GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
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gel.com

March 28, 2018

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

Re: CHPRC SAF F17-070
Work Order: 446404
SDG: GEL446404

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 22, 2018. 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,

Anna Dupree for
Heather Shaffer
Project Manager

Purchase Order: 303979
Chain of Custody: F17-070-113, F17-070-115 and F17-070-427
Enclosures

Table of Contents

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F17-070
SDG: GEL446404

March 28, 2018

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 March 22, 2018, 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.

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
446404001	B3H6X0
446404002	B3H6X2
446404003	B3H8X2

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.

Anna Dupree for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL446404
Work Order #: 446404

GC/MS Volatile

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

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

Metals

Determination of Metals by ICP-MS

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

General Chemistry

Ion Chromatography

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

Holding Times
Sample (See Below) was initially analyzed within holding; however, the holding time had expired prior to reanalysis of diluted sample. The data is qualified.

Sample	Analyte	Value
1203994718 (Non SDG 446405002PS)	Chloride, Nitrate and Sulfate	Received 22-MAR-18, within holding, analyzed 22-MAR-18, out of holding 22-MAR-18

Sample Dilutions
The following samples 1203994717 (Non SDG 446405002DUP), 1203994718 (Non SDG 446405002PS) and 446404003 (B3H8X2) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	446404 003
Chloride	20X
Nitrate	20X
Sulfate	20X

Radiochemistry

I129LL_SEP_LEPS_GS: COMMON (low level)

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

9310_ALPHABETA_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

Duplication Criteria between QC Sample and Duplicate Sample
The QC Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1203995177 (B3H6X0DUP)	ALPHA	RPD 21.1* (0.00%-20.00%) RER 0.816 (0-2)

Technical Information

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.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1203995178 (B3H6X0MS) and 1203995179 (B3H6X0MSD), aliquots were reduced to conserve sample volume.

TC99_EIE_LSC: COMMON

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

TRITIUM_DIST_LSC: COMMON

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.

Miscellaneous Information

Additional Comments
The matrix spike, 1203995046 (B3H6X0MS), aliquot was reduced to conserve sample volume.

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

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 446404		F17-070-113	PAGE 1 OF 1
COLLECTOR Jeff Tucksen CHPRC	**COMPANY CONTACT** LYNCH, SA	**TELEPHONE NO.** 373-5586	**PROJECT COORDINATOR** LYNCH, SA	**REQUIRED TAT** 7 Days
SAMPLING LOCATION C9608, POST DEV	**PROJECT DESIGNATION** 200-UP-1 Remedial Action Wells Sampling and Analysis - Water		**SAF NO.** F17-070	ORIGINAL
ICE CHEST NO. GWS-392	**FIELD LOGBOOK NO.** HNF-N-645 6 - 88	**ACTUAL SAMPLE DEPTH** 296.45	**PURCHASE ORDER/CHARGE CODE** 300192	**METHOD OF SHIPMENT** FEDERAL EXPRESS
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 9210		**BILL OF LADING/AIR BILL NO.** 771802519899	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

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

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	None
HOLDING TIME	6 Months	6 Months	6 Months	6 Months	6 Months
TYPE OF CONTAINER	G/P	P	G/P	G/P	P
NO. OF CONTAINER(S)	1	1	4	1	1
VOLUME	500mL	1L	1L	500mL	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	9310_ALPHABETA_GPC: COMMON {Gross alpha, Gross beta};	I129LL_SEP_LEPS_GS: COMMON;	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON;
SAMPLE NO.	**FILTERED**	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**				
B3H6X0	Yes	WATER	MAR 21 2018	1120	✓	✓	✓	✓	✓

CHAIN OF POSSESSION RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/ PRINT NAMES RECEIVED BY/STORED IN	DATE/TIME
Jeff Tucksen CHPRC	MAR 21 2018 1215	Daniel Klug CHPRC	MAR 21 2018 1215
Daniel Klug CHPRC Fed Ex	MAR 21 2018 1600	FEDEX Chakeris Tarplin GEL Laboratories	3/22/18 0840

