

December 22, 2017

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

Re: CHPRC SAF W18-012
Work Order: 439418
SDG: GEL439418

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on December 07, 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,



Kaitlyn Stone for
Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: W18-012-057, W18-012-062, W18-012-066 and W18-012-067
Enclosures



Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....7

Data Review Qualifier Definitions.....13

Laboratory Certifications.....15

Metals Analysis.....17

 Case Narrative.....18

 Sample Data Summary.....22

 Quality Control Summary.....27

General Chem Analysis.....39

 Case Narrative.....40

 Sample Data Summary.....47

 Quality Control Summary.....54

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF W18-012
SDG: GEL439418**

December 22, 2017

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 07, 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. 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.

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
439418001	B3FKF7
439418002	B3FKF9
439418003	B3FKK0
439418004	B3FKK3
439418005	B3FK83
439418006	B3FK86
439418007	B3FK88

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: General Chemistry and Metals.

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.



Kaitlyn Stone for
Heather Shaffer
Project Manager

**Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL439418
Work Order #: 439418**

Metals

Determination of Metals by ICP

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.

Calibration Information

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 439418001 (B3FKF7) and 439418002 (B3FKF9).

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203933966 (MB)	Potassium	See applicable report

Matrix Spike (MS/MSD) Recovery Statement

The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203933969 (B3FKF7MSD)	Sodium	70.4* (75%-125%)

Determination of Metals by ICP-MS

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.

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203934033 (MB)	Uranium	0.08 between (0.067 - 0.1)

Determination of Metals by ICP-MS

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.

Quality Control (QC) Information**Method Blank (MB) Statement**

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203943166 (MB)	Zinc	3.31 between (3.3 - 5)

General Chemistry**Cyanide, Total**

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.

Cyanide, Chlorinated

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-analysis**

Samples 1203934168 (MB) and 1203934169 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported. Samples 439418003 (B3FKK0), 439418004 (B3FKK3), 439418005 (B3FK83) and 439418006 (B3FK86) were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported.

Cyanide, Amenable to Chlorination

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.

Cyanide, Free

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.

Miscellaneous Information

Additional Comments

Total CN levels above the MDL for Free CN were detected in samples . Free CN was performed per SOP (GL-GC-E-073).

Alkalinity

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

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2MHill Plateau
Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

W18-012-057

Page 1 of 1

Collector: Juan Aguilar / ECHERC W18-012 Telephone No.: 509-376-4650

SAF No.: RCRA, DECEMBER 2017 RCRA, DECEMBER 2017 Purchase Order/Charge Code: 300071

Project Title: RCRA, DECEMBER 2017 RCRA, DECEMBER 2017 Ice Chest No.: GWS-681

Shipped To (Lab): GEL Laboratories, LLC Method of Shipment Commercial Carrier Bill of Lading/Air Bill No.: 77092310185

Protocol: RCRA Priority: 15 Days PRIORITY Offsite Property No.: 8824

SPECIAL INSTRUCTIONS

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

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FKF7	N	W	12-6-17	0813	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3FKF7	N	W	12-6-17	0813	1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B3FKF9	Y	W	12-6-17	0813	1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2

Relinquished By: Juan Aguilar / ECHERC Signature: <i>[Signature]</i> Date/Time: DEC 06 2017 1820 Print First and Last Name: Juan Aguilar Last Name: Aguilar Date/Time: DEC 06 2017 1020	Received By: Malcolm Chum / ECHERC Signature: <i>[Signature]</i> Date/Time: DEC 06 2017 1020 Print First and Last Name: Malcolm Chum Last Name: Chum Date/Time: DEC 06 2017 1020
Relinquished By: Juan Aguilar / ECHERC Signature: <i>[Signature]</i> Date/Time: DEC 06 2017 1400 Print First and Last Name: Juan Aguilar Last Name: Aguilar Date/Time: DEC 06 2017 1400	Received By: FEDEX Signature: <i>[Signature]</i> Date/Time: 12-7-17 Print First and Last Name: FEDEX Last Name: FEDEX Date/Time: 12-7-17 9:20
Relinquished By: Juan Aguilar / ECHERC Signature: <i>[Signature]</i> Date/Time: DEC 06 2017 Print First and Last Name: Juan Aguilar Last Name: Aguilar Date/Time: DEC 06 2017	Received By: STACY BOONT Signature: <i>[Signature]</i> Date/Time: 12-7-17 Print First and Last Name: STACY BOONT Last Name: BOONT Date/Time: 12-7-17 9:20
Relinquished By: Juan Aguilar / ECHERC Signature: <i>[Signature]</i> Date/Time: DEC 06 2017 Print First and Last Name: Juan Aguilar Last Name: Aguilar Date/Time: DEC 06 2017	Received By: FEDEX Signature: <i>[Signature]</i> Date/Time: 12-7-17 Print First and Last Name: FEDEX Last Name: FEDEX Date/Time: 12-7-17 9:20

