
365668006	B30158
365668007	B30156
365668008	B30154
365668009	B30164
365668010	B30166
1203250602	Method Blank (MB)ICP
1203250603	Laboratory Control Sample (LCS)
1203250606	365668003(B30148L) Serial Dilution (SD)
1203250604	365668003(B30148S) Matrix Spike (MS)
1203250605	365668003(B30148SD) Matrix Spike Duplicate (MSD)
1203250548	Method Blank (MB)ICP-MS
1203250549	Laboratory Control Sample (LCS)
1203250552	365668003(B30148L) Serial Dilution (SD)
1203250550	365668003(B30148S) Matrix Spike (MS)
1203250551	365668003(B30148SD) Matrix Spike Duplicate (MSD)

### Sample Analysis

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

### Method/Analysis Information

<b>Analytical Batch:</b>	1452575 and 1452552
<b>Prep Batch :</b>	1452573 and 1452551
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 23, GL-MA-E-006 REV# 11 and GL-MA-E-014 REV# 25
<b>Analytical Method:</b>	SW846 3005A/6010C and SW846 3005A/6020A
<b>Prep Method :</b>	SW846 3005A

### Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

### System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma

February 19, 2015

atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

### **Calibration Information**

#### **Instrument Calibration**

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

#### **CRDL/PQL Requirements**

The CRDL/PQL standard recoveries met the referenced advisory control limits.

#### **ICSA/ICSAB Statement**

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

#### **Continuing Calibration Blanks (CCB) Requirements**

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

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

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

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

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

The MBs analyzed with this SDG met the acceptance criteria.

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

The LCS spike recoveries met the acceptance limits.

#### **Quality Control (QC) Sample Statement**

The following samples were selected as the quality control (QC) samples for this SDG: 365668003 (B30148)-ICP and ICP-MS.

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

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

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

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD values between qualifying analyte results in the MS and MSD were within the acceptance limits.

#### **Serial Dilution % Difference Statement**

Not all the applicable analyte percent difference (%D) values were within the acceptance criteria. The %D values for barium and uranium were not within the acceptance criteria in sample 1203250552 (B30148SDILT)-ICP-MS.

### **Technical Information**

#### **Holding Time Specifications**

February 19, 2015

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Preparation Information**

The samples in this SDG were not diluted and prepared according to the cited SOP.

**Miscellaneous Information**

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**

A data exception report was not required for this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Certification Statement**

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

February 19, 2015

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365668 GEL Work Order: 365668

**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.

M Duplicate precision not met.

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:** Patricia Steele

**Date:** 19 FEB 2015

**Title:** Data Validator

# Sample Data Summary

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30148	Project:	CPRC0S15001
Sample ID:	365668003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 08:37		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP</b>												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	U	-0.24	+/-1.67	5.00	30.0	ug/L	1	HSC	01/29/15	2014	1452575	1
7440-38-2												
Barium		137	+/-27.4	1.00	5.00	ug/L	1					
7440-39-3												
Cadmium	U	-0.0066	+/-0.333	1.00	5.00	ug/L	1					
7440-43-9												
Calcium		109000	+/-21700	50.0	200	ug/L	1					
7440-70-2												
Chromium		8.95	+/-1.82	1.00	5.00	ug/L	1					
7440-47-3												
Cobalt	U	-0.0138	+/-0.333	1.00	5.00	ug/L	1					
7440-48-4												
Copper	U	-1.4	+/-1.04	3.00	10.0	ug/L	1					
7440-50-8												
Iron	B	69.9	+/-17.2	30.0	100	ug/L	1					
7439-89-6												
Magnesium		22200	+/-4450	110	300	ug/L	1					
7439-95-4												
Manganese	U	1.83	+/-0.760	2.00	10.0	ug/L	1					
7439-96-5												
Nickel	B	3.90	+/-0.927	1.50	5.00	ug/L	1					
7440-02-0												
Potassium		9480	+/-1900	50.0	150	ug/L	1					
7440-09-7												
Silver	U	-0.389	+/-0.342	1.00	5.00	ug/L	1					
7440-22-4												
Sodium		22400	+/-4480	100	300	ug/L	1					
7440-23-5												
Vanadium		8.38	+/-1.71	1.00	5.00	ug/L	1					
7440-62-2												
Zinc	U	0.475	+/-1.10	3.30	10.0	ug/L	1					
7440-66-6												
Antimony	U	-0.209	+/-1.17	3.50	10.0	ug/L	1	HSC	02/02/15	1134	1452575	2
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30148      Project: CPRC0S15001  
 Sample ID: 365668003      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>											
<i>6020_METALS_ICPMS: Antimony + Arsenic(1) "As Received"</i>											
Antimony 7440-36-0	U	0.198	+/-0.336	1.00	3.00	ug/L	1	SKJ	02/19/15	0113	1452552 3
Arsenic 7440-38-2	U	0.881	+/-0.593	1.70	5.00	ug/L	1				

