

May 09, 2016



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2040 Savage Road Charleston, SC 29407
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gel.com

May 09, 2016

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

Re: CHPRC SAF I16-018
Work Order: 394995
SDG: GEL394995

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 12, 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: I16-018-006 and I16-018-007
Enclosures



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Case Narrative

May 09, 2016

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF I16-018
SDG: GEL394995

May 09, 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 April 12, 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
394995001	B34KD1
394995002	B34KD2

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.

May 09, 2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

May 09, 2016
Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL394995
Work Order #: 394995

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.

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 394995002 (B34KD2) was recounted to verify sample results. Recount is reported. Sample 1203532370 (MB) was recounted due to a suspected blank false positive. The recount is reported.

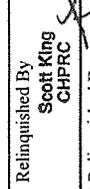
Certification Statement

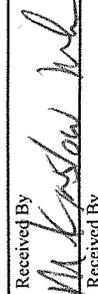
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

100 lbs

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# I16-018-006
		394995				Page 1 of 1
Collector	Scott King CHPRC	Contact/Requester	Karen Waters-Husted		Telephone No.	509-376-4650
SAF No.	I16-018	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	200U1, APRIL 2016	Logbook No.	HNF-N-50683 / 54		Ice Chest No.	GCS-379
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	776078567998
Protocol	CERCLA	Priority:	30 Days	PRIORITY	Offsite Property No.	6512
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time		
*** 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		N/A		Total Activity Exemption: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time
B34KD1	N	APR 11 2016	0800	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months
B34KD1	N	W	↓	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months

Relinquished By Scott King CHPRC	Print 	Sign	Date/Time APR 11 2016 1130
Relinquished By J.C. Fulton CHPRC	Print 	Sign	Date/Time APR 11 2016 1130
Relinquished By 8027	Print 	Sign	Date/Time APR 11 2016 1400
Relinquished By	Print 	Sign	Date/Time APR 11 2016 1400

Received By J.C. Fulton CHPRC	Print 	Sign	Date/Time APR 11 2016 1130
Received By FEDEX	Print 	Sign	Date/Time APR 11 2016 1130
Received By M. Kinslow CHPRC	Print 	Sign	Date/Time 4-12-16 0940

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
PRINTED ON 2/29/2016	FSR ID = FSR25467	A-6004-842 (REV 2)	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # 116-018-007
		394995		Page 1 of 1
Collector Scott King CHPRC	Contact/Requester Karen Waters-Husted	Telephone No.	509-376-4650	
SAF No. 116-018	Sampling Origin Hanford Site	Purchase Order/Charge Code	300071	
Project Title 200UP1, APRIL 2016	Logbook No. HNF-N-506 83154	Ice Chest No.	645-379	
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.	776078567998	
Protocol CERCLA	Priority: 30 Days	Offsite Property No.	6512	
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Total Activity Exemption: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
*** 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		N/A		
Sample No.	Filter	* Date	Time	No/Type Container
B34KD2	N	W APR 11 2016	11:10	2x4-L G/P
B34KD2	N	W		1x500-mL P
				Sample Analysis
				1129LL_SEP_LEPS_GS_LL: COMMON
				TRITIUM_DIST_LSC: COMMON
				Holding Time
				6 Months
				6 Months
				Preservative
				None
				None

Relinquished By Scott King CHPRC	Print 	Sign	Received By J.C. Fulton/CHPRC	Print 	Sign	Date/Time APR 11 2016 1130
Relinquished By J.C. Fulton/CHPRC	Print 	Sign	Received By FEDEX	Print 	Sign	Date/Time APR 11 2016 1400
Relinquished By	Print 	Sign	Received By M. Kinslow	Print 	Sign	Date/Time 4-11-16 0940
Relinquished By	Print 	Sign	Received By	Print 	Sign	Date/Time

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

May 09, 2016



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>394995</u>
Received By: <u>M/K</u>		Date Received: <u>4-12-16</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>0/20</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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2c</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>139462962</u> Secondary Temperature Device Serial# (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air <input checked="" type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>7760 7856 8398 2c</u> <u>7998 2c</u> <u>7830 21^c no ice</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 4/12/16 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 09 May 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

May 09, 2016

Radiochemistry

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL394995

Work Order #: 394995

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: 1558783

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
394995001	B34KD1
394995002	B34KD2
1203525563	Method Blank (MB)
1203525564	394858001(NonSDG) Sample Duplicate (DUP)
1203525565	394858001(NonSDG) Matrix Spike (MS)
1203525566	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

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

Analytical Batch: 1561314

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
394995001	B34KD1
394995002	B34KD2
1203532370	Method Blank (MB)
1203532371	394995001(B34KD1) Sample Duplicate (DUP)
1203532372	394995001(B34KD1) Matrix Spike (MS)
1203532373	Laboratory Control Sample (LCS)

