



February 07, 2018

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

Re: CHPRC SAF I18-003 & S18-012 for RDR  
Work Order: 442037  
SDG: GEL442037

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on December 09, 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: I18-003-119, I18-003-126 and S18-012-146  
Enclosures



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# **Recheck, Recount, or Reanalysis Order**

## RECHECK, RECOUNT, OR REANALYSIS ORDER

01/16/2018

**Order Number: 180116GEL-R9330**

GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

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**Sample Delivery Group: GEL439740**

Method Name: TC99\_EIE\_LSC

Sample#: B3FF96

Sample Date: 12/7/2017 1:24:00 PM

SAF #: I18-003

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
439740004	1/16/2018 4:01:56 PM	Technetium-99	REANALYZE	15 Days / 15 Days
Special Instructions: Result is out of trend - possible sample swap. SLF 01/16/2018				

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Deliver Report Results to: CHPRC

P.O. Box 1600

Richland, WA 99352

C/O Mr.Scot Fitzgerald

## RECHECK, RECOUNT, OR REANALYSIS ORDER

01/16/2018

**Order Number: 180116GEL-R9336**

GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

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**Sample Delivery Group: GEL439740**

Method Name: TC99\_EIE\_LSC

Sample#: B3FDW7

Sample Date: 12/8/2017 10:00:00 AM

SAF #: I18-003

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
439740002	1/16/2018 4:03:02 PM	Technetium-99	REANALYZE	15 Days / 15 Days
Special Instructions:	Result is out of trend.	Possible sample swap.	SLF 01/16/2017	

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Deliver Report Results to: CHPRC

P.O. Box 1600

Richland, WA 99352

C/O Mr.Scot Fitzgerald

**Subject:** RE: Request for Recheck, or Reanalysis Order / R9330 SAF I18-003  
**From:** "Fitzgerald, Scot L" <Scot\_L\_Fitzgerald@rl.gov>  
**Date:** 2/5/2018 4:54 PM  
**To:** 'Heather Shaffer' <Heather.Shaffer@gel.com>

Heather,

If I am understanding correctly, go ahead and report all three results in the rerun data package (442037).

Thanks

Scot

---

**From:** Heather Shaffer [mailto:Heather.Shaffer@gel.com]  
**Sent:** Monday, February 05, 2018 8:52 AM  
**To:** Fitzgerald, Scot L <Scot\_L\_Fitzgerald@rl.gov>; ^CPP Sample Management <CPP\_Sample\_Management@rl.gov>  
**Cc:** Douglas, James G (Jim) <James\_G\_Jim\_Douglas@rl.gov>; Medley, Heather A <Heather\_A\_Medley@rl.gov>; Sumner, Laine C <Laine\_C\_Sumner@rl.gov>; Todak, David <David\_Todak@rl.gov>; Waters-husted, Karen S <Karen\_S\_Waters-husted@rl.gov>  
**Subject:** Re: Request for Recheck, or Reanalysis Order / R9330 SAF I18-003

Scot,

With regards to the RDRs R9330 and R9336:

We re-ran the original batch to figure out where the swap happened. It appears the analyst poured the same sample up twice and missed the last sample in the batch. There are three samples where the first prep does not match the second run. Original IDs B3FDW7 (439740002) and B3FF96 (439740004) which were relogged under GEL442037. The other sample is B3FH28 (439745009) which was originally reported as a non-detect and now has a hit of around 165 pCi/L. Do you want us to revise the original data packages for all three samples? Or revise just GEL439745, and continue with the reporting of GEL relog 442037. Please advise.

