



December 19, 2017

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

Re: CHPRC SAF S18-011
Work Order: 439812
SDG: GEL439812

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on November 01, 2017 and October 31, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: S18-011-214 and S18-011-253
Enclosures

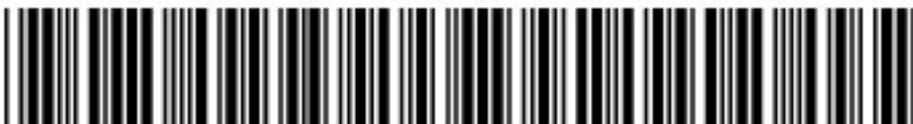


Table of Contents

Recheck, Recount, or Reanalysis Order.....	1
Case Narrative.....	3
Chain of Custody and Supporting Documentation.....	7
Data Review Qualifier Definitions.....	10
Laboratory Certifications.....	12
Radiological Analysis.....	14
Case Narrative.....	15
Sample Data Summary.....	18
Quality Control Summary.....	21

Recheck, Recount, or Reanalysis Order

RECHECK, RECOUNT, OR REANALYSIS ORDER

12/06/2017

Order Number: 171205GEL-R9281

GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

Sample Delivery Group: GEL436589

Method Name: SRISO_SEP_PRECIP_GPC

Sample#: B3F5R7

Sample Date: 10/27/2017 12:47:00 PM

SAF #: S18-011

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
436589008	12/6/2017 1:39:34 PM	Strontium-90	RECOUNT	15 Days / 15 Days

Sample Delivery Group: GEL436714

Method Name: SRISO_SEP_PRECIP_GPC

Sample#: B3F864

Sample Date: 10/30/2017 11:22:00 AM

SAF #: S18-011

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
436714008	12/6/2017 1:39:34 PM	Strontium-90	RECOUNT	15 Days / 15 Days

Deliver Report Results to: CHPRC

P.O. Box 1600

Richland, WA 99352

C/O Mr.Scot Fitzgerald

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S18-011
SDG: GEL439812**

December 19, 2017

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 November 01, 2017 and October 31, 2017, 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. Samples under this SDG were a client request for reanalysis per RDR9281. The group leader reviewed the reanalysis data and determined the samples were most likely switched during analysis. The client was notified of this response.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
439812001	B3F5R7
439812002	B3F864

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: 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.

12/19/2017

REV.0

Heather Shaffer

Heather Shaffer
Project Manager

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL439812
Work Order #: 439812

SRISO_SEP_PRECIP_GPC: COMMON

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

Technical Information

Recounts

Sample 439812001 (B3F5R7) was verified by recounting at least five days from the separation date. The recount is reported.

Miscellaneous Information

Additional Comments

Samples were reanalyzed as requested by the client. According to the reanalysis results, the initial reported results for these two samples appear to have been switched during the initial analysis. It is possible that there was an analyst error during the aliquot process for these two samples during the initial analysis. Reporting reanalysis results under work order 439812. 439812001 (B3F5R7) and 439812002 (B3F864).

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		C.O.C.# S18-011-214 Page 1 of 1	
<p align="center">CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</p> <p align="center"><i>Relog</i> <i>12/20/17 439812</i></p>		Telephone No.: 509-376-4650	
Collector:	Daniel Klug CHPRC	Contact/Requester: Karen Waters-Husted	
SAF No.:	S18-011	Purchase Order/Charge Code: 300071	
Project Title:	SURV, NOVEMBER 2017	Ice Chest No.: <i>6WS-627</i>	
Shipped To (Lab):	GEL Laboratories, LLC	Bill of Lading/Air Bill No.:	
Protocol:	SURV	Offsite Property No.: <i>8657</i>	
<p>POSSIBLE SAMPLE HAZARDS/REMARK</p> <p>** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1</p>			
SPECIAL INSTRUCTIONS		N/A	
Sample No.	Filter	* Date	Time
B3F864	N	10/30/17	1122
B3F864	N	10/30/17	1122
B3F864	N	10/30/17	1122
No/Type Container		Sample Analysis	
1x500-mL G/P		C14_LSC: COMMON	
1x1-L G/P		SRISO_SEP_PRECIP_GPC: COMMON	
1x250-mL P		TRITIUM_DIST_LSC: COMMON	
Holding Time		Preservative	
6 Months		None	
6 Months		HNO3 to pH <2	
6 Months		None	