SPECIAL INSTRUCTIONS
TRVL-18-056;Water samples to be purged until field readings of DO stabilize at or above 7,000 µg/L and REDOX potential is at least 200 rMV
(1) 6020_METALS_ICPMS: COMMON {Chromium}; 6020_METALS_ICPMS: COMMON (Add-on) {Manganese, Uranium};

FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 3/20/2018 **FSR ID = FSR54734** **TRVL NUM = TRVL-18-056** A-6003-618 (REV 3)

3/28/2018

REV.0

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 446484		F17-070-115	PAGE 1 OF 1
COLLECTOR Jeff Tucksen CHPRC	**COMPANY CONTACT** LYNCH, SA	**TELEPHONE NO.** 373-5586	**PROJECT COORDINATOR** LYNCH, SA	**REQUIRED TAT** 7 Days
SAMPLING LOCATION C9608, POST DEV	**PROJECT DESIGNATION** 200-UP-1 Remedial Action Wells Sampling and Analysis - Water		**SAF NO.** F17-070	ORIGINAL
ICE CHEST NO. GWS-392	**FIELD LOGBOOK NO.** HNF-N-645 16 - 88	**ACTUAL SAMPLE DEPTH** 296.45	**PURCHASE ORDER/CHARGE CODE** 300192	**METHOD OF SHIPMENT** FEDERAL EXPRESS
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 9210		**BILL OF LADING/AIR BILL NO.** 7718025199899	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

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

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	HCl or H2SO4 to pH <2/Cool <=6C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs*
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	8260_VOA_GCMS: COMMON {Carbon tetrachloride, Trichloroethene };

SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3H6X2	No	WATER	MAR 21 2018	1120	✓

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Jeff Tucksen CHPRC	MAR 21 2018 1215	Daniel Klug CHPRC	MAR 21 2018 1215
Daniel Klug CHPRC	MAR 21 2018 1460	FEDEX	
Fed Ex		Chakeris Tarplin/ GEL Laboratories	3/22/18 0840

SPECIAL INSTRUCTIONS
TRVL-18-056;Water samples to be purged until field readings of DO stabilize at or above 7,000 µg/L and REDOX potential is at least 200 rMV

FINAL SAMPLE DISPOSITION | **DISPOSAL METHOD** | **DISPOSED BY** | **DATE/TIME**

PRINTED ON 3/20/2018 | FSR ID = FSR54734 | TRVL NUM = TRVL-18-056 | A-6003-618 (REV 3)

3/28/2018

REV.0

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 446404		F17-070-427	PAGE 1 OF 1
COLLECTOR Jeff Tucksen CHPRC	**COMPANY CONTACT** LYNCH, SA	**TELEPHONE NO.** 373-5586	**PROJECT COORDINATOR** LYNCH, SA	**REQUIRED TAT** 7 Days
SAMPLING LOCATION C9608, POST DEV	**PROJECT DESIGNATION** 200-UP-1 Remedial Action Wells Sampling and Analysis - Water		**SAF NO.** F17-070	ORIGINAL
ICE CHEST NO. GWS-392	**FIELD LOGBOOK NO.** HNF-N-645 6 - 88	**ACTUAL SAMPLE DEPTH** 296.45	**PURCHASE ORDER/CHARGE CODE** 300192	**METHOD OF SHIPMENT** FEDERAL EXPRESS
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 9210		**BILL OF LADING/AIR BILL NO.** 7718 0251 9899	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

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

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	Cool <=6C
HOLDING TIME	48 Hours
TYPE OF CONTAINER	P
NO. OF CONTAINER(S)	1
VOLUME	125mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3H8X2	Yes	WATER	MAR 21 2018	1120	~~1120~~ SAR 3-21-18

3/28/2018

CHAIN OF POSSESSION RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/ PRINT NAMES RECEIVED BY/STORED IN	DATE/TIME
Jeff Tucksen CHPRC	MAR 21 2018 1315	Daniel Klug CHPRC	MAR 21 2018 1315
Daniel Klug CHPRC	MAR 21 2018 1400	FEDEX	
Fed Ex		Chakeris Tarplin GEL Laboratories	3/22/18 0840

