

February 27, 2015



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www.gel.com

February 25, 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: 366137
SDG: GEL366137

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 30, 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: S15-001-149, S15-001-173 and S15-001-174
Enclosures



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Case Narrative

February 27, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S15-001
SDG: GEL366137

February 25, 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 30, 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:

<u>Laboratory Identification</u>	<u>Sample Description</u>
366137001	B30134
366137002	B300T2
366137003	B30135
366137004	B30133

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 27, 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 Volatile, General Chemistry, Metals and Radiochemistry.

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 Manger (or designee) and the laboratory's client services representative as verified by their signatures on this report.



Heather Shaffer
Project Manager

SAMPLE ISSUE RESOLUTION	SIR NUM	SDR15-206
	REV NUM	0
	DATE INITIATED	2/9/2014

SAMPLE EVENT INFORMATION

SAF NUM(S) S15-001
OPERABLE UNIT(S) NONE
PROJECT(S) SURV15
SAMPLE EVENT TITLE(S) SURV15
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 3
SAMPLE NUMBERS B30133, B30134, B30135
SAMPLE MATRIX WATER
COLLECTION DATE 1/29/2015 - 1/29/2015
SDG NUM GEL366137

ISSUE BACKGROUND

CLASS Chain of Custody Issue (Field)
TYPE Sample Date/time is missing/incorrect/illegible
DESCRIPTION Upon chain of custody data entry for SDG GEL366137, COCs #S15-001-174 (Sample #B30134) and #S15-001-173 (Samples #B30133 & #B30135), the sample date (year) is incorrect.

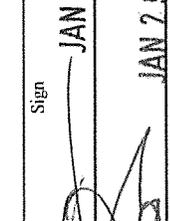
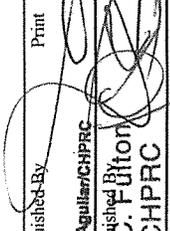
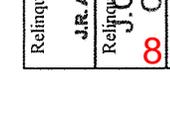
DISPOSITION

DESCRIPTION PROPOSED DISPOSITION: Document and close
JUSTIFICATION ACCEPTED DISPOSITION: Document and close
SUBMITTED BY: Gayelyn Gibson Date: 2/2/2015
ACCEPTED BY: Sara Champoux Date: 2/9/2015

Chain of Custody and Supporting Documentation

February 27, 2015

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # S15-001-174
Collector J.R. Aguilar/CHPRC		Contact/Requester Karen Waters-Husted		Telephone No. 509-376-4650		Page 1 of 1
SAF No. S15-001	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071				
Project Title SURV, JANUARY 2015	Logbook No. HNF-N-506 67 / 81	Ice Chest No. 175-291				
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 712760907253				
Protocol SURV	Priority: 30 Days	PRIORITY		Offsite Property No. 5374		
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		
Sample No. B30134	Filter N	* W	Date 1-29-14	Time 0821	No./Type Container 1x250-ml G/P	Sample Analysis 9056_ANIONS_IC: COMMON
Holding Time 28 Days/48 Hours			Preservative Cool <=6C			
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>						

Relinquished By J.R. Aguilar/CHPRC	Print 	Sign 	Date/Time JAN 29 2015 1030	Received By J.C. Fulton	Print 	Sign 	Date/Time JAN 29 2015 1030	Matrix *
Relinquished By J.C. Fulton	Print 	Sign 	Date/Time 1400	Received By FED EX	Print 	Sign 	Date/Time 1-30-15 0858	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By 8 of 9	Print 	Sign 	Date/Time 	Received By 	Print 	Sign 	Date/Time 	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
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)

PRINTED O 12/16/2014

February 27, 2015

CH2M Hill Plateau Remediation Company		C.O.C. # S15-001-149 Page 1 of 1	
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			
Collector	S.W. King/CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	S15-001	Sampling Origin	Hanford Site
Project Title	SURV, JANUARY 2015	Logbook No.	HNF-N-506 77159
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier
Protocol	SURV	Priority:	30 Days
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 Hold Time Hold Time	Offsite Property No. 5375 Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B300T2	N	JAN 29 2015	1254	1x250-mL G/P	9012_CYANIDE: COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By S.W. King/CHPRC	Print <i>[Signature]</i>	Sign	Date/Time JAN 29 2015 1345	Received By L.D. Wall CHPRC	Print L.D. Wall	Sign <i>[Signature]</i>	Date/Time JAN 29 2015 1345	Matrix *
Relinquished By L.D. Wall CHPRC	Print <i>[Signature]</i>	Sign	Date/Time JAN 29 2015 1400	Received By M. Kinslow	Print FEDEX	Sign <i>[Signature]</i>	Date/Time 1-30-15 0855	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
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	
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)

Disposed By

Date/Time

February 27, 2015

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C. # **S15-001-173**
 Page 1 of 1

Collector J.R. Aguller/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-506 67/81
Ice Chest No. (105-291)
Bill of Lading/Air Bill No. 772760904253
Shipped To (Lab) GEL Laboratories, LLC
Method of Shipment Commercial Carrier
Offsite Property No. 5374
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 438.1

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B30135	Y	W	1-29-14	0821	1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_CPMS: GW 01	6 Months	HNO3 to pH <2
B30133	N	W			1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_CPMS: GW 01	6 Months	HNO3 to pH <2
B30133	N	W			4x40-mL aGs*	8260_VOA_GCMS_IX: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30133	N	W			1x2-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B30133	N	W			1x4-L G/P	GAMMA_GS: COMMON	6 Months	HNO3 to pH <2
B30133	N	W			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B30133	N	W	1-29-14	0821	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By J.R. Aguller/CHPRC
Print [Signature]
Sign [Signature]
Date/Time JAN 29 2015 10:00
Received By J.C. Fulton
Print [Signature]
Sign [Signature]
Date/Time JAN 29 2015 10:00
Relinquished By [Signature]
Print [Signature]
Sign [Signature]
Date/Time JAN 29 2015 14:00
Received By [Signature]
Print [Signature]
Sign [Signature]
Date/Time 1-30-15 08:50
Relinquished By [Signature]
Print [Signature]
Sign [Signature]
Date/Time [Signature]

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)

Client: <u>OPRC</u>	SDG/AR/COC/Work Order: <u>306137</u>
Received By: <u>mk</u>	Date Received: <u>1-30-15</u>
Suspected Hazard Information	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No *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>Opnd</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 type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <small>*all temperatures are recorded in Celsius</small>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130532776</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

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

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

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 25 February 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
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 27, 2015
GC/MS Volatile
Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL366137
Work Order #: 366137

Method/Analysis Information

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

Analytical Method: SW846 8260C

Analytical Batch Number: 1454890

Sample Analysis

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

Sample ID	Client ID
366137004	B30133
1203256971	Method Blank (MB)
1203256972	Laboratory Control Sample (LCS)
1203256973	Laboratory Control Sample (LCS)
1203256974	366158001(B2YXJ9) Post Spike (PS)
1203256975	366158001(B2YXJ9) Post Spike Duplicate (PSD)
1203256976	366158001(B2YXJ9) Post Spike (PS)
1203256977	366158001(B2YXJ9) Post Spike Duplicate (PSD)

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

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

SOP Reference

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

Calibration Information

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

Initial Calibration

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

Continuing Calibration Verification Requirements

The calibration verification standard requirements were not all met for sample 366137004 (B30133). There were no positive results for any of the analytes that were outside the calibration criteria. The results are reported.

Quality Control (QC) Information

Blank (MB) Statement

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS (See Below) recoveries were not all within the acceptance limits. There were no detected analytes in the samples. The results are reported.

Sample	Analyte	Value
1203256973 (LCS)	2-Chloro-1,3-butadiene	137* (70%-130%)

QC Sample Designation

Sample 366158001 (B2YXJ9) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits.

Sample	Analyte	Value
1203256974 (Non SDG 366158001PS)	2-Butanone	58.8* (70%-130%)
	2-Hexanone	69.5* (70%-130%)
	Acetone	44.1* (70%-130%)
1203256975 (Non SDG 366158001PSD)	2-Butanone	58.3* (70%-130%)
	2-Hexanone	67.2* (70%-130%)
	Acetone	43.6* (70%-130%)

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

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

DER #1378853 was generated for this SDG.

Manual Integrations

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

TIC Comment

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

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

System Configuration

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

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

Certification Statement

February 27, 2015

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 27, 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: GEL366137 GEL Work Order: 366137

The Qualifiers in this report are defined as follows:

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

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

DL Indicates that sample is diluted.

