

April 03, 2018

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

Re: CHPRC SAF F16-045
Work Order: 445372
SDG: GEL445372

Dear Mr. Fitzgerald:

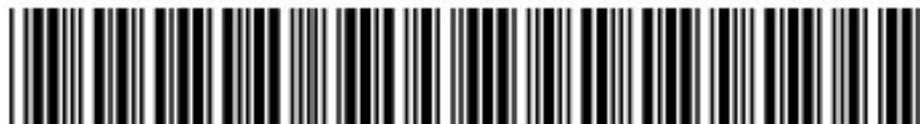
GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 07, 2018. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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: 304235 - 7C
Chain of Custody: F16-045-1027, F16-045-1031, F16-045-1033, F16-045-1036, F16-045-1040, F16-045-1043,
F16-045-1046 and F16-045-996
Enclosures



SAMPLE ISSUE RESOLUTION (SIR) REPORT		SIR Number: SIR18-0528
		Rev. Number: 0
		Date Initiated: 03/08/2018
<u>SAMPLE EVENT INFORMATION</u>		
SAF NUM(S):	F16-045	
LABORATORY:	GEL	
<u>SAMPLING INFORMATION</u>		
NUMBER OF SAMPLES:	1	
SAMPLE NUMBERS:	B3HW19	
SAMPLE MATRIX:	WATER	
SDG NUM(S):	GEL445372	
<u>ISSUE BACKGROUND</u>		
CLASS:	Field Sampling Issue	
TYPE:	Insufficient Sample Volume Collected	
DESCRIPTION:	One vial for 8260_VOA analysis on sample ID B3HW19 was received with headspace	
<u>RESOLUTION</u>		
PROPOSED RESOLUTION:	The lab will avoid using this vial.	
FINAL RESOLUTION:	Accept proposed resolution	
SUBMITTED BY:		
SHAFFER, H	_____	03/08/2018 _____
ACCEPTED BY:		
NAGEL, SE	_____	03/08/2018 _____

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Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F16-045
SDG: GEL445372**

April 03, 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 07, 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:

<u>Laboratory Identification</u>	<u>Sample Description</u>
445372001	B3HW49
445372002	B3HW53
445372003	B3HW58
445372004	B3HW78
445372005	B3HW62
445372006	B3HW65
445372007	B3HW19
445372008	B3HW55

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
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL445372
Work Order #: 445372

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.

Technical Information

Sample Dilutions/Methanol Dilutions

Samples were diluted because target analyte concentrations exceeded the calibration range.

Analyte	445372			
	001	004	005	007
Several	2X 1X	4X 1X	2X	40X 1X

Sample Re-extraction/Re-analysis

Sample 445372002 (B3HW53) was re-analyzed and reported due to possible carry-over from a previously analyzed sample.

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 the data were not adversely affected. 445372001 (B3HW49), 445372002 (B3HW53), 445372003 (B3HW58), 445372004 (B3HW78), 445372005 (B3HW62), 445372006 (B3HW65) and 445372007 (B3HW19).

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

Cyanide, Total

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.

Cyanide, Chlorinated

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.

Cyanide, Amenable to Chlorination

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.

Cyanide, Free

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.

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.

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.

C14_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 445372007 (B3HW19) was recounted to verify sample results. Recount is reported. Sample 1203986389 (Non SDG 445297005DUP) was recounted due to results more negative than the three sigma TPU. The second count is 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 1203986413 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Miscellaneous Information**Additional Comments**

The matrix spike, 1203986415 (Non SDG 445294001MS), 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

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 445372				F16-045-1027	PAGE 1 OF 1
COLLECTOR Barbara Briggs /CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC		REQUIRED TAT 30 Days		
SAMPLING LOCATION Valve V03-YE21, 289TF, 299-W22-90		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling		SAF NO. F16-045	ORIGINAL		
ICE CHEST NO. 6WS-592	FIELD LOGBOOK NO. HNF-N-49119	ACTUAL SAMPLE DEPTH N/A		PURCHASE ORDER/CHARGE CODE 304235	METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9118		BILL OF LADING/AIR BILL NO. 7717 3347 4017			
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.	PRESERVATION	HCl or H2SO4 to pH <2/Cool <=6C	HNO3 to pH <2	HNO3 to pH <2	None	None
		HOLDING TIME	14 Days	6 Months	6 Months	6 Months	6 Months
		TYPE OF CONTAINER	aGs*	G/P	G/P	P	G/P
		NO. OF CONTAINER(S)	4	1	1	1	4
		VOLUME	40mL	500mL	500mL	1L	1L
SPECIAL HANDLING AND/OR STORAGE N/A	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON;	I129LL_SEP_LE PS_GS: COMMON;	
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B3HW49	N/A	WATER	MAR 06 2018	10500	✓	✓	✓

APRIL 3, 2018

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
Barbara Briggs /CHPRC	MAR 06 2018 1140	Daniel Klug /CHPRC	MAR 06 2018 1140	TRVL-18-083	
Daniel Klug /CHPRC	MAR 06 2018	FEDEX		(1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene};	
		C. Taplin	3/7/18	(2) 6020_METALS_ICPMS: COMMON {Aluminum, Cadmium, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron};	
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 445372				F16-045-1031	PAGE 1 OF 1	
COLLECTOR Barbara Briggs /CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC		REQUIRED TAT 30 Days			
SAMPLING LOCATION Valve V03-YE22 289TF, 299-W22-91		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling		SAF NO. F16-045	ORIGINAL			
ICE CHEST NO. 6WS-59Z	FIELD LOGBOOK NO. HNF-N-49119	ACTUAL SAMPLE DEPTH N/A	PURCHASE ORDER/CHARGE CODE 304235	METHOD OF SHIPMENT FEDERAL EXPRESS				
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9118	BILL OF LADING/AIR BILL NO. 7717 3347 4017					
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.		PRESERVATION	HCl or H2SO4 to pH <2/Cool <=6C	HNO3 to pH <2	HNO3 to pH <2	None	None
			HOLDING TIME	14 Days	6 Months	6 Months	6 Months	6 Months
			TYPE OF CONTAINER	aGs*	G/P	G/P	P	G/P
			NO. OF CONTAINER(S)	4	1	1	1	4
			VOLUME	40mL	500mL	500mL	1L	1L
	SPECIAL HANDLING AND/OR STORAGE N/A		SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS.	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON;	I129LL_SEP_LE PS_GS: COMMON;
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B3HW53	N/A	WATER	MAR 06 2018	0945	✓	✓	✓	

APRIL 3, 2018

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-18-083	
Barbara Briggs /CHPRC	MAR 06 2018 1140	Daniel Klug CHPRC	MAR 06 2018 1140	(1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene};	
Daniel Klug CHPRC	MAR 06 2018 1140	FEDEX		(2) 6020_METALS_ICPMS: COMMON {Aluminum, Cadmium, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron};	
		C. Tarplin	3/7/18 0900		
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 445372				F16-045-1036	PAGE 1 OF 1	
COLLECTOR Barbara Briggs /CHPRC		COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC		REQUIRED TAT 30 Days		
SAMPLING LOCATION Valve V03-YE23, 289TF, 299-W22-92		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling		SAF NO. F16-045		ORIGINAL		
ICE CHEST NO. 6WS-592		FIELD LOGBOOK NO. HNF-N-49119	ACTUAL SAMPLE DEPTH N/A	PURCHASE ORDER/CHARGE CODE 304235		METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9118		BILL OF LADING/AIR BILL NO. 7717 3347 4017				
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.	PRESERVATION	HCl or H2SO4 to pH <2/Cool <=6C	HNO3 to pH <2	HNO3 to pH <2	None	None	
		HOLDING TIME	14 Days	6 Months	6 Months	6 Months	6 Months	
		TYPE OF CONTAINER	aGs*	G/P	G/P	P	G/P	
		NO. OF CONTAINER(S)	4	1	1	1	4	
		VOLUME	40mL	500mL ✓	500mL ✓	1L	1L	
		SPECIAL HANDLING AND/OR STORAGE N/A	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON;	I129LL_SEP_LE PS_GS: COMMON;
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B3HW58	N/A	WATER	MAR 06 2018	1045	✓	✓	✓	✓

APRIL 3, 2018

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-18-083	
Barbara Briggs /CHPRC	MAR 06 2018 1140	Daniel Klug CHPRC	MAR 06 2018 1140	(1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene};	
Daniel Klug CHPRC	MAR 06 2018 1400	FEDEX		(2) 6020_METALS_ICPMS: COMMON {Aluminum, Cadmium, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron};	
		C. Tarplin	3/7/18 0900		
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

44 LDS

CH2MHill Plateau Remediation Company		445372	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F16-045-1040	PAGE 1 OF 1	
COLLECTOR Barbara Briggs /CHPRC		COMPANY CONTACT SUMNER, LC		TELEPHONE NO. 376-3922		PROJECT COORDINATOR SUMNER, LC		REQUIRED TAT 30 Days	
SAMPLING LOCATION Valve V04-YE24, 289TA, 299-W19-125		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling			SAF NO. F16-045		ORIGINAL		
ICE CHEST NO. 605-733		FIELD LOGBOOK NO. HNF-N-49119		ACTUAL SAMPLE DEPTH N/A		PURCHASE ORDER/CHARGE CODE 304235		METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9115			BILL OF LADING/AIR BILL NO. 7717 3051 2354				
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.		PRESERVATION		HCl or H2SO4 to pH <2/Cool <=6C	HNO3 to pH <2	HNO3 to pH <2	None	None
	SPECIAL HANDLING AND/OR STORAGE N/A		HOLDING TIME		14 Days	6 Months	6 Months	6 Months	6 Months
			TYPE OF CONTAINER		aGs*	G/P	G/P	P	G/P
			NO. OF CONTAINER(S)		4	1	1	1	4
			VOLUME		40mL	500mL	500mL	1L	1L
			SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON;	I129LL_SEP_LE PS_GS: COMMON;
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B3HW78	No	WATER	MAR 06 2018	0815	✓	✓	✓	✓	✓