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

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

W18-012-062

Page 1 of 1

Collector: Juan Aguilar / CHPRC
SAF No.: W18-012
Project Title: RCRA, DECEMBER 2017
Shipped To (Lab): GEL Laboratories, LLC
Protocol: RCRA

Contact/Requester: Karen Waters-Husted
Sampling Origin: Hanford Site
Logbook No.: HNF-N-506-95170
Method of Shipment: Commercial Carrier
Priority: 15 Days **PRIORITY**

Telephone No.: 509-376-4650
Purchase Order/Charge Code: 300071
Ice Chest No.: GWS-681
Bill of Lading/Air Bill No.: 22092310185
Offsite Property No.: 8824

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FKK0	N	W	12-6-17	0901	1x500-mL aG	9014 CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FKK3	Y	W	12-6-17	0901	1x500-mL aG	9014 CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

Relinquished By: Juan Aguilar / CHPRC
Signature: M.R.C.
Date/Time: DEC 06 2017 19:28

Received By: Malcolm Chunn / CHPRC
Signature: M.R.C.
Date/Time: DEC 06 2017 10:20

Relinquished By: Juan Aguilar / CHPRC
Signature: M.R.C.
Date/Time: DEC 06 2017 1400

Received By: Stacy Boone / CHPRC
Signature: Stacy Boone
Date/Time: 12-7-17 9:20

Relinquished By: Juan Aguilar / CHPRC
Signature: M.R.C.
Date/Time: DEC 06 2017 1400

Received By: Stacy Boone / CHPRC
Signature: Stacy Boone
Date/Time: 12-7-17 9:20

Relinquished By: Juan Aguilar / CHPRC
Signature: M.R.C.
Date/Time: DEC 06 2017 1400

Received By: Stacy Boone / CHPRC
Signature: Stacy Boone
Date/Time: 12-7-17 9:20

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

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

CH2M Hill Plateau Remediation Company C.O.C.#
W18-012-066
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

432418

Collector: W18-012 **Contact/Requester:** Karen Waters-Husted **Telephone No.:** 509-376-4650

SAF No.: RCRA, DECEMBER 2017 **Sampling Origin:** Hanford Site **Purchase Order/Charge Code:** 300071

Project Title: GEL Laboratories, LLC **Logbook No.:** HNF-N-506 ~ 95170 **Ice Chest No.:** 9405-409

Shipped To (Lab): RCRA **Method of Shipment:** Commercial Carrier **Bill of Lading/Air Bill No.:** 7709 23110211

Protocol: RCRA **Priority:** 15 Days **PRIORITY** **Offsite Property No.:** 8824

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FK83	N	W	12-6-17	1039	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FK86	Y	W	12-6-17	1039	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

Relinquished By: Juan Aguilar Signature	DEC 06 2017	1135	Date/Time	Received By: Jeff Lucas Signature	DEC 06 2017	1135	Date/Time
Print First and Last Name	Signature	Signature	Date/Time	Print First and Last Name	Signature	Date/Time	Date/Time
Relinquished By: Jeff Lucas Signature	DEC 06 2017	1400	Date/Time	Received By: FEDEX Signature	12/7/17	9:20	Date/Time
Print First and Last Name	Signature	Signature	Date/Time	Print First and Last Name	Signature	Date/Time	Date/Time
Relinquished By: Fedex Signature	Signature	Signature	Date/Time	Received By: Stacy Boone Signature	Signature	Signature	Date/Time
Print First and Last Name	Signature	Signature	Date/Time	Print First and Last Name	Signature	Signature	Date/Time
Relinquished By: Signature	Signature	Signature	Date/Time	Received By: Signature	Signature	Signature	Date/Time
Print First and Last Name	Signature	Signature	Date/Time	Print First and Last Name	Signature	Signature	Date/Time