SPECIAL INSTRUCTIONS
TRVL-18-056;Water samples to be purged until field readings of DO stabilize at or above 7,000 µg/L and REDOX potential is at least 200 rMV
(1) 300.0_ANIONS_IC: COMMON {Chloride, Nitrogen in Nitrate, Sulfate};

12 of 62

REV.0

FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 3/20/2018 | FSR ID = FSR54734 | TRVL NUM = TRVL-18-056 | A-6003-618 (REV 3)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

#3

Client: CPRC	SDG/AR/COC/Work Order: 446404
Received By: C. Tarplin	Date Received: 03-22-2018
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 7717 9705 5798 771802519899

Suspected Hazard Information	Yes	No	
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?	X		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): (CPM) mR/Hr Classified as: (Rad 1) Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?		X	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	X			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: (Wet Ice) Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: 1°C
4	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: IR4-17 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	X			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	X			If Yes, Are Encores or Soil Kits present? Yes___ No X (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes X No___ N/A___ (If unknown, select No) VOA vials free of headspace? Yes X No___ N/A___ Sample ID's and containers affected:
8	Samples received within holding time?	X			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11	Number of containers received match number indicated on COC?	X			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			X	
13	COC form is properly signed in relinquished/received sections?	X			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials MEH Date 03/26/18 Page 1 of 1

GL-CHL-SR-001 Rev 5

Data Review Qualifier Definitions

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 (843) 556−8171

Report Date: 28−MAR−18

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 (0rganics 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 analyte was detected in the associated method blank >/= MDC or >5% sample activity.	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 >= 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 >= 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 28 March 2018

State	Certification
Alaska	17−018
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	LA180011
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122018−1
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−18−13
Utah NELAP	SC000122018−26
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL446404
Work Order #: 446404

Product: **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method: SW846 8260C
Analytical Procedure: GL-OA-E-038 REV# 26
Analytical Batch: 1750924

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

GEL Sample ID#	Client Sample Identification
446404002	B3H6X2
1203997962	Method Blank (MB)
1203997963	Laboratory Control Sample (LCS)
1203997964	446404002(B3H6X2) Post Spike (PS)
1203997965	446404002(B3H6X2) Post Spike Duplicate (PSD)

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL446404 GEL Work Order: 446404

The Qualifiers in this report are defined as follows:

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

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

DL Indicates that sample is diluted.

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

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: Erin Haubert **Name: Erin Haubert**

Date: 28 MAR 2018 **Title: Data Validator**

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**GEL446404**	**Date Collected:**	**03/21/2018 11:20**	**Matrix:**	**WATER**
Lab Sample ID:	**446404002**	**Date Received:**	**03/22/2018 08:40**		
		Client:	**CPRC001**	**Project:**	**CPRC0F17070**
Client ID:	**B3H6X2**	**Method:**	**SW846 8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1750924**	**Inst:**	**VOA3.I**	**Dilution:**	**1**
Run Date:	**03/28/2018 01:56**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**03/28/2018 01:56**				
Data File:	**032718V3\3B231.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	J	3.57	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	1.51	ug/L	0.300	2.00	5.00

Quality Control Summary

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

QC Summary

Report Date: March 28, 2018

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **446404**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1750924										
QC1203997963 LCS										
Carbon tetrachloride	50.0			56.8	ug/L		114	(70%-130%)	JP1	03/27/18 23:52
Trichloroethylene	50.0			55.8	ug/L		112	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			52.0	ug/L		104	(70%-130%)		
**Bromofluorobenzene	50.0			50.0	ug/L		100	(70%-130%)		
**Toluene-d8	50.0			48.3	ug/L		97	(70%-130%)		
QC1203997962 MB										
Carbon tetrachloride			U	0.300	ug/L					03/28/18 01:25
Trichloroethylene			U	0.300	ug/L					
**1,2-Dichloroethane-d4	50.0			50.3	ug/L		101	(70%-130%)		
**Bromofluorobenzene	50.0			51.4	ug/L		103	(70%-130%)		
**Toluene-d8	50.0			46.6	ug/L		93	(70%-130%)		
QC1203997964 446404002 PS										
Carbon tetrachloride	50.0	J	3.57	58.6	ug/L		110	(70%-130%)		03/28/18 04:00
Trichloroethylene	50.0	J	1.51	53.7	ug/L		104	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		51.1	52.9	ug/L		106	(70%-130%)		