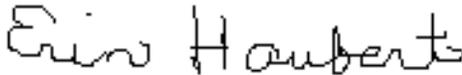
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 24 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:	B30133	Project:	CPRC0S15001
Sample ID:	366137004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 08:21		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
<i>8260_VOA_GCMS_IX: COMMON "As Received"</i>											
1,1,1,2-Tetrachloroethane	U	0.00	0.300	5.00	ug/L	1	CDS1	02/03/15	1353	1454890	1
630-20-6											
1,1,1-Trichloroethane	U	0.00	0.300	5.00	ug/L	1					
71-55-6											
1,1,2,2-Tetrachloroethane	U	0.00	0.300	5.00	ug/L	1					
79-34-5											
1,1,2-Trichloroethane	U	0.00	0.300	5.00	ug/L	1					
79-00-5											
1,1-Dichloroethane	U	0.00	0.300	10.0	ug/L	1					
75-34-3											
1,1-Dichloroethylene	U	0.00	0.300	10.0	ug/L	1					
75-35-4											
1,2,3-Trichloropropane	U	0.00	0.300	5.00	ug/L	1					
96-18-4											
1,2-Dibromo-3-chloropropane	U	0.00	0.500	5.00	ug/L	1					
96-12-8											
1,2-Dibromoethane	U	0.00	0.300	5.00	ug/L	1					
106-93-4											
1,2-Dichloroethane	U	0.00	0.300	5.00	ug/L	1					
107-06-2											
1,2-Dichloropropane	U	0.00	0.300	5.00	ug/L	1					
78-87-5											
2-Butanone	TU	0.00	3.00	10.0	ug/L	1					
78-93-3											
2-Chloro-1,3-butadiene	U	0.00	0.300	10.0	ug/L	1					
126-99-8											
2-Hexanone	TU	0.00	3.00	20.0	ug/L	1					
591-78-6											
4-Methyl-2-pentanone	U	0.00	3.00	10.0	ug/L	1					
108-10-1											
Acetone	TU	0.00	3.00	20.0	ug/L	1					
67-64-1											
Acetonitrile	U	0.00	16.7	100	ug/L	1					
75-05-8											
Acrolein	U	0.00	3.00	100	ug/L	1					
107-02-8											

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: B30133 Project: CPRC0S15001
 Sample ID: 366137004 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
<i>8260_VOA_GCMS_IX: COMMON "As Received"</i>											
Acrylonitrile	U	0.00	3.00	100	ug/L	1					
107-13-1											
Allyl chloride	U	0.00	3.00	10.0	ug/L	1					
107-05-1											
Benzene	U	0.00	0.300	5.00	ug/L	1					
71-43-2											
Bromoform	U	0.00	0.300	5.00	ug/L	1					
75-25-2											
Carbon disulfide	U	0.00	1.60	10.0	ug/L	1					
75-15-0											
Carbon tetrachloride	U	0.00	0.300	5.00	ug/L	1					
56-23-5											
Chlorobenzene	U	0.00	0.300	5.00	ug/L	1					
108-90-7											
Chloroethane	U	0.00	0.300	10.0	ug/L	1					
75-00-3											
Chloroform	U	0.00	0.300	5.00	ug/L	1					
67-66-3											
Dibromochloromethane	U	0.00	0.300	5.00	ug/L	1					
124-48-1											
Dibromomethane	U	0.00	0.300	10.0	ug/L	1					
74-95-3											
Dichlorodifluoromethane	U	0.00	0.300	10.0	ug/L	1					
75-71-8											
Ethyl methacrylate	U	0.00	3.00	10.0	ug/L	1					
97-63-2											
Ethylbenzene	U	0.00	0.300	5.00	ug/L	1					
100-41-4											
Iodomethane	U	0.00	3.00	10.0	ug/L	1					
74-88-4											
Isobutyl alcohol	U	0.00	33.0	500	ug/L	1					
78-83-1											
Methacrylonitrile	U	0.00	3.00	10.0	ug/L	1					
126-98-7											
Methylene chloride	U	1.27	1.60	5.00	ug/L	1					
75-09-2											
Styrene	U	0.00	0.300	5.00	ug/L	1					
100-42-5											
Tetrachloroethylene	U	0.00	0.300	5.00	ug/L	1					
127-18-4											

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 18, 2015

Client Sample ID: B30133 Project: CPRC0S15001
 Sample ID: 366137004 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
<i>8260_VOA_GCMS_IX: COMMON "As Received"</i>											
Toluene	U	0.00	0.300	5.00	ug/L	1					
108-88-3											
Trichloroethylene	U	0.00	0.300	5.00	ug/L	1					
79-01-6											
Vinyl acetate	U	0.00	1.60	50.0	ug/L	1					
108-05-4											
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-1,3-Dichloropropylene	U	0.00	0.300	5.00	ug/L	1					
10061-01-5											
trans-1,2-Dichloroethylene	U	0.00	0.300	5.00	ug/L	1					
156-60-5											
trans-1,3-Dichloropropylene	U	0.00	0.300	5.00	ug/L	1					
10061-02-6											
trans-1,4-Dichloro-2-butene	U	0.00	1.50	50.0	ug/L	1					
110-57-6											

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	8260_VOA_GCMS_IX: COMMON "As Received"	51.5 ug/L	50.0	103	(77%-123%)
Bromofluorobenzene	8260_VOA_GCMS_IX: COMMON "As Received"	52.1 ug/L	50.0	104	(80%-120%)
Toluene-d8	8260_VOA_GCMS_IX: COMMON "As Received"	46.1 ug/L	50.0	92.1	(80%-120%)

Quality Control Summary

February 27, 2015
GEL LABORATORIES LLC

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QC Summary

Report Date: February 18, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 366137

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS										
Batch	1454890									
QC1203256972 LCS										
1,1,1,2-Tetrachloroethane	50.0		51.2	ug/L		102	(70%-130%)	CDS1	02/03/15	08:53
1,1,1-Trichloroethane	50.0		60.3	ug/L		121	(70%-130%)			
1,1,2,2-Tetrachloroethane	50.0		47.3	ug/L		94.5	(70%-130%)			
1,1,2-Trichloroethane	50.0		49.1	ug/L		98.3	(70%-130%)			
1,1-Dichloroethane	50.0		49.6	ug/L		99.2	(70%-130%)			
1,1-Dichloroethylene	50.0		51.1	ug/L		102	(70%-130%)			
1,2,3-Trichloropropane	50.0		49.3	ug/L		98.5	(70%-130%)			
1,2-Dibromo-3-chloropropane	50.0		55.8	ug/L		112	(70%-130%)			
1,2-Dibromoethane	50.0		54.0	ug/L		108	(70%-130%)			
1,2-Dichloroethane	50.0		55.8	ug/L		112	(70%-130%)			
1,2-Dichloropropane	50.0		48.3	ug/L		96.6	(70%-130%)			
2-Butanone	250		264	ug/L		106	(70%-130%)			
2-Hexanone	250		265	ug/L		106	(70%-130%)			
4-Methyl-2-pentanone	250		232	ug/L		93	(70%-130%)			
Acetone	250		285	ug/L		114	(70%-130%)			
Acetonitrile	1250		1110	ug/L		88.7	(70%-130%)			
Benzene	50.0		48.9	ug/L		97.8	(70%-130%)			
Bromoform	50.0		59.7	ug/L		119	(70%-130%)			
Carbon disulfide	250		243	ug/L		97	(70%-130%)			
Carbon tetrachloride	50.0		60.3	ug/L		121	(70%-130%)			

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<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>
Volatile-GC/MS											
Batch	1454890										
Chlorobenzene	50.0			50.0	ug/L		100	(70%-130%)	CDS1	02/03/15	08:53
Chloroethane	50.0			47.6	ug/L		95.2	(70%-130%)			
Chloroform	50.0			53.9	ug/L		108	(70%-130%)			
Dibromochloromethane	50.0			60.1	ug/L		120	(70%-130%)			
Dibromomethane	50.0			54.1	ug/L		108	(70%-130%)			
Dichlorodifluoromethane	50.0			54.2	ug/L		108	(70%-130%)			
Ethylbenzene	50.0			51.0	ug/L		102	(70%-130%)			
Iodomethane	250			267	ug/L		107	(70%-130%)			
Methylene chloride	50.0			44.8	ug/L		89.6	(70%-130%)			
Styrene	50.0			56.0	ug/L		112	(70%-130%)			
Tetrachloroethylene	50.0			52.0	ug/L		104	(70%-130%)			
Toluene	50.0			46.8	ug/L		93.5	(70%-130%)			
Trichloroethylene	50.0			53.4	ug/L		107	(70%-130%)			
Vinyl acetate	250			262	ug/L		105	(70%-130%)			
Vinyl chloride	50.0			56.5	ug/L		113	(70%-130%)			
Xylenes (total)	150			153	ug/L		102	(70%-130%)			
cis-1,3-Dichloropropylene	50.0			58.5	ug/L		117	(70%-130%)			
trans-1,2-Dichloroethylene	50.0			49.4	ug/L		98.8	(70%-130%)			
trans-1,3-Dichloropropylene	50.0			54.8	ug/L		110	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			52.2	ug/L		104	(77%-123%)			
**Bromofluorobenzene	50.0			49.6	ug/L		99.1	(80%-120%)			