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30151	Project:	CPRC0S15001
Sample ID:	365668004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 08:37		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP</b>												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	U	-0.352	+/-1.67	5.00	30.0	ug/L	1	HSC	01/29/15	2036	1452575	1
7440-38-2		140	+/-27.9	1.00	5.00	ug/L	1					
Barium		140	+/-27.9	1.00	5.00	ug/L	1					
7440-39-3												
Cadmium	U	-0.0779	+/-0.334	1.00	5.00	ug/L	1					
7440-43-9												
Calcium		112000	+/-22300	50.0	200	ug/L	1					
7440-70-2												
Chromium	B	2.27	+/-0.563	1.00	5.00	ug/L	1					
7440-47-3												
Cobalt	U	-0.473	+/-0.346	1.00	5.00	ug/L	1					
7440-48-4												
Copper	U	-0.651	+/-1.01	3.00	10.0	ug/L	1					
7440-50-8												
Iron	U	14.1	+/-10.4	30.0	100	ug/L	1					
7439-89-6												
Magnesium		22900	+/-4590	110	300	ug/L	1					
7439-95-4												
Manganese	U	0.697	+/-0.681	2.00	10.0	ug/L	1					
7439-96-5												
Nickel	B	1.62	+/-0.596	1.50	5.00	ug/L	1					
7440-02-0												
Potassium		9730	+/-1950	50.0	150	ug/L	1					
7440-09-7												
Silver	U	-0.512	+/-0.349	1.00	5.00	ug/L	1					
7440-22-4												
Sodium		22900	+/-4580	100	300	ug/L	1					
7440-23-5												
Vanadium		7.76	+/-1.59	1.00	5.00	ug/L	1					
7440-62-2												
Zinc	U	-2.33	+/-1.19	3.30	10.0	ug/L	1					
7440-66-6												
Antimony	U	0.270	+/-1.17	3.50	10.0	ug/L	1	HSC	02/02/15	1156	1452575	2
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30151      Project: CPRC0S15001  
 Sample ID: 365668004      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>											
<i>6020_METALS_ICPMS: Arsenic (I) "As Received"</i>											
Antimony 7440-36-0	U	0.283	+/-0.338	1.00	3.00	ug/L	1	SKJ	02/19/15	0206	1452552 3
Arsenic 7440-38-2	U	0.674	+/-0.582	1.70	5.00	ug/L	1				

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30161	Project:	CPRC0S15001
Sample ID:	365668005	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 10:45		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP</b>												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	B	5.33	+/-1.98	5.00	30.0	ug/L	1	HSC	01/29/15	2040	1452575	1
7440-38-2		89.3	+/-17.9	1.00	5.00	ug/L	1					
Barium		0.053	+/-0.334	1.00	5.00	ug/L	1					
7440-39-3	U	92400	+/-18500	50.0	200	ug/L	1					
Cadmium		2.73	+/-0.639	1.00	5.00	ug/L	1					
7440-43-9		0.0816	+/-0.334	1.00	5.00	ug/L	1					
Calcium		-1.19	+/-1.03	3.00	10.0	ug/L	1					
7440-70-2		5.81	+/-10.1	30.0	100	ug/L	1					
Chromium	B	19800	+/-3970	110	300	ug/L	1					
7440-47-3		0.591	+/-0.677	2.00	10.0	ug/L	1					
Cobalt	U	0.272	+/-0.503	1.50	5.00	ug/L	1					
7440-48-4		8150	+/-1630	50.0	150	ug/L	1					
Copper	U	-0.373	+/-0.342	1.00	5.00	ug/L	1					
7440-50-8		22800	+/-4560	100	300	ug/L	1					
Iron		10.7	+/-2.17	1.00	5.00	ug/L	1					
7439-89-6		-3.05	+/-1.26	3.30	10.0	ug/L	1					
Magnesium	U	3.05	+/-1.32	3.50	10.0	ug/L	1	HSC	02/02/15	1200	1452575	2
7439-95-4												
Manganese												
7439-96-5												
Nickel												
7440-02-0												
Potassium												
7440-09-7												
Silver	U											
7440-22-4												
Sodium												
7440-23-5												
Vanadium												
7440-62-2												
Zinc	U											
7440-66-6												
Antimony	U											
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30161      Project: CPRC0S15001  
 Sample ID: 365668005      Client ID: CPRC001

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>												
<i>6020_METALS_ICPMS: Arsenic (I) "As Received"</i>												
Antimony 7440-36-0	U	0.310	+/-0.339	1.00	3.00	ug/L	1	SKJ	02/19/15	0213	1452552	3
Arsenic 7440-38-2	B	1.72	+/-0.663	1.70	5.00	ug/L	1					

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30158	Project:	CPRC0S15001
Sample ID:	365668006	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 10:45		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP</b>												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	U	-0.708	+/-1.67	5.00	30.0	ug/L	1	HSC	01/29/15	2043	1452575	1
7440-38-2		88.9	+/-17.8	1.00	5.00	ug/L	1					
Barium												
7440-39-3												
Cadmium	U	0.100	+/-0.334	1.00	5.00	ug/L	1					
7440-43-9												
Calcium		94300	+/-18900	50.0	200	ug/L	1					
7440-70-2												
Chromium	B	3.12	+/-0.708	1.00	5.00	ug/L	1					
7440-47-3												
Cobalt	U	-0.352	+/-0.341	1.00	5.00	ug/L	1					
7440-48-4												
Copper	U	-2.52	+/-1.12	3.00	10.0	ug/L	1					
7440-50-8												
Iron	B	68.6	+/-17.0	30.0	100	ug/L	1					
7439-89-6												
Magnesium		20200	+/-4050	110	300	ug/L	1					
7439-95-4												
Manganese	U	0.650	+/-0.679	2.00	10.0	ug/L	1					
7439-96-5												
Nickel	U	0.361	+/-0.505	1.50	5.00	ug/L	1					
7440-02-0												
Potassium		8350	+/-1670	50.0	150	ug/L	1					
7440-09-7												
Silver	U	-0.199	+/-0.336	1.00	5.00	ug/L	1					
7440-22-4												
Sodium		23100	+/-4620	100	300	ug/L	1					
7440-23-5												
Vanadium		10.6	+/-2.15	1.00	5.00	ug/L	1					
7440-62-2												
Zinc	U	-3.07	+/-1.26	3.30	10.0	ug/L	1					
7440-66-6												
Antimony	U	0.488	+/-1.17	3.50	10.0	ug/L	1	HSC	02/02/15	1203	1452575	2
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30158      Project: CPRC0S15001  
 Sample ID: 365668006      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method	
<b>Metals Analysis-ICP-MS</b>												
<i>6020_METALS_ICPMS: Antimony + Arsenic(1) "As Received"</i>												
Antimony 7440-36-0	U	0.130	+/-0.334	1.00	3.00	ug/L	1	SKJ	02/19/15	0220	1452552	3
Arsenic 7440-38-2	U	1.43	+/-0.635	1.70	5.00	ug/L	1					