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QC Summary

Workorder: **446404**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1750924											
**Bromofluorobenzene	50.0		50.3		49.4	ug/L		99	(70%-130%)	JP1	03/28/18 04:00
**Toluene-d8	50.0		49.1		48.7	ug/L		97	(70%-130%)		
QC1203997965 446404002 PSD											
Carbon tetrachloride	50.0	J	3.57		56.0	ug/L	5	105	(0%-20%)		03/28/18 04:31
Trichloroethylene	50.0	J	1.51		51.2	ug/L	5	99	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		51.1		51.5	ug/L		103	(70%-130%)		
**Bromofluorobenzene	50.0		50.3		47.2	ug/L		94	(70%-130%)		
**Toluene-d8	50.0		49.1		45.8	ug/L		92	(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 (0rganics only)

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QC Summary

Workorder: **446404**

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

Volatile

Surrogate Recovery Report

SDG Number: **GEL446404**

Matrix Type: **LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203997963	LCS for batch 1750924	104	97	100
1203997962	MB for batch 1750924	101	93	103
446404002	B3H6X2	102	98	101
1203997964	B3H6X2PS	106	97	99
1203997965	B3H6X2PSD	103	92	94

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

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL446404
Work Order #: 446404

Product: **Determination of Metals by ICP-MS**
Analytical Method: SW846 3005A/6020B
Analytical Procedure: GL-MA-E-014 REV# 32
Analytical Batch: 1749473

Preparation Method: SW846 3005A
Preparation Procedure: GL-MA-E-006 REV# 14
Preparation Batch: 1749471

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

GEL Sample ID#	Client Sample Identification
446404001	B3H6X0
1203994739	Method Blank (MB)**ICP-MS**
1203994740	Laboratory Control Sample (LCS)
1203994743	446404001(B3H6X0L) Serial Dilution (SD)
1203994741	446404001(B3H6X0S) Matrix Spike (MS)
1203994742	446404001(B3H6X0SD) 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

ICSA/ICSAB Statement
For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Certification Statement

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

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL446404 GEL Work Order: 446404

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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: Nik-Cole Elmore**

Date: 27 MAR 2018 **Title: Data Validator**

Sample Data Summary

GEL Laboratories LLC

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL446404 **CONTRACT:** CPRC0F17070 **METHOD TYPE:** SW846

SAMPLE ID: 446404001 **BASIS:** As Received **DATE COLLECTED** 21−MAR−18

CLIENT ID: B3H6X0 **LEVEL:** Low **DATE RECEIVED** 22−MAR−18

MATRIX: WATER **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−47−3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	03/23/18 20:14	180323−1	1749473
7439−96−5	Manganese	63.7	ug/L		1	5	5	1	MS	BAJ	03/23/18 20:14	180323−1	1749473
7440−61−1	Uranium	1.47	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/24/18 03:13	180323−3	1749473

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1749473	1749471	SW846 3005A	50	mL	50	mL	03/22/18	JXM8