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QC Summary

Workorder: 366137

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
**Toluene-d8	50.0			46.5	ug/L		92.9	(80%-120%)			
QC1203256973	LCS										
2-Chloro-1,3-butadiene	50.0			68.3	ug/L		137*	(70%-130%)	CDS1	02/03/15	09:23
Acrolein	250			219	ug/L		87.6	(70%-130%)			
Acrylonitrile	250			249	ug/L		99.5	(70%-130%)			
Allyl chloride	250			288	ug/L		115	(70%-130%)			
Ethyl methacrylate	250			267	ug/L		107	(70%-130%)			
Isobutyl alcohol	2500			2860	ug/L		114	(70%-130%)			
Methacrylonitrile	250			268	ug/L		107	(70%-130%)			
trans-1,4-Dichloro-2-butene	250			264	ug/L		106	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			52.3	ug/L		105	(77%-123%)			
**Bromofluorobenzene	50.0			50.1	ug/L		100	(80%-120%)			
**Toluene-d8	50.0			45.6	ug/L		91.2	(80%-120%)			
QC1203256971	MB										
1,1,1,2-Tetrachloroethane			U	0.300	ug/L					02/03/15	09:53
1,1,1-Trichloroethane			U	0.300	ug/L						
1,1,2,2-Tetrachloroethane			U	0.300	ug/L						
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						
1,2,3-Trichloropropane			U	0.300	ug/L						
1,2-Dibromo-3-chloropropane			U	0.500	ug/L						
1,2-Dibromoethane			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						

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QC Summary

Workorder: 366137

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
1,2-Dichloropropane			U	0.300	ug/L				CDS1	02/03/15	09:53
2-Butanone			U	3.00	ug/L						
2-Chloro-1,3-butadiene			U	0.300	ug/L						
2-Hexanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Acetonitrile			U	16.7	ug/L						
Acrolein			U	3.00	ug/L						
Acrylonitrile			U	3.00	ug/L						
Allyl chloride			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Bromoform			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						
Chloroethane			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Dibromochloromethane			U	0.300	ug/L						
Dibromomethane			U	0.300	ug/L						
Dichlorodifluoromethane			U	0.300	ug/L						
Ethyl methacrylate			U	3.00	ug/L						

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QC Summary

Workorder: 366137

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
Ethylbenzene			U	0.300	ug/L						
Iodomethane			U	3.00	ug/L				CDS1	02/03/15	09:53
Isobutyl alcohol			U	33.0	ug/L						
Methacrylonitrile			U	3.00	ug/L						
Methylene chloride			U	1.60	ug/L						
Styrene			U	0.300	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl acetate			U	1.60	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
cis-1,3-Dichloropropylene			U	0.300	ug/L						
trans-1,2-Dichloroethylene			U	0.300	ug/L						
trans-1,3-Dichloropropylene			U	0.300	ug/L						
trans-1,4-Dichloro-2-butene			U	1.50	ug/L						
**1,2-Dichloroethane-d4	50.0			52.8	ug/L		106	(77%-123%)			
**Bromofluorobenzene	50.0			50.1	ug/L		100	(80%-120%)			
**Toluene-d8	50.0			45.3	ug/L		90.5	(80%-120%)			
QC1203256974 366158001 PS											
1,1,1,2-Tetrachloroethane	50.0	U	0.00	48.6	ug/L		97.1	(70%-130%)		02/03/15	14:54
1,1,1-Trichloroethane	50.0	U	0.00	56.5	ug/L		113	(70%-130%)			
1,1,2,2-Tetrachloroethane	50.0	U	0.00	48.4	ug/L		96.8	(70%-130%)			

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QC Summary

Workorder: 366137

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
1,1,2-Trichloroethane	50.0	U	0.00	47.7	ug/L		95.5	(70%-130%)	CDS1	02/03/15	14:54
1,1-Dichloroethane	50.0	U	0.00	50.0	ug/L		100	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	51.2	ug/L		102	(70%-130%)			
1,2,3-Trichloropropane	50.0	U	0.00	48.3	ug/L		96.5	(70%-130%)			
1,2-Dibromo-3-chloropropane	50.0	U	0.00	55.3	ug/L		111	(70%-130%)			
1,2-Dibromoethane	50.0	U	0.00	50.7	ug/L		101	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	52.3	ug/L		105	(70%-130%)			
1,2-Dichloropropane	50.0	U	0.00	49.0	ug/L		98	(70%-130%)			
2-Butanone	250	TU	0.00	T 147	ug/L		58.8 *	(70%-130%)			
2-Hexanone	250	TU	0.00	T 174	ug/L		69.5 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	216	ug/L		86.4	(70%-130%)			
Acetone	250	TU	0.00	T 110	ug/L		44.1 *	(70%-130%)			
Acetonitrile	1250	U	0.00	1140	ug/L		91.4	(70%-130%)			
Benzene	50.0	U	0.00	48.7	ug/L		97.4	(70%-130%)			
Bromoform	50.0	U	0.00	54.6	ug/L		109	(70%-130%)			
Carbon disulfide	250	U	0.00	252	ug/L		101	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	56.8	ug/L		114	(70%-130%)			
Chlorobenzene	50.0	U	0.00	48.4	ug/L		96.7	(70%-130%)			
Chloroethane	50.0	U	0.00	43.2	ug/L		86.5	(70%-130%)			
Chloroform	50.0	U	0.00	52.2	ug/L		104	(70%-130%)			
Dibromochloromethane	50.0	U	0.00	56.1	ug/L		112	(70%-130%)			

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GEL LABORATORIES LLC

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QC Summary

Workorder: 366137

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
Dibromomethane	50.0	U	0.00	52.0	ug/L		104	(70%-130%)			
Dichlorodifluoromethane	50.0	U	0.00	44.0	ug/L		88	(70%-130%)	CDS1	02/03/15	14:54
Ethylbenzene	50.0	U	0.00	49.7	ug/L		99.4	(70%-130%)			
Iodomethane	250	U	0.00	262	ug/L		105	(70%-130%)			
Methylene chloride	50.0		5.15	49.7	ug/L		89.1	(70%-130%)			
Styrene	50.0	U	0.00	53.1	ug/L		106	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	49.1	ug/L		98.2	(70%-130%)			
Toluene	50.0	U	0.00	46.0	ug/L		91.9	(70%-130%)			
Trichloroethylene	50.0	U	0.00	51.1	ug/L		102	(70%-130%)			
Vinyl acetate	250	U	0.00	210	ug/L		84.1	(70%-130%)			
Vinyl chloride	50.0	U	0.00	46.5	ug/L		92.9	(70%-130%)			
Xylenes (total)	150	U	0.00	147	ug/L		98.3	(70%-130%)			
cis-1,3-Dichloropropylene	50.0	U	0.00	55.3	ug/L		111	(70%-130%)			
trans-1,2-Dichloroethylene	50.0	U	0.00	49.5	ug/L		99	(70%-130%)			
trans-1,3-Dichloropropylene	50.0	U	0.00	52.1	ug/L		104	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		51.8	51.7	ug/L		103	(77%-123%)			
**Bromofluorobenzene	50.0		52.3	50.8	ug/L		102	(80%-120%)			
**Toluene-d8	50.0		45.5	46.8	ug/L		93.5	(80%-120%)			
QC1203256976 366158001 PS											
2-Chloro-1,3-butadiene	50.0	U	0.00	59.3	ug/L		119	(70%-130%)		02/03/15	15:54
Acrolein	250	U	0.00	273	ug/L		109	(70%-130%)			
Acrylonitrile	250	U	0.00	217	ug/L		86.8	(70%-130%)			
Allyl chloride	250	U	0.00	242	ug/L		96.6	(70%-130%)			