APRIL 3, 2018

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-18-083 (1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene}; (2) 6020_METALS_ICPMS: COMMON {Aluminum, Cadmium, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron};	
Barbara Briggs /CHPRC	MAR 06 2018 0920	Daniel Klug /CHPRC	MAR 06 2018 0920		
Daniel Klug /CHPRC	MAR 06 2018 1400	FEDEX			
		C-Tamplin	3/7/18 0950		

FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 445372				F16-045-1043	PAGE 1 OF 1
COLLECTOR Barbara Briggs /CHPRC		COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC		REQUIRED TAT 30 Days	
SAMPLING LOCATION Valve V18-YE25, 289TA, 299-W19-113		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling		SAF NO. F16-045		ORIGINAL	
ICE CHEST NO. GWS-733		FIELD LOGBOOK NO. HNF-N-49119	ACTUAL SAMPLE DEPTH N/A	PURCHASE ORDER/CHARGE CODE 304235		METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9115	BILL OF LADING/AIR BILL NO. 7717 3051 2354				
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.	PRESERVATION	HCl or H2SO4 to pH <2/Cool <=6C	HNO3 to pH <2	HNO3 to pH <2	None	None
		HOLDING TIME	14 Days	6 Months	6 Months	6 Months	6 Months
		TYPE OF CONTAINER	aGs*	G/P	G/P	P	G/P
		NO. OF CONTAINER(S)	4	1	1	1	4
		VOLUME	40mL	500mL	500mL	1L	1L
	SPECIAL HANDLING AND/OR STORAGE N/A	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON;	I129LL_SEP_LE PS_GS: COMMON;
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B3HW62	N/A	WATER	MAR 06 2018	0845	✓	✓	✓

APRIL 3, 2018

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-18-083	
Barbara Briggs /CHPRC	MAR 06 2018 0910	Daniel Klug /CHPRC	MAR 06 2018 0910	(1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene};	
Daniel Klug /CHPRC	MAR 06 2018 /400	FEDEX		(2) 6020_METALS_ICPMS: COMMON {Aluminum, Cadmium, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron};	
		C. Tarelin	3/7/18		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME		

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REV. 0

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 445372				F16-045-1046	PAGE 1 OF 1	
COLLECTOR Barbara Briggs /CHPRC		COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC		REQUIRED TAT 30 Days		
SAMPLING LOCATION Valve V18-YE26, 289TA, 299-W19-114		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling		SAF NO. F16-045		ORIGINAL		
ICE CHEST NO. 6WS-733		FIELD LOGBOOK NO. HNF-N-49119	ACTUAL SAMPLE DEPTH N/A	PURCHASE ORDER/CHARGE CODE 304235		METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9115	BILL OF LADING/AIR BILL NO. 7717 3051 2354					
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.		PRESERVATION	HCl or H2SO4 to pH <2/Cool <=6C	HNO3 to pH <2	HNO3 to pH <2	None	None
			HOLDING TIME	14 Days	6 Months	6 Months	6 Months	6 Months
			TYPE OF CONTAINER	aGs*	G/P	G/P	P	G/P
			NO. OF CONTAINER(S)	4	1	1	1	4
			VOLUME	40mL	500mL	500mL	1L	1L
	SPECIAL HANDLING AND/OR STORAGE N/A		SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON;	I129LL_SEP_LE PS_GS: COMMON;
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B3HW65	N/A	WATER	MAR 06 2018	0900	✓	✓	✓	

APRIL 3, 2018

CHAIN OF POSSESSION RELINQUISHED BY/REMOVED FROM Barbara Briggs /CHPRC		SIGN/ PRINT NAMES RECEIVED BY/STORED IN Daniel Klug /CHPRC	SPECIAL INSTRUCTIONS TRVL-18-083 (1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene}; (2) 6020_METALS_ICPMS: COMMON {Aluminum, Cadmium, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron};
DATE/TIME	DATE/TIME	DATE/TIME	
MAR 06 2018 0920	MAR 06 2018 0920	MAR 06 2018 0920	
Daniel Klug /CHPRC	Fed Ex	C. Tarplin /CHPRC	3/7/18 0920
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

86105

CH2M Hill Plateau Remediation Company		445372		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F16-045-996	PAGE 1 OF 1
COLLECTOR Tim Callaway /CHPRC		COMPANY CONTACT SUMNER, LC		TELEPHONE NO. 376-3922		PROJECT COORDINATOR SUMNER, LC		REQUIRED TAT 30 Days	
SAMPLING LOCATION Valve V03-YE07, 289TC, 299-W11-90		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling				SAF NO. F16-045		ORIGINAL	
ICE CHEST NO. GWS-740		FIELD LOGBOOK NO. HNF-N-49119		ACTUAL SAMPLE DEPTH N/A		PURCHASE ORDER/CHARGE CODE 304235		METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9113		BILL OF LADING/AIR BILL NO. 77117 28510888					
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.		PRESERVATION HCl or H2SO4 to pH <2/Cool <=6C		HNO3 to pH <2	HNO3 to pH <2	None	None	NaOH to pH >=12/Cool <=6C
			HOLDING TIME 14 Days		6 Months	6 Months	6 Months	6 Months	14 Days
			TYPE OF CONTAINER aGs*		G/P	G/P	P	G/P	aG
			NO. OF CONTAINER(S) 4		1	1	1	4	1
			VOLUME 40mL		500mL	500mL	1L	1L	500mL
	SPECIAL HANDLING AND/OR STORAGE N/A		SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS		SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST_LSC: COMMON; C14_LSC: COMMON;	I129LL_SEP_LE PS_GS: COMMON;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B3HW19	N/A	WATER	MAR 05 2018	1215	✓	✓	✓	✓	✓

APRIL 3, 2018

CHAIN OF POSSESSION RELINQUISHED BY/REMOVED FROM Tim Callaway /CHPRC		DATE/TIME MAR 05 2018 1215	SIGN/ PRINT NAMES RECEIVED BY/STORED IN SSU-1	DATE/TIME MAR 05 2018 1245	SPECIAL INSTRUCTIONS TRVL-18-083 (1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene}; (2) 6020_METALS_ICPMS: COMMON {Aluminum, Cadmium, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron}; (3) 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON;
SSU-1		MAR 06 2018 0715	Leaky Wall /CHPRC	MAR 06 2018 0715	
Leaky Wall /CHPRC		MAR 06 2018 1400	FEDEX	MAR 06 2018 1400	
Fed Ex		MAR 06 2018 1400	C. Tarplin	3/7/18 0900	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY			DATE/TIME

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REV. 0

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 445372			F16-045-1033	PAGE 1 OF 1
COLLECTOR Barbara Briggs /CHPRC		COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC	REQUIRED TAT 30 Days	
SAMPLING LOCATION Valve V03-YE22 289TF, 299-W22-91 FXR		PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling		SAF NO. F16-045	ORIGINAL	
ICE CHEST NO. GWS-592		FIELD LOGBOOK NO. HNF-N-49119	ACTUAL SAMPLE DEPTH N/A	PURCHASE ORDER/CHARGE CODE 304235	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. 9118		BILL OF LADING/AIR BILL NO. 7717 3347 4017		
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.		PRESERVATION HCl or H2SO4 to pH <2/Cool <=6C			
			HOLDING TIME 14 Days			
			TYPE OF CONTAINER aGs*			
			NO. OF CONTAINER(S) 4			
			VOLUME 40mL			
	SPECIAL HANDLING AND/OR STORAGE N/A		SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS			
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B3HW55	N/A	WATER	MAR 06 2018	0945	✓	

APRIL 3, 2018

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
Barbara Briggs /CHPRC	MAR 06 2018 1140	Daniel Klug CHPRC	MAR 06 2018 1140	TRVL-18-083	
Daniel Klug CHPRC	MAR 06 2018 1400	FEDEX		(1) 8260_VOA_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene};	
Fed Ex		C. Tarplin	3/7/18		
			0900		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	

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REV. 0



SAMPLE RECEIPT & REVIEW FORM

#5

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>445372</u>		
Received By: <u>Chakeris Tarplin</u>		Date Received: <u>March 07, 2018</u>		
Carrier and Tracking Number		Circle Applicable:		
		<input type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other		
		771730512354 (2.c) 771728511439 (2.c) 771728510888 (2.c) 771728511196 (2.c) 771735096241 (2.c) 771734188526 (2.c) 771728510947 (1.c) 771733474017 (2.c)		
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.		
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____		
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM/mR/Hr Classified as: <u>Rad 1</u> Rad 2 Rad 3		
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:		
Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3 Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice <u>None</u> Other: *all temperatures are recorded in Celsius TEMP: _____
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>IR4-17</u> Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>			If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No _____ N/A _____ (If unknown, select No) VOA vials free of headspace? Yes _____ No <input checked="" type="checkbox"/> N/A _____ Sample ID's and containers affected: <u>B3FVR8 125</u> <u>B3HW19 124</u>
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
Comments (Use Continuation Form if needed):				

PM (or PMA) review: Initials MGH Date 3/8/18 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 analyte was detected in the associated method blank \geq 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 \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 03 April 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 #: GEL445372
Work Order #: 445372**

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

Analytical Method: SW846 8260C

Analytical Procedure: GL-OA-E-038 REV# 26

Analytical Batch: 1747154

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372001	B3HW49
445372002	B3HW53
445372003	B3HW58
445372004	B3HW78
445372005	B3HW62
445372006	B3HW65
445372007	B3HW19
445372008	B3HW55
1203989623	Method Blank (MB)
1203989625	Laboratory Control Sample (LCS)
1203989627	445458001(B3HW93) Post Spike (PS)
1203989628	445458001(B3HW93) Post Spike Duplicate (PSD)
1203992144	Method Blank (MB)
1203992145	Method Blank (MB)
1203992146	Laboratory Control Sample (LCS)
1203992147	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

Sample Dilutions/Methanol Dilutions

Samples were diluted because target analyte concentrations exceeded the calibration range.

