

6/15/2016



a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417  
2040 Savage Road Charleston, SC 29407  
P 843.556.8171  
F 843.766.1178

[gel.com](http://gel.com)

June 15, 2016

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

Re: CHPRC SAF F13-002  
Work Order: 398477  
SDG: GEL398477

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 02, 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,

  
Brielle Luthman for  
Heather Shaffer  
Project Manager

Purchase Order: 300071ES20  
Chain of Custody: F13-002-2051 and F13-002-2113  
Enclosures



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# Case Narrative

**General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF F13-002  
SDG: GEL398477**

**June 15, 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 June 02, 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:

<b>Laboratory Identification</b>	<b>Sample Description</b>
398477001	B35JR0
398477002	B35K00

**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.

6/15/2016

*B. Luthman*  
Brielle Luthman for  
Heather Shaffer  
Project Manager

**Radiochemistry  
Technical Case Narrative  
CH2M Hill Plateau Remediation Company (CPRC)  
SDG #: GEL398477  
Work Order #: 398477**

**UIISO\_IE\_PRECIP\_AEA: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**

Batch was re-prepped once to to low tracer yields/high activity and a second time due to high MDA's. The third analysis is being reported.

**Recounts**

Sample 1203566544 (B35JR8DUP) was recounted due to a suspected false positive. The original count is being 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**

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F13-002-2051	PAGE 1 OF 1
COLLECTOR K.C. Patterson/CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC	PRICE CODE 7C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 299-E33-344, YE28 Wk 2	PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling	FIELD LOGBOOK NO. HNF-N-49115	SAF NO. F13-002	AIR QUALITY	
ICE CHEST NO. GWS-288	ACTUAL SAMPLE DEPTH N/A	OFFSITE PROPERTY NO. 6680	COA 303111	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	BILL OF LADING/AIR BILL NO. 7764 212 9141				
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. N/A	PRESERVATION HNO3 to pH <2	HOLDING TIME 6 Months	TYPE OF CONTAINER G/P	NO. OF CONTAINER(S) 1
		VOLUME 1L	SAMPLE ANALYSIS UI/SO_LI_PRECT P. AREA; COMMON;		
SPECIAL HANDLING AND/OR STORAGE					
SAMPLE NO. B35JRO	MATRIX* WATER	SAMPLE DATE MAY 31 2016	SAMPLE TIME 1247		

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM K.C. Patterson/CHPRC	DATE/TIME MAY 31 2016 1410	RECEIVED BY/STORED IN SSU-1	DATE/TIME MAY 31 2016 1410	TRVL-16-137 ** The 1-Liter poly bottle for Generic Testing will be used to perform the Isotopic Analyses as outlined in the project's Statement of Work with RPL.	
RELINQUISHED BY/REMOVED FROM SSU-1	DATE/TIME JUN 01 2016 1240	RECEIVED BY/STORED IN Leah West / CHPRC	DATE/TIME JUN 01 2016 1240		
RELINQUISHED BY/REMOVED FROM Leah West / CHPRC	DATE/TIME JUN 01 2016 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME JUN 01 2016 1400		
RELINQUISHED BY/REMOVED FROM FedEx	DATE/TIME	RECEIVED BY/STORED IN Sara Campbell / DASH	DATE/TIME 6/24/16 0910		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 5/5/2016	FSR ID = FSR32157	TRVL NUM = TRVL-16-137		A-6003-618 (REV 2)	





Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

398477

Client: OPRC SDG/AR/COC/Work Order: 398477/398477/398475 *05 6/2/16*

Received By: Sarah Hill Date Received: 6/2/16

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?  Yes  No Maximum Net Counts Observed\* (Observed Counts - Area Background Counts): 0cpm

Classified Radioactive II or III by RSO?  Yes  No If yes, Were swipes taken of sample containers < action levels?

COC/Samples marked containing PCBs?  Yes  No

Package, COC, and/or Samples marked as beryllium or asbestos containing?  Yes  No If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.

Shipped as a DOT Hazardous?  Yes  No Hazard Class Shipped: UN#:

Samples identified as Foreign Soil?  Yes  No

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>3°C</u>
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device-Serial # (If Applicable): <u>E5102009184</u>
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.				Circle Applicable: FedEx Air <u>FedEx Ground</u> UPS Field Services Courier Other <u>7764 2112 9141</u>

Comments (Use Continuation Form if needed):

# **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 15 June 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 #: GEL398477  
 Work Order #: 398477**

**Product:** UISO\_IE\_PRECIP\_AEA:COMMON

**Analytical Method:** UISO\_IE\_PRECIP\_AEA

**Analytical Procedure:** GL-RAD-A-011 REV# 26

**Analytical Batch:** 1574182

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>
398477001	B35JR0
398477002	B35K00
1203566543	Method Blank (MB)
1203566544	398475001(B35JR8) Sample Duplicate (DUP)
1203566545	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**

Batch was re-prepped once to to low tracer yields/high activity and a second time due to high MDA's. The third analysis is being reported.