Relinquished By:	Daniel Klug CHPRC	OCT 30 2017	1347	Received By:	SSU-1	OCT 30 2017	1347
Print First and Last Name		Signature		Print First and Last Name		Signature	
Relinquished By:	<i>SSU#1</i>	OCT 31 2017	0800	Received By:	<i>Lesly West</i> CHPRC	OCT 31 2017	0800
Print First and Last Name		Signature		Print First and Last Name		Signature	
Relinquished By:	<i>Lesly West</i> CHPRC	OCT 31 2017	1400	Received By:	FEDEX		
Print First and Last Name		Signature		Print First and Last Name		Signature	
Relinquished By:	<i>Lesly West</i> CHPRC	OCT 31 2017	1400	Received By:	<i>STACY BOONE</i>	9-1-17	9:00
Print First and Last Name		Signature		Print First and Last Name		Signature	
Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:		Date/Time:			

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquid
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
WL	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

A-6004-842 (REV 3)

FSR ID = FSR51389

Printed On 9/26/2017

Data Review Qualifier Definitions

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

Report Date: 19-DEC-17

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 19 December 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
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 Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Radiological Analysis

Case Narrative

**Radiochemistry
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL439812
 Work Order #: 439812**

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Procedure: GL-RAD-A-004 REV# 19

Analytical Batch: 1725184

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
439812001	B3F5R7
439812002	B3F864
1203935872	Method Blank (MB)
1203935873	439745008(NonSDG) Sample Duplicate (DUP)
1203935874	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 439812001 (B3F5R7) was verified by recounting at least five days from the separation date. The recount is reported.

Miscellaneous Information

Additional Comments

Samples were reanalyzed as requested by the client. According to the reanalysis results, the initial reported results for these two samples appear to have been switched during the initial analysis. It is possible that there was an analyst error during the aliquot process for these two samples during the initial analysis. Reporting reanalysis results under work order 439812. 439812001 (B3F5R7) and 439812002 (B3F864).

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: GEL439812 GEL Work Order: 439812

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Heather McCarty

Date: 19 DEC 2017

Title: Analyst II

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL439812	Client: CPRC001	Project: CPRC0S18011
Lab Sample ID: 439812001	Date Collected: 10/27/2017 12:47	Matrix: WATER
Client Sample: -Relog from 436589008	Date Received: 10/31/2017 08:55	
Client ID: B3F5R7		Prep Basis: "As Received"
Batch ID: 1725184	Method: SRISO_SEP_PRECIP_GPC	SOP Ref: GL-RAD-A-004
Run Date: 12/19/2017 06:17	Analyst: LXB3	Instrument: PIC1B
Data File: S1725184r.xls	Aliquot: 300 mL	Count Time: 60 min
Prep Batch: 1725184	Prep Method: EPA 905.0 Modified/DOE RP5	
Prep Date: 12/13/2017 09:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		18.7	pCi/L	+/-1.81	3.44	1.17	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.00	7.85	mg	76.4	(40%-110%)

Comments:

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: GEL439812	Client: CPRC001	Project: CPRC0S18011
Lab Sample ID: 439812002	Date Collected: 10/30/2017 11:22	Matrix: WATER
Client Sample: -Relog from 436714008	Date Received: 11/01/2017 09:00	
Client ID: B3F864		Prep Basis: "As Received"
Batch ID: 1725184	Method: SRISO_SEP_PRECIP_GPC	SOP Ref: GL-RAD-A-004
Run Date: 12/14/2017 15:50	Analyst: LXB3	Instrument: PIC7A
Data File: S1725184r.xls	Aliquot: 300 mL	Count Time: 60 min
Prep Batch: 1725184	Prep Method: EPA 905.0 Modified/DOE RP5	
Prep Date: 12/13/2017 09:24		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	0.741	pCi/L	+/-0.816	0.825	1.36	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.40	7.85	mg	81.5	(40%-110%)

Comments:

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: December 19, 2017
Page 1 of 1

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 439812

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1725184								
QC1203935872	MB								
Strontium-90			U	-1.45	pCi/L			LXB3	12/14/1715:50
				Uncert: +/-0.595					
				TPU: +/-0.595					
**Strontium Carrier	7.85			6.90	mg	REC: 88	(40%-110%)		
QC1203935873	439745008	DUP							
Strontium-90		U	0.599	U	0.217				12/14/1716:01
				Uncert: +/-0.916		RPD: 0	N/A		
				TPU: +/-0.921		RER: 0.642	(0-2)		
**Strontium Carrier	7.85	7.00		7.20	mg	REC: 92	(40%-110%)		
QC1203935874	LCS								
Strontium-90	78.8			63.1	pCi/L	REC: 80	(80%-120%)		12/14/1716:01
				Uncert: +/-3.81					
				TPU: +/-10.6					
**Strontium Carrier	7.85			7.40	mg	REC: 94	(40%-110%)		

Notes:

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

The Qualifiers in this report are defined as follows:

- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
- 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.
- UX Gamma Spectroscopy--Uncertain identification
- 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.

** 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.