

July 08, 2016

July 08, 2016

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

Re: CHPRC SAF X16-037
Work Order: 399217
SDG: GEL399217

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 11, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,


Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: X16-037-060
Enclosures



Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....7

Data Review Qualifier Definitions.....10

Laboratory Certifications.....12

Volatile Analysis.....14

 Case Narrative.....15

 Sample Data Summary.....18

 Quality Control Summary.....20

Metals Analysis.....28

 Case Narrative.....29

 Sample Data Summary.....32

 Quality Control Summary.....35

General Chem Analysis.....41

 Case Narrative.....42

 Sample Data Summary.....45

 Quality Control Summary.....47

Radiological Analysis.....50

 Case Narrative.....51

 Sample Data Summary.....56

 Quality Control Summary.....60

Case Narrative

July 08, 2016

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X16-037
SDG: GEL399217

July 08, 2016

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 11, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
399217001	B35LW7
399217002	B35LX0

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile, General Chemistry, Metals and Radiochemistry.

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

July 08, 2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

July 08, 2016

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL399217
Work Order #: 399217

GC/MS Volatile

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

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

Calibration Information

Continuing Calibration Verification Requirements

The calibration verification standard requirements were all met for samples .

Quality Control (QC) Information

Matrix Spike/Matrix Spike Duplicate Recovery Statement

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

Sample	Analyte	Value
1203572275 (Non SDG 399704021PS)	2-Butanone	58* (70%-130%)
	Acetone	47* (70%-130%)
1203572276 (Non SDG 399704021PSD)	2-Butanone	50* (70%-130%)
	4-Methyl-2-pentanone	67* (70%-130%)
	Acetone	41* (70%-130%)

Metals

Determination of Metals by ICP

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

Calibration Information

CRDL/PQL Requirements

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

July 08, 2016

the data were not adversely affected. 399217001 (B35LW7) and 399217002 (B35LX0).

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of potassium. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203566362 (MB).

General Chemistry

Alkalinity

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

Quality Control (QC) Information

Method Blank (MB) Statement

The method blank associated with this data was slightly above the normal acceptance limits. The data for sample 1203572189 (MB) was deemed acceptable because the values for all reported samples were more than 10 times the value of the method blank.

Radiochemistry

SRISO_SEP_PRECIP_GPC: COMMON

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

Quality Control (QC) Information

QC Information

The sample and duplicate, 1203566156 (B35MC9DUP), do not meet the client relative error ratio requirement; however, both sample and duplicate results are less than the minimum detectable activity.

Technical Information

Recounts

Sample 1203566157 (LCS) was recounted due to high recovery. The recount is reported. Sample 1203566155 (MB) was recounted due to a suspected blank false positive. The recount is reported.

C14_LSC: COMMON

July 08, 2016

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

Technical Information

Recounts

Sample 399217001 (B35LW7) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

TRITIUM_DIST_LSC: COMMON

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

Technical Information

Recounts

Sample 1203570616 (Non SDG 398682002DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

Certification Statement

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

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X16-037-060**
Page 1 of 1

Collector: K.C. Patterson/CHPRC
 SAF No.: X16-037
 Project Title: 100-KW Rebound Study, May 31, 2016
 Shipped To (Lab): **GEL Laboratories, LLC**
 Protocol: CERCLA

Contact/Requester: Karen Waters-Husted
 Sampling Origin: Hanford Site
 Logbook No.: HNF-N-506 **83/81**
 Method of Shipment: Commercial Carrier
 Priority: **30 Days**

Telephone No.: 509-376-4650
 Purchase Order/Charge Code: 304027
 Ice Chest No.: **605-322**
 Bill of Lading/Air Bill No.: **776497603868**
 Offsite Property No.: **6716**

PRIORITY
 SPECIAL INSTRUCTIONS: Hold Time
 SPECIAL INSTRUCTIONS: N/A
 Special Handling: N/A
 Total Activity Exemption: Yes No

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35LW7	N	W JUN 10 2016	0812	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35LW7	N	W		1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35LW7	N	W		4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35LW7	N	W		1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35LW7	N	W		3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35LW7	N	W		1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B35LX0	Y	W		1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

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

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
K.C. Patterson/CHPRC			JUN 10 2016 0955	Lesly Wall/CHPRC			JUN 10 2016 0955	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			JUN 10 2016 1400	Received By	FEDEX			
Relinquished By				Received By			6-11-16 0900	
Relinquished By				Received By				