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30156	Project:	CPRC0S15001
Sample ID:	365668007	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:22		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	U	1.36	+/-1.69	5.00	30.0	ug/L	1	HSC	01/29/15	2046	1452575	1
7440-38-2												
Barium		116	+/-23.3	1.00	5.00	ug/L	1					
7440-39-3												
Cadmium	U	-0.0702	+/-0.334	1.00	5.00	ug/L	1					
7440-43-9												
Calcium		97300	+/-19500	50.0	200	ug/L	1					
7440-70-2												
Chromium	B	2.58	+/-0.614	1.00	5.00	ug/L	1					
7440-47-3												
Cobalt	U	0.211	+/-0.336	1.00	5.00	ug/L	1					
7440-48-4												
Copper	U	-1.58	+/-1.05	3.00	10.0	ug/L	1					
7440-50-8												
Iron	U	18.9	+/-10.7	30.0	100	ug/L	1					
7439-89-6												
Magnesium		19100	+/-3820	110	300	ug/L	1					
7439-95-4												
Manganese	U	1.02	+/-0.697	2.00	10.0	ug/L	1					
7439-96-5												
Nickel	B	2.96	+/-0.774	1.50	5.00	ug/L	1					
7440-02-0												
Potassium		8230	+/-1650	50.0	150	ug/L	1					
7440-09-7												
Silver	U	-0.267	+/-0.338	1.00	5.00	ug/L	1					
7440-22-4												
Sodium		21700	+/-4350	100	300	ug/L	1					
7440-23-5												
Vanadium		8.22	+/-1.68	1.00	5.00	ug/L	1					
7440-62-2												
Zinc	U	-2.42	+/-1.20	3.30	10.0	ug/L	1					
7440-66-6												
Antimony	U	0.318	+/-1.17	3.50	10.0	ug/L	1	HSC	02/02/15	1206	1452575	2
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30156      Project: CPRC0S15001  
 Sample ID: 365668007      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>											
<i>6020_METALS_ICPMS: Arsenic (I) "As Received"</i>											
Antimony 7440-36-0	U	0.241	+/-0.337	1.00	3.00	ug/L	1	SKJ	02/19/15	0226	1452552 3
Arsenic 7440-38-2	U	0.500	+/-0.575	1.70	5.00	ug/L	1				

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30154	Project:	CPRC0S15001
Sample ID:	365668008	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:22		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP</b>												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	U	-0.0452	+/-1.67	5.00	30.0	ug/L	1	HSC	01/29/15	2049	1452575	1
7440-38-2		114	+/-22.8	1.00	5.00	ug/L	1					
Barium		114	+/-22.8	1.00	5.00	ug/L	1					
7440-39-3												
Cadmium	U	0.0076	+/-0.333	1.00	5.00	ug/L	1					
7440-43-9												
Calcium		95500	+/-19100	50.0	200	ug/L	1					
7440-70-2												
Chromium		8.88	+/-1.81	1.00	5.00	ug/L	1					
7440-47-3												
Cobalt	U	0.154	+/-0.335	1.00	5.00	ug/L	1					
7440-48-4												
Copper	U	-1.33	+/-1.04	3.00	10.0	ug/L	1					
7440-50-8												
Iron	B	48.0	+/-13.9	30.0	100	ug/L	1					
7439-89-6												
Magnesium		18800	+/-3750	110	300	ug/L	1					
7439-95-4												
Manganese	U	0.923	+/-0.692	2.00	10.0	ug/L	1					
7439-96-5												
Nickel	B	4.92	+/-1.10	1.50	5.00	ug/L	1					
7440-02-0												
Potassium		8020	+/-1600	50.0	150	ug/L	1					
7440-09-7												
Silver	U	-0.302	+/-0.339	1.00	5.00	ug/L	1					
7440-22-4												
Sodium		21400	+/-4290	100	300	ug/L	1					
7440-23-5												
Vanadium		8.29	+/-1.69	1.00	5.00	ug/L	1					
7440-62-2												
Zinc	U	-3.08	+/-1.26	3.30	10.0	ug/L	1					
7440-66-6												
Antimony	U	0.819	+/-1.18	3.50	10.0	ug/L	1	HSC	02/02/15	1210	1452575	2
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30154      Project: CPRC0S15001  
 Sample ID: 365668008      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>											
<i>6020_METALS_ICPMS: Antimony + Arsenic(1) "As Received"</i>											
Antimony 7440-36-0	U	0.138	+/-0.334	1.00	3.00	ug/L	1	SKJ	02/19/15	0233	1452552 3
Arsenic 7440-38-2	U	1.25	+/-0.619	1.70	5.00	ug/L	1				