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QC Summary

Workorder: **366137**

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
Ethyl methacrylate	250	U	0.00	237	ug/L		94.6	(70%-130%)	CDS1	02/03/15	15:54
Isobutyl alcohol	2500	U	0.00	2510	ug/L		100	(70%-130%)			
Methacrylonitrile	250	U	0.00	239	ug/L		95.4	(70%-130%)			
trans-1,4-Dichloro-2-butene	250	U	0.00	228	ug/L		91.3	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		51.8	52.1	ug/L		104	(77%-123%)			
**Bromofluorobenzene	50.0		52.3	51.6	ug/L		103	(80%-120%)			
**Toluene-d8	50.0		45.5	45.9	ug/L		91.8	(80%-120%)			
QC1203256975 366158001 PSD											
1,1,1,2-Tetrachloroethane	50.0	U	0.00	48.8	ug/L	0.452	97.5	(0%-20%)		02/03/15	15:24
1,1,1-Trichloroethane	50.0	U	0.00	57.2	ug/L	1.37	114	(0%-20%)			
1,1,2,2-Tetrachloroethane	50.0	U	0.00	46.7	ug/L	3.55	93.4	(0%-20%)			
1,1,2-Trichloroethane	50.0	U	0.00	47.2	ug/L	1.22	94.3	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	50.1	ug/L	0.0599	100	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	51.6	ug/L	0.837	103	(0%-20%)			
1,2,3-Trichloropropane	50.0	U	0.00	46.8	ug/L	3.14	93.5	(0%-20%)			
1,2-Dibromo-3-chloropropane	50.0	U	0.00	52.8	ug/L	4.74	106	(0%-20%)			
1,2-Dibromoethane	50.0	U	0.00	50.4	ug/L	0.634	101	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	53.0	ug/L	1.25	106	(0%-20%)			
1,2-Dichloropropane	50.0	U	0.00	49.1	ug/L	0.183	98.2	(0%-20%)			
2-Butanone	250	TU	0.00	T	146	ug/L	0.915	58.3*		(0%-20%)	
2-Hexanone	250	TU	0.00	T	168	ug/L	3.35	67.2*		(0%-20%)	
4-Methyl-2-pentanone	250	U	0.00	210	ug/L	2.59	84.2	(0%-20%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
Acetone	250	TU	0.00	T	109	ug/L	1.14	43.6*	(0%-20%)	CDS1	02/03/15 15:24
Acetonitrile	1250	U	0.00		1100	ug/L	3.40	88.4	(0%-20%)		
Benzene	50.0	U	0.00		49.5	ug/L	1.49	98.9	(0%-20%)		
Bromoform	50.0	U	0.00		55.5	ug/L	1.60	111	(0%-20%)		
Carbon disulfide	250	U	0.00		249	ug/L	1.11	99.8	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		57.0	ug/L	0.246	114	(0%-20%)		
Chlorobenzene	50.0	U	0.00		47.8	ug/L	1.27	95.5	(0%-20%)		
Chloroethane	50.0	U	0.00		41.4	ug/L	4.30	82.8	(0%-20%)		
Chloroform	50.0	U	0.00		52.7	ug/L	0.896	105	(0%-20%)		
Dibromochloromethane	50.0	U	0.00		55.2	ug/L	1.62	110	(0%-20%)		
Dibromomethane	50.0	U	0.00		52.2	ug/L	0.403	104	(0%-20%)		
Dichlorodifluoromethane	50.0	U	0.00		43.2	ug/L	1.88	86.4	(0%-20%)		
Ethylbenzene	50.0	U	0.00		49.2	ug/L	0.930	98.5	(0%-20%)		
Iodomethane	250	U	0.00		261	ug/L	0.188	104	(0%-20%)		
Methylene chloride	50.0		5.15		49.0	ug/L	1.42	87.7	(0%-20%)		
Styrene	50.0	U	0.00		53.8	ug/L	1.20	108	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		48.4	ug/L	1.35	96.9	(0%-20%)		
Toluene	50.0	U	0.00		45.0	ug/L	2.00	90.1	(0%-20%)		
Trichloroethylene	50.0	U	0.00		52.4	ug/L	2.51	105	(0%-20%)		
Vinyl acetate	250	U	0.00		213	ug/L	1.05	85	(0%-20%)		
Vinyl chloride	50.0	U	0.00		47.2	ug/L	1.54	94.3	(0%-20%)		

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1454890										
Xylenes (total)	150	U	0.00	147	ug/L	0.605	97.7	(0%-20%)			
cis-1,3-Dichloropropylene	50.0	U	0.00	55.3	ug/L	0.0181	111	(0%-20%)	CDS1	02/03/15	15:24
trans-1,2-Dichloroethylene	50.0	U	0.00	49.6	ug/L	0.262	99.2	(0%-20%)			
trans-1,3-Dichloropropylene	50.0	U	0.00	51.3	ug/L	1.55	103	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		51.8	51.7	ug/L		103	(77%-123%)			
**Bromofluorobenzene	50.0		52.3	50.2	ug/L		100	(80%-120%)			
**Toluene-d8	50.0		45.5	45.7	ug/L		91.4	(80%-120%)			
QC1203256977 366158001 PSD											
2-Chloro-1,3-butadiene	50.0	U	0.00	58.1	ug/L	2.11	116	(0%-20%)		02/03/15	16:24
Acrolein	250	U	0.00	269	ug/L	1.47	107	(0%-20%)			
Acrylonitrile	250	U	0.00	208	ug/L	4.17	83.2	(0%-20%)			
Allyl chloride	250	U	0.00	237	ug/L	1.91	94.8	(0%-20%)			
Ethyl methacrylate	250	U	0.00	229	ug/L	3.46	91.4	(0%-20%)			
Isobutyl alcohol	2500	U	0.00	2380	ug/L	5.06	95.4	(0%-20%)			
Methacrylonitrile	250	U	0.00	229	ug/L	3.89	91.8	(0%-20%)			
trans-1,4-Dichloro-2-butene	250	U	0.00	219	ug/L	3.96	87.8	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		51.8	52.6	ug/L		105	(77%-123%)			
**Bromofluorobenzene	50.0		52.3	51.4	ug/L		103	(80%-120%)			
**Toluene-d8	50.0		45.5	46.4	ug/L		92.8	(80%-120%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis

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QC Summary

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

DATA EXCEPTION REPORT

Mo.Day Yr. 04-FEB-15	Division: Federal	Quality Criteria: SOP	Type: Process
Instrument Type: VOA GC/MS	Test / Method: 8260C	Matrix Type: Liquid	Client Code: CPRC001
Batch ID: 1454890	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 366137(GEL366137),366158(GEL366158),366160(GEL366160),366192(X501331),366204(GEL366204),366206(GEL366206),366207(GEL366207)

Application Issues:

Failed Recovery for MS/MSD, or PS/PSD

Other

Failed Recovery for PS/PSD

Failed Recovery for LCS/LCSD

Specification and Requirements Exception Description:	DER Disposition:
<p>1. The percent drift for 2-Chloro-1,3-butadiene was outside of acceptance limits in the continuing calibration verification sample with high bias. The effected SDG's are GEL 366137, GEL366158, GEL366206.</p> <p>2. The recovery for 2-Chloro-1,3-butadiene was outside of acceptance limits in LCS 1203256973. The effected SDG's are GEL 366137, GEL366158, GEL366206.</p> <p>2-Chloro-1,3-butadiene 137% limits: 70-130%</p> <p>3. 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 366158001. The calculated relative percent differences between the MS and MSD were within acceptance limits for all client requested compounds.</p>	<p>1,2. Narrate and report data. The compound was not detected in the associated samples.</p> <p>3. Narrate and report data.</p>

Originator's Name:

Crystal Stacey 04-FEB-15

Data Validator/Group Leader:

Erin Haubert 04-FEB-15

Metals Analysis

Case Narrative

February 27, 2015

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL366137

Work Order #: 366137

Sample ID	Client ID
366137003	B30135
366137004	B30133
1203255312	Method Blank (MB)ICP
1203255313	Laboratory Control Sample (LCS)
1203255316	366137003(B30135L) Serial Dilution (SD)
1203255314	366137003(B30135S) Matrix Spike (MS)
1203255315	366137003(B30135SD) Matrix Spike Duplicate (MSD)
1203255290	Method Blank (MB)ICP-MS
1203255291	Laboratory Control Sample (LCS)
1203255294	366137003(B30135L) Serial Dilution (SD)
1203255292	366137003(B30135S) Matrix Spike (MS)
1203255293	366137003(B30135SD) Matrix Spike Duplicate (MSD)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1454332 and 1454322
Prep Batch :	1454331 and 1454321
Standard Operating Procedures:	GL-MA-E-013 REV# 23, GL-MA-E-006 REV# 11 and GL-MA-E-014 REV# 25
Analytical Method:	SW846 3005A/6010C and SW846 3005A/6020A
Prep Method :	SW846 3005A

Preparation/Analytical Method Verification

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

System Configuration

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

The Metals analysis - ICPMS was performed on a 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.

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The 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: 366137003 (B30135)-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

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding

February 27, 2015

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 27, 2015

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL366137 GEL Work Order: 366137

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

C Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.

D Results are reported from a diluted aliquot of sample.

N Spike Sample recovery is outside control limits.