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

July 08, 2016

July 08, 2016

SAMPLE RECEIPT & REVIEW FORM

Client: <u>OPPC</u>		SDG/AR/COC/Work Order: <u>399217</u>
Received By: <u>ML</u>		Date Received: <u>6-11-16</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>CPM 0</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2C</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>13046196L</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:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Preservation added, Lot#: Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.				Circle Applicable: FedEx Air <u>7764 9768</u> FedEx Ground 3868 2C UPS 3423 2C Field Services Courier Other

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 6/11/16 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 08 July 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

July 08, 2016

GC/MS Volatile

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL399217

Work Order #: 399217

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

Analytical Method: SW846 8260C

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

Analytical Batch: 1576428

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399217001	B35LW7
1203572273	Method Blank (MB)
1203572274	Laboratory Control Sample (LCS)
1203572275	399704021(NonSDG) Post Spike (PS)
1203572276	399704021(NonSDG) Post Spike Duplicate (PSD)

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

Data Summary:

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

Quality Control (QC) Information

Matrix Spike/Matrix Spike Duplicate Recovery Statement

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

Sample	Analyte	Value
1203572275 (Non SDG 399704021PS)	2-Butanone	58* (70%-130%)
	Acetone	47* (70%-130%)
1203572276 (Non SDG 399704021PSD)	2-Butanone	50* (70%-130%)
	4-Methyl-2-pentanone	67* (70%-130%)
	Acetone	41* (70%-130%)

Certification Statement

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

July 08, 2016

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: GEL399217 GEL Work Order: 399217

The Qualifiers in this report are defined as follows:

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

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

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

DL Indicates that sample is diluted.

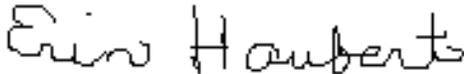
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 08 JUL 2016

Title: Data Validator

Sample Data Summary

July 08, 2016

Page 1 of 1

Certificate of Analysis
Sample Summary

SDG Number: GEL399217	Date Collected: 06/10/2016 08:12	Matrix: WATER
Lab Sample ID: 399217001	Date Received: 06/11/2016 09:00	
Client ID: B35LW7	Client: CPRC001	Project: CPRC0X16037
Batch ID: 1576428	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/22/2016 10:21	Inst: VOA3.I	Dilution: 1
Prep Date: 06/22/2016 10:21	Analyst: CDS1	Purge Vol: 5 mL
Data File: 062216V3\3O306.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	0.320	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	1.15	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	TU	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	JT	3.02	ug/L	3.00	10.0	20.0

Quality Control Summary

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 8, 2016

Page 1 of 6

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399217

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1576428										
QC1203572274	LCS										
1,1,1-Trichloroethane	50.0			56.6	ug/L		113	(70%-130%)	CDS1	06/22/16	08:44
1,1,2-Trichloroethane	50.0			50.1	ug/L		100	(70%-130%)			
1,1-Dichloroethane	50.0			51.2	ug/L		102	(70%-130%)			
1,1-Dichloroethylene	50.0			56.5	ug/L		113	(70%-130%)			
1,2-Dichloroethane	50.0			45.1	ug/L		90	(70%-130%)			
2-Butanone	250			238	ug/L		95	(70%-130%)			
4-Methyl-2-pentanone	250			201	ug/L		80	(70%-130%)			
Acetone	250			249	ug/L		100	(70%-130%)			
Benzene	50.0			52.0	ug/L		104	(70%-130%)			
Carbon disulfide	250			277	ug/L		111	(70%-130%)			
Carbon tetrachloride	50.0			54.4	ug/L		109	(70%-130%)			
Chlorobenzene	50.0			52.2	ug/L		104	(70%-130%)			
Chloroform	50.0			50.1	ug/L		100	(70%-130%)			
Ethylbenzene	50.0			50.1	ug/L		100	(70%-130%)			
Methylene chloride	50.0			54.5	ug/L		109	(70%-130%)			
Tetrachloroethylene	50.0			55.9	ug/L		112	(70%-130%)			
Toluene	50.0			50.6	ug/L		101	(70%-130%)			
Trichloroethylene	50.0			54.8	ug/L		110	(70%-130%)			
Vinyl chloride	50.0			49.6	ug/L		99	(70%-130%)			
Xylenes (total)	150			153	ug/L		102	(70%-130%)			

