

8/10/2016



August 10, 2016

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

Re: CHPRC SAF A16-006
Work Order: 401512
SDG: GEL401512

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 14, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071JDBA - 7H
Chain of Custody: A16-006-014 and A16-006-015
Enclosures

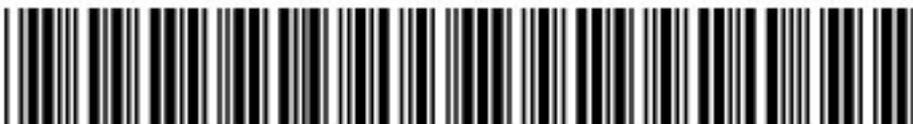


Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Definitions.....	9
Laboratory Certifications.....	11
Radiological Analysis.....	13
Case Narrative.....	14
Sample Data Summary.....	18
Quality Control Summary.....	25

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF A16-006
SDG: GEL401512**

August 10, 2016

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on July 14, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
401512001	B35RK6
401512002	B35RK8

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.

8/10/2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

**Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401512
Work Order #: 401512**

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

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 1203585993 (Non SDG 400884001DUP) was recounted to verify sample results. Recount is reported.

TRITIUM_DIST_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.

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C. # **A16-006-014**
 Page 1 of 1

401512

Telephone No. 509-376-4650
 Purchase Order/Charge Code 300071
 Ice Chest No. CWS-543
 Bill of Lading/Air Bill No. 776739993689
 Offsite Property No. 6824

Contact/Requester Karen Waters-Husted
 Sampling Origin Hanford Site
 Logbook No. HNF-N-506 85/92
 Method of Shipment Commercial Carrier
 Priority: 30 Days **PRIORITY**

Hold Time
 SPECIAL INSTRUCTIONS
 N/A
 Special Handling: N/A

Total Activity Exemption: Yes No

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

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35RK6	N	W JUL 13 2016	1023	2x4-L G/P	1129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B35RK6	N	W JUL 13 2016	1023	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B35RK6	N	W JUL 13 2016	1023	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By J.R. Aguilar/CHPRC	Print <i>Janelle Zunker</i>	Sign <i>Janelle Zunker</i>	Date/Time JUL 13 2016 1130	Received By Janelle Zunker CHPRC	Print <i>Janelle Zunker</i>	Sign <i>Janelle Zunker</i>	Date/Time JUL 13 2016 1130
Relinquished By Janelle Zunker CHPRC	Print <i>Janelle Zunker</i>	Sign <i>Janelle Zunker</i>	Date/Time JUL 13 2016 1400	Received By FEDEX	Print FEDEX	Sign <i>Janelle Zunker</i>	Date/Time JUL 13 2016 1400
Relinquished By	Print <i>Janelle Zunker</i>	Sign <i>Janelle Zunker</i>	Date/Time JUL 13 2016 1400	Received By <i>M. Kinsten</i>	Print <i>M. Kinsten</i>	Sign <i>M. Kinsten</i>	Date/Time 7-14-16 0905
Relinquished By	Print <i>Janelle Zunker</i>	Sign <i>Janelle Zunker</i>	Date/Time JUL 13 2016 1400	Received By	Print <i>Janelle Zunker</i>	Sign <i>Janelle Zunker</i>	Date/Time 7-14-16 0905

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

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

FINAL SAMPLE DISPOSITION
 PRINTED ON 5/26/2016
 FSR ID = FSR32462
 A-6004-842 (REV 2)

86165
401512

C.O.C.#
A16-006-015
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company
Collector J.R. Aguilera/CHPRC
Contact/Requester Karen Waters-Husted
Telephone No. 509-376-4650
SAF No. A16-006
Sampling Origin Hanford Site
Purchase Order/Charge Code 300071
Project Title LLWMA-1 AND LLWMA-4 PA, JULY
Logbook No. HNF-N-506 85/92
Ice Chest No. CWS-543
Shipped To (Lab) GEL Laboratories, LLC
Method of Shipment Commercial Carrier
Bill of Lading/Air Bill No. 77673999 3689
Protocol SURV
Priority: 30 Days
Offsite Property No. 6824
Hold Time
SPECIAL INSTRUCTIONS
 N/A
 Special Handling: N/A
Hold Time
 Total Activity Exemption: Yes No