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	

~~February 19, 2015~~  
**GEL LABORATORIES LLC**

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

**Certificate of Analysis**

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30164	Project:	CPRC0S15001
Sample ID:	365668009	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:55		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP</b>												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	U	-2.63	+/-1.75	5.00	30.0	ug/L	1	HSC	01/29/15	2052	1452575	1
7440-38-2												
Barium		85.9	+/-17.2	1.00	5.00	ug/L	1					
7440-39-3												
Cadmium	U	0.0691	+/-0.334	1.00	5.00	ug/L	1					
7440-43-9												
Calcium		79500	+/-15900	50.0	200	ug/L	1					
7440-70-2												
Chromium		15.7	+/-3.17	1.00	5.00	ug/L	1					
7440-47-3												
Cobalt	U	-0.22	+/-0.336	1.00	5.00	ug/L	1					
7440-48-4												
Copper	U	-0.789	+/-1.01	3.00	10.0	ug/L	1					
7440-50-8												
Iron		153	+/-32.2	30.0	100	ug/L	1					
7439-89-6												
Magnesium		16900	+/-3370	110	300	ug/L	1					
7439-95-4												
Manganese	B	2.65	+/-0.852	2.00	10.0	ug/L	1					
7439-96-5												
Nickel		16.3	+/-3.29	1.50	5.00	ug/L	1					
7440-02-0												
Potassium		7840	+/-1570	50.0	150	ug/L	1					
7440-09-7												
Silver	U	-0.315	+/-0.339	1.00	5.00	ug/L	1					
7440-22-4												
Sodium		22800	+/-4560	100	300	ug/L	1					
7440-23-5												
Vanadium		10.7	+/-2.17	1.00	5.00	ug/L	1					
7440-62-2												
Zinc	U	-1.79	+/-1.16	3.30	10.0	ug/L	1					
7440-66-6												
Antimony	U	2.64	+/-1.28	3.50	10.0	ug/L	1	HSC	02/02/15	1213	1452575	2
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30164      Project: CPRC0S15001  
 Sample ID: 365668009      Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>											
<i>6020_METALS_ICPMS: Antimony + Arsenic(1) "As Received"</i>											
Antimony 7440-36-0	U	0.145	+/-0.335	1.00	3.00	ug/L	1	SKJ	02/19/15	0240	1452552 3
Arsenic 7440-38-2	B	2.73	+/-0.787	1.70	5.00	ug/L	1				

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30166	Project:	CPRC0S15001
Sample ID:	365668010	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:55		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Arsenic	U	0.398	+/-1.67	5.00	30.0	ug/L	1	HSC	01/29/15	2055	1452575	1
7440-38-2		84.5	+/-16.9	1.00	5.00	ug/L	1					
Barium		84.5	+/-16.9	1.00	5.00	ug/L	1					
7440-39-3												
Cadmium	U	0.182	+/-0.335	1.00	5.00	ug/L	1					
7440-43-9												
Calcium		78700	+/-15700	50.0	200	ug/L	1					
7440-70-2												
Chromium	B	2.94	+/-0.676	1.00	5.00	ug/L	1					
7440-47-3												
Cobalt	U	-0.0529	+/-0.334	1.00	5.00	ug/L	1					
7440-48-4												
Copper	U	-1.37	+/-1.04	3.00	10.0	ug/L	1					
7440-50-8												
Iron	U	22.0	+/-10.9	30.0	100	ug/L	1					
7439-89-6												
Magnesium		16600	+/-3320	110	300	ug/L	1					
7439-95-4												
Manganese	U	0.638	+/-0.679	2.00	10.0	ug/L	1					
7439-96-5												
Nickel		9.13	+/-1.89	1.50	5.00	ug/L	1					
7440-02-0												
Potassium		7770	+/-1550	50.0	150	ug/L	1					
7440-09-7												
Silver	U	-0.317	+/-0.339	1.00	5.00	ug/L	1					
7440-22-4												
Sodium		23100	+/-4630	100	300	ug/L	1					
7440-23-5												
Vanadium		10.4	+/-2.10	1.00	5.00	ug/L	1					
7440-62-2												
Zinc	U	-2.41	+/-1.20	3.30	10.0	ug/L	1					
7440-66-6												
Antimony	U	1.76	+/-1.22	3.50	10.0	ug/L	1	HSC	02/02/15	1216	1452575	2
7440-36-0												

**Metals Analysis-ICP-MS**

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID: B30166      Project: CPRC0S15001  
 Sample ID: 365668010      Client ID: CPRC001

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>												
<i>6020_METALS_ICPMS: Arsenic (I) "As Received"</i>												
Antimony 7440-36-0	U	0.177	+/-0.335	1.00	3.00	ug/L	1	SKJ	02/19/15	0246	1452552	3
Arsenic 7440-38-2	U	0.448	+/-0.574	1.70	5.00	ug/L	1	SKJ	02/19/15	1518	1452552	4

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/26/15	0800	1452551
SW846 3005A	SW846 3005A for 6010C	JXM5	01/26/15	0800	1452573