Thank you,  
Heather

On 1/16/2018 7:02 PM, Fitzgerald, Scot L wrote:

See Attachment

--

**Heather Shaffer**  
Project Manager



2040 Savage Road, Charleston, SC 29407 | PO Box 30712, Charleston, SC 29417

Office Direct: 843.769.7386 | Office Main: 843.556.8171 | Fax: 843.766.1178

E-Mail: [heather.shaffer@gel.com](mailto:heather.shaffer@gel.com) | Website: [www.gel.com](http://www.gel.com)

**Analytical Testing | Environmental | Engineering | Surveying**



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<http://www.gellaboratories.com>

# Case Narrative

**General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF I18-003 & S18-012 for RDR  
SDG: GEL442037**

**February 07, 2018**

**Laboratory Identification:**

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

**Summary**

**Sample receipt**

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on December 09, 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 requested reanalysis for Tc-99. Please see the enclosed RDRs 180116GEL-R9330 and 180116GEL-R9336 for further details. While running the reanalysis the lab discovered that it was a mix up in samples and a third sample was also impacted. Please refer to the enclosed e-mail for further details..

**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:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
442037001	B3FDW7
442037002	B3FF96
442037003	B3FH28

**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.



Heather Shaffer  
Project Manager

**Radiochemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL442037  
Work Order #: 442037**

**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 1203956155 (LCS) was recounted due to low recovery. The recount is reported.

**Miscellaneous Information****Additional Comments**

Client requested re-analysis of 439740002 and 439740004 due to possible sample swap. Results showed that it was not just a simple swap and entire original batch was re-run. It was found that the two samples above and one other (439745009) did not match original results. Samples are being reported under relog work order 442037.

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

Samples were re-prepped to verify sample results. Reanalysis is reported.

**Recounts**

Sample 442037003 (B3FH28) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

**Miscellaneous Information****Additional Comments**

Client requested re-analysis of 439740002 and 439740004 due to possible sample swap. Results showed that it was not just a simple swap and entire original batch was re-run. It was found that the two samples and one other (439745009) did not match original results. Samples are being reported under relog work order 442037. 442037003 (B3FH28).

**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.# I18-003-126 Page 1 of 1	
Collector: Juan Aguilera FRSBC		Telephone No.: 509-376-4650	
SAF No.: I18-003		Purchase Order/Charge Code: 300071	
Project Title: AEA, DECEMBER 2017		Ice Chest No.: 6W 5-7 30	
Shipped To (Lab): GEL Laboratories, LLC		Bill of Lading/Air Bill No.: 770947483523	
Protocol: SURV		Offsite Property No.: 885A	
<b>POSSIBLE SAMPLE HAZARDS/REMARK</b> ** ** 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		<b>SPECIAL INSTRUCTIONS</b> N/A	
Sample No. B3FP96	Filter N	Date 12-7-17	Time 1324
No/Type Container	1x500-mL G/P		
Sample Analysis		Holding Time	Preservative
TC99_BIE_LSC: COMMON		6 Months	HNO3 to pH <2

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

45/11/18-489740-442037 Revoy

Contact/Requester: Karen Waters-Husted  
 Sampling Origin: Hanford Site  
 Logbook No.: HNF-N-506 - 96/148  
 Method of Shipment Commercial Carrier  
 Priority: 15 Days PRIORITY

**POSSIBLE SAMPLE HAZARDS/REMARK**  
 \*\* \*\* 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

N/A

Received By: SSU-1  
 Print First and Last Name: MIKE ESPARZA  
 Signature: [Signature]  
 Date/Time: DEC 07 2017 1420

Relinquished By: SSU-1  
 Print First and Last Name: MIKE ESPARZA  
 Signature: [Signature]  
 Date/Time: DEC 08 2017

Received By: FRSBC  
 Print First and Last Name: [Signature]  
 Signature: [Signature]  
 Date/Time: DEC 08 2017 10:20

Relinquished By: FRSBC  
 Print First and Last Name: [Signature]  
 Signature: [Signature]  
 Date/Time: DEC 08 2017

Received By: [Signature]  
 Print First and Last Name: [Signature]  
 Signature: [Signature]  
 Date/Time: 12-9-17 10:20