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

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35RK8	N	W JUL 13 2016	1141	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B35RK8	N	W JUL 13 2016	1141	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B35RK8	N	W JUL 13 2016	1141	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By J.R. Aguilera/CHPRC Print Sign JUL 13 2016 Date/Time 1155	Received By Janelle Zunker CHPRC Print Sign JUL 13 2016 Date/Time 1155	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By Janelle Zunker CHPRC Print Sign JUL 13 2016 Date/Time 1400	Received By FEDEX Print Sign JUL 13 2016 Date/Time 1400	
Relinquished By Print Sign JUL 13 2016 Date/Time 1400	Received By M. Kinslow Print Sign JUL 13 2016 Date/Time 1400	
Relinquished By Print Sign JUL 13 2016 Date/Time 1400	Received By Print Sign JUL 13 2016 Date/Time 1400	

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time
 FSR ID = FSR32464
 PRINTED ON 5/26/2016
 A-6004-842 (REV 2)

SAMPLE RECEIPT & REVIEW FORM

Client:	<u>CPRC</u>	SDG/AR/COC/Work Order:	<u>40512</u>
Received By:	<u>MIC</u>	Date Received:	<u>7-14-16</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>cpm</u>	
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>		
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped:	UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>1c 2c</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130462962</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air <u>7767 3999</u> FedEx Ground 3840 2c UPS 3689 2c Field Services 3932 1c Courier Other

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 7/15/16 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 10 August 2016

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

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401512
Work Order #: 401512**

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: 1581778

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
401512001	B35RK6
401512002	B35RK8
1203584985	Method Blank (MB)
1203584986	401492001(B35RM1) Sample Duplicate (DUP)
1203584987	401492001(B35RM1) Matrix Spike (MS)
1203584988	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	Data rejected due to no valid peak.	Iodine-129	401512002	B35RK8

Product: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 4

Analytical Batch: 1582186

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
401512001	B35RK6
401512002	B35RK8
1203585992	Method Blank (MB)
1203585993	400884001(NonSDG) Sample Duplicate (DUP)

1203585994 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 1203585993 (Non SDG 400884001DUP) was recounted to verify sample results. Recount is reported.

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

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

Analytical Batch: 1582195

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
401512001	B35RK6
401512002	B35RK8
1203586023	Method Blank (MB)
1203586024	400884001(NonSDG) Sample Duplicate (DUP)
1203586025	400884001(NonSDG) Matrix Spike (MS)
1203586026	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.

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: GEL401512 GEL Work Order: 401512

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: Theresa Austin

Date: 10 AUG 2016

Title: Group Leader

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL401512	Client: CPRC001	Project: CPRC0A16006
Lab Sample ID: 401512001	Date Collected: 07/13/2016 10:23	Matrix: WATER
	Date Received: 07/14/2016 09:05	
Client ID: B35RK6	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1581778	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 08/05/2016 15:36	Aliquot: 1.5 L	Instrument: XRAY5
Data File: I401512001.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1581778		
Prep Date: 08/04/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.115	pCi/L	+/-0.290	0.295	0.543	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: GEL401512	Client: CPRC001	Project: CPRC0A16006
Lab Sample ID: 401512001	Date Collected: 07/13/2016 10:23	Matrix: WATER
	Date Received: 07/14/2016 09:05	
Client ID: B35RK6	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1582186	Analyst: GXR1	SOP Ref: GL-RAD-A-059
Run Date: 07/26/2016 11:14	Aliquot: 100 mL	Instrument: LSCBROWN
Data File: E1582186.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 30 min
Prep Batch: 1582186		
Prep Date: 07/22/2016 13:25		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	21.1	pCi/L	+/-22.2	22.3	37.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	24400	28900	CPM	84.4	(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

Page 1 of 1

SDG Number: GEL401512
 Lab Sample ID: 401512001

Client: CPRC001
 Date Collected: 07/13/2016 10:23
 Date Received: 07/14/2016 09:05

Project: CPRC0A16006
 Matrix: WATER

Client ID: B35RK6
 Batch ID: 1582195
 Run Date: 07/25/2016 14:31
 Data File: T1582195.xls
 Prep Batch: 1582195
 Prep Date: 07/22/2016 12:17

Method: TRITIUM_DIST_LSC
 Analyst: TXJ1
 Aliquot: 50 mL
 Prep Method: EPA 906.0 Modified