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

Disposed By: _____ 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

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# W18-012-067
Page 1 of 1

Collector: Juan Aguilar /CHPRC
SAF No.: W18-012
Project Title: RCRA, DECEMBER 2017
Shipped To (Lab): GEL Laboratories, LLC
Protocol: RCRA
Contact/Requester: Karen Waters-Husted
Sampling Origin: Hanford Site
Logbook No.: HNF-N-506 -95170
Method of Shipment: Commercial Carrier
Priority: 15 Days
Telephone No.: 509-376-4650
Purchase Order/Charge Code: 300071
Ice Chest No.: GWS-681
Bill of Lading/Air Bill No.: 7709 234085
Offsite Property No.: 8824

SPECIAL INSTRUCTIONS

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

N/A

Sample No.	Filter	* W	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FK88	N	W	12-6-17	1005	1x250-mL G/P	2320_AKALINITY: COMMON	14 Days	Cool <=6C

Relinquished By: Juan Aguilar /CHPRC Signature: M.R.C. Date/Time: DEC 06 2017 1020	Received By: Malcom Chunn /CHPRC Signature: M.R.C. Date/Time: DEC 06 2017 1020
Relinquished By: Malcom Chunn /CHPRC Signature: M.R.C. Date/Time: DEC 06 2017 1400	Received By: FEDEX Signature: FEDEX Date/Time: 12-7-17 9:20
Relinquished By: [Signature] Signature: [Signature] Date/Time: [Date/Time]	Received By: STACY BOONE /CHPRC Signature: STACY BOONE Date/Time: 12-7-17 9:20
Relinquished By: [Signature] Signature: [Signature] Date/Time: [Date/Time]	Received By: [Signature] Signature: [Signature] Date/Time: [Date/Time]
Relinquished By: [Signature] Signature: [Signature] Date/Time: [Date/Time]	Received By: [Signature] Signature: [Signature] Date/Time: [Date/Time]
FINAL SAMPLE DISPOSITION	Disposed By: [Signature] Date/Time: [Date/Time]

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

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 22 December 2017

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	LA170010
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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL439418
Work Order #: 439418

Product: Determination of Metals by ICP

Analytical Method: SW846 3005A/6010D

Analytical Procedure: GL-MA-E-013 REV# 30

Analytical Batch: 1724495

Product: Determination of Metals by ICP-MS

Analytical Method: SW846 3005A/6020B

Analytical Procedure: GL-MA-E-014 REV# 32

Analytical Batches: 1724523 and 1728070

Preparation Method: SW846 3005A

Preparation Procedure: GL-MA-E-006 REV# 14

Preparation Batches: 1724494, 1724522 and 1728069

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
439418001	B3FKF7
439418002	B3FKF9
1203933966	Method Blank (MB) ICP
1203933967	Laboratory Control Sample (LCS)
1203933970	439418001(B3FKF7L) Serial Dilution (SD)
1203933968	439418001(B3FKF7S) Matrix Spike (MS)
1203933969	439418001(B3FKF7SD) Matrix Spike Duplicate (MSD)
1203942669	439418001(B3FKF7PS) Post Spike (PS)
1203934033	Method Blank (MB) ICP-MS
1203943166	Method Blank (MB) ICP-MS
1203934034	Laboratory Control Sample (LCS)
1203943167	Laboratory Control Sample (LCS)
1203934037	439418001(B3FKF7L) Serial Dilution (SD)
1203943170	439418001(B3FKF7L) Serial Dilution (SD)
1203934035	439418001(B3FKF7S) Matrix Spike (MS)
1203943168	439418001(B3FKF7S) Matrix Spike (MS)
1203934036	439418001(B3FKF7SD) Matrix Spike Duplicate (MSD)
1203943169	439418001(B3FKF7SD) Matrix Spike Duplicate (MSD)

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.

Calibration Information

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 439418001 (B3FKF7) and 439418002 (B3FKF9)-ICP.

ICSA/ICSAB Statement

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Quality Control (QC) Information**Method Blank (MB) Statement**

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203933966 (MB)	Potassium	See applicable report
1203934033 (MB)	Uranium	0.08 between (0.067 - 0.1)
1203943166 (MB)	Zinc	3.31 between (3.3 - 5)

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203933969 (B3FKF7MSD)	Sodium	70.4* (75%-125%)

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: GEL439418 GEL Work Order: 439418

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- 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).
- 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.
- 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.