Analyte	445372			
	001	004	005	007
Several	2X 1X	4X 1X	2X	40X 1X

Sample Re-extraction/Re-analysis

Sample 445372002 (B3HW53) was re-analyzed and reported due to possible carry-over from a previously analyzed sample.

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: GEL445372 GEL Work Order: 445372

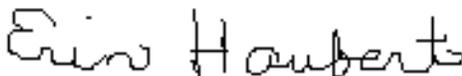
The Qualifiers in this report are defined as follows:

- 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
- 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:** 03 APR 2018**Title:** Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL445372	Date Collected: 03/06/2018 10:20	Matrix: WATER
Lab Sample ID: 445372001	Date Received: 03/07/2018 09:00	
Client ID: B3HW49	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/14/2018 19:34	Inst: VOA3.I	Dilution: 1
Prep Date: 03/14/2018 19:34	Analyst: JP1	Purge Vol: 5 mL
Data File: 031418V3\3Z320.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
67-66-3	Chloroform	J	2.85	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: GEL445372	Date Collected: 03/06/2018 10:20	Matrix: WATER
Lab Sample ID: 445372001	Date Received: 03/07/2018 09:00	
Client ID: B3HW49DL	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/15/2018 19:30	Inst: VOA3.I	Dilution: 2
Prep Date: 03/15/2018 19:30	Analyst: JP1	Purge Vol: 5 mL
Data File: 031518V3\3Z418.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	102	ug/L	0.600	4.00	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: GEL445372	Date Collected: 03/06/2018 09:45	Matrix: WATER
Lab Sample ID: 445372002	Date Received: 03/07/2018 09:00	
	Client: CPRC001	Project: CPRC0F16045
Client ID: B3HW53	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Batch ID: 1747154	Inst: VOA3.I	Dilution: 1
Run Date: 03/15/2018 20:01	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 03/15/2018 20:01		
Data File: 031518V3\3Z419.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride		72.0	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	1.92	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL445372	Date Collected: 03/06/2018 10:45	Matrix: WATER
Lab Sample ID: 445372003	Date Received: 03/07/2018 09:00	
Client ID: B3HW58	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/14/2018 20:37	Inst: VOA3.I	Dilution: 1
Prep Date: 03/14/2018 20:37	Analyst: JP1	Purge Vol: 5 mL
Data File: 031418V3\3Z322.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride		82.9	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	2.39	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL445372	Date Collected: 03/06/2018 08:15	Matrix: WATER
Lab Sample ID: 445372004	Date Received: 03/07/2018 09:00	
Client ID: B3HW78	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/14/2018 21:08	Inst: VOA3.I	Dilution: 1
Prep Date: 03/14/2018 21:08	Analyst: JP1	Purge Vol: 5 mL
Data File: 031418V3\3Z323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
67-66-3	Chloroform		6.64	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
79-01-6	Trichloroethylene	J	3.67	ug/L	0.300	2.00	5.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: GEL445372	Date Collected: 03/06/2018 08:15	Matrix: WATER
Lab Sample ID: 445372004	Date Received: 03/07/2018 09:00	
Client ID: B3HW78DL	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/15/2018 20:33	Inst: VOA3.I	Dilution: 4
Prep Date: 03/15/2018 20:33	Analyst: JP1	Purge Vol: 5 mL
Data File: 031518V3\3Z420.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	182	ug/L	1.20	8.00	5.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Date Collected: 03/06/2018 08:45	Matrix: WATER
Lab Sample ID: 445372005	Date Received: 03/07/2018 09:00	
Client ID: B3HW62	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/15/2018 21:04	Inst: VOA3.I	Dilution: 2
Prep Date: 03/15/2018 21:04	Analyst: JP1	Purge Vol: 5 mL
Data File: 031518V3\3Z421.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	107	ug/L	0.600	4.00	5.00
67-66-3	Chloroform	DJ	4.70	ug/L	0.600	4.00	5.00
75-09-2	Methylene chloride	DU	3.20	ug/L	3.20	10.0	5.00
79-01-6	Trichloroethylene	DJ	1.46	ug/L	0.600	4.00	5.00
74-87-3	Chloromethane	DU	0.600	ug/L	0.600	4.00	10.0
75-01-4	Vinyl chloride	DU	0.600	ug/L	0.600	4.00	10.0
156-59-2	cis-1,2-Dichloroethylene	DU	0.600	ug/L	0.600	4.00	

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL445372	Date Collected: 03/06/2018 09:00	Matrix: WATER
Lab Sample ID: 445372006	Date Received: 03/07/2018 09:00	
Client ID: B3HW65	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/15/2018 21:36	Inst: VOA3.I	Dilution: 1
Prep Date: 03/15/2018 21:36	Analyst: JP1	Purge Vol: 5 mL
Data File: 031518V3\3Z422.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride		68.3	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	4.17	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
79-01-6	Trichloroethylene	J	2.20	ug/L	0.300	2.00	5.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL445372	Date Collected: 03/05/2018 12:15	Matrix: WATER
Lab Sample ID: 445372007	Date Received: 03/07/2018 09:00	
Client ID: B3HW19	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/15/2018 22:07	Inst: VOA3.I	Dilution: 1
Prep Date: 03/15/2018 22:07	Analyst: JP1	Purge Vol: 5 mL
Data File: 031518V3\3Z423.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
67-66-3	Chloroform		9.72	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
79-01-6	Trichloroethylene		9.78	ug/L	0.300	2.00	5.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: GEL445372	Date Collected: 03/05/2018 12:15	Matrix: WATER
Lab Sample ID: 445372007	Date Received: 03/07/2018 09:00	
Client ID: B3HW19DL	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/16/2018 12:42	Inst: VOA3.I	Dilution: 40
Prep Date: 03/16/2018 12:42	Analyst: JP1	Purge Vol: 5 mL
Data File: 031618V3\3Z508.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	1080	ug/L	12.0	80.0	5.00

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL445372	Date Collected: 03/06/2018 09:45	Matrix: WATER
Lab Sample ID: 445372008	Date Received: 03/07/2018 09:00	
Client ID: B3HW55	Client: CPRC001	Project: CPRC0F16045
Batch ID: 1747154	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/16/2018 13:14	Inst: VOA3.I	Dilution: 1
Prep Date: 03/16/2018 13:14	Analyst: JP1	Purge Vol: 5 mL
Data File: 031618V3\3Z509.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride		22.5	ug/L	1.60	5.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: March 27, 2018

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 445372

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1747154										
QC1203989625	LCS										
Carbon tetrachloride	50.0			45.4	ug/L		91	(70%-130%)	JP1	03/14/18	12:11
Chloroform	50.0			42.4	ug/L		85	(70%-130%)			
Chloromethane	50.0			45.3	ug/L		91	(70%-130%)			
Methylene chloride	50.0			40.0	ug/L		80	(70%-130%)			
Trichloroethylene	50.0			46.4	ug/L		93	(70%-130%)			
Vinyl chloride	50.0			49.5	ug/L		99	(70%-130%)			
cis-1,2-Dichloroethylene	50.0			45.0	ug/L		90	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			46.9	ug/L		94	(70%-130%)			
**Bromofluorobenzene	50.0			51.6	ug/L		103	(70%-130%)			
**Toluene-d8	50.0			49.1	ug/L		98	(70%-130%)			
QC1203992146	LCS										
Carbon tetrachloride	50.0			44.7	ug/L		89	(70%-130%)		03/16/18	10:35
Chloroform	50.0			45.5	ug/L		91	(70%-130%)			
Chloromethane	50.0			50.1	ug/L		100	(70%-130%)			

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QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1747154										
Methylene chloride	50.0			41.0	ug/L		82	(70%-130%)	JP1	03/16/18	10:35
Trichloroethylene	50.0			45.2	ug/L		90	(70%-130%)			
Vinyl chloride	50.0			50.9	ug/L		102	(70%-130%)			
cis-1,2-Dichloroethylene	50.0			46.1	ug/L		92	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			51.0	ug/L		102	(70%-130%)			
**Bromofluorobenzene	50.0			49.1	ug/L		98	(70%-130%)			
**Toluene-d8	50.0			51.6	ug/L		103	(70%-130%)			
QC1203992147 LCS											
Carbon tetrachloride	50.0			47.3	ug/L		95	(70%-130%)		03/19/18	12:05
Chloroform	50.0			43.9	ug/L		88	(70%-130%)			
Chloromethane	50.0			51.3	ug/L		103	(70%-130%)			
Methylene chloride	50.0			41.9	ug/L		84	(70%-130%)			
Trichloroethylene	50.0			45.8	ug/L		92	(70%-130%)			
Vinyl chloride	50.0			53.8	ug/L		108	(70%-130%)			
cis-1,2-Dichloroethylene	50.0			46.3	ug/L		93	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			55.3	ug/L		111	(70%-130%)			