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

# Quality Control Summary

**February 19, 2015**  
**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: February 19, 2015

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

**Contact: Mr. Scot Fitzgerald**

**Workorder: 365668**

<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD/D%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
<b>Metals Analysis - ICPMS</b>											
Batch	1452552										
QC1203250549	LCS										
Antimony	50.0			55.4	ug/L		111	(80%-120%)	SKJ	02/19/15	00:47
Arsenic	50.0			49.9	ug/L		99.7	(80%-120%)			
QC1203250548	MB										
Antimony			U	ND	ug/L					02/19/15	00:40
Arsenic			U	ND	ug/L						
QC1203250550	365668003 MS										
Antimony	50.0	U	ND	55.1	ug/L		110	(75%-125%)		02/19/15	01:20
Arsenic	50.0	U	ND	51.0	ug/L		100	(75%-125%)			
QC1203250551	365668003 MSD										
Antimony	50.0	U	ND	55.2	ug/L	0.167	110	(0%-20%)		02/19/15	01:27
Arsenic	50.0	U	ND	52.9	ug/L	3.66	104	(0%-20%)			
QC1203250552	365668003 SDILT										
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/19/15	01:40
Arsenic		U	ND DU	ND	ug/L	N/A		(0%-10%)			
<b>Metals Analysis-ICP</b>											
Batch	1452575										
QC1203250603	LCS										
Antimony	500			513	ug/L		103	(80%-120%)	HSC	02/02/15	11:31
Arsenic	500			477	ug/L		95.4	(80%-120%)		01/29/15	20:11
Barium	500			493	ug/L		98.5	(80%-120%)			
Cadmium	500			481	ug/L		96.3	(80%-120%)			
Calcium	5000			4860	ug/L		97.2	(80%-120%)			
Chromium	500			489	ug/L		97.8	(80%-120%)			
Cobalt	500			497	ug/L		99.4	(80%-120%)			

February 19, 2015  
**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 365668

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1452575										
Copper	500			496	ug/L		99.1	(80%-120%)	HSC	01/29/15	20:11
Iron	5000			4960	ug/L		99.1	(80%-120%)			
Magnesium	5000			4940	ug/L		98.9	(80%-120%)			
Manganese	500			489	ug/L		97.9	(80%-120%)			
Nickel	500			485	ug/L		97.1	(80%-120%)			
Potassium	5000			5090	ug/L		102	(80%-120%)			
Silver	500			478	ug/L		95.6	(80%-120%)			
Sodium	5000			5140	ug/L		103	(80%-120%)			
Vanadium	500			507	ug/L		101	(80%-120%)			
Zinc	500			475	ug/L		95	(80%-120%)			
QC1203250602	MB										
Antimony			U	ND	ug/L					02/02/15	11:27
Arsenic			U	ND	ug/L					01/29/15	20:08
Barium			U	ND	ug/L						
Cadmium			U	ND	ug/L						
Calcium			U	ND	ug/L						
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Manganese			U	ND	ug/L						

**February 19, 2015**  
**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 365668

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1452575										
Nickel			U	ND	ug/L				HSC	01/29/15	20:08
Potassium			U	ND	ug/L						
Silver			U	ND	ug/L						
Sodium			U	ND	ug/L						
Vanadium			U	ND	ug/L						
Zinc			U	ND	ug/L						
QC1203250604 365668003 MS											
Antimony	500	U	ND	551	ug/L		110	(75%-125%)		02/02/15	11:37
Arsenic	500	U	ND	520	ug/L		104	(75%-125%)		01/29/15	20:17
Barium	500		137	648	ug/L		102	(75%-125%)			
Cadmium	500	U	ND	484	ug/L		96.7	(75%-125%)			
Calcium	5000		109000	120000	ug/L		N/A	(75%-125%)			
Chromium	500		8.95	513	ug/L		101	(75%-125%)			
Cobalt	500	U	ND	483	ug/L		96.6	(75%-125%)			
Copper	500	U	ND	520	ug/L		104	(75%-125%)			
Iron	5000	B	69.9	5140	ug/L		101	(75%-125%)			
Magnesium	5000		22200	28500	ug/L		N/A	(75%-125%)			
Manganese	500	U	ND	496	ug/L		98.8	(75%-125%)			
Nickel	500	B	3.90	471	ug/L		93.5	(75%-125%)			
Potassium	5000		9480	14900	ug/L		109	(75%-125%)			
Silver	500	U	ND	495	ug/L		99.1	(75%-125%)			
Sodium	5000		22400	28800	ug/L		N/A	(75%-125%)			

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**QC Summary**

Workorder: **365668**

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1452575										
Vanadium	500		8.38	546	ug/L		108	(75%-125%)	HSC	01/29/15	20:17
Zinc	500	U	ND	483	ug/L		96.4	(75%-125%)			
QC1203250605	365668003 MSD										
Antimony	500	U	ND	548	ug/L	0.593	110	(0%-20%)		02/02/15	11:40
Arsenic	500	U	ND	506	ug/L	2.72	101	(0%-20%)		01/29/15	20:20
Barium	500		137	643	ug/L	0.807	101	(0%-20%)			
Cadmium	500	U	ND	477	ug/L	1.41	95.4	(0%-20%)			
Calcium	5000		109000	121000	ug/L	1.10	N/A	(0%-20%)			
Chromium	500		8.95	509	ug/L	0.726	100	(0%-20%)			
Cobalt	500	U	ND	478	ug/L	1.07	95.6	(0%-20%)			
Copper	500	U	ND	518	ug/L	0.325	104	(0%-20%)			
Iron	5000	B	69.9	5160	ug/L	0.384	102	(0%-20%)			
Magnesium	5000		22200	28900	ug/L	1.30	N/A	(0%-20%)			
Manganese	500	U	ND	492	ug/L	0.905	97.9	(0%-20%)			
Nickel	500	B	3.90	463	ug/L	1.85	91.7	(0%-20%)			
Potassium	5000		9480	15100	ug/L	1.08	112	(0%-20%)			
Silver	500	U	ND	494	ug/L	0.394	98.7	(0%-20%)			
Sodium	5000		22400	29000	ug/L	0.634	N/A	(0%-20%)			
Vanadium	500		8.38	541	ug/L	0.912	107	(0%-20%)			
Zinc	500	U	ND	478	ug/L	1.06	95.4	(0%-20%)			
QC1203250606	365668003 SDILT										
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/02/15	11:44
Arsenic		U	ND DU	ND	ug/L	N/A		(0%-10%)		01/29/15	20:24

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**QC Summary**

Workorder: 365668

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1452575										
Barium		137	D	26.6	ug/L	2.81		(0%-10%)	HSC	01/29/15	20:24
Cadmium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Calcium		109000	D	21100	ug/L	2.82		(0%-10%)			
Chromium		8.95	D	2.02	ug/L	12.6		(0%-10%)			
Cobalt	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Copper	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Iron	B	69.9	DU	ND	ug/L	N/A		(0%-10%)			
Magnesium		22200	D	4380	ug/L	1.41		(0%-10%)			
Manganese	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Nickel	B	3.90	DU	ND	ug/L	N/A		(0%-10%)			
Potassium		9480	D	1760	ug/L	7.27		(0%-10%)			
Silver	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Sodium		22400	D	4300	ug/L	4.08		(0%-10%)			
Vanadium		8.38	D	1.78	ug/L	6.5		(0%-10%)			
Zinc	U	ND	DU	ND	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 >= 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.