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

Review/Validation

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

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

Signature: 

Name: Patricia Steele

Date: 26 FEB 2015

Title: Data Validator

Sample Data Summary

~~February 27, 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 26, 2015

Client Sample ID:	B30135	Project:	CPRC0S15001
Sample ID:	366137003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 08:21		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		73500	+/-14700	50.0	200	ug/L	1	HSC	02/17/15	0926	1454332 1
7440-70-2											
Iron	B	32.5	+/-11.9	30.0	100	ug/L	1				
7439-89-6											
Magnesium		18700	+/-3740	110	300	ug/L	1				
7439-95-4											
Potassium		5900	+/-1180	50.0	150	ug/L	1				
7440-09-7											
Sodium		15400	+/-3080	100	300	ug/L	1				
7440-23-5											
Vanadium		14.6	+/-2.94	1.00	5.00	ug/L	1				
7440-62-2											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.368	+/-0.341	1.00	5.00	ug/L	1	BAJ	02/20/15	1551	1454322 2
7440-36-0											
Arsenic		4.46	+/-1.06	1.70	5.00	ug/L	1				
7440-38-2											
Barium		62.4	+/-12.5	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.021	+/-0.0369	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		2.58	+/-0.843	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	B	0.283	+/-0.0657	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.040	+/-0.167	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	B	1.53	+/-0.453	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	2.83	+/-0.568	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	U	0.411	+/-0.186	0.500	2.00	ug/L	1				
7440-02-0											
Silver	U	0.015	+/-0.0667	0.200	2.00	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 26, 2015

Client Sample ID: B30135 Project: CPRC0S15001
 Sample ID: 366137003 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
7440-22-4		544	+/-109	2.00	10.0	ug/L					
Strontium											
7440-24-6	U	0.047	+/-0.150	0.450	2.00	ug/L					
Thallium											
7440-28-0	U	0.152	+/-0.131	0.383	2.00	ug/L					
Thorium											
7440-29-1	U	0.202	+/-0.336	1.00	5.00	ug/L					
Tin											
7440-31-5	B	4.11	+/-1.43	3.50	10.0	ug/L					
Zinc											
7440-66-6	U	4.98	+/-5.10	15.0	50.0	ug/L	1	BAJ	02/20/15	1900	1454322 3
Aluminum											
7429-90-5		18.4	+/-3.91	4.00	15.0	ug/L					
Boron											
7440-42-8	U	0.211	+/-0.124	0.350	8.00	ug/L					
Copper											
7440-50-8	B	2.90	+/-0.765	1.50	5.00	ug/L					
Selenium											
7782-49-2		5.26	+/-1.05	0.067	0.200	ug/L					
Uranium											
7440-61-1	U	-0.008	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1446	1454322 4
Beryllium											
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	02/02/15	0800	1454321
SW846 3005A	SW846 3005A for 6010C	JXM5	02/02/15	0800	1454331

The following Analytical Methods were performed

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

Certificate of Analysis

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

Report Date: February 26, 2015

Client Sample ID:	B30133	Project:	CPRC0S15001
Sample ID:	366137004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 08:21		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		72300	+/-14500	50.0	200	ug/L	1	HSC	02/17/15	0947	1454332 1
7440-70-2											
Iron		116	+/-25.2	30.0	100	ug/L	1				
7439-89-6											
Magnesium		18500	+/-3690	110	300	ug/L	1				
7439-95-4											
Potassium		5770	+/-1150	50.0	150	ug/L	1				
7440-09-7											
Sodium		15200	+/-3030	100	300	ug/L	1				
7440-23-5											
Vanadium		15.4	+/-3.10	1.00	5.00	ug/L	1				
7440-62-2											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.224	+/-0.336	1.00	5.00	ug/L	1	BAJ	02/20/15	1603	1454322 2
7440-36-0											
Arsenic		4.15	+/-1.01	1.70	5.00	ug/L	1				
7440-38-2											
Barium		63.2	+/-12.6	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.027	+/-0.0371	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		2.88	+/-0.881	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	U	0.049	+/-0.0347	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.145	+/-0.169	0.500	2.00	ug/L	1				
7439-92-1											
Manganese		6.12	+/-1.27	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	2.66	+/-0.536	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	U	0.459	+/-0.190	0.500	2.00	ug/L	1				
7440-02-0											
Silver	U	0.033	+/-0.067	0.200	2.00	ug/L	1				

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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 26, 2015

Client Sample ID: B30133 Project: CPRC0S15001
 Sample ID: 366137004 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
7440-22-4 Strontium		564	+/-113	2.00	10.0	ug/L					
7440-24-6 Thallium	U	0.056	+/-0.150	0.450	2.00	ug/L					
7440-28-0 Thorium	U	0.077	+/-0.129	0.383	2.00	ug/L					
7440-29-1 Tin	U	0.177	+/-0.335	1.00	5.00	ug/L					
7440-31-5 Zinc	U	2.64	+/-1.28	3.50	10.0	ug/L					
7440-66-6 Aluminum	U	6.69	+/-5.18	15.0	50.0	ug/L	1	BAJ	02/20/15	1909	1454322 3
7429-90-5 Boron		18.3	+/-3.89	4.00	15.0	ug/L					
7440-42-8 Copper	B	0.429	+/-0.145	0.350	8.00	ug/L					
7440-50-8 Selenium	B	2.57	+/-0.716	1.50	5.00	ug/L					
7782-49-2 Uranium		5.20	+/-1.04	0.067	0.200	ug/L					
7440-61-1 Beryllium	U	0.012	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1451	1454322 4
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	02/02/15	0800	1454321
SW846 3005A	SW846 3005A for 6010C	JXM5	02/02/15	0800	1454331

The following Analytical Methods were performed

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

Quality Control Summary

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QC Summary

Report Date: February 26, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 366137

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1454322										
QC1203255291	LCS										
Aluminum	2000			2040	ug/L		102	(80%-120%)	BAJ	02/20/15	18:58
Antimony	50.0			51.8	ug/L		104	(80%-120%)		02/20/15	15:49
Arsenic	50.0			44.5	ug/L		89	(80%-120%)			
Barium	50.0			54.0	ug/L		108	(80%-120%)			
Beryllium	50.0			54.1	ug/L		108	(80%-120%)	SKJ	02/23/15	14:40
Boron	100			99.7	ug/L		99.7	(80%-120%)	BAJ	02/20/15	18:58
Cadmium	50.0			50.2	ug/L		100	(80%-120%)		02/20/15	15:49
Chromium	50.0			50.9	ug/L		102	(80%-120%)			
Cobalt	50.0			50.4	ug/L		101	(80%-120%)			
Copper	50.0			49.5	ug/L		99	(80%-120%)		02/20/15	18:58
Lead	50.0			49.9	ug/L		99.8	(80%-120%)		02/20/15	15:49
Manganese	50.0			51.2	ug/L		102	(80%-120%)			
Molybdenum	50.0			49.3	ug/L		98.5	(80%-120%)			
Nickel	50.0			50.5	ug/L		101	(80%-120%)			
Selenium	50.0			50.5	ug/L		101	(80%-120%)		02/20/15	18:58
Silver	50.0			49.8	ug/L		99.7	(80%-120%)		02/20/15	15:49
Strontium	50.0			54.0	ug/L		108	(80%-120%)			
Thallium	50.0			48.6	ug/L		97.2	(80%-120%)			
Thorium	50.0			48.9	ug/L		97.8	(80%-120%)			
Tin	50.0			52.9	ug/L		106	(80%-120%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1454322										
Uranium	50.0			51.5	ug/L		103	(80%-120%)	BAJ	02/20/15	18:58
Zinc	50.0			49.3	ug/L		98.5	(80%-120%)		02/20/15	15:49
QC1203255290	MB										
Aluminum			U	ND	ug/L					02/20/15	18:56
Antimony			U	ND	ug/L					02/20/15	15:46
Arsenic			U	ND	ug/L						
Barium			U	ND	ug/L						
Beryllium			U	ND	ug/L				SKJ	02/23/15	14:39
Boron			U	ND	ug/L				BAJ	02/20/15	18:56
Cadmium			U	ND	ug/L					02/20/15	15:46
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L					02/20/15	18:56
Lead			U	ND	ug/L					02/20/15	15:46
Manganese			U	ND	ug/L						
Molybdenum			U	ND	ug/L						
Nickel			U	ND	ug/L						
Selenium			U	ND	ug/L					02/20/15	18:56
Silver			U	ND	ug/L					02/20/15	15:46
Strontium			U	ND	ug/L						
Thallium			U	ND	ug/L						
Thorium			U	ND	ug/L						