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QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1747154										
**Bromofluorobenzene	50.0			47.8	ug/L		96	(70%-130%)	JP1	03/19/18	12:05
**Toluene-d8	50.0			49.2	ug/L		98	(70%-130%)			
QC1203989623	MB										
Carbon tetrachloride			U	0.300	ug/L					03/14/18	13:14
Chloroform			U	0.300	ug/L						
Chloromethane			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
cis-1,2-Dichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			49.8	ug/L		100	(70%-130%)			
**Bromofluorobenzene	50.0			52.4	ug/L		105	(70%-130%)			
**Toluene-d8	50.0			50.2	ug/L		100	(70%-130%)			
QC1203992144	MB										
Carbon tetrachloride			U	0.300	ug/L					03/16/18	12:10
Chloroform			U	0.300	ug/L						
Chloromethane			U	0.300	ug/L						

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QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1747154										
Methylene chloride			U	1.60	ug/L				JP1	03/16/18	12:10
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
cis-1,2-Dichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			55.1	ug/L		110	(70%-130%)			
**Bromofluorobenzene	50.0			50.2	ug/L		100	(70%-130%)			
**Toluene-d8	50.0			48.8	ug/L		98	(70%-130%)			
QC1203992145 MB											
Carbon tetrachloride			U	0.300	ug/L					03/19/18	14:12
Chloroform			U	0.300	ug/L						
Chloromethane			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
cis-1,2-Dichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			56.0	ug/L		112	(70%-130%)			

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QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1747154										
**Bromofluorobenzene	50.0			50.4	ug/L		101	(70%-130%)	JP1	03/19/18	14:12
**Toluene-d8	50.0			50.2	ug/L		100	(70%-130%)			
QC1203989627 445458001 PS											
Carbon tetrachloride	50.0	U	0.00	48.5	ug/L		97	(70%-130%)		03/19/18	20:36
Chloroform	50.0	U	0.00	44.7	ug/L		89	(70%-130%)			
Chloromethane	50.0	U	0.00	44.9	ug/L		90	(70%-130%)			
Methylene chloride	50.0	U	0.00	39.6	ug/L		79	(70%-130%)			
Trichloroethylene	50.0	U	0.00	45.0	ug/L		90	(70%-130%)			
Vinyl chloride	50.0	U	0.00	46.8	ug/L		94	(70%-130%)			
cis-1,2-Dichloroethylene	50.0	U	0.00	45.1	ug/L		90	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		53.9	55.2	ug/L		110	(70%-130%)			
**Bromofluorobenzene	50.0		53.4	46.5	ug/L		93	(70%-130%)			
**Toluene-d8	50.0		51.3	50.8	ug/L		102	(70%-130%)			
QC1203989628 445458001 PSD											
Carbon tetrachloride	50.0	U	0.00	47.3	ug/L	3	95	(0%-20%)		03/19/18	21:08
Chloroform	50.0	U	0.00	45.5	ug/L	2	91	(0%-20%)			
Chloromethane	50.0	U	0.00	47.7	ug/L	6	95	(0%-20%)			

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QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1747154										
Methylene chloride	50.0	U	0.00	42.1	ug/L	6	84	(0%-20%)	JP1	03/19/18	21:08
Trichloroethylene	50.0	U	0.00	47.1	ug/L	4	94	(0%-20%)			
Vinyl chloride	50.0	U	0.00	51.6	ug/L	10	103	(0%-20%)			
cis-1,2-Dichloroethylene	50.0	U	0.00	45.5	ug/L	1	91	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		53.9	58.2	ug/L		116	(70%-130%)			
**Bromofluorobenzene	50.0		53.4	48.0	ug/L		96	(70%-130%)			
**Toluene-d8	50.0		51.3	52.6	ug/L		105	(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)

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QC Summary

Workorder: 445372

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

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

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

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

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

Volatile
Surrogate Recovery Report

SDG Number: GEL445372

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203989625	LCS for batch 1747154	94	98	103
1203989623	MB for batch 1747154	100	100	105
445372001	B3HW49	103	96	100
445372003	B3HW58	110	95	100
445372004	B3HW78	106	97	103
445372001	B3HW49DL	106	D 93	D 105
445372002	B3HW53	108	93	106
445372004	B3HW78DL	107	D 98	D 105
445372005	B3HW62	104	D 96	D 104
445372006	B3HW65	110	92	103
445372007	B3HW19	111	97	102
1203992146	LCS for batch 1747154	102	103	98
1203992144	MB for batch 1747154	110	98	100
445372007	B3HW19DL	107	D 101	D 97
445372008	B3HW55	112	99	97
1203992147	LCS for batch 1747154	111	98	96
1203992145	MB for batch 1747154	112	100	101
1203989627	B3HW93PS	110	102	93
1203989628	B3HW93PSD	116	105	96

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

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL445372
Work Order #: 445372

Product: Determination of Metals by ICP**Analytical Method:** SW846 3005A/6010D**Analytical Procedure:** GL-MA-E-013 REV# 30**Analytical Batch:** 1745005**Product: Determination of Metals by ICP-MS****Analytical Method:** SW846 3005A/6020B**Analytical Procedure:** GL-MA-E-014 REV# 32**Analytical Batch:** 1745000**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 14**Preparation Batches:** 1744998 and 1745004

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372001	B3HW49
445372002	B3HW53
445372003	B3HW58
445372004	B3HW78
445372005	B3HW62
445372006	B3HW65
445372007	B3HW19
1203985122	Method Blank (MB) ICP
1203985123	Laboratory Control Sample (LCS)
1203985126	445310005(NonSDGL) Serial Dilution (SD)
1203985124	445310005(NonSDGS) Matrix Spike (MS)
1203985125	445310005(NonSDGSD) Matrix Spike Duplicate (MSD)
1203985114	Method Blank (MB) ICP-MS
1203985115	Laboratory Control Sample (LCS)
1203985118	445372001(B3HW49L) Serial Dilution (SD)
1203985116	445372001(B3HW49S) Matrix Spike (MS)
1203985117	445372001(B3HW49SD) 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. 445372001 (B3HW49), 445372002 (B3HW53), 445372003 (B3HW58), 445372004 (B3HW78), 445372005 (B3HW62), 445372006 (B3HW65) and 445372007 (B3HW19)-ICP.

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.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL445372 GEL Work Order: 445372

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

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

Review/Validation

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

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

Signature:**Name: Jamie Johnson****Date: 02 APR 2018****Title: Group Leader**

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL445372

CONTRACT: CPRC0F16045

METHOD TYPE: SW846

SAMPLE ID: 445372001

BASIS: As Received

DATE COLLECTED 06-MAR-18

CLIENT ID: B3HW49

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-38-2	Arsenic	4.32	ug/L	B	2	5	5	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/23/18 15:04	032318-1	1745005
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-70-2	Calcium	25400	ug/L		50	200	200	1	P	HSC	03/23/18 15:04	032318-1	1745005
7440-47-3	Chromium	19.3	ug/L		3	10	10	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-50-8	Copper	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 15:04	032318-1	1745005
7439-95-4	Magnesium	8570	ug/L		110	300	300	1	P	HSC	03/23/18 15:04	032318-1	1745005
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7439-98-7	Molybdenum	9.14	ug/L		0.2	0.5	0.5	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-02-0	Nickel	0.680	ug/L	B	0.6	2	2	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-09-7	Potassium	3080	ug/L		50	150	150	1	P	HSC	03/23/18 15:04	032318-1	1745005
7782-49-2	Selenium	2.76	ug/L	B	2	5	5	1	MS	BAJ	03/20/18 11:55	180320-4	1745000
7440-23-5	Sodium	19300	ug/L		100	300	300	1	P	HSC	03/23/18 15:04	032318-1	1745005
7440-61-1	Uranium	2.26	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/19/18 19:44	180319-3	1745000
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	03/19/18 19:44	180319-3	1745000

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8

***Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL445372

CONTRACT: CPRC0F16045

METHOD TYPE: SW846

SAMPLE ID: 445372002

BASIS: As Received

DATE COLLECTED 06-MAR-18

CLIENT ID: B3HW53

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-38-2	Arsenic	4.36	ug/L	B	2	5	5	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/23/18 15:08	032318-1	1745005
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-70-2	Calcium	27000	ug/L		50	200	200	1	P	HSC	03/23/18 15:08	032318-1	1745005
7440-47-3	Chromium	29.7	ug/L		3	10	10	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-50-8	Copper	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 15:08	032318-1	1745005
7439-95-4	Magnesium	9300	ug/L		110	300	300	1	P	HSC	03/23/18 15:08	032318-1	1745005
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7439-98-7	Molybdenum	8.72	ug/L		0.2	0.5	0.5	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-02-0	Nickel	0.649	ug/L	B	0.6	2	2	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-09-7	Potassium	3100	ug/L		50	150	150	1	P	HSC	03/23/18 15:08	032318-1	1745005
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	03/20/18 12:06	180320-4	1745000
7440-23-5	Sodium	15400	ug/L		100	300	300	1	P	HSC	03/23/18 15:08	032318-1	1745005
7440-61-1	Uranium	2.37	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/19/18 20:01	180319-3	1745000
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	03/19/18 20:01	180319-3	1745000