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1576428										
**1,2-Dichloroethane-d4	50.0			47.8	ug/L		96	(70%-130%)	CDS1	06/22/16	08:44
**Bromofluorobenzene	50.0			48.8	ug/L		98	(70%-130%)			
**Toluene-d8	50.0			48.6	ug/L		97	(70%-130%)			
QC1203572273	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/22/16	09:51
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1576428										
Vinyl chloride			U	0.300	ug/L				CDS1	06/22/16	09:51
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			47.8	ug/L		96	(70%-130%)			
**Bromofluorobenzene	50.0			46.6	ug/L		93	(70%-130%)			
**Toluene-d8	50.0			49.6	ug/L		99	(70%-130%)			
QC1203572275 399704021 PS											
1,1,1-Trichloroethane	50.0	U	0.00	48.4	ug/L		97	(70%-130%)		06/22/16	19:00
1,1,2-Trichloroethane	50.0	U	0.00	49.0	ug/L		98	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	45.1	ug/L		90	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	44.7	ug/L		89	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	42.3	ug/L		85	(70%-130%)			
2-Butanone	250	TU	0.00 T	145	ug/L		58*	(70%-130%)			
4-Methyl-2-pentanone	250	TU	0.00	193	ug/L		77	(70%-130%)			
Acetone	250	TU	0.00 T	117	ug/L		47*	(70%-130%)			
Benzene	50.0	U	0.00	45.8	ug/L		92	(70%-130%)			
Carbon disulfide	250	U	0.00	227	ug/L		91	(70%-130%)			
Carbon tetrachloride	50.0	J	1.05	47.9	ug/L		94	(70%-130%)			
Chlorobenzene	50.0	U	0.00	47.2	ug/L		94	(70%-130%)			
Chloroform	50.0	J	0.500	46.1	ug/L		91	(70%-130%)			
Ethylbenzene	50.0	U	0.00	45.1	ug/L		90	(70%-130%)			
Methylene chloride	50.0	U	0.00	48.3	ug/L		97	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	51.3	ug/L		103	(70%-130%)			

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1576428										
Toluene	50.0	U	0.00	45.8	ug/L		92	(70%-130%)	CDS1	06/22/16	19:00
Trichloroethylene	50.0	U	0.00	47.5	ug/L		95	(70%-130%)			
Vinyl chloride	50.0	U	0.00	43.4	ug/L		87	(70%-130%)			
Xylenes (total)	150	U	0.00	137	ug/L		91	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		50.1	49.0	ug/L		98	(70%-130%)			
**Bromofluorobenzene	50.0		44.2	49.6	ug/L		99	(70%-130%)			
**Toluene-d8	50.0		51.2	49.4	ug/L		99	(70%-130%)			
QC1203572276 399704021 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	47.5	ug/L	2	95	(0%-20%)		06/22/16	19:30
1,1,2-Trichloroethane	50.0	U	0.00	45.3	ug/L	8	91	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	42.7	ug/L	5	85	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	41.9	ug/L	7	84	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	40.7	ug/L	4	81	(0%-20%)			
2-Butanone	250	TU	0.00	T	124	ug/L	15	50*	(0%-20%)		
4-Methyl-2-pentanone	250	TU	0.00	T	167	ug/L	15	67*	(0%-20%)		
Acetone	250	TU	0.00	T	102	ug/L	13	41*	(0%-20%)		
Benzene	50.0	U	0.00	43.9	ug/L	4	88	(0%-20%)			
Carbon disulfide	250	U	0.00	214	ug/L	6	86	(0%-20%)			
Carbon tetrachloride	50.0	J	1.05	46.0	ug/L	4	90	(0%-20%)			
Chlorobenzene	50.0	U	0.00	44.4	ug/L	6	89	(0%-20%)			
Chloroform	50.0	J	0.500	44.9	ug/L	3	89	(0%-20%)			
Ethylbenzene	50.0	U	0.00	42.7	ug/L	5	85	(0%-20%)			