Relinquished By: [Signature]  
 Print First and Last Name: [Signature]  
 Signature: [Signature]  
 Date/Time: 12-9-17 10:20

Disposal Method (e.g., Return to customer, per lab procedure, used in process):

Disposed By: [Signature]

Date/Time: [Date/Time]

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

<b>CH2M Hill Plateau Remediation Company</b> C.O.C.# S18-012-146 Page 1 of 12 2/18/18 <del>439745</del> <del>Relog 442037</del>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> Telephone No.: 509-376-4650 Purchase Order/Charge Code: 300071 Ice Chest No.: 6WS-730 Bill of Lading/Air Bill No.: 70941483523 Offsite Property No.: 8832																																									
Collector: Larry Rosano /CHPRC SAF No.: S18-012 Project Title: SURV, DECEMBER 2017 Shipped To (Lab): GEL Laboratories, LLC Protocol: SURV	Contact/Requester: Karen Waters-Husted Sampling Origin: Hanford Site Logbook No.: HNF-N-506 98/11 Method of Shipment: Commercial Carrier Priority: 15 Days PRIORITY	SPECIAL INSTRUCTIONS N/A																																									
POSSIBLE SAMPLE HAZARDS/REMARK ** ** 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																																											
<table border="1"> <thead> <tr> <th>Sample No.</th> <th>Filter</th> <th>* Time</th> <th>Date</th> <th>No/Type Container</th> <th>Sample Analysis</th> <th>Holding Time</th> <th>Preservative</th> </tr> </thead> <tbody> <tr> <td>B3FH28</td> <td>N</td> <td>W</td> <td>12-7-17 0826</td> <td>4X1-L aG</td> <td>8270_SVOA_GCMS: 1,4 Dioxane (1)</td> <td>7/40 Days</td> <td>Cool &lt;=6C</td> </tr> <tr> <td>B3FH28</td> <td>N</td> <td>W</td> <td>↓</td> <td>1x4-L G/P</td> <td>1129LL_SEP_LEPS_GS_LL: COMMON</td> <td>6 Months</td> <td>None</td> </tr> <tr> <td>B3FH28</td> <td>N</td> <td>W</td> <td>↓</td> <td>1x500-mL G/P</td> <td>TC99_EIE_LSC: COMMON</td> <td>6 Months</td> <td>HNO3 to pH &lt;2</td> </tr> <tr> <td>B3FH28</td> <td>N</td> <td>W</td> <td>12-7-17 0826</td> <td>1x250-mL P</td> <td>TRITIUM_DIST_LSC: COMMON</td> <td>6 Months</td> <td>None</td> </tr> </tbody> </table>	Sample No.	Filter	* Time	Date	No/Type Container	Sample Analysis	Holding Time	Preservative	B3FH28	N	W	12-7-17 0826	4X1-L aG	8270_SVOA_GCMS: 1,4 Dioxane (1)	7/40 Days	Cool <=6C	B3FH28	N	W	↓	1x4-L G/P	1129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None	B3FH28	N	W	↓	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2	B3FH28	N	W	12-7-17 0826	1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None			
Sample No.	Filter	* Time	Date	No/Type Container	Sample Analysis	Holding Time	Preservative																																				
B3FH28	N	W	12-7-17 0826	4X1-L aG	8270_SVOA_GCMS: 1,4 Dioxane (1)	7/40 Days	Cool <=6C																																				
B3FH28	N	W	↓	1x4-L G/P	1129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None																																				
B3FH28	N	W	↓	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2																																				
B3FH28	N	W	12-7-17 0826	1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None																																				