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8

***Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL445372

CONTRACT: CPRC0F16045

METHOD TYPE: SW846

SAMPLE ID: 445372003

BASIS: As Received

DATE COLLECTED 06-MAR-18

CLIENT ID: B3HW58

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-38-2	Arsenic	5.31	ug/L		2	5	5	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/23/18 15:11	032318-1	1745005
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-70-2	Calcium	26000	ug/L		50	200	200	1	P	HSC	03/23/18 15:11	032318-1	1745005
7440-47-3	Chromium	19.5	ug/L		3	10	10	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-50-8	Copper	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 15:11	032318-1	1745005
7439-95-4	Magnesium	8570	ug/L		110	300	300	1	P	HSC	03/23/18 15:11	032318-1	1745005
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7439-98-7	Molybdenum	10.5	ug/L		0.2	0.5	0.5	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-02-0	Nickel	0.726	ug/L	B	0.6	2	2	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-09-7	Potassium	3240	ug/L		50	150	150	1	P	HSC	03/23/18 15:11	032318-1	1745005
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	03/20/18 12:08	180320-4	1745000
7440-23-5	Sodium	19100	ug/L		100	300	300	1	P	HSC	03/23/18 15:11	032318-1	1745005
7440-61-1	Uranium	3.65	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/19/18 20:11	180319-3	1745000
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	03/19/18 20:11	180319-3	1745000

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8

***Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL445372

CONTRACT: CPRC0F16045

METHOD TYPE: SW846

SAMPLE ID: 445372004

BASIS: As Received

DATE COLLECTED 06-MAR-18

CLIENT ID: B3HW78

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	52.9	ug/L		19.3	50	50	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-38-2	Arsenic	3.06	ug/L	B	2	5	5	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/23/18 15:14	032318-1	1745005
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-70-2	Calcium	41800	ug/L		50	200	200	1	P	HSC	03/23/18 15:14	032318-1	1745005
7440-47-3	Chromium	3.85	ug/L	B	3	10	10	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-50-8	Copper	0.345	ug/L	B	0.3	1	1	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7439-89-6	Iron	180	ug/L		30	100	100	1	P	HSC	03/23/18 15:14	032318-1	1745005
7439-95-4	Magnesium	13900	ug/L		110	300	300	1	P	HSC	03/23/18 15:14	032318-1	1745005
7439-96-5	Manganese	9.42	ug/L		1	5	5	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7439-98-7	Molybdenum	3.69	ug/L		0.2	0.5	0.5	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-02-0	Nickel	0.753	ug/L	B	0.6	2	2	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-09-7	Potassium	4010	ug/L		50	150	150	1	P	HSC	03/23/18 15:14	032318-1	1745005
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	03/20/18 12:10	180320-4	1745000
7440-23-5	Sodium	14100	ug/L		100	300	300	1	P	HSC	03/23/18 15:14	032318-1	1745005
7440-61-1	Uranium	1.43	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/19/18 20:14	180319-3	1745000
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	03/19/18 20:14	180319-3	1745000

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8

***Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL445372

CONTRACT: CPRC0F16045

METHOD TYPE: SW846

SAMPLE ID: 445372005

BASIS: As Received

DATE COLLECTED 06-MAR-18

CLIENT ID: B3HW62

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	215	ug/L		19.3	50	50	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-38-2	Arsenic	3.85	ug/L	B	2	5	5	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/23/18 15:17	032318-1	1745005
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-70-2	Calcium	59600	ug/L		50	200	200	1	P	HSC	03/23/18 15:17	032318-1	1745005
7440-47-3	Chromium	4.61	ug/L	B	3	10	10	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-50-8	Copper	2.02	ug/L		0.3	1	1	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7439-89-6	Iron	62	ug/L	B	30	100	100	1	P	HSC	03/23/18 15:17	032318-1	1745005
7439-95-4	Magnesium	18700	ug/L		110	300	300	1	P	HSC	03/23/18 15:17	032318-1	1745005
7439-96-5	Manganese	4.51	ug/L	B	1	5	5	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7439-98-7	Molybdenum	4.85	ug/L		0.2	0.5	0.5	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-02-0	Nickel	5.27	ug/L		0.6	2	2	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-09-7	Potassium	4140	ug/L		50	150	150	1	P	HSC	03/23/18 15:17	032318-1	1745005
7782-49-2	Selenium	2.64	ug/L	B	2	5	5	1	MS	BAJ	03/20/18 12:11	180320-4	1745000
7440-23-5	Sodium	15000	ug/L		100	300	300	1	P	HSC	03/23/18 15:17	032318-1	1745005
7440-61-1	Uranium	154	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/19/18 20:17	180319-3	1745000
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	03/19/18 20:17	180319-3	1745000

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8

***Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL445372

CONTRACT: CPRC0F16045

METHOD TYPE: SW846

SAMPLE ID: 445372006

BASIS: As Received

DATE COLLECTED 06-MAR-18

CLIENT ID: B3HW65

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-38-2	Arsenic	4.23	ug/L	B	2	5	5	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/23/18 15:20	032318-1	1745005
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-70-2	Calcium	40800	ug/L		50	200	200	1	P	HSC	03/23/18 15:20	032318-1	1745005
7440-47-3	Chromium	3.91	ug/L	B	3	10	10	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-50-8	Copper	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 15:20	032318-1	1745005
7439-95-4	Magnesium	13100	ug/L		110	300	300	1	P	HSC	03/23/18 15:20	032318-1	1745005
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7439-98-7	Molybdenum	6.36	ug/L		0.2	0.5	0.5	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-02-0	Nickel	6.04	ug/L		0.6	2	2	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-09-7	Potassium	3800	ug/L		50	150	150	1	P	HSC	03/23/18 15:20	032318-1	1745005
7782-49-2	Selenium	3.13	ug/L	B	2	5	5	1	MS	BAJ	03/20/18 12:13	180320-4	1745000
7440-23-5	Sodium	13900	ug/L		100	300	300	1	P	HSC	03/23/18 15:20	032318-1	1745005
7440-61-1	Uranium	20.2	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/19/18 20:21	180319-3	1745000
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	03/19/18 20:21	180319-3	1745000

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8

***Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL445372

CONTRACT: CPRC0F16045

METHOD TYPE: SW846

SAMPLE ID: 445372007

BASIS: As Received

DATE COLLECTED 05-MAR-18

CLIENT ID: B3HW19

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-38-2	Arsenic	3.02	ug/L	B	2	5	5	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/23/18 15:23	032318-1	1745005
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-70-2	Calcium	91300	ug/L		50	200	200	1	P	HSC	03/23/18 15:23	032318-1	1745005
7440-47-3	Chromium	90.2	ug/L		3	10	10	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-48-4	Cobalt	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-50-8	Copper	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 15:23	032318-1	1745005
7439-95-4	Magnesium	30400	ug/L		110	300	300	1	P	HSC	03/23/18 15:23	032318-1	1745005
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7439-98-7	Molybdenum	1.67	ug/L		0.2	0.5	0.5	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-02-0	Nickel	0.883	ug/L	B	0.6	2	2	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-09-7	Potassium	6090	ug/L		50	150	150	1	P	HSC	03/23/18 15:23	032318-1	1745005
7782-49-2	Selenium	4.15	ug/L	B	2	5	5	1	MS	BAJ	03/20/18 12:15	180320-4	1745000
7440-23-5	Sodium	18900	ug/L		100	300	300	1	P	HSC	03/23/18 15:23	032318-1	1745005
7440-61-1	Uranium	1.83	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/19/18 20:24	180319-3	1745000
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	03/19/18 20:24	180319-3	1745000

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8

***Analytical Methods:**

P SW846 3005A/6010D

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: April 2, 2018

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 445372

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1745000										
QC1203985115	LCS										
Aluminum	2000			2050	ug/L		102	(80%-120%)	BAJ	03/19/18	19:18
Arsenic	50.0			53.1	ug/L		106	(80%-120%)			
Cadmium	50.0			51.0	ug/L		102	(80%-120%)			
Chromium	50.0			50.2	ug/L		100	(80%-120%)			
Cobalt	50.0			49.8	ug/L		99.6	(80%-120%)			
Copper	50.0			50.8	ug/L		102	(80%-120%)			
Manganese	50.0			50.1	ug/L		100	(80%-120%)			
Molybdenum	50.0			50.3	ug/L		101	(80%-120%)			
Nickel	50.0			53.7	ug/L		107	(80%-120%)			
Selenium	50.0			52.3	ug/L		105	(80%-120%)		03/20/18	11:53
Uranium	50.0			46.6	ug/L		93.3	(80%-120%)		03/19/18	19:18
Zinc	50.0			51.2	ug/L		102	(80%-120%)			
QC1203985114	MB										
Aluminum			U	19.3	ug/L					03/19/18	19:15

