



October 12, 2015

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

Re: CHPRC SAF X16-001  
Work Order: 382605  
SDG: GEL382605

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 06, 2015. 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,

Sarah Edwards for  
Heather Shaffer  
Project Manager

Purchase Order: 300071JDBA 7H  
Chain of Custody: X16-001-219 and X16-001-225  
Enclosures



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# Case Narrative

October 16, 2015

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF X16-001  
SDG: GEL382605

October 12, 2015

**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 October 06, 2015, 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:

<b>Laboratory Identification</b>	<b>Sample Description</b>
382605001	B32TB5
382605002	B32TC6

**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.

This package, to the best of my knowledge, 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.

*Sarah M Edwards*  
October 16, 2015

Sarah Edwards for  
Heather Shaffer  
Project Manager

# **Chain of Custody and Supporting Documentation**

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# X16-001-225

Page 1 of 1

382605

Collector	K.C. Patterson/CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X16-001	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271
Project Title	100-BC-5 RI, OCTOBER 2015	Logbook No.	HNF-N-506 17/164	Ice Chest No.	CSWS-513
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	774667176976
Protocol	CERCLA	Priority:	15 Days	Offsite Property No.	6022

**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 #58.1

**SPECIAL INSTRUCTIONS** Hold Time  
 Submit deliverables & invoices to CPP Sample Management.

Total Activity Exemption: Yes  No

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32TC6	N	W OCT 05 2015	0911	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

October 16, 2015

Relinquished By K.C. Patterson/CHPRC	Print 	Sign	Date/Time OCT 05 2015 1030	Received By F. AL HALL/CHPRC	Print 	Sign	Date/Time OCT 05 2015 1030	Matrix *
Relinquished By F. AL HALL/CHPRC	Print 	Sign	Date/Time OCT 05 2015 1400	Received By FEDEX	Print 	Sign	Date/Time OCT 05 2015 1030	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 Fedex	Print 	Sign	Date/Time OCT 05 2015	Received By Cristina Sorensen / CHPRC	Print 	Sign	Date/Time 10/16/15 0915	
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	

**FINAL SAMPLE DISPOSITION**  
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # X16-001-219  
Page 1 of 1

382605

Collector	K.C. Patterson/CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X16-001	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271
Project Title	100-BC-5 RI, OCTOBER 2015	Logbook No.	HNF-N-506 77/64	Ice Chest No.	6WS-513
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7746 6717 6976
Protocol	CERCLA	Priority:	15 Days	Offsite Property No.	6022

Sample No.	B32TB5	Filter	N	Date	10/5/2015	Time	1055	No/Type Container	1x500-mL P	Sample Analysis	TRITIUM_DIST_LSC: COMMON	Holding Time	6 Months	Preservative	None
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**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

**SPECIAL INSTRUCTIONS** Hold Time  
 Submit deliverables & invoices to ^CPP Sample Management.

Total Activity Exemption: Yes  No

October 16, 2015

Relinquished By	K.C. Patterson/CHPRC	Print		Sign		Date/Time	OCT 05 2015 120	Received By	L.D. Wall	Print		Sign		Date/Time	OCT 05 2015 120	Matrix *	DS = Drum Solids
Relinquished By	L.D. Wall	CHPRC		FEDEX		Date/Time	1400	Received By	FEDEX					Date/Time		DL = Drum Liquids	
Relinquished By	FEDEX					Date/Time		Received By	chelsea seago					Date/Time		T = Tissue	
Relinquished By						Date/Time		Received By						Date/Time		WI = Wipe	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By		Date/Time	
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October 16, 2015

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>CPRC</u>		SDG/AR/COC/Work Order:	
Received By: <u>CSJ</u>		Date Received: <u>10/16/15</u>	
Suspected Hazard Information	Yes	No	*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 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"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>1.5 °C</u>
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>EAD092024932</u> Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" 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"/>			Sample ID's and containers affected:
7	VOA vials contain acid preservation?	<input checked="" type="checkbox"/>			(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
9	Are Encore containers present?	<input checked="" type="checkbox"/>			(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
13	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
15	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
16	Carrier and tracking number.	<input checked="" type="checkbox"/>			Circle Applicable: FedEx <u>Air</u> FedEx Ground UPS Field Services Courier Other <u>7746 6717 6976</u>

Comments (Use Continuation Form if needed):

# **Data Review Qualifier Definitions**

## Project Specific Qualifier Definitions for GEL Client Code: **CPRC**

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	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	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol-condensation product	Y	Organics	Semi-Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H Hold Date In RAD replaces UI. Same usage as standard X as well.
N	Programmed	Spike Sample recovery is outside control limits.	Y			
*	Programmed	Duplicate analysis not within control limits	Y	Inorganics		
>	Programmed	Result greater than quantifiable range or greater than upper limit of the analysis range	Y	General Chemistry		
Z	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
B	Programmed	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).	Y	Inorganics	Metals	Replaces J Estimated Value
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (Organics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely preformed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is $\geq$ MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	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).	Y	General Chemistry		Replaces J Estimated Value
C	Programmed	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.	Y	Inorganics	Metals	Replaces B Blank Detection
C	Programmed	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.	Y	General Chemistry		Replaces B Blank Detection
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

**Project Specific Qualifier Definitions for GEL Client Code: CPRC**

<b>Code</b>	<b>Status</b>	<b>Qualifier Definition</b>	<b>CofA</b>	<b>Department</b>	<b>Fraction</b>	<b>Additional Comments</b>
UX	Manual	Gamma Spectroscopy--Uncertain identification	Y	Radiological		