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: Nik-Cole Elmore

Date: 22 DEC 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL439418

CONTRACT: CPRCOW18012

METHOD TYPE: SW846

SAMPLE ID: 439418001

BASIS: As Received

DATE COLLECTED 06-DEC-17

CLIENT ID: B3FKF7

LEVEL: Low

DATE RECEIVED 07-DEC-17

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-38-2	Arsenic	6.96	ug/L		2	5	5	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-39-3	Barium	37.2	ug/L		0.67	2	2	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	SKJ	12/21/17 12:53	171221-2	1724523
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	12/20/17 17:45	122017-1	1724495
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-70-2	Calcium	53000	ug/L		50	200	200	1	P	JWJ	12/20/17 17:45	122017-1	1724495
7440-47-3	Chromium	19.4	ug/L		3	10	10	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-48-4	Cobalt	0.455	ug/L	B	0.3	1	1	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-50-8	Copper	1.08	ug/L		0.3	1	1	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7439-89-6	Iron	396	ug/L		30	100	100	1	P	JWJ	12/20/17 17:45	122017-1	1724495
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7439-95-4	Magnesium	17300	ug/L		110	300	300	1	P	JWJ	12/20/17 17:45	122017-1	1724495
7439-96-5	Manganese	5.7	ug/L		1	5	5	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7439-98-7	Molybdenum	2.86	ug/L		0.2	0.5	0.5	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-02-0	Nickel	33.7	ug/L		0.6	2	2	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-09-7	Potassium	7580	ug/L		50	150	150	1	P	JWJ	12/20/17 17:45	122017-1	1724495
7782-49-2	Selenium	7.4	ug/L		2	5	5	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-23-5	Sodium	14700	ug/L	N	100	300	300	1	P	JWJ	12/20/17 17:45	122017-1	1724495
7440-24-6	Strontium	320	ug/L		2	10	10	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-61-1	Uranium	3.6	ug/L		0.067	0.2	0.2	1	MS	BAJ	12/20/17 17:30	171220-11	1724523
7440-62-2	Vanadium	18.1	ug/L		1	5	5	1	P	JWJ	12/20/17 17:45	122017-1	1724495
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	MS	BAJ	12/22/17 08:33	171221-10	1728070

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1724495	1724494	SW846 3005A	50	mL	50	mL	12/07/17	JXM8
1724523	1724522	SW846 3005A	50	mL	50	mL	12/07/17	JXM8
1728070	1728069	SW846 3005A	25	mL	25	mL	12/21/17	JXM8

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

***Analytical Methods:**

P	SW846 3005A/6010D
MS	SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL439418

CONTRACT: CPRCOW18012

METHOD TYPE: SW846

SAMPLE ID: 439418002

BASIS: As Received

DATE COLLECTED 06-DEC-17

CLIENT ID: B3FKF9

LEVEL: Low

DATE RECEIVED 07-DEC-17

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-38-2	Arsenic	7.16	ug/L		2	5	5	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-39-3	Barium	37.8	ug/L		0.67	2	2	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	SKJ	12/21/17 12:59	171221-2	1724523
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	12/20/17 17:55	122017-1	1724495
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-70-2	Calcium	48800	ug/L		50	200	200	1	P	JWJ	12/20/17 17:55	122017-1	1724495
7440-47-3	Chromium	6.23	ug/L	B	3	10	10	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-48-4	Cobalt	0.405	ug/L	B	0.3	1	1	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-50-8	Copper	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7439-89-6	Iron	41.2	ug/L	B	30	100	100	1	P	JWJ	12/20/17 17:55	122017-1	1724495
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7439-95-4	Magnesium	15800	ug/L		110	300	300	1	P	JWJ	12/20/17 17:55	122017-1	1724495
7439-96-5	Manganese	4.66	ug/L	B	1	5	5	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7439-98-7	Molybdenum	2.74	ug/L		0.2	0.5	0.5	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-02-0	Nickel	36.3	ug/L		0.6	2	2	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-09-7	Potassium	6930	ug/L		50	150	150	1	P	JWJ	12/20/17 17:55	122017-1	1724495
7782-49-2	Selenium	7.59	ug/L		2	5	5	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-23-5	Sodium	14800	ug/L	N	100	300	300	1	P	JWJ	12/20/17 17:55	122017-1	1724495
7440-24-6	Strontium	320	ug/L		2	10	10	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-61-1	Uranium	3.57	ug/L		0.067	0.2	0.2	1	MS	BAJ	12/20/17 17:47	171220-11	1724523
7440-62-2	Vanadium	16.3	ug/L		1	5	5	1	P	JWJ	12/20/17 17:55	122017-1	1724495
7440-66-6	Zinc	3.8	ug/L	CB	3.3	10	10	1	MS	BAJ	12/22/17 08:39	171221-10	1728070