February 19, 2015  
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**QC Summary**

Workorder: 365668

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
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 #: GEL365668  
Work Order #: 365668**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1452865

**Method:** 9060\_TOC: COMMON

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 9060A:

<b>Sample ID</b>	<b>Client ID</b>
365668003	B30148
365668006	B30158
365668008	B30154
365668009	B30164
1203251309	Method Blank (MB)
1203251310	Laboratory Control Sample (LCS)
1203251291	Laboratory Control Sample Duplicate (LCSD)
1203251311	365668003(B30148) Sample Duplicate (DUP)
1203251312	365668003(B30148) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**

The RPD between the LCS and LCSD met the acceptance limits.

**Quality Control (QC) Designation**

Sample365668003 (B30148) was selected for QC analysis.

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

The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Method/Analysis Information**

**Product:** Ion Chromatography  
**Analytical Batch:** 1452517      **Method:** 9056\_ANIONS\_IC: COMMON

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
365668001	B30150
365668002	B30160
1203250455	Method Blank (MB)
1203250456	Laboratory Control Sample (LCS)
1203250457	365668001(B30150) Sample Duplicate (DUP)
1203250458	365668001(B30150) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**

The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 365668001 (B30150) was selected for QC analysis.

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

The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

Samples 1203250457 (B30150DUP), 1203250458 (B30150PS), 365668001 (B30150) and 365668002 (B30160) were diluted because target analyte concentrations exceeded the calibration range. The following samples in this sample group were diluted due to matrix interference. 1203250457 (B30150DUP), 1203250458 (B30150PS), 365668001 (B30150) and 365668002 (B30160).

	<b>365668</b>	
Analyte	<b>001</b>	<b>002</b>
Nitrate	5X	5X
Sulfate	5X	5X

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**

Samples 1203250457 (B30150DUP), 1203250458 (B30150PS), 365668001 (B30150) and 365668002 (B30160) were manually integrated to correctly position the baseline as set in the calibration standards.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Method/Analysis Information**

**Product:** Ammonia Nitrogen  
**Analytical Batch:** 1452820      **Method:** 350.1\_AMMONIA: COMMON  
**Prep Batch :** 1452819      **Method:** EPA 350.2 Prep

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

<b>Sample ID</b>	<b>Client ID</b>
365668003	B30148
365668006	B30158
365668008	B30154
365668009	B30164
1203251177	Method Blank (MB)
1203251178	Laboratory Control Sample (LCS)
1203251183	365755001(B30168) Sample Duplicate (DUP)
1203251184	365755001(B30168) Matrix Spike (MS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**

The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB 1203251177 (MB) 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.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample365755001 (B30168) was selected for QC analysis.

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

The matrix spike recovered outside of the established acceptance limits due to matrix interference. 1203251184 (B30168MS).

**Duplicate Relative Percent Difference (RPD) Statement**

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203251183 (B30168DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1378032. 1203251184 (B30168MS).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Method/Analysis Information**

**Product:** COD  
**Analytical Batch:** 1453379 **Method:** 410.4\_COD: COMMON

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 410.4:

<b>Sample ID</b>	<b>Client ID</b>
365668003	B30148
365668006	B30158
365668008	B30154
365668009	B30164
1203252746	Method Blank (MB)
1203252747	Laboratory Control Sample (LCS)
1203252750	365858003(B30174) Sample Duplicate (DUP)
1203252751	365858003(B30174) Matrix Spike (MS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-061 REV# 18.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Spectrometric analysis was performed on a Spectronic 20D+ Digital Spectrophotometer.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**

The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample365858003 (B30174) was selected for QC analysis.

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

The matrix spike recovered outside of the established acceptance limits due to matrix interference. 1203252751 (B30174MS).

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1376910. 1203252751 (B30174MS).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

February 19, 2015

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

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

February 19, 2015

**GEL LABORATORIES LLC**

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365668 GEL Work Order: 365668

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

- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is  $\geq$  EQL or is  $> 5\%$  of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

**Review/Validation**

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

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

Signature: 

Name: **Thomas Lewis**

Date: **19 FEB 2015**

Title: **Data Validator**

# Sample Data Summary

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30150	Project:	CPRC0S15001
Sample ID:	365668001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 08:37		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>9056_ANIONS_IC: COMMON "As Received"</i>											
Chloride 16887-00-6		6240	+/-209	67.0	200	ug/L	1	MXL201/23/15	1419	1452517	1
Fluoride 16984-48-8	B	158	+/-12.2	33.0	500	ug/L	1				
Nitrite-N 14797-65-0	U	0.00	+/-12.7	38.0	250	ug/L	1				
Nitrate-N 14797-55-8	D	3740	+/-136	165	500	ug/L	5	MXL201/23/15	1808	1452517	2
Sulfate 14808-79-8	D	42100	+/-1420	665	2000	ug/L	5				