Prep Basis: "As Received"
 SOP Ref: GL-RAD-A-002
 Instrument: LSCRED
 Count Time: 40 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	133	pCi/L	+/-194	196	330	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: GEL401512	Client: CPRC001	Project: CPRC0A16006
Lab Sample ID: 401512002	Date Collected: 07/13/2016 11:41	Matrix: WATER
	Date Received: 07/14/2016 09:05	
Client ID: B35RK8		Prep Basis: "As Received"
Batch ID: 1581778	Method: DOE EML HASL-300,I-01 Mo	SOP Ref: GL-RAD-A-006
Run Date: 08/05/2016 15:37	Analyst: MJH1	Instrument: XRAY6
Data File: I401512002.CNF;1	Aliquot: 1.5 L	Count Time: 120 min
Prep Batch: 1581778	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 08/04/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	UX	0.00	pCi/L	+/-0.318	0.323	0.356	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: GEL401512	Client: CPRC001	Project: CPRC0A16006
Lab Sample ID: 401512002	Date Collected: 07/13/2016 11:41	Matrix: WATER
	Date Received: 07/14/2016 09:05	
Client ID: B35RK8	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1582186	Analyst: GXR1	SOP Ref: GL-RAD-A-059
Run Date: 07/26/2016 11:46	Aliquot: 100 mL	Instrument: LSCBROWN
Data File: E1582186.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 30 min
Prep Batch: 1582186		
Prep Date: 07/22/2016 13:25		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	2.17	pCi/L	+/-21.9	21.9	37.6	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	24400	28900	CPM	84.2	(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: GEL401512	Client: CPRC001	Project: CPRC0A16006
Lab Sample ID: 401512002	Date Collected: 07/13/2016 11:41	Matrix: WATER
	Date Received: 07/14/2016 09:05	
Client ID: B35RK8	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1582195	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/25/2016 15:13	Aliquot: 50 mL	Instrument: LSCRED
Data File: T1582195.xls	Prep Method: EPA 906.0 Modified	Count Time: 40 min
Prep Batch: 1582195		
Prep Date: 07/22/2016 12:17		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		622	pCi/L	+/-217	248	325	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.

Quality Control Summary

8/10/2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: August 10, 2016

Page 1 of 2

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 401512

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1581778								
QC1203584985	MB								
Iodine-129			U	-0.117	pCi/L			MJH1	08/06/1615:24
				Uncert:					
				TPU:					
QC1203584986	401492001	DUP							
Iodine-129			U	-0.105	pCi/L				08/06/1615:24
				Uncert:		RPD: 0	N/A		
				TPU:		RER: 0.465	(0-2)		
QC1203584987	401492001	MS							
Iodine-129			U	-0.105	pCi/L	REC: 92	(75%-125%)		08/06/1615:25
				Uncert:					
				TPU:					
QC1203584988	LCS								
Iodine-129				27.7	pCi/L	REC: 104	(80%-120%)		08/06/1615:27
				Uncert:					
				TPU:					
Rad Liquid Scintillation									
Batch	1582186								
QC1203585992	MB								
Technetium-99			U	1.14	pCi/L			GXR1	07/26/1613:22
				Uncert:					
				TPU:					
**Technetium-99m Tracer				28900	CPM	REC: 83	(30%-105%)		
QC1203585993	400884001	DUP							
Technetium-99				41.3	pCi/L				07/27/1612:35
				Uncert:		RPD: 30	(0% - 100%)		
				TPU:		RER: 0.858	(0-2)		
**Technetium-99m Tracer				28900	CPM	REC: 84	(30%-105%)		
QC1203585994	LCS								
Technetium-99				861	pCi/L	REC: 97	(80%-120%)		07/26/1614:25
				Uncert:					
				TPU:					
**Technetium-99m Tracer				28900	CPM	REC: 88	(30%-105%)		
Batch	1582195								
QC1203586023	MB								
Tritium			U	-22.9	pCi/L			TXJ1	07/25/1617:19
				Uncert:					
				TPU:					
QC1203586024	400884001	DUP							
Tritium			U	39.3	pCi/L				07/25/1618:01
				Uncert:		RPD: 0	N/A		
				TPU:		RER: 0.882	(0-2)		
QC1203586025	400884001	MS							
Tritium			U	39.3	pCi/L	REC: 82	(75%-125%)		07/25/1618:43

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QC Summary

Workorder: 401512

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch	1582195									
		Uncert:	+/-195	+/-275						
		TPU:	+/-195	+/-459						
QC1203586026	LCS									
Tritium	2320			1940	pCi/L	REC: 84 (80%-120%)			07/25/16	19:25
		Uncert:		+/-274						
		TPU:		+/-464						

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 $\geq 2X$ the MDA and, after corrections, result is \geq 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.