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1454322										
Tin			U	ND	ug/L				BAJ	02/20/15	15:46
Uranium			U	ND	ug/L					02/20/15	18:56
Zinc			U	ND	ug/L					02/20/15	15:46
QC1203255292 366137003 MS											
Aluminum	2000	U	ND	2100	ug/L		105	(75%-125%)		02/20/15	19:02
Antimony	50.0	U	ND	52.9	ug/L		105	(75%-125%)		02/20/15	15:53
Arsenic	50.0		4.46	48.9	ug/L		88.9	(75%-125%)			
Barium	50.0		62.4	115	ug/L		105	(75%-125%)			
Beryllium	50.0	U	ND	56.4	ug/L		113	(75%-125%)	SKJ	02/23/15	14:47
Boron	100		18.4	120	ug/L		102	(75%-125%)	BAJ	02/20/15	19:02
Cadmium	50.0	U	ND	50.1	ug/L		100	(75%-125%)		02/20/15	15:53
Chromium	50.0		2.58	50.4	ug/L		95.6	(75%-125%)			
Cobalt	50.0	B	0.283	48.2	ug/L		95.8	(75%-125%)			
Copper	50.0	U	ND	48.0	ug/L		95.6	(75%-125%)		02/20/15	19:02
Lead	50.0	U	ND	47.8	ug/L		95.5	(75%-125%)		02/20/15	15:53
Manganese	50.0	B	1.53	51.3	ug/L		99.4	(75%-125%)			
Molybdenum	50.0	B	2.83	54.2	ug/L		103	(75%-125%)			
Nickel	50.0	U	ND	46.9	ug/L		93	(75%-125%)			
Selenium	50.0	B	2.90	51.8	ug/L		97.8	(75%-125%)		02/20/15	19:02
Silver	50.0	U	ND	47.9	ug/L		95.8	(75%-125%)		02/20/15	15:53
Strontium	50.0		544	615	ug/L		N/A	(75%-125%)			
Thallium	50.0	U	ND	47.5	ug/L		94.9	(75%-125%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1454322										
Thorium	50.0	U	ND	48.7	ug/L		97.1	(75%-125%)	BAJ	02/20/15	15:53
Tin	50.0	U	ND	53.2	ug/L		106	(75%-125%)			
Uranium	50.0		5.26	55.7	ug/L		101	(75%-125%)		02/20/15	19:02
Zinc	50.0	B	4.11	47.7	ug/L		87.2	(75%-125%)		02/20/15	15:53
QC1203255293 366137003 MSD											
Aluminum	2000	U	ND	2090	ug/L	0.551	104	(0%-20%)		02/20/15	19:04
Antimony	50.0	U	ND	52.4	ug/L	1.01	104	(0%-20%)		02/20/15	15:56
Arsenic	50.0		4.46	49.1	ug/L	0.351	89.3	(0%-20%)			
Barium	50.0		62.4	116	ug/L	1.55	108	(0%-20%)			
Beryllium	50.0	U	ND	58.3	ug/L	3.34	117	(0%-20%)	SKJ	02/23/15	14:48
Boron	100		18.4	116	ug/L	3.41	97.9	(0%-20%)	BAJ	02/20/15	19:04
Cadmium	50.0	U	ND	49.7	ug/L	0.807	99.4	(0%-20%)		02/20/15	15:56
Chromium	50.0		2.58	52.3	ug/L	3.67	99.4	(0%-20%)			
Cobalt	50.0	B	0.283	49.5	ug/L	2.78	98.5	(0%-20%)			
Copper	50.0	U	ND	48.1	ug/L	0.139	95.7	(0%-20%)		02/20/15	19:04
Lead	50.0	U	ND	48.1	ug/L	0.688	96.2	(0%-20%)		02/20/15	15:56
Manganese	50.0	B	1.53	52.3	ug/L	2.08	102	(0%-20%)			
Molybdenum	50.0	B	2.83	53.4	ug/L	1.58	101	(0%-20%)			
Nickel	50.0	U	ND	48.9	ug/L	4.30	97.1	(0%-20%)			
Selenium	50.0	B	2.90	53.8	ug/L	3.89	102	(0%-20%)		02/20/15	19:04
Silver	50.0	U	ND	47.6	ug/L	0.729	95.1	(0%-20%)		02/20/15	15:56
Strontium	50.0		544	607	ug/L	1.37	N/A	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1454322										
Thallium	50.0	U	ND	48.0	ug/L	1.13	96	(0%-20%)	BAJ	02/20/15	15:56
Thorium	50.0	U	ND	49.8	ug/L	2.22	99.3	(0%-20%)			
Tin	50.0	U	ND	54.3	ug/L	2.12	108	(0%-20%)			
Uranium	50.0		5.26	56.3	ug/L	0.948	102	(0%-20%)		02/20/15	19:04
Zinc	50.0	B	4.11	49.5	ug/L	3.66	90.7	(0%-20%)		02/20/15	15:56
QC1203255294 366137003 SDILT											
Aluminum		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	19:08
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	16:00
Arsenic			4.46 DU	ND	ug/L	N/A		(0%-10%)			
Barium			62.4 D	12.8	ug/L	2.54		(0%-10%)			
Beryllium		U	ND DU	ND	ug/L	N/A		(0%-10%)	SKJ	02/23/15	14:49
Boron			18.4 D	5.46	ug/L	48.4		(0%-10%)	BAJ	02/20/15	19:08
Cadmium		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	16:00
Chromium			2.58 DU	ND	ug/L	N/A		(0%-10%)			
Cobalt		B	0.283 DU	ND	ug/L	N/A		(0%-10%)			
Copper		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	19:08
Lead		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	16:00
Manganese		B	1.53 DU	ND	ug/L	N/A		(0%-10%)			
Molybdenum		B	2.83 D	0.637	ug/L	12.6		(0%-10%)			
Nickel		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Selenium		B	2.90 DU	ND	ug/L	N/A		(0%-10%)		02/20/15	19:08
Silver		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	16:00

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1454322										
Strontium		544	D	109	ug/L	.202		(0%-10%)	BAJ	02/20/15	16:00
Thallium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Thorium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Tin	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Uranium		5.26	D	1.05	ug/L	.57		(0%-10%)		02/20/15	19:08
Zinc	B	4.11	DU	ND	ug/L	N/A		(0%-10%)		02/20/15	16:00

Metals Analysis-ICP

Batch 1454332

QC1203255313	LCS										
Calcium		5000		5110	ug/L		102	(80%-120%)	HSC	02/17/15	09:23
Iron		5000		5090	ug/L		102	(80%-120%)			
Magnesium		5000		5140	ug/L		103	(80%-120%)			
Potassium		5000		5030	ug/L		101	(80%-120%)			
Sodium		5000		5060	ug/L		101	(80%-120%)			
Vanadium		500		527	ug/L		105	(80%-120%)			
QC1203255312	MB										
Calcium			U	ND	ug/L					02/17/15	09:20
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Potassium			U	ND	ug/L						
Sodium			U	ND	ug/L						
Vanadium			U	ND	ug/L						
QC1203255314	366137003	MS									
Calcium		5000	73500	79400	ug/L		N/A	(75%-125%)		02/17/15	09:29

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1454332										
Iron	5000	B	32.5	5090	ug/L		101	(75%-125%)			
Magnesium	5000		18700	23700	ug/L		98.9	(75%-125%)	HSC	02/17/15	09:29
Potassium	5000		5900	11300	ug/L		108	(75%-125%)			
Sodium	5000		15400	20600	ug/L		104	(75%-125%)			
Vanadium	500		14.6	549	ug/L		107	(75%-125%)			
QC1203255315 366137003 MSD											
Calcium	5000		73500	78900	ug/L	0.729	N/A	(0%-20%)		02/17/15	09:31
Iron	5000	B	32.5	5060	ug/L	0.510	101	(0%-20%)			
Magnesium	5000		18700	23500	ug/L	0.585	96.1	(0%-20%)			
Potassium	5000		5900	11200	ug/L	1.00	106	(0%-20%)			
Sodium	5000		15400	20300	ug/L	1.42	97.8	(0%-20%)			
Vanadium	500		14.6	549	ug/L	0.0565	107	(0%-20%)			
QC1203255316 366137003 SDILT											
Calcium			73500	D	14500	ug/L	1	(0%-10%)		02/17/15	09:33
Iron		B	32.5	DU	ND	ug/L	N/A	(0%-10%)			
Magnesium			18700	D	3800	ug/L	1.54	(0%-10%)			
Potassium			5900	D	1130	ug/L	4.41	(0%-10%)			
Sodium			15400	D	3030	ug/L	1.75	(0%-10%)			
Vanadium			14.6	D	3.24	ug/L	11.1	(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

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL366137
Work Order #: 366137**

Method/Analysis Information

Product: Cyanide and Total
Analytical Batch: 1454518 **Method:** 9012_CYANIDE: COMMON
Prep Batch : 1454517 **Method:** SW846 9010C Distillation

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9012B:

Sample ID	Client ID
366137002	B300T2
1203255767	Method Blank (MB)
1203255768	Laboratory Control Sample (LCS)
1203255772	366137002(B300T2) Sample Duplicate (DUP)
1203255776	366137002(B300T2) 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-095 REV# 17.