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 5 of 6

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1576428										
Methylene chloride	50.0	U	0.00	48.2	ug/L	0	96	(0%-20%)	CDS1	06/22/16	19:30
Tetrachloroethylene	50.0	U	0.00	47.7	ug/L	7	95	(0%-20%)			
Toluene	50.0	U	0.00	43.0	ug/L	6	86	(0%-20%)			
Trichloroethylene	50.0	U	0.00	45.9	ug/L	4	92	(0%-20%)			
Vinyl chloride	50.0	U	0.00	43.9	ug/L	1	88	(0%-20%)			
Xylenes (total)	150	U	0.00	132	ug/L	4	88	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		50.1	46.3	ug/L		93	(70%-130%)			
**Bromofluorobenzene	50.0		44.2	46.0	ug/L		92	(70%-130%)			
**Toluene-d8	50.0		51.2	48.9	ug/L		98	(70%-130%)			

Notes:

The Qualifiers in this report are defined as follows:

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

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 6 of 6

<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>
-----------------	------------	---------------	-------------	-----------	--------------	-------------	-------------	--------------	--------------	-------------	-------------

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

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

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

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

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

July 08, 2016

Surrogate Recovery Report

SDG Number: GEL399217

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203572274	LCS for batch 1576428	96	97	98
1203572273	MB for batch 1576428	96	99	93
399217001	B35LW7	99	103	94
1203572275	B35D79PS	98	99	99
1203572276	B35D79PSD	93	98	92

Surrogate

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

Acceptance Limits

(70%-130%)

(70%-130%)

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Metals Analysis

Case Narrative

July 08, 2016

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL399217

Work Order #: 399217

Product: Determination of Metals by ICP

Analytical Method: 6010_METALS_ICP

Analytical Procedure: GL-MA-E-013 REV# 26

Analytical Batch: 1574121

Preparation Method: SW846 3005A

Preparation Procedure: GL-MA-E-006 REV# 13

Preparation Batch: 1574120

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399217001	B35LW7
399217002	B35LX0
1203566362	Method Blank (MB)ICP
1203566363	Laboratory Control Sample (LCS)
1203566366	399103001(NonSDGL) Serial Dilution (SD)
1203566364	399103001(NonSDGS) Matrix Spike (MS)
1203566365	399103001(NonSDGSD) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Calibration Information

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 399217001 (B35LW7) and 399217002 (B35LX0).

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of potassium. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203566362 (MB).

Certification Statement

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

July 08, 2016

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: GEL399217 GEL Work Order: 399217

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

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

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

Signature: 

Name: Nik-Cole Elmore

Date: 08 JUL 2016

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL399217

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 399217001

BASIS: As Received

DATE COLLECTED 10-JUN-16

CLIENT ID: B35LW7

LEVEL: Low

DATE RECEIVED 11-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.52	ug/L	B	3.5	10	10	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	06/23/16 09:46	062316-2	1574121
7440-39-3	Barium	37.7	ug/L		1	5	5	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-70-2	Calcium	65100	ug/L		50	200	200	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-47-3	Chromium	6.26	ug/L		1	5	5	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-50-8	Copper	4.19	ug/L	B	3	10	10	1	P	HSC	06/20/16 16:26	062016-1	1574121
7439-89-6	Iron	39	ug/L	B	30	100	100	1	P	HSC	06/20/16 16:26	062016-1	1574121
7439-95-4	Magnesium	14700	ug/L		110	300	300	1	P	HSC	06/20/16 16:26	062016-1	1574121
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-02-0	Nickel	1.69	ug/L	B	1.5	5	5	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-09-7	Potassium	7140	ug/L		50	150	150	1	P	HSC	06/23/16 09:46	062316-2	1574121
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-23-5	Sodium	20300	ug/L		100	300	300	1	P	HSC	06/20/16 16:26	062016-1	1574121
7440-62-2	Vanadium	8.33	ug/L		1	5	5	1	P	HSC	06/23/16 09:46	062316-2	1574121
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	06/20/16 16:26	062016-1	1574121

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1574121	1574120	SW846 3005A	50	mL	50	mL	06/14/16	JP1