**Recounts**

Sample 1203566544 (B35JR8DUP) was recounted due to a suspected false positive. The original count is being 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.

**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: GEL398477 GEL Work Order: 398477

**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:** 15 JUN 2016

**Title:** Group Leader

# Sample Data Summary

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

SDG Number: GEL398477  
 Lab Sample ID: 398477001

Client: CPRC001  
 Date Collected: 05/31/2016 12:47  
 Date Received: 06/02/2016 09:10

Project: CPRC0F13002  
 Matrix: WATER

Client ID: B35JR0  
 Batch ID: 1574182  
 Run Date: 06/13/2016 22:13  
 Data File: S0398477001\_UU.3A.gcnf  
 Prep Batch: 1574182  
 Prep Date: 06/13/2016 00:00

Method: UIISO\_IE\_PRECIP\_AEA  
 Analyst: MXS2  
 Aliquot: 0.001 L  
 Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "As Received"  
 SOP Ref: GL-RAD-A-011  
 Instrument: 1009  
 Count Time: 505 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234		9140	pCi/L	+/-326	1010	28.4	1.00
15117-96-1/13982-7	Uranium-235/236		614	pCi/L	+/-94.9	115	29.8	1.00
7440-61-1	Uranium-238		9390	pCi/L	+/-330	1040	28.4	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	1790	2090	pCi/L	85.9	(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**

Page 1 of 1

SDG Number: GEL398477  
 Lab Sample ID: 398477002

Client: CPRC001  
 Date Collected: 05/31/2016 13:32  
 Date Received: 06/02/2016 09:10

Project: CPRC0F13002  
 Matrix: WATER

Client ID: B35K00  
 Batch ID: 1574182  
 Run Date: 06/13/2016 22:13  
 Data File: S0398477002\_UU.3A.gcnf  
 Prep Batch: 1574182  
 Prep Date: 06/13/2016 00:00

Method: UIISO\_IE\_PRECIP\_AEA  
 Analyst: MXS2  
 Aliquot: 0.001 L  
 Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "As Received"  
 SOP Ref: GL-RAD-A-011  
 Instrument: 1011  
 Count Time: 505 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234		29500	pCi/L	+/-766	3750	64.7	1.00
15117-96-1/13982-7	Uranium-235/236		1890	pCi/L	+/-217	320	55.8	1.00
7440-61-1	Uranium-238		30300	pCi/L	+/-777	3860	57.5	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	1150	2090	pCi/L	55.1	(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

6/15/2016

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 15, 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: 398477

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Alpha Spec</b>									
Batch	1574182								
QC1203566543	MB								
Uranium-233/234			U	0.398	pCi/L			MXS2	06/13/1622:13
				Uncert:					
				TPU:					
Uranium-235/236			U	0.593	pCi/L				
				Uncert:					
				TPU:					
Uranium-238			U	0.399	pCi/L				
				Uncert:					
				TPU:					
**Uranium-232 Tracer	52.1			45.1	pCi/L	REC: 86	(30%-105%)		
				Uncert:					
				TPU:					
QC1203566544	398475001	DUP							
Uranium-233/234		U	0.233	1.14	pCi/L				
				Uncert:		RPD: 28	(0% - 100%)		
				TPU:		RER: 0.948	(0-2)		
Uranium-235/236				0.988	pCi/L				
				Uncert:		RPD: 6	(0% - 100%)		
				TPU:		RER: 0.297	(0-2)		
Uranium-238		U	0.360	U 0.442	pCi/L				
				Uncert:		RPD: 0	N/A		
				TPU:		RER: 0.417	(0-2)		
**Uranium-232 Tracer	52.2	21.6		26.7	pCi/L	REC: 51	(30%-105%)		
				Uncert:					
				TPU:					
QC1203566545	LCS								
Uranium-233/234				63.0	pCi/L				
				Uncert:					
				TPU:					
Uranium-235/236				3.68	pCi/L				
				Uncert:					
				TPU:					
Uranium-238	67.3			72.1	pCi/L	REC: 107	(80%-120%)		
				Uncert:					
				TPU:					
**Uranium-232 Tracer	52.1			49.0	pCi/L	REC: 94	(30%-105%)		
				Uncert:					
				TPU:					

**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

6/15/2016

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 398477

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
D										
N										
U										
UX										
X										
Y										
Z										

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.