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 Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

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

Sample366137002 (B300T2) 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: 1454349 **Method:** 9056_ANIONS_IC: COMMON

Sample Analysis

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

Sample ID	Client ID
366137001	B30134
1203255359	Method Blank (MB)
1203255360	Laboratory Control Sample (LCS)
1203255361	366140002(B2YXM4) Sample Duplicate (DUP)
1203255362	366140002(B2YXM4) 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

Sample366140002 (B2YXM4) 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

The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203255361 (Non SDG 366140002DUP), 1203255362 (Non SDG 366140002PS) and 366137001 (B30134). Samples 1203255361 (Non SDG 366140002DUP), 1203255362 (Non SDG 366140002PS) and 366137001 (B30134) were diluted based on historical data.

Analyte	366137
	001
Chloride	10X
Nitrate	10X
Sulfate	10X

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 1203255361 (Non SDG 366140002DUP), 1203255362 (Non SDG 366140002PS) and 366137001 (B30134) 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.

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 27, 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: GEL366137 GEL Work Order: 366137

The Qualifiers in this report are defined as follows:

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

D Results are reported from a diluted aliquot of sample.

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

Review/Validation

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

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

Signature:



Name: Thomas Lewis

Date: 25 FEB 2015

Title: Data Validator

Sample Data Summary

~~February 27, 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 25, 2015

Client Sample ID:	B30134	Project:	CPRC0S15001
Sample ID:	366137001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 08:21		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
<i>9056_ANIONS_IC: COMMON "As Received"</i>										
Fluoride 16984-48-8	B	252	+/-13.8	33.0	500	ug/L	1	RXB5 01/30/15 1623	1454349	1
Nitrite-N 14797-65-0	U	0.00	+/-12.7	38.0	250	ug/L	1			
Chloride 16887-00-6	D	9780	+/-395	670	2000	ug/L	10	RXB5 01/30/15 1927	1454349	2
Nitrate-N 14797-55-8	D	5600	+/-217	330	1000	ug/L	10			
Sulfate 14808-79-8	D	33100	+/-1190	1330	4000	ug/L	10			

The following Analytical Methods were performed

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

Certificate of Analysis

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

Report Date: February 25, 2015

Client Sample ID:	B300T2	Project:	CPRC0S15001
Sample ID:	366137002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15 12:54		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
<i>9012_CYANIDE: COMMON "As Received"</i>											
Cyanide, Total		40.3	1.67	5.00	ug/L	1	AXH3	02/04/15	0920	1454518	1
											57-12-5

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	02/04/15	0843	1454517

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9012B	

Quality Control Summary

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Report Date: February 25, 2015

Page 1 of 2

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 366137

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

Flow Injection Analysis

Batch	1454518										
QC1203255772	366137002	DUP									
Cyanide, Total		40.3		39.9	ug/L	0.998		(0%-30%)	AXH3	02/04/15	09:21
QC1203255768	LCS										
Cyanide, Total	50.0			45.6	ug/L		91.2	(90%-110%)		02/04/15	09:06
QC1203255767	MB										
Cyanide, Total			U	1.67	ug/L					02/04/15	09:05
QC1203255776	366137002	MS									
Cyanide, Total	100	40.3		137	ug/L		96.7	(58%-134%)		02/04/15	09:22

Ion Chromatography

Batch	1454349										
QC1203255361	366140002	DUP									
Chloride		D	40000	D	40000	ug/L	0.0475		(0%-20%)	RXB5	01/30/15 21:31
Fluoride		B	311	B	304	ug/L	2.34 ^		(+/-500)		01/30/15 17:55
Nitrate-N		D	6400	D	6430	ug/L	0.468		(0%-20%)		01/30/15 21:31
Nitrite-N		U	38.0	U	38.0	ug/L	N/A				01/30/15 17:55
Sulfate		D	74300	D	73800	ug/L	0.563		(0%-20%)		01/30/15 21:31
QC1203255360	LCS										
Chloride	5000				4840	ug/L		96.8	(90%-110%)		01/30/15 23:04
Fluoride	2500				2500	ug/L		99.9	(90%-110%)		
Nitrate-N	2500				2500	ug/L		100	(90%-110%)		
Nitrite-N	2500				2560	ug/L		102	(90%-110%)		
Sulfate	10000				10200	ug/L		102	(90%-110%)		
QC1203255359	MB										
Chloride				U	67.0	ug/L					01/30/15 22:33
Fluoride				U	33.0	ug/L					

February 27, 2015
GEL LABORATORIES LLC

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

QC Summary

Workorder: 366137

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1454349										
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L				RXB5	01/30/15	22:33
Sulfate			U	133	ug/L						
QC1203255362	366140002 PS										
Chloride	5.00	D	4.00	D	9.47	mg/L	109	(90%-110%)		01/30/15	22:02
Fluoride	2.50	B	0.311		2.74	mg/L	97	(90%-110%)		01/30/15	18:26
Nitrate-N	2.50	D	0.640	D	3.19	mg/L	102	(90%-110%)		01/30/15	22:02
Nitrite-N	2.50	U	0.00		2.50	mg/L	99.8	(90%-110%)		01/30/15	18:26
Sulfate	10.0	D	7.43	D	18.2	mg/L	108	(90%-110%)		01/30/15	22:02

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.

Radiological Analysis

February 27, 2015
Radiochemistry
Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL366137
Work Order #: 366137

Method/Analysis Information

Product: GAMMA_GS:COMMON (Cs137,Co60,Eu152,Eu154,Eu155)
Analytical Method: EPA 901.1
Analytical Batch Number: 1454199

Sample ID	Client ID
366137004	B30133
1203254931	MB for batch 1454199
1203254933	Laboratory Control Sample (LCS)
1203254932	365992007(B30195) Sample Duplicate (DUP)

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-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 365992007 (B30195).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: 9310_ALPHABETA_GPC: COMMON
Analytical Method: EPA 900.0/SW846 9310
Analytical Batch Number: 1454656

Sample ID	Client ID
366137004	B30133
1203257786	MB for batch 1454656
1203257790	Laboratory Control Sample (LCS)
1203257787	365992007(B30195) Sample Duplicate (DUP)
1203257788	365992007(B30195) Matrix Spike (MS)
1203257789	365992007(B30195) Matrix Spike Duplicate (MSD)

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-RAD-A-001 REV# 18.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 365992007 (B30195).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information

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

Recounts

Samples 1203257788 (B30195MS) and 1203257789 (B30195MSD) were recounted due to high recovery. The recounts are reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

February 27, 2015

The matrix spike and matrix spike duplicate, 1203257788 (B30195MS) and 1203257789 (B30195MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: EPA 905.0 Modified

Analytical Batch Number: 1457323

Sample ID	Client ID
366137004	B30133
1203263708	MB for batch 1457323
1203263710	Laboratory Control Sample (LCS)
1203263709	366710005(B30658) Sample Duplicate (DUP)

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-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 366710005 (B30658).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 1455401

Sample ID	Client ID
366137004	B30133
1203258254	MB for batch 1455401
1203258257	Laboratory Control Sample (LCS)
1203258255	366367017(B2YP42) Sample Duplicate (DUP)
1203258256	366367017(B2YP42) 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-RAD-A-002 REV# 21.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 366367017 (B2YP42).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 366137004 (B30133) was recounted to verify sample results. The recount result is similar to the original result. Original result is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

February 27, 2015

Qualifier Information

Manual qualifiers were not required.