GEL LABORATORIES LLC

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

QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1745000										
Arsenic			U	2.00	ug/L				BAJ	03/19/18	19:15
Cadmium			U	0.300	ug/L						
Chromium			U	3.00	ug/L						
Cobalt			U	0.300	ug/L						
Copper			U	0.300	ug/L						
Manganese			U	1.00	ug/L						
Molybdenum			U	0.200	ug/L						
Nickel			U	0.600	ug/L						
Selenium			U	2.00	ug/L					03/20/18	11:52
Uranium			U	0.067	ug/L					03/19/18	19:15
Zinc			U	3.30	ug/L						
QC1203985116 445372001 MS											
Aluminum	2000	U	19.3	2000	ug/L		99.9	(75%-125%)		03/19/18	19:48
Arsenic	50.0	B	4.32	55.5	ug/L		102	(75%-125%)			
Cadmium	50.0	U	0.300	48.6	ug/L		97.3	(75%-125%)			
Chromium	50.0		19.3	68.2	ug/L		97.8	(75%-125%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1745000										
Cobalt	50.0	U	0.300	47.2	ug/L		94.4	(75%-125%)	BAJ	03/19/18	19:48
Copper	50.0	U	0.300	46.5	ug/L		92.8	(75%-125%)			
Manganese	50.0	U	1.00	45.0	ug/L		89.6	(75%-125%)			
Molybdenum	50.0		9.14	60.8	ug/L		103	(75%-125%)			
Nickel	50.0	B	0.680	49.5	ug/L		97.7	(75%-125%)			
Selenium	50.0	B	2.76	54.1	ug/L		103	(75%-125%)		03/20/18	11:57
Uranium	50.0		2.26	49.3	ug/L		94	(75%-125%)		03/19/18	19:48
Zinc	50.0	U	3.30	53.0	ug/L		104	(75%-125%)			
QC1203985117 445372001 MSD											
Aluminum	2000	U	19.3	2000	ug/L	0.258	99.6	(0%-20%)		03/19/18	19:51
Arsenic	50.0	B	4.32	54.5	ug/L	1.67	100	(0%-20%)			
Cadmium	50.0	U	0.300	48.7	ug/L	0.154	97.4	(0%-20%)			
Chromium	50.0		19.3	67.8	ug/L	0.628	97	(0%-20%)			
Cobalt	50.0	U	0.300	48.8	ug/L	3.18	97.5	(0%-20%)			
Copper	50.0	U	0.300	46.0	ug/L	0.951	91.9	(0%-20%)			
Manganese	50.0	U	1.00	45.8	ug/L	1.7	91.2	(0%-20%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1745000										
Molybdenum	50.0	9.14		60.1	ug/L	1.2	102	(0%-20%)	BAJ	03/19/18	19:51
Nickel	50.0	B	0.680	49.0	ug/L	0.999	96.7	(0%-20%)			
Selenium	50.0	B	2.76	53.3	ug/L	1.57	101	(0%-20%)		03/20/18	11:59
Uranium	50.0		2.26	48.5	ug/L	1.6	92.4	(0%-20%)		03/19/18	19:51
Zinc	50.0	U	3.30	50.5	ug/L	4.8	98.8	(0%-20%)			
QC1203985118 445372001 SDILT											
Aluminum		U	2.44 DU	96.5	ug/L	N/A		(0%-20%)		03/19/18	19:58
Arsenic		B	4.32 DU	10.0	ug/L	N/A		(0%-20%)			
Cadmium		U	0.006 DU	1.50	ug/L	N/A		(0%-20%)			
Chromium			19.3 BD	3.99	ug/L	3.26		(0%-20%)			
Cobalt		U	0.021 DU	1.50	ug/L	N/A		(0%-20%)			
Copper		U	0.087 DU	1.50	ug/L	N/A		(0%-20%)			
Manganese		U	0.187 DU	5.00	ug/L	N/A		(0%-20%)			
Molybdenum			9.14 D	1.77	ug/L	3.1		(0%-20%)			
Nickel		B	0.680 DU	3.00	ug/L	N/A		(0%-20%)			
Selenium		B	2.76 DU	10.0	ug/L	N/A		(0%-20%)		03/20/18	12:01

GEL LABORATORIES LLC

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

QC Summary

Workorder: 445372

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1745000										
Uranium		2.26	D	0.451	ug/L	.0443		(0%-20%)	BAJ	03/19/18	19:58
Zinc	U	1.13	DU	16.5	ug/L	N/A		(0%-20%)			
Metals Analysis-ICP											
Batch	1745005										
QC1203985123	LCS										
Boron	500			491	ug/L		98.3	(80%-120%)	HSC	03/23/18	14:35
Calcium	5000			4810	ug/L		96.3	(80%-120%)			
Iron	5000			4760	ug/L		95.3	(80%-120%)			
Magnesium	5000			4760	ug/L		95.2	(80%-120%)			
Potassium	5000			4470	ug/L		89.4	(80%-120%)			
Sodium	5000			4550	ug/L		90.9	(80%-120%)			
QC1203985122	MB										
Boron			U	15.0	ug/L					03/23/18	14:32
Calcium			U	50.0	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Potassium			U	50.0	ug/L						
Sodium			U	100	ug/L						

GEL LABORATORIES LLC

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

QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1745005										
QC1203985124	445310005	MS									
Boron	500	U	15.0	491	ug/L		97.8	(75%-125%)	HSC	03/23/18	14:40
Calcium	5000	U	50.0	4920	ug/L		98	(75%-125%)			
Iron	5000	U	30.0	4850	ug/L		96.8	(75%-125%)			
Magnesium	5000	U	110	4890	ug/L		97.8	(75%-125%)			
Potassium	5000	U	50.0	4790	ug/L		95.7	(75%-125%)	TXT1	03/30/18	13:32
Sodium	5000	U	100	4680	ug/L		93.1	(75%-125%)	HSC	03/23/18	14:40
QC1203985125	445310005	MSD									
Boron	500	U	15.0	493	ug/L	0.455	98.2	(0%-20%)		03/23/18	14:42
Calcium	5000	U	50.0	4990	ug/L	1.41	99.4	(0%-20%)			
Iron	5000	U	30.0	4880	ug/L	0.479	97.3	(0%-20%)			
Magnesium	5000	U	110	4920	ug/L	0.538	98.3	(0%-20%)			
Potassium	5000	U	50.0	4830	ug/L	0.849	96.6	(0%-20%)	TXT1	03/30/18	13:35
Sodium	5000	U	100	4740	ug/L	1.3	94.4	(0%-20%)	HSC	03/23/18	14:42
QC1203985126	445310005	SDILT									
Boron		U	1.80 DU	75.0	ug/L	N/A		(0%-20%)		03/23/18	14:44
Calcium		U	17.9 DU	250	ug/L	N/A		(0%-20%)			
Iron		U	12.6 DU	150	ug/L	N/A		(0%-20%)			

GEL LABORATORIES LLC

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

QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1745005										
Magnesium	U	3.18	DU	550	ug/L	N/A		(0%-20%)	HSC	03/23/18	14:44
Potassium	U	-35.4	DU	250	ug/L	N/A		(0%-20%)	TXT1	03/30/18	13:37
Sodium	U	25.6	DU	500	ug/L	N/A		(0%-20%)	HSC	03/23/18	14:44

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 #: GEL445372
Work Order #: 445372**

Product: Cyanide, Free

Analytical Method: 9014_CYANIDE

Analytical Procedure: GL-GC-E-073 REV# 8

Analytical Batch: 1744584

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372007	B3HW19

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: Cyanide, Amenable to Chlorination
Analytical Method: 9012_CYANIDE
Analytical Procedure: GL-GC-E-107 REV# 10
Analytical Batches: 1744583, 1744582 and 1744581

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372007	B3HW19

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: Cyanide, Total

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-095 REV# 21

Analytical Batches: 1744580 and 1744579

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372007	B3HW19
1203984180	Method Blank (MB)
1203984181	Laboratory Control Sample (LCS)
1203984182	445222002(B3HW05) Sample Duplicate (DUP)
1203984184	445222002(B3HW05) Matrix Spike (MS)
1203985068	445222002(B3HW05) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Product: Cyanide, Chlorinated

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-095 REV# 21

Analytical Batches: 1744582 and 1744581

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372007	B3HW19
1203984186	Method Blank (MB)
1203984187	Laboratory Control Sample (LCS)
1203984188	445222002(B3HW05) Sample Duplicate (DUP)
1203984189	445222003(B3HW08) Sample Duplicate (DUP)

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: GEL445372 GEL Work Order: 445372

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: Kristen Mizzell

Date: 13 MAR 2018

Title: Team Leader

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 13, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F16-045

Client Sample ID: B3HW19 Project: CPRC0F16045
 Sample ID: 445372007 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 05-MAR-18 12:15
 Receive Date: 07-MAR-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	U	1.67	1.67	5.00	ug/L	1.00	1	AXH3	03/08/18	0728	1744580	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	1.00	1.00	2.00	ug/L		1	AXH3	03/08/18	0934	1744584	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	1.67	1.67	5.00	ug/L		1	AXH3	03/08/18	0810	1744583	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	03/08/18	0650	1744579
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	03/08/18	0650	1744581

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
 DL: Detection Limit PF: Prep Factor
 MDA: Minimum Detectable Activity RL: Reporting Limit
 MDC: Minimum Detectable Concentration 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 13, 2018

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 445372

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Flow Injection Analysis											
Batch	1744580										
QC1203984182	445222002	DUP									
Cyanide, Total		27.1		26.2	ug/L	3.38		(0%-20%)	AXH3	03/08/18	06:58
QC1203984181	LCS										
Cyanide, Total	50.0			48.3	ug/L		96.6	(80%-120%)		03/08/18	06:55
QC1203984180	MB										
Cyanide, Total			U	1.67	ug/L					03/08/18	06:54
QC1203984184	445222002	MS									
Cyanide, Total	100	27.1		129	ug/L		102	(75%-125%)		03/08/18	06:59
QC1203985068	445222002	MSD									
Cyanide, Total	100	27.1		129	ug/L	0	102	(0%-20%)		03/08/18	07:00
Batch	1744582										
QC1203984188	445222002	DUP									
Cyanide, Chlorinated		26.6		26.5	ug/L	0.377		(0%-20%)	AXH3	03/08/18	07:38
QC1203984189	445222003	DUP									
Cyanide, Chlorinated		26.5		26.7	ug/L	0.752		(0%-20%)		03/08/18	07:40
QC1203984187	LCS										
Cyanide, Chlorinated	50.0		U	1.67	ug/L		0	(-200%-200%)		03/08/18	07:32
QC1203984186	MB										
Cyanide, Chlorinated			U	1.67	ug/L					03/08/18	07:31