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30160	Project:	CPRC0S15001
Sample ID:	365668002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 10:45		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography</b>										
<i>9056_ANIONS_IC: COMMON "As Received"</i>										
Chloride 16887-00-6		6530	+/-219	67.0	200	ug/L	1	MXL201/23/15 1630	1452517	1
Fluoride 16984-48-8	B	271	+/-14.2	33.0	500	ug/L	1			
Nitrite-N 14797-65-0	U	0.00	+/-12.7	38.0	250	ug/L	1			
Nitrate-N 14797-55-8	D	3280	+/-122	165	500	ug/L	5	MXL201/23/15 1947	1452517	2
Sulfate 14808-79-8	D	42100	+/-1420	665	2000	ug/L	5			

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	

~~February 19, 2015~~  
**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30148	Project:	CPRC0S15001
Sample ID:	365668003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 08:37		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>											
<i>9060_TOC: COMMON "As Received"</i>											
Total Organic Carbon #1		1120	330	1000	ug/L	1	TSM	01/28/15	1510	1452865	1
Total Organic Carbon #2		1370	330	1000	ug/L	1					
Total Organic Carbon #3	B	939	330	1000	ug/L	1					
Total Organic Carbon #4		1000	330	1000	ug/L	1					
Total Organic Carbon Average		1110	330	1000	ug/L	1					
<b>Nutrient Analysis</b>											
<i>350.1_AMMONIA: COMMON "As Received"</i>											
Nitrogen, Ammonia 7664-41-7	C	66.3	+/-6.08	17.0	50.0	ug/L	1	KLP1	02/02/15	1207	1452820 2
<b>Spectrometric Analysis</b>											
<i>410.4_COD: COMMON "As Received"</i>											
COD	U	-7740	6670	20000	ug/L	1	SXC5	01/28/15	1507	1453379	3

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/02/15	1125	1452819

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	EPA 350.1	
3	EPA 410.4	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30158	Project:	CPRC0S15001
Sample ID:	365668006	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 10:45		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>											
<i>9060_TOC: COMMON "As Received"</i>											
Total Organic Carbon #1		2410	330	1000	ug/L	1	TSM	01/28/15	1612	1452865	1
Total Organic Carbon #2		2480	330	1000	ug/L	1					
Total Organic Carbon #3		2540	330	1000	ug/L	1					
Total Organic Carbon #4		2440	330	1000	ug/L	1					
Total Organic Carbon Average		2470	330	1000	ug/L	1					
<b>Nutrient Analysis</b>											
<i>350.1_AMMONIA: COMMON "As Received"</i>											
Nitrogen, Ammonia 7664-41-7	C	91.3	+/-6.43	17.0	50.0	ug/L	1	KLP1	02/02/15	1208	1452820 2
<b>Spectrometric Analysis</b>											
<i>410.4_COD: COMMON "As Received"</i>											
COD	U	-7740	6670	20000	ug/L	1	SXC5	01/28/15	1507	1453379	3

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/02/15	1125	1452819

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	EPA 350.1	
3	EPA 410.4	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30154	Project:	CPRC0S15001
Sample ID:	365668008	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:22		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>											
<i>9060_TOC: COMMON "As Received"</i>											
Total Organic Carbon #1	B	765	330	1000	ug/L	1	TSM	01/28/15	1646	1452865	1
Total Organic Carbon #2		1110	330	1000	ug/L	1					
Total Organic Carbon #3	B	727	330	1000	ug/L	1					
Total Organic Carbon #4	B	935	330	1000	ug/L	1					
Total Organic Carbon Average	B	884	330	1000	ug/L	1					
<b>Nutrient Analysis</b>											
<i>350.1_AMMONIA: COMMON "As Received"</i>											
Nitrogen, Ammonia	C	51.4	+/-5.92	17.0	50.0	ug/L	1	KLP1	02/02/15	1209	1452820 2
<i>7664-41-7</i>											
<b>Spectrometric Analysis</b>											
<i>410.4_COD: COMMON "As Received"</i>											
COD	U	-5110	6670	20000	ug/L	1	SXC5	01/28/15	1507	1453379	3

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/02/15	1125	1452819

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	EPA 350.1	
3	EPA 410.4	

## Certificate of Analysis

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF S15-001**

Report Date: February 19, 2015

Client Sample ID:	B30164	Project:	CPRC0S15001
Sample ID:	365668009	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	22-JAN-15 09:55		
Receive Date:	23-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>											
<i>9060_TOC: COMMON "As Received"</i>											
Total Organic Carbon #1	B	584	330	1000	ug/L	1	TSM	01/28/15	1719	1452865	1
Total Organic Carbon #2	B	880	330	1000	ug/L	1					
Total Organic Carbon #3	B	548	330	1000	ug/L	1					
Total Organic Carbon #4	B	718	330	1000	ug/L	1					
Total Organic Carbon Average	B	683	330	1000	ug/L	1					
<b>Nutrient Analysis</b>											
<i>350.1_AMMONIA: COMMON "As Received"</i>											
Nitrogen, Ammonia 7664-41-7	BC	38.6	+/-5.81	17.0	50.0	ug/L	1	KLP1	02/02/15	1210	1452820 2
<b>Spectrometric Analysis</b>											
<i>410.4_COD: COMMON "As Received"</i>											
COD	U	-5110	6670	20000	ug/L	1	SXC5	01/28/15	1507	1453379	3

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/02/15	1125	1452819

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	EPA 350.1	
3	EPA 410.4	

# Quality Control Summary

**February 19, 2015**  
**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: February 19, 2015

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**CH2M Hill Plateau Remediation Company**