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 27, 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: GEL366137 GEL Work Order: 366137

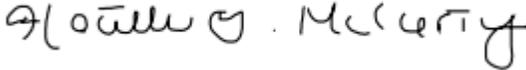
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Heather McCarty

Date: 24 FEB 2015

Title: Analyst II

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 24, 2015

Client Sample ID:	B30133	Project:	CPRC0S15001
Sample ID:	366137004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	29-JAN-15		
Receive Date:	30-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
<i>GAMMA_GS:COMMON (Cs137,Co60,Eu152,Eu154,Eu155) "As Received"</i>													
Cesium-137 10045-97-3	U	-2.02	+/-3.12	5.43	+/-3.26	10.0	pCi/L		MJH1	02/03/15	0726	1454199	1
Cobalt-60 10198-40-0	U	-0.739	+/-2.83	5.39	+/-2.85		pCi/L						
Europium-152 14683-23-9	U	-1.86	+/-9.23	16.0	+/-9.27		pCi/L						
Europium-154 15585-10-1	U	1.92	+/-7.32	15.7	+/-7.38		pCi/L						
Europium-155 14391-16-3	U	5.80	+/-12.1	22.1	+/-12.4		pCi/L						
Rad Gas Flow Proportional Counting													
<i>9310_ALPHABETA_GPC: COMMON "As Received"</i>													
Alpha 12587-46-1		7.26	+/-2.77	2.92	+/-3.05	3.00	pCi/L		AXJ1	02/09/15	1332	1454656	2
Beta 12587-47-2		20.3	+/-2.30	2.26	+/-4.15	4.00	pCi/L						
<i>SRISO_SEP_PRECIP_GPC: COMMON "As Received"</i>													
Total Strontium SR-RAD	U	1.86	+/-1.20	1.89	+/-1.28	2.00	pCi/L		KSD1	02/21/15	1141	1457323	3
Rad Liquid Scintillation Analysis													
<i>TRITIUM_DIST_LSC: COMMON "As Received"</i>													
Tritium 10028-17-8		6100	+/-191	82.3	+/-1190	100	pCi/L		BYS1	02/13/15	1722	1455401	4

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 900.0/SW846 9310
3	EPA 905.0 Modified
4	EPA 906.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Strontium Carrier	SRISO_SEP_PRECIP_GPC: COM	88.9	(25%-125%)

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 24, 2015

Client Sample ID: B30133 Project: CPRC0S15001
 Sample ID: 366137004 Client ID: CPRC001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time Batch	Mtd.
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Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96 sigma).
 The Qualifiers in this report are defined as follows :

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

The above sample is reported on an "as received" basis.

Quality Control Data

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 24, 2015
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Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 366137

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1454199								
QC1203254931	MB								
Cesium-137			U	1.53	pCi/L			MJH1	02/03/1509:07
				Uncert: +/-3.02					
				TPU: +/-3.10					
Cobalt-60			U	-1.06	pCi/L				
				Uncert: +/-2.82					
				TPU: +/-2.87					
Europium-152			U	-11.7	pCi/L				
				Uncert: +/-9.92					
				TPU: +/-11.3					
Europium-154			U	-3.75	pCi/L				
				Uncert: +/-7.99					
				TPU: +/-8.17					
Europium-155			U	-12.8	pCi/L				
				Uncert: +/-10.9					
				TPU: +/-12.4					
QC1203254932	365992007	DUP							
Cesium-137		U -0.798	U	-1.75	pCi/L				02/03/1509:08
				Uncert: +/-3.95		RPD: 0	N/A		
				TPU: +/-3.97		RER: 0.309	(0-2)		
Cobalt-60		U 3.02	U	-1.2	pCi/L				
				Uncert: +/-3.38		RPD: 0	N/A		
				TPU: +/-3.65		RER: 1.57	(0-2)		
Europium-152		U -13.8	U	4.14	pCi/L				
				Uncert: +/-15.8		RPD: 0	N/A		
				TPU: +/-17.1		RER: 1.65	(0-2)		
Europium-154		U -7.62	U	-6.29	pCi/L				
				Uncert: +/-21.7		RPD: 0	N/A		
				TPU: +/-22.0		RER: 0.101	(0-2)		
Europium-155		U 5.84	U	22.1	pCi/L				
				Uncert: +/-17.0		RPD: 0	N/A		
				TPU: +/-17.2		RER: 1.15	(0-2)		
QC1203254933	LCS								
Americium-241	34500			38900	pCi/L	REC: 113	(80%-120%)		02/03/1508:52
				Uncert: +/-1120					
				TPU: +/-2890					
Cesium-137	13900			14400	pCi/L	REC: 104	(80%-120%)		
				Uncert: +/-316					
				TPU: +/-1210					
Cobalt-60	16200			16500	pCi/L	REC: 102	(80%-120%)		
				Uncert: +/-371					
				TPU: +/-1380					
Europium-152			U	-37.9	pCi/L				
				Uncert: +/-230					
				TPU: +/-231					

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QC Summary

Workorder: 366137

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1454199								
Europium-154			U	-103	pCi/L				
	Uncert:			+/-119					
	TPU:			+/-128					
Europium-155			U	-79.1	pCi/L				
	Uncert:			+/-240					
	TPU:			+/-243					
Rad Gas Flow									
Batch	1454656								
QC1203257786	MB								
Alpha			U	-0.00461	pCi/L			AXJ1	02/09/1513:32
	Uncert:			+/-1.01					
	TPU:			+/-1.01					
Beta			U	-1.5	pCi/L				
	Uncert:			+/-1.30					
	TPU:			+/-1.30					
QC1203257787	365992007	DUP							
Alpha		U	-0.62	U	-0.269	pCi/L			02/09/1513:32
	Uncert:		+/-1.43		+/-1.27		RPD: 0	N/A	
	TPU:		+/-1.43		+/-1.27		RER: 0.360	(0-2)	
Beta			5.08		5.08	pCi/L			
	Uncert:		+/-1.59		+/-1.55		RPD: 0	(0% - 100%)	
	TPU:		+/-1.80		+/-1.77		RER: 0.00368	(0-2)	
QC1203257788	365992007	MS							
Alpha	243	U	-0.62		301	pCi/L	REC: 124	(75%-125%)	02/10/1515:06
	Uncert:		+/-1.43		+/-30.7				
	TPU:		+/-1.43		+/-60.6				
Beta	949		5.08		1180	pCi/L	REC: 123	(75%-125%)	
	Uncert:		+/-1.59		+/-40.0				
	TPU:		+/-1.80		+/-204				
QC1203257789	365992007	MSD							
Alpha	243	U	-0.62		275	pCi/L	REC: 113	(75%-125%)	02/10/1511:46
	Uncert:		+/-1.43		+/-28.6		RPD: 9	(0%-20%)	
	TPU:		+/-1.43		+/-55.5		RER: 0.615	(0-2)	
Beta	949		5.08		1150	pCi/L	REC: 121	(75%-125%)	
	Uncert:		+/-1.59		+/-39.3		RPD: 2	(0%-20%)	
	TPU:		+/-1.80		+/-192		RER: 0.180	(0-2)	
QC1203257790	LCS								
Alpha	81.1				97.0	pCi/L	REC: 120	(80%-120%)	02/09/1513:11
	Uncert:				+/-8.51				
	TPU:				+/-18.0				
Beta	316				360	pCi/L	REC: 114	(80%-120%)	
	Uncert:				+/-12.6				
	TPU:				+/-59.9				
Batch	1457323								
QC1203263708	MB								
Total Strontium			U	-0.436	pCi/L			KSD1	02/21/1511:42
	Uncert:			+/-0.593					
	TPU:			+/-0.594					
QC1203263709	366710005	DUP							
Total Strontium		U	-0.204	U	0.779	pCi/L			02/21/1511:42

QC Summary

Workorder: 366137

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1457323								
		Uncert:	+/-0.687	+/-0.826					
		TPU:	+/-0.687	+/-0.845		RPD: 0	N/A		
						RER: 1.77	(0-2)		
QC1203263710	LCS								
Total Strontium	79.0			69.4	pCi/L	REC: 88	(80%-120%)		02/21/1511:42
		Uncert:		+/-3.86					
		TPU:		+/-16.4					
Rad Liquid Scintillation									
Batch	1455401								
QC1203258254	MB								
Tritium			U	-32.4	pCi/L			BYS1	02/14/1521:10
		Uncert:		+/-44.5					
		TPU:		+/-44.5					
QC1203258255	366367017	DUP							
Tritium		213		226	pCi/L				02/14/1523:12
		Uncert:	+/-59.2	+/-59.9		RPD: 6	(0% - 100%)		
		TPU:	+/-72.1	+/-74.1		RER: 0.247	(0-2)		
QC1203258256	366367017	MS							
Tritium	1870	213		2160	pCi/L	REC: 104	(75%-125%)		02/15/1501:15
		Uncert:	+/-59.2	+/-336					
		TPU:	+/-72.1	+/-536					
QC1203258257	LCS								
Tritium	1870			1890	pCi/L	REC: 101	(80%-120%)		02/15/1501:33
		Uncert:		+/-308					
		TPU:		+/-478					

Notes:

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

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- A The TIC is a suspected aldol-condensation product
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
- C Analyte has been confirmed by GC/MS analysis
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- E Reported value is estimated due to interferences. See comment in narrative.
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- M Duplicate precision not met.

QC Summary

Workorder: 366137

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
N	Spike Sample recovery is outside control limits.									
P	Aroclor target analyte with greater than 25% difference between column analyses.									
S	Reported value determined by the Method of Standard Additions (MSA)									
T	Spike and/or spike duplicate sample recovery is outside control limits.									
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.									
UX	Gamma Spectroscopy--Uncertain identification									
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
o	Analyte failed to recover within LCS limits (Organics only)									

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

** Indicates analyte is a surrogate compound.

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

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

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