Notes:

The Qualifiers in this report are defined as follows:

GEL LABORATORIES LLC

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

QC Summary

Workorder: 445372

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<	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 #: GEL445372
Work Order #: 445372

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: 1745261

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372001	B3HW49
445372002	B3HW53
445372003	B3HW58
445372004	B3HW78
445372005	B3HW62
445372006	B3HW65
445372007	B3HW19
1203985644	Method Blank (MB)
1203985645	445297001(NonSDG) Sample Duplicate (DUP)
1203985646	445297001(NonSDG) Matrix Spike (MS)
1203985647	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.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Results are considered a false positive due to no valid peak.	Iodine-129	445372004	B3HW78
			445372005	B3HW62

Product: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 5

Analytical Batch: 1745596

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372001	B3HW49
445372002	B3HW53
445372003	B3HW58
445372004	B3HW78
445372005	B3HW62
445372006	B3HW65
445372007	B3HW19
1203986370	Method Blank (MB)
1203986371	445294001(NonSDG) Sample Duplicate (DUP)
1203986372	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: C14_LSC: COMMON

Analytical Method: C14_LSC

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

Analytical Batch: 1745608

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372001	B3HW49
445372002	B3HW53
445372003	B3HW58
445372004	B3HW78
445372005	B3HW62
445372006	B3HW65
445372007	B3HW19
1203986388	Method Blank (MB)
1203986389	445297005(NonSDG) Sample Duplicate (DUP)
1203986390	445297005(NonSDG) Matrix Spike (MS)
1203986391	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 445372007 (B3HW19) was recounted to verify sample results. Recount is reported. Sample 1203986389 (Non SDG 445297005DUP) was recounted due to results more negative than the three sigma TPU. The second count is reported.

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 22

Analytical Batch: 1745617

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445372001	B3HW49
445372002	B3HW53
445372003	B3HW58
445372004	B3HW78
445372005	B3HW62
445372006	B3HW65
445372007	B3HW19
1203986413	Method Blank (MB)
1203986414	445294001(NonSDG) Sample Duplicate (DUP)
1203986415	445294001(NonSDG) Matrix Spike (MS)
1203986416	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 1203986413 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Miscellaneous Information**Additional Comments**

The matrix spike, 1203986415 (Non SDG 445294001MS), 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

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL445372 GEL Work Order: 445372

The Qualifiers in this report are defined as follows:

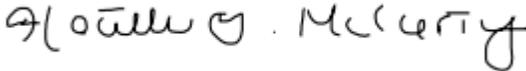
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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: Heather McCarty

Date: 29 MAR 2018

Title: Analyst II

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372001	Date Collected: 03/06/2018 10:20	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW49	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1745261	Analyst: BSW1	SOP Ref: GL-RAD-A-006
Run Date: 03/14/2018 12:37	Aliquot: 1.2 L	Instrument: XRAY1
Data File: I445372001.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1745261		
Prep Date: 03/13/2018 10:04		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.183	pCi/L	+/-0.373	0.382	0.578	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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372001	Date Collected: 03/06/2018 10:20	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW49	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1745596	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 03/28/2018 08:40	Aliquot: 100 mL	Instrument: LSCYELLOW
Data File: E1745596.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 15 min
Prep Batch: 1745596		
Prep Date: 03/23/2018 15:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		464	pCi/L	+/-35.3	62.1	29.8	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	99700	1.16E+05	CPM	86.3	(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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372001	Date Collected: 03/06/2018 10:20	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW49	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1745608	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 03/12/2018 12:11	Aliquot: 100 mL	Instrument: LSCGOLD
Data File: C1745608R.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 15 min
Prep Batch: 1745608		
Prep Date: 03/09/2018 14:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	2.63	pCi/L	+/-19.4	19.4	33.5	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372001	Date Collected: 03/06/2018 10:20	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW49	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1745617	Analyst: MXH8	SOP Ref: GL-RAD-A-002
Run Date: 03/15/2018 03:13	Aliquot: 50 mL	Instrument: LSCPURPLE
Data File: T1745617R.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1745617		
Prep Date: 03/14/2018 07:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1020	pCi/L	+/-207	285	294	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372002	Date Collected: 03/06/2018 09:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW53	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1745261	Analyst: BSW1	SOP Ref: GL-RAD-A-006
Run Date: 03/14/2018 12:38	Aliquot: 1.2 L	Instrument: XRAY2
Data File: I445372002.CNF;2	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 180 min
Prep Batch: 1745261		
Prep Date: 03/13/2018 10:04		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.0945	pCi/L	+/-0.448	0.450	0.830	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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372002	Date Collected: 03/06/2018 09:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW53	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1745596	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 03/28/2018 08:56	Aliquot: 100 mL	Instrument: LSCYELLOW
Data File: E1745596.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 15 min
Prep Batch: 1745596		
Prep Date: 03/23/2018 15:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		4160	pCi/L	+/-93.2	468	29.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	1.04E+05	1.16E+05	CPM	90	(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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372002	Date Collected: 03/06/2018 09:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW53	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1745608	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 03/12/2018 12:27	Aliquot: 100 mL	Instrument: LSCGOLD
Data File: C1745608R.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 15 min
Prep Batch: 1745608		
Prep Date: 03/09/2018 14:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	16.2	pCi/L	+/-20.1	20.3	33.9	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.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372002	Date Collected: 03/06/2018 09:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW53	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1745617	Analyst: MXH8	SOP Ref: GL-RAD-A-002
Run Date: 03/15/2018 04:05	Aliquot: 50 mL	Instrument: LSCPURPLE
Data File: T1745617R.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1745617		
Prep Date: 03/14/2018 07:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		2460	pCi/L	+/-254	540	300	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372003	Date Collected: 03/06/2018 10:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW58		Prep Basis: "As Received"
Batch ID: 1745261	Method: DOE EML HASL-300,I-01 Mo	SOP Ref: GL-RAD-A-006
Run Date: 03/14/2018 12:38	Analyst: BSW1	Instrument: XRAY4
Data File: I445372003.CNF;1	Aliquot: 1.2 L	Count Time: 120 min
Prep Batch: 1745261	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 03/13/2018 10:04		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.0339	pCi/L	+/-0.506	0.506	0.943	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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372003	Date Collected: 03/06/2018 10:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW58	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1745596	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 03/28/2018 09:13	Aliquot: 100 mL	Instrument: LSCYELLOW
Data File: E1745596.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 15 min
Prep Batch: 1745596		
Prep Date: 03/23/2018 15:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		1480	pCi/L	+/-58.5	173	30.5	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	98400	1.16E+05	CPM	85.2	(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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372003	Date Collected: 03/06/2018 10:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW58	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1745608	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 03/12/2018 12:44	Aliquot: 100 mL	Instrument: LSCGOLD
Data File: C1745608R.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 15 min
Prep Batch: 1745608		
Prep Date: 03/09/2018 14:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	7.85	pCi/L	+/-20.0	20.0	34.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372003	Date Collected: 03/06/2018 10:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW58	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1745617	Analyst: MXH8	SOP Ref: GL-RAD-A-002
Run Date: 03/15/2018 04:58	Aliquot: 50 mL	Instrument: LSCPURPLE
Data File: T1745617R.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1745617		
Prep Date: 03/14/2018 07:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		3350	pCi/L	+/-281	706	306	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372004	Date Collected: 03/06/2018 08:15	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW78		Prep Basis: "As Received"
Batch ID: 1745261	Method: DOE EML HASL-300,I-01 Mo	SOP Ref: GL-RAD-A-006
Run Date: 03/14/2018 12:38	Analyst: BSW1	Instrument: XRAY5
Data File: I445372004.CNF;1	Aliquot: 1.2 L	Count Time: 120 min
Prep Batch: 1745261	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 03/13/2018 10:04		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	X	0.683	pCi/L	+/-0.584	0.588	0.503	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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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

Page 1 of 1

SDG Number: GEL445372
Lab Sample ID: 445372004

Client: CPRC001
Date Collected: 03/06/2018 08:15
Date Received: 03/07/2018 09:00

Project: CPRC0F16045
Matrix: WATER

Client ID: B3HW78
Batch ID: 1745596
Run Date: 03/28/2018 09:29
Data File: E1745596.xls
Prep Batch: 1745596
Prep Date: 03/23/2018 15:00

Method: TC99_EIE_LSC
Analyst: CXS7
Aliquot: 100 mL
Prep Method: DOE EML HASL-300, Tc-02-

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-059
Instrument: LSCYELLOW
Count Time: 15 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		260	pCi/L	+/-28.5	40.4	29.6	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	1.04E+05	1.16E+05	CPM	90.4	(30%-105%)

Comments:

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

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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372004	Date Collected: 03/06/2018 08:15	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW78	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1745608	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 03/12/2018 13:00	Aliquot: 100 mL	Instrument: LSCGOLD
Data File: C1745608R.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 15 min
Prep Batch: 1745608		
Prep Date: 03/09/2018 14:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	10.5	pCi/L	+/-20.1	20.2	34.3	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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372004	Date Collected: 03/06/2018 08:15	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW78	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1745617	Analyst: MXH8	SOP Ref: GL-RAD-A-002
Run Date: 03/15/2018 05:50	Aliquot: 50 mL	Instrument: LSCPURPLE
Data File: T1745617R.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1745617		
Prep Date: 03/14/2018 07:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	34.2	pCi/L	+/-176	176	304	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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372005	Date Collected: 03/06/2018 08:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW62	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1745261	Analyst: BSW1	SOP Ref: GL-RAD-A-006
Run Date: 03/14/2018 12:39	Aliquot: 1.2 L	Instrument: XRAY6
Data File: I445372005.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1745261		
Prep Date: 03/13/2018 10:04		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	X	1.10	pCi/L	+/-0.612	0.622	0.473	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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372005	Date Collected: 03/06/2018 08:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW62	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1745596	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 03/28/2018 09:45	Aliquot: 100 mL	Instrument: LSCYELLOW
Data File: E1745596.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 15 min
Prep Batch: 1745596		
Prep Date: 03/23/2018 15:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		1620	pCi/L	+/-58.9	188	28.7	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	1.06E+05	1.16E+05	CPM	91.7	(30%-105%)

Comments:

- 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
- 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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372005	Date Collected: 03/06/2018 08:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW62	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1745608	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 03/12/2018 13:17	Aliquot: 100 mL	Instrument: LSCGOLD
Data File: C1745608R.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 15 min
Prep Batch: 1745608		
Prep Date: 03/09/2018 14:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-10.7	pCi/L	+/-19.7	19.7	35.0	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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372005	Date Collected: 03/06/2018 08:45	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW62	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1745617	Analyst: MXH8	SOP Ref: GL-RAD-A-002
Run Date: 03/15/2018 06:42	Aliquot: 50 mL	Instrument: LSCPURPLE
Data File: T1745617R.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1745617		
Prep Date: 03/14/2018 07:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		953	pCi/L	+/-212	281	308	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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372006	Date Collected: 03/06/2018 09:00	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW65	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1745261	Analyst: BSW1	SOP Ref: GL-RAD-A-006
Run Date: 03/14/2018 12:39	Aliquot: 1.2 L	Instrument: GAM21
Data File: I445372006.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1745261		
Prep Date: 03/13/2018 10:04		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129		1.28	pCi/L	+/-0.693	0.705	0.591	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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372006	Date Collected: 03/06/2018 09:00	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW65		Prep Basis: "As Received"
Batch ID: 1745596	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 03/28/2018 10:01	Analyst: CXS7	Instrument: LSCYELLOW
Data File: E1745596.xls	Aliquot: 100 mL	Count Time: 15 min
Prep Batch: 1745596	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 03/23/2018 15:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		403	pCi/L	+/-33.6	55.7	30.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	1.01E+05	1.16E+05	CPM	87.3	(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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372006	Date Collected: 03/06/2018 09:00	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW65	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1745608	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 03/12/2018 13:36	Aliquot: 100 mL	Instrument: LSCGOLD
Data File: C1745608R.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 15 min
Prep Batch: 1745608		
Prep Date: 03/09/2018 14:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	7.40	pCi/L	+/-20.0	20.1	34.4	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372006	Date Collected: 03/06/2018 09:00	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW65	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1745617	Analyst: MXH8	SOP Ref: GL-RAD-A-002
Run Date: 03/15/2018 07:34	Aliquot: 50 mL	Instrument: LSCPURPLE
Data File: T1745617R.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1745617		
Prep Date: 03/14/2018 07:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		562	pCi/L	+/-195	223	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.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372007	Date Collected: 03/05/2018 12:15	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW19	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1745261	Analyst: BSW1	SOP Ref: GL-RAD-A-006
Run Date: 03/14/2018 15:55	Aliquot: 1.2 L	Instrument: XRAY1
Data File: I445372007.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1745261		
Prep Date: 03/13/2018 10:04		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.118	pCi/L	+/-0.398	0.401	0.641	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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372007	Date Collected: 03/05/2018 12:15	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW19	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1745596	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 03/28/2018 06:50	Aliquot: 100 mL	Instrument: LSCYELLOW
Data File: E1745596.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 60 min
Prep Batch: 1745596		
Prep Date: 03/23/2018 15:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		875	pCi/L	+/-34.7	103	33.5	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	57100	1.16E+05	CPM	49.4	(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: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372007	Date Collected: 03/05/2018 12:15	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW19	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1745608	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 03/13/2018 08:23	Aliquot: 100 mL	Instrument: LSCGOLD
Data File: C1745608R.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 15 min
Prep Batch: 1745608		
Prep Date: 03/09/2018 14:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	18.4	pCi/L	+/-19.1	19.4	32.0	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL445372	Client: CPRC001	Project: CPRC0F16045
Lab Sample ID: 445372007	Date Collected: 03/05/2018 12:15	Matrix: WATER
	Date Received: 03/07/2018 09:00	
Client ID: B3HW19	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1745617	Analyst: MXH8	SOP Ref: GL-RAD-A-002
Run Date: 03/15/2018 08:26	Aliquot: 50 mL	Instrument: LSCPURPLE
Data File: T1745617R.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1745617		
Prep Date: 03/14/2018 07:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		10000	pCi/L	+/-420	1980	308	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: March 29, 2018
Page 1 of 3

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 445372

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1745261								
QC1203985644	MB								
Iodine-129			U	-0.121	pCi/L			BSW1	03/14/1815:57
				Uncert: +/-0.310					
				TPU: +/-0.315					
QC1203985645	445297001	DUP							
Iodine-129		U	-0.311	U	-0.117	pCi/L			03/15/1806:16
				Uncert: +/-0.405	+/-0.356	RPD: 0	N/A		
				TPU: +/-0.430	+/-0.360	RER: 0.678	(0-2)		
QC1203985646	445297001	MS							
Iodine-129		U	-0.311		31.6	pCi/L	REC: 92 (75%-125%)		03/15/1806:32
				Uncert: +/-0.405	+/-3.66				
				TPU: +/-0.430	+/-4.83				
QC1203985647	LCS								
Iodine-129					34.7	pCi/L	REC: 111 (80%-120%)		03/15/1806:33
				Uncert: +/-4.93					
				TPU: +/-6.26					
Rad Liquid Scintillation									
Batch	1745596								
QC1203986370	MB								
Technetium-99			U	-12	pCi/L			CXS7	03/28/1811:22
				Uncert: +/-15.6					
				TPU: +/-15.6					
**Technetium-99m Tracer	1.16E+05				1.04E+05	CPM	REC: 90 (30%-105%)		
QC1203986371	445294001	DUP							
Technetium-99		U	0.208	U	-14.6	pCi/L			03/28/1811:38
				Uncert: +/-15.3	+/-15.4	RPD: 0	N/A		
				TPU: +/-15.3	+/-15.4	RER: 1.34	(0-2)		
**Technetium-99m Tracer	1.16E+05	1.10E+05			1.05E+05	CPM	REC: 91 (30%-105%)		
QC1203986372	LCS								
Technetium-99					888	pCi/L	REC: 99 (80%-120%)		03/28/1811:54
				Uncert: +/-44.6					
				TPU: +/-107					
**Technetium-99m Tracer	1.16E+05				1.07E+05	CPM	REC: 93 (30%-105%)		
Batch	1745608								
QC1203986388	MB								
Carbon-14			U	10.9	pCi/L			BXM4	03/12/1814:52
				Uncert: +/-20.3					
				TPU: +/-20.4					
QC1203986389	445297005	DUP							
Carbon-14		U	-1.2	U	24.5	pCi/L			03/13/1808:40
				Uncert: +/-19.6	+/-19.5	RPD: 0	N/A		
				TPU: +/-19.6	+/-20.0	RER: 1.8	(0-2)		
QC1203986390	445297005	MS							
Carbon-14		U	-1.2		706	pCi/L	REC: 94 (75%-125%)		03/12/1815:29

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QC Summary

Workorder: 445372

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1745608								
		Uncert:	+/-19.6	+/-38.8					
		TPU:	+/-19.6	+/-137					
QC1203986391	LCS								
Carbon-14	751			634	pCi/L	REC: 84	(80%-120%)		03/12/1815:46
		Uncert:		+/-37.5					
		TPU:		+/-123					
Batch	1745617								
QC1203986413	MB								
Tritium			U	-4.59	pCi/L			MXH8	03/16/1808:35
		Uncert:		+/-148					
		TPU:		+/-148					
QC1203986414	445294001	DUP							
Tritium		U	-43.2	U	86.1				03/15/1811:13
		Uncert:	+/-171		+/-178	RPD: 0	N/A		
		TPU:	+/-171		+/-178	RER: 1.03	(0-2)		
QC1203986415	445294001	MS							
Tritium	5150	U	-43.2		4850	pCi/L	REC: 94	(75%-125%)	03/15/1812:05
		Uncert:	+/-171		+/-510				
		TPU:	+/-171		+/-1070				
QC1203986416	LCS								
Tritium	2570			2410	pCi/L	REC: 94	(80%-120%)		03/15/1812:57
		Uncert:		+/-255					
		TPU:		+/-530					

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 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.

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

QC Summary

Workorder: 445372

Page 3 of 3

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

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

** Indicates analyte is a surrogate compound.

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

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

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