Relinquished By: Larry Rosano /CHPRC Print First and Last Name: Larry Rosano Signature: [Signature] Date/Time: DEC 07 2017 1115	Received By: MIKE ESPARZA /CHPRC Print First and Last Name: MIKE ESPARZA Signature: [Signature] Date/Time: DEC 07 2017 1205
Relinquished By: MIKE ESPARZA /CHPRC Print First and Last Name: MIKE ESPARZA Signature: [Signature] Date/Time: DEC 08 2017 1640	Received By: MIKE ESPARZA /CHPRC Print First and Last Name: MIKE ESPARZA Signature: [Signature] Date/Time: DEC 08 2017 1740
Relinquished By: MIKE ESPARZA /CHPRC Print First and Last Name: MIKE ESPARZA Signature: [Signature] Date/Time: DEC 08 2017 1640	Received By: MIKE ESPARZA /CHPRC Print First and Last Name: MIKE ESPARZA Signature: [Signature] Date/Time: DEC 08 2017 1740
Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Disposed By: [Signature] Date/Time: [Date/Time]	

C.O.C. No. 518-012-146		Page 2 of 2	
Relinquished By	Print	Sign	Date/Time
Received By	Print	Sign	Date/Time
STACY BOONE	Print	Sign	12-9-17 10:20
Relinquished By	Print	Sign	Date/Time
Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time
Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time
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Received By	Print	Sign	Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

FedEx

STACY BOONE

A-6003-962 (03/05)

# **Data Review Qualifier Definitions**

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

Report Date: 06-FEB-18

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

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

# Laboratory Certifications

**List of current GEL Certifications as of 07 February 2018**

<b>State</b>	<b>Certification</b>
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	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S.Carolina 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 #: GEL442037**  
**Work Order #: 442037**

**Product:** TC99\_EIE\_LSC: COMMON  
**Analytical Method:** TC99\_EIE\_LSC  
**Analytical Procedure:** GL-RAD-A-059 REV# 5  
**Analytical Batch:** 1733141

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
442037001	B3FDW7
442037002	B3FF96
1203956153	Method Blank (MB)
1203956154	442037001(B3FDW7) Sample Duplicate (DUP)
1203956155	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 1203956155 (LCS) was recounted due to low recovery. The recount is reported.

**Miscellaneous Information**

**Additional Comments**

Client requested re-analysis of 439740002 and 439740004 due to possible sample swap. Results showed that it was not just a simple swap and entire original batch was re-run. It was found that the two samples above and one other (439745009) did not match original results. Samples are being reported under relog work order 442037.

**Product:** TC99\_EIE\_LSC: COMMON  
**Analytical Method:** TC99\_EIE\_LSC  
**Analytical Procedure:** GL-RAD-A-059 REV# 5  
**Analytical Batch:** 1735433

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
442037003	B3FH28

1203961876	Method Blank (MB)
1203961877	439419001(NonSDG) Sample Duplicate (DUP)
1203961878	Laboratory Control Sample (LCS)

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

**Data Summary:**

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

**Technical Information**

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

Samples were reprepared to verify sample results. Reanalysis is reported.

**Recounts**

Sample 442037003 (B3FH28) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

**Miscellaneous Information**

**Additional Comments**

Client requested re-analysis of 439740002 and 439740004 due to possible sample swap. Results showed that it was not just a simple swap and entire original batch was re-run. It was found that the two samples and one other (439745009) did not match original results. Samples are being reported under relog work order 442037. 442037003 (B3FH28).

**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: GEL442037 GEL Work Order: 442037

**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:** 06 FEB 2018

**Title:** Analyst II

# Sample Data Summary

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL442037	Client: CPRC001	Project: CPRC0118003
Lab Sample ID: 442037001	Date Collected: 12/08/2017 10:00	Matrix: WATER
Client Sample: -Relog from 439740002	Date Received: 12/09/2017 10:20	
Client ID: B3FDW7		Prep Basis: "As Received"
Batch ID: 1733141	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 01/28/2018 06:51	Analyst: CXS7	Instrument: LSCGOLD
Data File: E1733141R.xls	Aliquot: 100 mL	Count Time: 25 min
Prep Batch: 1733141	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 01/23/2018 12:44		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		1960	pCi/L	+/-59.7	225	39.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	27100	34200	CPM	79.4	(30%-105%)