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

May 09, 2016

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 394995002 (B34KD2) was recounted to verify sample results. Recount is reported. Sample 1203532370 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Certification Statement

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

May 09, 2016

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL394995 GEL Work Order: 394995

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Theresa Austin

Date: 09 MAY 2016

Title: Group Leader

Sample Data Summary

May 09, 2016

**Certificate of Analysis
Sample Summary**

SDG Number: GEL394995	Client: CPRC001	Project: CPRC0116018
Lab Sample ID: 394995001	Date Collected: 04/11/2016 08:00	Matrix: WATER
	Date Received: 04/12/2016 09:40	
Client ID: B34KD1	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1558783	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 04/22/2016 09:12	Aliquot: 1.5 L	Instrument: XRAY5
Data File: I394995001.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1558783		
Prep Date: 04/20/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.260	pCi/L	+/-0.396	0.414	0.895	1.00

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.

May 09, 2016

**Certificate of Analysis
Sample Summary**

SDG Number: GEL394995	Client: CPRC001	Project: CPRC0116018
Lab Sample ID: 394995001	Date Collected: 04/11/2016 08:00	Matrix: WATER
	Date Received: 04/12/2016 09:40	
Client ID: B34KD1	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1561314	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 05/06/2016 19:50	Aliquot: 50 mL	Instrument: LSCYELLOW
Data File: T1561314.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1561314		
Prep Date: 05/06/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	159	pCi/L	+/-175	178	294	400

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.

May 09, 2016

**Certificate of Analysis
Sample Summary**

SDG Number: GEL394995	Client: CPRC001	Project: CPRC0116018
Lab Sample ID: 394995002	Date Collected: 04/11/2016 11:10	Matrix: WATER
	Date Received: 04/12/2016 09:40	
Client ID: B34KD2	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1558783	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 04/22/2016 10:57	Aliquot: 1.5 L	Instrument: XRAY1
Data File: I394995002.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1558783		
Prep Date: 04/20/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129		3.49	pCi/L	+/-0.807	0.880	0.496	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

May 09, 2016

**Certificate of Analysis
Sample Summary**

SDG Number: GEL394995	Client: CPRC001	Project: CPRC0116018
Lab Sample ID: 394995002	Date Collected: 04/11/2016 11:10	Matrix: WATER
	Date Received: 04/12/2016 09:40	
Client ID: B34KD2	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1561314	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 05/08/2016 08:52	Aliquot: 50 mL	Instrument: LSCYELLOW
Data File: T1561314R.xls	Prep Method: EPA 906.0 Modified	Count Time: 40 min
Prep Batch: 1561314		
Prep Date: 05/06/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		7090	pCi/L	+/-454	1440	319	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Comments:

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: May 9, 2016
Page 1 of 2

Client : CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 394995

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1558783								
QC1203525563	MB								
Iodine-129			U	0.120	pCi/L			MJH1	04/25/1606:56
				Uncert: +/-0.380					
				TPU: +/-0.384					
QC1203525564	394858001	DUP							
Iodine-129		4.28		4.07	pCi/L				04/25/1606:58
				Uncert: +/-0.534		RPD: 5 (0% - 20%)			
				TPU: +/-0.682		RER: 0.298 (0-2)			
QC1203525565	394858001	MS							
Iodine-129		27.7	4.28	27.2	pCi/L	REC: 83 (75%-125%)			04/25/1608:09
				Uncert: +/-0.534					
				TPU: +/-0.682					
QC1203525566	LCS								
Iodine-129		27.7		24.7	pCi/L	REC: 89 (80%-120%)			04/25/1608:26
				Uncert: +/-3.45					
				TPU: +/-4.25					
Rad Liquid Scintillation									
Batch	1561314								
QC1203532370	MB								
Tritium			U	-4.54	pCi/L			TXJ1	05/08/1619:11
				Uncert: +/-187					
				TPU: +/-187					
QC1203532371	394995001	DUP							
Tritium		U	159	U	77.8	pCi/L			05/07/1610:55
				Uncert: +/-175		RPD: 0 N/A			
				TPU: +/-178		RER: 0.656 (0-2)			
QC1203532372	394995001	MS							
Tritium		2360	U	159	1870	pCi/L	REC: 80 (75%-125%)		05/07/1611:41
				Uncert: +/-175					
				TPU: +/-178					
QC1203532373	LCS								
Tritium		2350		2020	pCi/L	REC: 86 (80%-120%)			05/07/1612:28
				Uncert: +/-263					
				TPU: +/-470					

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

QC Summary

Workorder: 394995

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