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1724495	1724494	SW846 3005A	50	mL	50	mL	12/07/17	JXM8
1724523	1724522	SW846 3005A	50	mL	50	mL	12/07/17	JXM8
1728070	1728069	SW846 3005A	25	mL	25	mL	12/21/17	JXM8

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

***Analytical Methods:**

P	SW846 3005A/6010D
MS	SW846 3005A/6020B

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: December 22, 2017

Page 1 of 11

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1724523										
QC1203934034	LCS										
Aluminum	2000			2260	ug/L		113	(80%-120%)	BAJ	12/20/17	17:26
Antimony	50.0			56.5	ug/L		113	(80%-120%)			
Arsenic	50.0			54.4	ug/L		109	(80%-120%)			
Barium	50.0			51.7	ug/L		103	(80%-120%)			
Beryllium	50.0			57.0	ug/L		114	(80%-120%)	SKJ	12/21/17	12:52
Cadmium	50.0			54.4	ug/L		109	(80%-120%)	BAJ	12/20/17	17:26
Chromium	50.0			54.5	ug/L		109	(80%-120%)			
Cobalt	50.0			51.3	ug/L		103	(80%-120%)			
Copper	50.0			49.1	ug/L		98.3	(80%-120%)			
Lead	50.0			53.2	ug/L		106	(80%-120%)			
Manganese	50.0			53.0	ug/L		106	(80%-120%)			
Molybdenum	50.0			57.2	ug/L		114	(80%-120%)			
Nickel	50.0			49.5	ug/L		99.1	(80%-120%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1724523										
Selenium	50.0			56.9	ug/L		114	(80%-120%)	BAJ	12/20/17	17:26
Silver	50.0			53.3	ug/L		107	(80%-120%)			
Strontium	50.0			56.3	ug/L		113	(80%-120%)			
Thallium	50.0			50.6	ug/L		101	(80%-120%)			
Thorium	50.0			51.5	ug/L		103	(80%-120%)			
Tin	50.0			58.6	ug/L		117	(80%-120%)			
Uranium	50.0			53.0	ug/L		106	(80%-120%)			
QC1203934033	MB										
Aluminum			U	19.3	ug/L					12/20/17	17:23
Antimony			U	1.00	ug/L						
Arsenic			U	2.00	ug/L						
Barium			U	0.670	ug/L						
Beryllium			U	0.200	ug/L				SKJ	12/21/17	12:50
Cadmium			U	0.300	ug/L				BAJ	12/20/17	17:23
Chromium			U	3.00	ug/L						
Cobalt			U	0.300	ug/L						

GEL LABORATORIES LLC

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QC Summary

Workorder: 439418

Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1724523										
Copper			U	0.300	ug/L				BAJ	12/20/17	17:23
Lead			U	0.500	ug/L						
Manganese			U	1.00	ug/L						
Molybdenum			U	0.200	ug/L						
Nickel			U	0.600	ug/L						
Selenium			U	2.00	ug/L						
Silver			U	0.300	ug/L						
Strontium			U	2.00	ug/L						
Thallium			U	0.600	ug/L						
Thorium			U	0.700	ug/L						
Tin			U	1.00	ug/L						
Uranium			B	0.080	ug/L						
QC1203934035 439418001 MS											
Aluminum	2000	U	19.3	2230	ug/L		111	(75%-125%)		12/20/17	17:33
Antimony	50.0	U	1.00	50.9	ug/L		101	(75%-125%)			
Arsenic	50.0		6.96	63.8	ug/L		114	(75%-125%)			