**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: GEL442037	Client: CPRC001	Project: CPRC0118003
Lab Sample ID: 442037002	Date Collected: 12/07/2017 13:24	Matrix: WATER
Client Sample: -Relog from 439740004	Date Received: 12/09/2017 10:20	
Client ID: B3FF96		Prep Basis: "As Received"
Batch ID: 1733141	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 01/28/2018 07:18	Analyst: CXS7	Instrument: LSCGOLD
Data File: E1733141R.xls	Aliquot: 100 mL	Count Time: 25 min
Prep Batch: 1733141	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 01/23/2018 12:44		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	24.5	pCi/L	+/-23.7	23.8	39.6	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	26200	34200	CPM	76.6	(30%-105%)

**Comments:**

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

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL442037	Client: CPRC001	Project: CPRC0118003
Lab Sample ID: 442037003	Date Collected: 12/07/2017 08:26	Matrix: WATER
Client Sample: -Relog from 439745009	Date Received: 12/09/2017 10:20	
Client ID: B3FH28		Prep Basis: "As Received"
Batch ID: 1735433	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 02/04/2018 12:22	Analyst: CXS7	Instrument: LSCRED
Data File: E1735433.xls	Aliquot: 100 mL	Count Time: 20 min
Prep Batch: 1735433	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 01/31/2018 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		162	pCi/L	+/-27.8	33.1	39.0	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	38800	40400	CPM	96.1	(30%-105%)

**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: February 6, 2018  
Page 1 of 2

**Client :** CH2MHill Plateau Remediation Company  
MSIN R3-50 CHPRC  
PO Box 1600  
Richland, Washington 99352  
**Contact:** Mr. Scot Fitzgerald  
**Workorder:** 442037

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Liquid Scintillation</b>									
Batch	1733141								
QC1203956153 MB									
Technetium-99			U	-8.2	pCi/L			CXS7	01/28/1807:45
				Uncert: +/-19.0					
				TPU: +/-19.0					
**Technetium-99m Tracer	34200			31800	CPM	REC: 93	(30%-105%)		
QC1203956154 442037001 DUP									
Technetium-99		1960		2120	pCi/L				01/28/1808:12
				Uncert: +/-59.7		RPD: 8	(0%-20%)		
				TPU: +/-225		RER: 0.965	(0-2)		
**Technetium-99m Tracer	34200	27100		30300	CPM	REC: 89	(30%-105%)		
QC1203956155 LCS									
Technetium-99		888		811	pCi/L	REC: 91	(80%-120%)		01/29/1807:23
				Uncert: +/-53.8					
				TPU: +/-105					
**Technetium-99m Tracer	34200			31200	CPM	REC: 91	(30%-105%)		
Batch	1735433								
QC1203961876 MB									
Technetium-99			U	-12.9	pCi/L			CXS7	02/04/1812:44
				Uncert: +/-21.9					
				TPU: +/-21.9					
**Technetium-99m Tracer	40400			37700	CPM	REC: 93	(30%-105%)		
QC1203961877 439419001 DUP									
Technetium-99		U 2.77	U	-11.5	pCi/L				02/04/1813:06
				Uncert: +/-20.4		RPD: 0	N/A		
				TPU: +/-20.4		RER: 0.684	(0-2)		
**Technetium-99m Tracer	40400	35400		36800	CPM	REC: 91	(30%-105%)		
QC1203961878 LCS									
Technetium-99		888		780	pCi/L	REC: 88	(80%-120%)		02/04/1813:27
				Uncert: +/-42.5					
				TPU: +/-96.1					
**Technetium-99m Tracer	40400			37900	CPM	REC: 94	(30%-105%)		

**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 analyte was detected in the associated method blank >= MDC or >5% sample activity.
- 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

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 442037

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