# Laboratory Certifications

**List of current GEL Certifications as of 12 October 2015**

<b>State</b>	<b>Certification</b>
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
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	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-18
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# Radiological Analysis

October 16, 2015

Radiochemistry

Technical Case Narrative

CH2M Hill Plateau Remediation Company (CPRC)

SDG #: GEL382605

Work Order #: 382605

**Method/Analysis Information**

**Product:** TRITIUM\_DIST\_LSC: COMMON

Analytical Method: TRITIUM\_DIST\_LSC

Analytical Batch Number: 1513193

<b>Sample ID</b>	<b>Client ID</b>
382605001	B32TB5
382605002	B32TC6
1203407417	Method Blank (MB)
1203407420	Laboratory Control Sample (LCS)
1203407418	382659003(B32X86) Sample Duplicate (DUP)
1203407419	382659003(B32X86) Matrix Spike (MS)

Samples 382605 001 and 002 in this SDG were analyzed on an "as received" basis.

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 21.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**QC Information**

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

**Designated QC**

The following sample was used for QC: 382659003 (B32X86).

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Recounts**

Samples 382605001 (B32TB5) and 382605002 (B32TC6) were recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1456200 was generated due to RDL less than MDA. 1. Samples 382601002, 382655002, 382659003, 382659005, 1203407417, and 1203407418 do not meet the required detection limit. The samples were counted the maximum count time of 120 minutes to achieve the best possible results. 1. Reporting results.

**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier Information**

Manual qualifiers were not required.

**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.

October 16, 2015

**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: GEL382605 GEL Work Order: 382605

**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:** Kate Gellatly

**Date:** 16 OCT 2015

**Title:** Analyst I

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 12-OCT-15	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LSC	<b>Test / Method:</b> EPA 906.0 Modified	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> CPRC
<b>Batch ID:</b> 1513193	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 382601(GEL382601),382603(GEL382603),382605(GEL382605),382655(GEL382655),382659(GEL382659)			
<b>Application Issues:</b> RDL less than MDA			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Samples 382601002, 382655002, 382659003, 382659005, 1203407417, and 1203407418 do not meet the required detection limit. The samples were counted the maximum count time of 120 minutes to achieve the best possible results.</p>		<p>1. Reporting results.</p>	

**Originator's Name:**

Lyndsey Pace 12-OCT-15

**Data Validator/Group Leader:**

Lesley Anderson 12-OCT-15

# Sample Data Summary

October 16, 2015

**Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> GEL382605	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0X16001
<b>Lab Sample ID:</b> 382605001	<b>Date Collected:</b> 10/05/2015 10:55	<b>Matrix:</b> WATER
	<b>Date Received:</b> 10/06/2015 09:15	
<b>Client ID:</b> B32TB5	<b>Method:</b> TRITIUM_DIST_LSC	<b>Prep Basis:</b> "As Received"
<b>Batch ID:</b> 1513193	<b>Analyst:</b> GXR1	<b>SOP Ref:</b> GL-RAD-A-002
<b>Run Date:</b> 10/09/2015 18:00	<b>Aliquot:</b> 50 mL	<b>Instrument:</b> LSCPINK
<b>Data File:</b> T1513193.xls	<b>Prep Method:</b> EPA 906.0 Modified	<b>Count Time:</b> 120.0297 min
<b>Prep Batch:</b> 1513193		
<b>Prep Date:</b> 10/09/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		2730	pCi/L	+/-175	556	112	100

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).

October 16, 2015  
Rad

**Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> GEL382605	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0X16001
<b>Lab Sample ID:</b> 382605002	<b>Date Collected:</b> 10/05/2015 09:11	<b>Matrix:</b> WATER
	<b>Date Received:</b> 10/06/2015 09:15	
<b>Client ID:</b> B32TC6	<b>Method:</b> TRITIUM_DIST_LSC	<b>Prep Basis:</b> "As Received"
<b>Batch ID:</b> 1513193	<b>Analyst:</b> GXR1	<b>SOP Ref:</b> GL-RAD-A-002
<b>Run Date:</b> 10/09/2015 20:03	<b>Aliquot:</b> 50 mL	<b>Instrument:</b> LSCPINK
<b>Data File:</b> T1513193.xls	<b>Prep Method:</b> EPA 906.0 Modified	<b>Count Time:</b> 120.0297 min
<b>Prep Batch:</b> 1513193		
<b>Prep Date:</b> 10/09/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1010	pCi/L	+/-119	228	114	100

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).

# Quality Control Data

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: October 15, 2015  
Page 1 of 1

**Client :** CH2MHill Plateau Remediation Company  
**MSIN R3-50 CHPRC**  
**PO Box 1600**  
**Richland, Washington 99352**  
**Contact:** Mr. Scot Fitzgerald  
**Workorder:** 382605

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
<b>Rad Liquid Scintillation</b>										
Batch	1513193									
QC1203407417	MB									
Tritium			U	31.6	pCi/L			GXR1	10/10/1507:31	
				Uncert: +/-65.3						
				TPU: +/-65.6						
QC1203407418	382659003	DUP								
Tritium		U	7.50	U	-29.9				10/10/1509:33	
				Uncert: +/-63.7		RPD: 0	N/A			
				TPU: +/-63.8		RER: 0.84	(0-2)			
QC1203407419	382659003	MS								
Tritium	1800	U	7.50		1410	REC: 78	(75%-125%)		10/10/1511:36	
				Uncert: +/-63.7						
				TPU: +/-63.8						
QC1203407420	LCS									
Tritium	1800				1830	REC: 102	(80%-120%)		10/10/1511:53	
				Uncert: +/-401						
				TPU: +/-535						

**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.