***Analytical Methods:**

P SW846 3005A/6010C

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL399217

CONTRACT: CPRC0X16037

METHOD TYPE: SW846

SAMPLE ID: 399217002

BASIS: As Received

DATE COLLECTED 10-JUN-16

CLIENT ID: B35LX0

LEVEL: Low

DATE RECEIVED 11-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.9	ug/L	B	3.5	10	10	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-38-2	Arsenic	5.53	ug/L	B	5	30	30	1	P	HSC	06/23/16 09:49	062316-2	1574121
7440-39-3	Barium	37.6	ug/L		1	5	5	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-70-2	Calcium	65300	ug/L		50	200	200	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-47-3	Chromium	4.8	ug/L	B	1	5	5	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-50-8	Copper	3.8	ug/L	B	3	10	10	1	P	HSC	06/20/16 16:29	062016-1	1574121
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/20/16 16:29	062016-1	1574121
7439-95-4	Magnesium	14800	ug/L		110	300	300	1	P	HSC	06/20/16 16:29	062016-1	1574121
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-09-7	Potassium	7140	ug/L		50	150	150	1	P	HSC	06/23/16 09:49	062316-2	1574121
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-23-5	Sodium	20200	ug/L		100	300	300	1	P	HSC	06/20/16 16:29	062016-1	1574121
7440-62-2	Vanadium	8.97	ug/L		1	5	5	1	P	HSC	06/23/16 09:49	062316-2	1574121
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	06/20/16 16:29	062016-1	1574121

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1574121	1574120	SW846 3005A	50	mL	50	mL	06/14/16	JP1

***Analytical Methods:**

P SW846 3005A/6010C

Quality Control Summary

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 8, 2016

Page 1 of 5

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399217

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1574121										
QC1203566363	LCS										
Antimony	500			486	ug/L		97.2	(80%-120%)	HSC	06/20/16	15:48
Arsenic	500			495	ug/L		98.9	(80%-120%)		06/23/16	09:09
Barium	500			493	ug/L		98.6	(80%-120%)		06/20/16	15:48
Cadmium	500			483	ug/L		96.6	(80%-120%)			
Calcium	5000			4950	ug/L		99	(80%-120%)			
Chromium	500			487	ug/L		97.5	(80%-120%)			
Cobalt	500			486	ug/L		97.1	(80%-120%)			
Copper	500			496	ug/L		99.3	(80%-120%)			
Iron	5000			4960	ug/L		99.2	(80%-120%)			
Magnesium	5000			4970	ug/L		99.4	(80%-120%)			
Manganese	500			488	ug/L		97.6	(80%-120%)			
Nickel	500			482	ug/L		96.4	(80%-120%)			
Potassium	5000			4840	ug/L		96.9	(80%-120%)		06/23/16	09:09
Silver	500			490	ug/L		98	(80%-120%)		06/20/16	15:48
Sodium	5000			5010	ug/L		100	(80%-120%)			
Vanadium	500			483	ug/L		96.5	(80%-120%)		06/23/16	09:09
Zinc	500			472	ug/L		94.4	(80%-120%)		06/20/16	15:48
QC1203566362	MB										
Antimony			U	3.50	ug/L					06/20/16	15:46
Arsenic			U	5.00	ug/L					06/23/16	09:06

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1574121										
Barium			U	1.00	ug/L					06/20/16	15:46
Cadmium			U	1.00	ug/L				HSC		
Calcium			U	50.0	ug/L						
Chromium			U	1.00	ug/L						
Cobalt			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Manganese			U	2.00	ug/L						
Nickel			U	1.50	ug/L						
Potassium			B	74.5	ug/L					06/23/16	09:06
Silver			U	1.00	ug/L					06/20/16	15:46
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L					06/23/16	09:06
Zinc			U	3.30	ug/L					06/20/16	15:46
QC1203566364 399103001 MS											
Antimony	500	U	3.50	492	ug/L		98.4	(75%-125%)		06/20/16	15:54
Arsenic	500	U	5.00	512	ug/L		102	(75%-125%)		06/23/16	09:15
Barium	500		58.8	549	ug/L		98	(75%-125%)		06/20/16	15:54
Cadmium	500	U	1.00	482	ug/L		96.3	(75%-125%)			
Calcium	5000		47300	53500	ug/L		N/A	(75%-125%)			
Chromium	500	B	3.95	488	ug/L		96.8	(75%-125%)			
Cobalt	500	U	1.00	468	ug/L		93.6	(75%-125%)			