**MSIN R3-50 CHPRC**

**PO Box 1600**

**Richland, Washington**

**Contact: Mr. Scot Fitzgerald**

**Workorder: 365668**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1452865										
QC1203251311	365668003	DUP									
Total Organic Carbon Average		1110	B	939	ug/L	16.6	^	(+/-1000)	TSM	01/28/15	15:44
QC1203251310	LCS										
Total Organic Carbon Average	10000			9790	ug/L			(85%-115%)		01/28/15	14:19
QC1203251291	LCSD										
Total Organic Carbon Average	10000			9910	ug/L	1.31		(0%-20%)		01/28/15	14:28
QC1203251309	MB										
Total Organic Carbon Average			U	330	ug/L					01/28/15	14:10
QC1203251312	365668003	PS									
Total Organic Carbon Average	10.0	1.11		10.6	mg/L			(65%-120%)		01/28/15	16:04
<b>Ion Chromatography</b>											
Batch	1452517										
QC1203250457	365668001	DUP									
Chloride		6240		6210	ug/L	0.337		(0%-20%)	MXL2	01/23/15	15:24
Fluoride		B	158	B	160	ug/L	0.755	^	(+/-500)		
Nitrate-N		D	3740	D	3780	ug/L	1.09		(0%-20%)		01/23/15 18:41
Nitrite-N		U	38.0	U	38.0	ug/L	N/A				01/23/15 15:24
Sulfate		D	42100	D	41800	ug/L	0.523		(0%-20%)		01/23/15 18:41
QC1203250456	LCS										
Chloride	5000			4750	ug/L			95	(90%-110%)		01/23/15 13:13
Fluoride	2500			2510	ug/L			100	(90%-110%)		
Nitrate-N	2500			2460	ug/L			98.6	(90%-110%)		
Nitrite-N	2500			2490	ug/L			99.4	(90%-110%)		
Sulfate	10000			9980	ug/L			99.8	(90%-110%)		
QC1203250455	MB										
Chloride			U	67.0	ug/L						01/23/15 12:41

**February 19, 2015**  
**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 365668

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1452517										
Fluoride			U	33.0	ug/L				MXL2	01/23/15	12:41
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L						
Sulfate			U	133	ug/L						
QC1203250458 365668001 PS											
Chloride	5.00	6.24		11.6	mg/L		107	(90%-110%)		01/23/15	15:57
Fluoride	2.50	B	0.158	2.59	mg/L		97.2	(90%-110%)			
Nitrate-N	2.50	D	0.749	D	3.22	mg/L	99	(90%-110%)		01/23/15	19:14
Nitrite-N	2.50	U	0.00	2.42	mg/L		96.8	(90%-110%)		01/23/15	15:57
Sulfate	10.0	D	8.41	D	19.0	mg/L	106	(90%-110%)		01/23/15	19:14
<b>Nutrient Analysis</b>											
Batch	1452820										
QC1203251183 365755001 DUP											
Nitrogen, Ammonia		NU	17.0	U	17.0	ug/L	N/A		KLP1	02/02/15	12:18
QC1203251178 LCS											
Nitrogen, Ammonia	1000			1060	ug/L		106	(90%-110%)		02/02/15	12:06
QC1203251177 MB											
Nitrogen, Ammonia			B	33.5	ug/L					02/02/15	12:06
QC1203251184 365755001 MS											
Nitrogen, Ammonia	1000	NU	17.0	N	1260	ug/L	125*	(90%-110%)		02/02/15	12:19
<b>Spectrometric Analysis</b>											
Batch	1453379										
QC1203252750 365858003 DUP											
COD		97500		100000	ug/L	2.66 ^		(+/-20000)	SXC5	01/28/15	15:09
QC1203252747 LCS											
COD	500000			505000	ug/L		101	(90%-110%)		01/28/15	15:04
QC1203252746 MB											
COD			U	6670	ug/L					01/28/15	15:04

February 19, 2015  
**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 365668

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Spectrometric Analysis</b>											
Batch	1453379										
QC1203252751	365858003	MS									
COD	500000	97500		521000	ug/L		84.7*	(90%-110%)	SXC5	01/28/15	15:09

**Notes:**

The Qualifiers in this report are defined as follows:

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

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

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

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

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

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

# Miscellaneous

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 28-JAN-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> VIS SPEC HIGH	<b>Test / Method:</b> EPA 410.4, HACH 8000	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> CBMW, CPRC, HASS, LATA,
<b>Batch ID:</b> 1453379	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 365668(GEL365668),365755(GEL365755),365858(GEL365858)</b>			
<b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed Recovery for MS:  QC 1203252751MS		1. The spike recovery falls outside of the established acceptance limits due to matrix interference.	

**Originator's Name:**

Sarah Carson 28-JAN-15

**Data Validator/Group Leader:**

Elzbieta Szulc 29-JAN-15

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 02-FEB-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 350.1, EPA 350.1 SC	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ALBR, CPRC, ESHL, GRSD,
<b>Batch ID:</b> 1452820	<b>Sample Numbers:</b> See Below		
<p><b>Potentially affected work order(s)(SDG):</b> 365668(GEL365668),365746(2015-698),365755(GEL365755),365858(GEL365858),365874,365982,366001,366038(V4025),366061,366091</p> <p><b>Application Issues:</b></p> <p>Failed Recovery for MS/MSD, or PS/PSD</p>			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Failed Recovery for MS/PS:</p> <p>QC 1203251182MS,1203251184MS</p>		<p>1. The spike recovery falls outside of the established acceptance limits due to matrix interference.</p>	

**Originator's Name:**

Kristen Parson 02-FEB-15

**Data Validator/Group Leader:**

Aubrey Kingsbury 02-FEB-15