***Analytical Methods:**

MS **SW846 3005A/6020B**

Quality Control Summary

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

QC Summary

Report Date: March 27, 2018

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **446404**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1749473										
QC1203994740 LCS										
Chromium	50.0			46.0	ug/L		92.1	(80%-120%)	BAJ	03/23/18 20:11
Manganese	50.0			46.0	ug/L		92	(80%-120%)		
Uranium	50.0			46.5	ug/L		93	(80%-120%)		03/24/18 03:10
QC1203994739 MB										
Chromium			U	3.00	ug/L					03/23/18 20:08
Manganese			U	1.00	ug/L					
Uranium			U	0.067	ug/L					03/24/18 03:07
QC1203994741 446404001 MS										
Chromium	50.0	U 3.00		47.1	ug/L		89.7	(75%-125%)		03/23/18 20:18
Manganese	50.0	63.7		108	ug/L		89.2	(75%-125%)		
Uranium	50.0	1.47		48.8	ug/L		94.6	(75%-125%)		03/24/18 03:16
QC1203994742 446404001 MSD										
Chromium	50.0	U 3.00		48.7	ug/L	3.35	92.9	(0%-20%)		03/23/18 20:21
Manganese	50.0	63.7		107	ug/L	1.4	86.2	(0%-20%)		
Uranium	50.0	1.47		49.0	ug/L	0.42	95	(0%-20%)		03/24/18 03:20

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QC Summary

Workorder: **446404**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1749473										
QC1203994743 446404001 SDILT										
Chromium	U	2.25	DU	15.0	ug/L	N/A		(0%-20%)	BAJ	03/23/18 20:27
Manganese		63.7	D	12.5	ug/L	2.1		(0%-20%)		
Uranium		1.47	D	0.303	ug/L	3.06		(0%-20%)		03/24/18 03:26

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

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL446404
Work Order #: 446404

Product: **Ion Chromatography**
Analytical Method: 300.0_ANIONS_IC
Analytical Procedure: GL-GC-E-086 REV# 25
Analytical Batch: 1749458

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

GEL Sample ID#	Client Sample Identification
446404003	B3H8X2
1203994715	Method Blank (MB)
1203994716	Laboratory Control Sample (LCS)
1203994717	446405002(NonSDG) Sample Duplicate (DUP)
1203994718	446405002(NonSDG) Post Spike (PS)

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

Holding Times
Sample (See Below) was initially analyzed within holding; however, the holding time had expired prior to reanalysis of diluted sample. The data is qualified.

Sample	Analyte	Value
1203994718 (Non SDG 446405002PS)	Chloride, Nitrate and Sulfate	Received 22-MAR-18, within holding, analyzed 22-MAR-18, out of holding 22-MAR-18

Sample Dilutions
The following samples 1203994717 (Non SDG 446405002DUP), 1203994718 (Non SDG 446405002PS) and 446404003 (B3H8X2) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	446404 003
Chloride	20X
Nitrate	20X
Sulfate	20X

Certification Statement

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

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL446404 GEL Work Order: 446404

The Qualifiers in this report are defined as follows:

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.

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

Review/Validation

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

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

Signature:  **Name: Aubrey Kingsbury**

Date: 28 MAR 2018 **Title: Analyst I**

Sample Data Summary

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

Certificate of Analysis

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF F17-070

Client Sample ID: B3H8X2
Sample ID: 446404003
Matrix: WATER
Collect Date: 21-MAR-18 11:20
Receive Date: 22-MAR-18
Collector: Client

Project: CPRC0F17070
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
300.0_ANIONS_IC: COMMON "As Received"												
Chloride	D	22200	1340	4000	ug/L		20	JXH5	03/23/18	1033	1749458	1
Nitrate-N	D	54100	660	2000	ug/L		20					
Sulfate	D	33100	2660	8000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	300.0_ANIONS_IC	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Quality Control Summary

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

QC Summary

Report Date: March 28, 2018

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **446404**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography												
Batch 1749458												
QC1203994717 446405002 DUP												
Chloride		D	15100	D	15100	ug/L	0		(0%-20%)	JXH5	03/22/18	15:08
Nitrate-N		D	12900	D	12800	ug/L	0.237		(0%-20%)			
Sulfate		D	49600	D	49900	ug/L	0.5		(0%-20%)			
QC1203994716 LCS												
Chloride	5000				4700	ug/L		94.1	(80%-120%)		03/22/18	18:14
Nitrate-N	2500				2400	ug/L		96.1	(80%-120%)			
Sulfate	10000				9780	ug/L		97.8	(80%-120%)			
QC1203994715 MB												
Chloride				U	67.0	ug/L					03/22/18	17:43
Nitrate-N				U	33.0	ug/L						
Sulfate				U	133	ug/L						
QC1203994718 446405002 PS												
Chloride	5.00	D	3.03	D	8.16	mg/L		103	(75%-125%)		03/22/18	16:41
Nitrate-N	2.50	D	2.58	DX	5.25	mg/L		107	(75%-125%)			
Sulfate	10.0	D	9.92	D	20.5	mg/L		105	(75%-125%)			