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1574121										
Copper	500	U	3.00	501	ug/L		99.9	(75%-125%)	HSC	06/20/16	15:54
Iron	5000	U	30.0	4880	ug/L		97.6	(75%-125%)			
Magnesium	5000		11200	16500	ug/L		105	(75%-125%)			
Manganese	500	U	2.00	480	ug/L		95.8	(75%-125%)			
Nickel	500	U	1.50	464	ug/L		92.6	(75%-125%)			
Potassium	5000		8700	13700	ug/L		99.3	(75%-125%)		06/23/16	09:15
Silver	500	U	1.00	490	ug/L		98	(75%-125%)		06/20/16	15:54
Sodium	5000		28300	33900	ug/L		N/A	(75%-125%)			
Vanadium	500		14.0	504	ug/L		98.1	(75%-125%)		06/23/16	09:15
Zinc	500	U	3.30	467	ug/L		93.4	(75%-125%)		06/20/16	15:54
QC1203566365 399103001 MSD											
Antimony	500	U	3.50	496	ug/L	0.686	99.1	(0%-20%)		06/20/16	15:57
Arsenic	500	U	5.00	498	ug/L	2.75	99.3	(0%-20%)		06/23/16	09:17
Barium	500		58.8	550	ug/L	0.142	98.2	(0%-20%)		06/20/16	15:57
Cadmium	500	U	1.00	477	ug/L	0.878	95.5	(0%-20%)			
Calcium	5000		47300	55000	ug/L	2.7	N/A	(0%-20%)			
Chromium	500	B	3.95	485	ug/L	0.501	96.3	(0%-20%)			
Cobalt	500	U	1.00	471	ug/L	0.707	94.3	(0%-20%)			
Copper	500	U	3.00	504	ug/L	0.521	100	(0%-20%)			
Iron	5000	U	30.0	4850	ug/L	0.686	96.9	(0%-20%)			
Magnesium	5000		11200	16700	ug/L	1.54	110	(0%-20%)			
Manganese	500	U	2.00	477	ug/L	0.562	95.3	(0%-20%)			

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1574121										
Nickel	500	U	1.50	468	ug/L	0.824	93.4	(0%-20%)	HSC	06/20/16	15:57
Potassium	5000		8700	13600	ug/L	0.484	98	(0%-20%)		06/23/16	09:17
Silver	500	U	1.00	488	ug/L	0.358	97.6	(0%-20%)		06/20/16	15:57
Sodium	5000		28300	34600	ug/L	2.2	N/A	(0%-20%)			
Vanadium	500		14.0	510	ug/L	1.15	99.3	(0%-20%)		06/23/16	09:17
Zinc	500	U	3.30	469	ug/L	0.425	93.8	(0%-20%)		06/20/16	15:57
QC1203566366 399103001 SDILT											
Antimony		U	-2.31 DU	17.5	ug/L	N/A		(0%-10%)		06/20/16	16:00
Arsenic		U	1.48 DU	25.0	ug/L	N/A		(0%-10%)		06/23/16	09:20
Barium			58.8 D	11.7	ug/L	.529		(0%-10%)		06/20/16	16:00
Cadmium		U	-0.251 DU	5.00	ug/L	N/A		(0%-10%)			
Calcium			47300 D	9530	ug/L	.82		(0%-10%)			
Chromium		B	3.95 DU	5.00	ug/L	N/A		(0%-10%)			
Cobalt		U	-0.448 DU	5.00	ug/L	N/A		(0%-10%)			
Copper		U	1.99 DU	15.0	ug/L	N/A		(0%-10%)			
Iron		U	6.15 DU	150	ug/L	N/A		(0%-10%)			
Magnesium			11200 D	2310	ug/L	2.96		(0%-10%)			
Manganese		U	0.830 DU	10.0	ug/L	N/A		(0%-10%)			
Nickel		U	0.698 DU	7.50	ug/L	N/A		(0%-10%)			
Potassium			8700 D	1720	ug/L	1.01		(0%-10%)		06/23/16	09:20
Silver		U	-0.825 DU	5.00	ug/L	N/A		(0%-10%)		06/20/16	16:00
Sodium			28300 D	5730	ug/L	1.11		(0%-10%)			

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1574121										
Vanadium		14.0	BD	3.03	ug/L	8.46		(0%-10%)	HSC	06/23/16	09:20
Zinc	U	-2.75	DU	16.5	ug/L	N/A		(0%-10%)		06/20/16	16:00

Notes:

The Qualifiers in this report are defined as follows:

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

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

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

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

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

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

General Chem Analysis

Case Narrative

July 08, 2016

**General Chemistry
Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL399217
Work Order #: 399217**

Product: Alkalinity

Analytical Method: 2320_ALKALINITY

Analytical Procedure: GL-GC-E-033 REV# 12

Analytical Batch: 1576390

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399217001	B35LW7
1203572189	Method Blank (MB)
1203572190	Laboratory Control Sample (LCS)
1203572191	399217001(B35LW7) Sample Duplicate (DUP)
1203572192	399279001(NonSDG) Sample Duplicate (DUP)

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

Data Summary:

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

Quality Control (QC) Information

Method Blank (MB) Statement

The method blank associated with this data was slightly above the normal acceptance limits. The data for sample 1203572189 (MB) was deemed acceptable because the values for all reported samples were more than 10 times the value of the method blank.

Certification Statement

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

July 08, 2016

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: GEL399217 GEL Work Order: 399217

The Qualifiers in this report are defined as follows:

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

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

Review/Validation

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

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

Signature: 

Name: Aubrey Kingsbury

Date: 27 JUN 2016

Title: Analyst I

Sample Data Summary

~~JUL 08 2016~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 27, 2016

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

Client Sample ID:	B35LW7	Project:	CPRC0X16037
Sample ID:	399217001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	10-JUN-16 08:12		
Receive Date:	11-JUN-16		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis											
2320_ALKALINITY: GW 01 "As Received"											
Alkalinity, Total as CaCO3	C	141000	725	1000	ug/L		KLP1	06/23/16	1350	1576390	1
Bicarbonate alkalinity (CaCO3)	C	141000	725	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	725	725	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

Quality Control Summary

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 27, 2016

Page 1 of 2

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399217

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, RPD%, REC%, Range, Anlst, Date, Time. Rows include Titration and Ion Analysis for various alkalinity tests (Alkalinity, Bicarbonate alkalinity, Carbonate alkalinity, Hydroxide alkalinity) across different batches and samples.

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
> Result greater than quantifiable range or greater than upper limit of the analysis range
B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
D Results are reported from a diluted aliquot of sample.

July 08, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 2 of 2

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

Case Narrative

July 08, 2016
Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL399217
Work Order #: 399217

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

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

Analytical Batch: 1574054

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399217001	B35LW7
1203566155	Method Blank (MB)
1203566156	398676005(B35MC9) Sample Duplicate (DUP)
1203566157	Laboratory Control Sample (LCS)

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

Data Summary:

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

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and duplicate, 1203566156 (B35MC9DUP), do not meet the client relative error ratio requirement; however, both sample and duplicate results are less than the minimum detectable activity.

Technical Information

Recounts

Sample 1203566157 (LCS) was recounted due to high recovery. The recount is reported. Sample 1203566155 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Product: C14_LSC: COMMON

Analytical Method: C14_LSC

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

Analytical Batch: 1575769

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
------------------------------	--

July 08, 2016

399217001	B35LW7
1203570561	Method Blank (MB)
1203570562	398682002(NonSDG) Sample Duplicate (DUP)
1203570563	398682002(NonSDG) Matrix Spike (MS)
1203570564	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Sample 399217001 (B35LW7) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1575790

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399217001	B35LW7
1203570615	Method Blank (MB)
1203570616	398682002(NonSDG) Sample Duplicate (DUP)
1203570617	398682002(NonSDG) Matrix Spike (MS)
1203570618	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Sample 1203570616 (Non SDG 398682002DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

July 08, 2016

Certification Statement

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

July 08, 2016

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: GEL399217 GEL Work Order: 399217

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: Theresa Austin

Date: 06 JUL 2016

Title: Group Leader

Sample Data Summary

July 08, 2016

**Certificate of Analysis
Sample Summary**

SDG Number: GEL399217	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 399217001	Date Collected: 06/10/2016 08:12	Matrix: WATER
	Date Received: 06/11/2016 09:00	
Client ID: B35LW7	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1574054	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 06/22/2016 14:33	Aliquot: 300 mL	Instrument: PIC5C
Data File: S1574054r3.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1574054		
Prep Date: 06/21/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.881	pCi/L	+/-0.758	0.758	1.73	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	5.80	7.37	mg	78.8	(40%-110%)

Comments:

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

July 08, 2016

**Certificate of Analysis
Sample Summary**

SDG Number: GEL399217
Lab Sample ID: 399217001

Client: CPRC001
Date Collected: 06/10/2016 08:12
Date Received: 06/11/2016 09:00

Project: CPRC0X16037
Matrix: WATER

Client ID: B35LW7
Batch ID: 1575769
Run Date: 06/23/2016 22:55
Data File: C1575769.xls
Prep Batch: 1575769
Prep Date: 06/23/2016 16:02

Method: C14_LSC
Analyst: TXJ1
Aliquot: 60 mL
Prep Method: EPA EERF C-01 Modified

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-003
Instrument: LSCTEAL
Count Time: 2.96666669845581 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		36800	pCi/L	+/-717	6870	88.9	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

Comments:

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

July 08, 2016

**Certificate of Analysis
Sample Summary**

SDG Number: GEL399217	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 399217001	Date Collected: 06/10/2016 08:12	Matrix: WATER
	Date Received: 06/11/2016 09:00	
Client ID: B35LW7	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1575790	Analyst: GXR1	SOP Ref: GL-RAD-A-002
Run Date: 06/28/2016 09:15	Aliquot: 50 mL	Instrument: LSCSILVER
Data File: T1575790.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1575790		
Prep Date: 06/27/2016 17:11		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		85100	pCi/L	+/-1330	16500	302	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

Comments:

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 6, 2016
Page 1 of 3

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 399217

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1574054								
QC1203566155	MB								
Strontium-90			U	-1.33	pCi/L			KSD1	06/22/1616:30
				Uncert: +/-0.649					
				TPU: +/-0.649					
**Strontium Carrier		7.37		6.40	mg	REC: 87	(40%-110%)		
QC1203566156	398676005	DUP							
Strontium-90		U	-0.749	U	0.723				06/22/1614:32
			Uncert: +/-0.670		+/-1.02	RPD: 0	N/A		
			TPU: +/-0.670		+/-1.03	RER: 2.35	(0-2)		
**Strontium Carrier		7.37	5.70	5.80	mg	REC: 79	(40%-110%)		
QC1203566157	LCS								
Strontium-90		73.0		84.5	pCi/L	REC: 116	(80%-120%)		06/24/1610:55
				Uncert: +/-4.07					
				TPU: +/-13.9					
**Strontium Carrier		7.37		5.70	mg	REC: 77	(40%-110%)		
Rad Liquid Scintillation									
Batch	1575769								
QC1203570561	MB								
Carbon-14			U	2.62	pCi/L			TXJ1	06/23/1622:59
				Uncert: +/-20.2					
				TPU: +/-20.2					
QC1203570562	398682002	DUP							
Carbon-14		U	-0.331	U	9.31				06/23/1623:30
			Uncert: +/-20.1		+/-20.3	RPD: 0	N/A		
			TPU: +/-20.1		+/-20.4	RER: 0.66	(0-2)		
QC1203570563	398682002	MS							
Carbon-14		1260	U	-0.331	1250	pCi/L	REC: 99	(75%-125%)	06/24/1600:01
				Uncert: +/-20.1	+/-47.4				
				TPU: +/-20.1	+/-237				
QC1203570564	LCS								
Carbon-14		1260		1310	pCi/L	REC: 103	(80%-120%)		06/24/1600:33
				Uncert: +/-46.9					
				TPU: +/-247					
Batch	1575790								
QC1203570615	MB								
Tritium			U	220	pCi/L			GXR1	06/28/1610:02
				Uncert: +/-172					
				TPU: +/-177					
QC1203570616	398682002	DUP							
Tritium		U	-106	U	-234				06/29/1609:19
			Uncert: +/-211		+/-199	RPD: 0	N/A		
			TPU: +/-211		+/-199	RER: 0.859	(0-2)		
QC1203570617	398682002	MS							
Tritium		2340	U	-106	2490	pCi/L	REC: 106	(75%-125%)	06/28/1611:36

QC Summary

Workorder: 399217

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch	1575790									
		Uncert:	+/-211	+/-280						
		TPU:	+/-211	+/-556						
QC1203570618	LCS									
Tritium	2330			2700	pCi/L	REC: 116	(80%-120%)		06/28/16	12:23
		Uncert:		+/-292						
		TPU:		+/-598						

Notes:

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

The Qualifiers in this report are defined as follows:

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

~~JUL 08, 2016~~
GEL LABORATORIES LLC

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

QC Summary

Workorder: 399217

Page 3 of 3

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

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

** 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.