Notes:

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QC Summary

Workorder: **446404**

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

The Qualifiers in this report are defined as follows:

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL446404
Work Order #: 446404

Product: **I129LL_SEP_LEPS_GS: COMMON (low level)**
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Procedure: GL-RAD-A-006 REV# 21
Analytical Batch: 1749688

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

GEL Sample ID#	Client Sample Identification
446404001	B3H6X0
1203995217	Method Blank (MB)
1203995218	446398002(NonSDG) Sample Duplicate (DUP)
1203995219	446398002(NonSDG) Matrix Spike (MS)
1203995220	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **9310_ALPHABETA_GPC: COMMON**
Analytical Method: 9310_ALPHABETA_GPC
Analytical Procedure: GL-RAD-A-001 REV# 19
Analytical Batch: 1749678

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

GEL Sample ID#	Client Sample Identification
446404001	B3H6X0
1203995176	Method Blank (MB)
1203995177	446404001(B3H6X0) Sample Duplicate (DUP)
1203995178	446404001(B3H6X0) Matrix Spike (MS)
1203995179	446404001(B3H6X0) Matrix Spike Duplicate (MSD)
1203995180	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

Duplication Criteria between QC Sample and Duplicate Sample
The QC Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1203995177 (B3H6X0DUP)	ALPHA	RPD 21.1* (0.00%-20.00%) RER 0.816 (0-2)

Technical Information

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.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1203995178 (B3H6X0MS) and 1203995179 (B3H6X0MSD), aliquots were reduced to conserve sample volume.

Product: **TC99_EIE_LSC: COMMON**
Analytical Method: TC99_EIE_LSC
Analytical Procedure: GL-RAD-A-059 REV# 5
Analytical Batch: 1749530

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

GEL Sample ID#	Client Sample Identification
446404001	B3H6X0
1203994874	Method Blank (MB)
1203994875	446404001(B3H6X0) Sample Duplicate (DUP)
1203994876	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **TRITIUM_DIST_LSC: COMMON**
Analytical Method: TRITIUM_DIST_LSC
Analytical Procedure: GL-RAD-A-002 REV# 22
Analytical Batch: 1749620

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

GEL Sample ID#	Client Sample Identification
446404001	B3H6X0
1203995044	Method Blank (MB)
1203995045	446404001(B3H6X0) Sample Duplicate (DUP)
1203995046	446404001(B3H6X0) Matrix Spike (MS)
1203995047	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.

Miscellaneous Information

Additional Comments
The matrix spike, 1203995046 (B3H6X0MS), aliquot was reduced to conserve sample volume.

Certification Statement

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

GEL LABORATORIES LLC

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL446404 GEL Work Order: 446404

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: Heather McCarty **Name:** **Heather McCarty**

Date: **28 MAR 2018** **Title:** **Analyst II**

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL446404**	**Client:**	**CPRC001**	**Project:**	**CPRC0F17070**
Lab Sample ID:	**446404001**	**Date Collected:**	**03/21/2018 11:20**	**Matrix:**	**WATER**
		Date Received:	**03/22/2018 08:40**		
Client ID:	**B3H6X0**			**Prep Basis:**	**"As Received"**
Batch ID:	**1749678**	**Method:**	**9310_ALPHABETA_GPC**	**SOP Ref:**	**GL-RAD-A-001**
Run Date:	**03/23/2018 13:20**	**Analyst:**	**JXK3**	**Instrument:**	**PIC2C**
Data File:	**AB1749678.xls**	**Aliquot:**	**150 mL**	**Count Time:**	**120 min**
Prep Batch:	**1749678**	**Prep Method:**	**EPA 900.0/SW846 9310**		
Prep Date:	**03/23/2018 08:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha *ALPHA*		14.7	pCi/L	+/-4.22	5.29	2.91	3.00
12587-47-2	Beta *BETA*		210	pCi/L	+/-6.77	35.0	1.47	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL446404**	**Client:**	**CPRC001**	**Project:**	**CPRC0F17070**
Lab Sample ID:	**446404001**	**Date Collected:**	**03/21/2018 11:20**	**Matrix:**	**WATER**
		Date Received:	**03/22/2018 08:40**		
Client ID:	**B3H6X0**			**Prep Basis:**	**"As Received"**
Batch ID:	**1749688**	**Method:**	**DOE EML HASL-300,I-01 Mo**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**03/26/2018 08:10**	**Analyst:**	**BSW1**	**Instrument:**	**XRAY6**
Data File:	**I446404001.CNF;1**	**Aliquot:**	**1.2 L**	**Count Time:**	**120 min**
Prep Batch:	**1749688**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**03/23/2018 11:18**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.671	pCi/L	+/-0.650	0.654	0.707	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL446404**	**Client:**	**CPRC001**	**Project:**	**CPRC0F17070**
Lab Sample ID:	**446404001**	**Date Collected:**	**03/21/2018 11:20**	**Matrix:**	**WATER**
		Date Received:	**03/22/2018 08:40**		
Client ID:	**B3H6X0**			**Prep Basis:**	**"As Received"**
Batch ID:	**1749530**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**03/28/2018 05:50**	**Analyst:**	**CXS7**	**Instrument:**	**LSCBLUE**
Data File:	**E1749530.xls**	**Aliquot:**	**100 mL**	**Count Time:**	**15 min**
Prep Batch:	**1749530**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**03/22/2018 13:49**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		335	pCi/L	+/-36.3	51.8	43.1	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	34400	36500	CPM	94.2	(30%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL446404**	**Client:**	**CPRC001**	**Project:**	**CPRC0F17070**
Lab Sample ID:	**446404001**	**Date Collected:**	**03/21/2018 11:20**	**Matrix:**	**WATER**
		Date Received:	**03/22/2018 08:40**		
Client ID:	**B3H6X0**			**Prep Basis:**	**"As Received"**
Batch ID:	**1749620**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**03/23/2018 13:00**	**Analyst:**	**MXH8**	**Instrument:**	**LSCBLUE**
Data File:	**T1749620.xls**	**Aliquot:**	**50 mL**	**Count Time:**	**50 min**
Prep Batch:	**1749620**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**03/23/2018 08:21**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		15400	pCi/L	+/-520	3020	282	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

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

Workorder: **446404**

Report Date: March 28, 2018

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1749688									
QC1203995217 MB									
Iodine-129			U	0.0328	pCi/L			BSW1	03/26/1808:14
Uncert:				+/-0.304					
TPU:				+/-0.304					
QC1203995218 446398002 DUP									
Iodine-129	U	0.436	U	-0.14	pCi/L				03/26/1809:33
Uncert:		+/-0.328		+/-0.361		RPD: 0	N/A		
TPU:		+/-0.385		+/-0.367		RER: 2.12	(0-2)		
QC1203995219 446398002 MS									
Iodine-129	34.7 U	0.436		32.5	pCi/L	REC: 92	(75%-125%)		03/26/1810:31
Uncert:		+/-0.328		+/-4.22					
TPU:		+/-0.385		+/-5.33					
QC1203995220 LCS									
Iodine-129	34.7			27.9	pCi/L	REC: 81	(80%-120%)		03/26/1811:37
Uncert:				+/-2.97					
TPU:				+/-4.07					
Rad Gas Flow									
Batch 1749678									
QC1203995176 MB									
Alpha			U	0.437	pCi/L			JXK3	03/23/1813:20
Uncert:				+/-1.39					
TPU:				+/-1.39					
Beta			U	-0.0625	pCi/L				
Uncert:				+/-1.51					
TPU:				+/-1.51					
QC1203995177 446404001 DUP									
Alpha		14.7		18.1	pCi/L				03/23/1813:20
Uncert:		+/-4.22		+/-4.81		RPD: 21*	(0%-20%)		
TPU:		+/-5.29		+/-6.40		RER: 0.816	(0-2)		
Beta		210		222	pCi/L				
Uncert:		+/-6.77		+/-6.92		RPD: 6	(0%-20%)		
TPU:		+/-35.0		+/-37.2		RER: 0.459	(0-2)		
QC1203995178 446404001 MS									
Alpha	403	14.7		440	pCi/L	REC: 106	(75%-125%)		
Uncert:		+/-4.22		+/-45.2					
TPU:		+/-5.29		+/-87.7					
Beta	1570	210		1930	pCi/L	REC: 110	(75%-125%)		
Uncert:		+/-6.77		+/-62.5					
TPU:		+/-35.0		+/-321					
QC1203995179 446404001 MSD									
Alpha	403	14.7		461	pCi/L	REC: 111	(75%-125%)		03/23/1813:20
Uncert:		+/-4.22		+/-46.4		RPD: 5	(0%-20%)		
TPU:		+/-5.29		+/-91.2		RER: 0.331	(0-2)		
Beta	1570	210		2040	pCi/L	REC: 117	(75%-125%)		
Uncert:		+/-6.77		+/-65.8		RPD: 6	(0%-20%)		

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QC Summary

Workorder: **446404**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch 1749678									
	TPU:	+/-35.0		+/-349					
						RER: 0.469	(0-2)		
QC1203995180 LCS									
Alpha	80.6			84.6	pCi/L	REC: 105	(80%-120%)		03/23/1813:20
	Uncert:			+/-7.88					
	TPU:			+/-16.2					
Beta	313			343	pCi/L	REC: 109	(80%-120%)		
	Uncert:			+/-12.0					
	TPU:			+/-57.2					
Rad Liquid Scintillation									
Batch 1749530									
QC1203994874 MB									
Technetium-99			U	-19.7	pCi/L			CXS7	03/28/1806:06
	Uncert:			+/-23.0					
	TPU:			+/-23.0					
**Technetium-99m Tracer	36500			36000	CPM	REC: 98	(30%-105%)		
QC1203994875 446404001 DUP									
Technetium-99		335		343	pCi/L				03/28/1806:23
	Uncert:	+/-36.3		+/-36.3		RPD: 3	(0%-20%)		
	TPU:	+/-51.8		+/-52.5		RER: 0.229	(0-2)		
**Technetium-99m Tracer	36500	34400		35200	CPM	REC: 96	(30%-105%)		
QC1203994876 LCS									
Technetium-99	888			791	pCi/L	REC: 89	(80%-120%)		03/28/1806:39
	Uncert:			+/-45.9					
	TPU:			+/-98.7					
**Technetium-99m Tracer	36500			36800	CPM	REC: 101	(30%-105%)		
Batch 1749620									
QC1203995044 MB									
Tritium			U	69.2	pCi/L			MXH8	03/23/1813:53
	Uncert:			+/-165					
	TPU:			+/-165					
QC1203995045 446404001 DUP									
Tritium		15400		16600	pCi/L				03/23/1814:45
	Uncert:	+/-520		+/-546		RPD: 8	(0%-20%)		
	TPU:	+/-3020		+/-3260		RER: 0.549	(0-2)		
QC1203995046 446404001 MS									
Tritium	5130	15400		21600	pCi/L	REC: 121	(75%-125%)		03/23/1815:37
	Uncert:	+/-520		+/-905					
	TPU:	+/-3020		+/-4270					
QC1203995047 LCS									
Tritium	2570			2250	pCi/L	REC: 88	(80%-120%)		03/23/1816:29
	Uncert:			+/-252					
	TPU:			+/-502					

Notes:

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

The Qualifiers in this report are defined as follows:

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QC Summary

Workorder: **446404**

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

*	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 analyte was detected in the associated method blank >/= MDC or >5% sample activity.
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 (0rganics 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 acceptence 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.