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QC Summary

Workorder: 439418

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS												
Batch	1724523											
Barium	50.0		37.2		89.5	ug/L		105	(75%-125%)	BAJ	12/20/17	17:33
Beryllium	50.0	U	0.200		59.7	ug/L		119	(75%-125%)	SKJ	12/21/17	12:55
Cadmium	50.0	U	0.300		56.4	ug/L		113	(75%-125%)	BAJ	12/20/17	17:33
Chromium	50.0		19.4		74.9	ug/L		111	(75%-125%)			
Cobalt	50.0	B	0.455		53.0	ug/L		105	(75%-125%)			
Copper	50.0		1.08		48.8	ug/L		95.5	(75%-125%)			
Lead	50.0	U	0.500		54.3	ug/L		108	(75%-125%)			
Manganese	50.0		5.70		56.9	ug/L		102	(75%-125%)			
Molybdenum	50.0		2.86		53.9	ug/L		102	(75%-125%)			
Nickel	50.0		33.7		81.6	ug/L		95.7	(75%-125%)			
Selenium	50.0		7.40		66.3	ug/L		118	(75%-125%)			
Silver	50.0	U	0.300		55.8	ug/L		111	(75%-125%)			
Strontium	50.0		320		368	ug/L		N/A	(75%-125%)			
Thallium	50.0	U	0.600		51.9	ug/L		104	(75%-125%)			
Thorium	50.0	U	0.700		55.1	ug/L		110	(75%-125%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 439418

Parname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS												
Batch	1724523											
Tin	50.0	U	1.00		50.8	ug/L		101	(75%-125%)	BAJ	12/20/17	17:33
Uranium	50.0		3.60		59.4	ug/L		112	(75%-125%)			
QC1203934036	439418001	MSD										
Aluminum	2000	U	19.3		2310	ug/L	3.78	115	(0%-20%)		12/20/17	17:37
Antimony	50.0	U	1.00		50.2	ug/L	1.36	99.6	(0%-20%)			
Arsenic	50.0		6.96		66.6	ug/L	4.32	119	(0%-20%)			
Barium	50.0		37.2		91.4	ug/L	2.06	108	(0%-20%)			
Beryllium	50.0	U	0.200		59.9	ug/L	0.284	120	(0%-20%)	SKJ	12/21/17	12:56
Cadmium	50.0	U	0.300		55.3	ug/L	1.93	111	(0%-20%)	BAJ	12/20/17	17:37
Chromium	50.0		19.4		81.4	ug/L	8.43	124	(0%-20%)			
Cobalt	50.0	B	0.455		55.4	ug/L	4.39	110	(0%-20%)			
Copper	50.0		1.08		51.8	ug/L	5.84	101	(0%-20%)			
Lead	50.0	U	0.500		54.3	ug/L	0.0829	108	(0%-20%)			
Manganese	50.0		5.70		60.0	ug/L	5.29	109	(0%-20%)			
Molybdenum	50.0		2.86		54.3	ug/L	0.65	103	(0%-20%)			
Nickel	50.0		33.7		86.5	ug/L	5.79	105	(0%-20%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1724523										
Selenium	50.0	7.40		68.1	ug/L	2.7	121	(0%-20%)	BAJ	12/20/17	17:37
Silver	50.0	U	0.300	55.2	ug/L	1.07	110	(0%-20%)			
Strontium	50.0		320	382	ug/L	3.66	N/A	(0%-20%)			
Thallium	50.0	U	0.600	51.7	ug/L	0.326	103	(0%-20%)			
Thorium	50.0	U	0.700	56.4	ug/L	2.2	112	(0%-20%)			
Tin	50.0	U	1.00	51.1	ug/L	0.736	102	(0%-20%)			
Uranium	50.0		3.60	59.8	ug/L	0.667	112	(0%-20%)			
QC1203934037 439418001 SDILT											
Aluminum		U	9.62 DU	96.5	ug/L	N/A		(0%-20%)		12/20/17	17:43
Antimony		U	0.350 DU	5.00	ug/L	N/A		(0%-20%)			
Arsenic			6.96 DU	10.0	ug/L	N/A		(0%-20%)			
Barium			37.2 D	7.92	ug/L	6.48		(0%-20%)			
Beryllium		U	0.00 DU	1.00	ug/L	N/A		(0%-20%)	SKJ	12/21/17	12:58
Cadmium		U	0.014 DU	1.50	ug/L	N/A		(0%-20%)	BAJ	12/20/17	17:43
Chromium			19.4 BD	3.91	ug/L	.628		(0%-20%)			
Cobalt		B	0.455 DU	1.50	ug/L	N/A		(0%-20%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1724523										
Copper		1.08	DU	1.50	ug/L	N/A		(0%-20%)	BAJ	12/20/17	17:43
Lead	U	0.098	DU	2.50	ug/L	N/A		(0%-20%)			
Manganese		5.70	BD	1.17	ug/L	2.61		(0%-20%)			
Molybdenum		2.86	D	0.603	ug/L	5.42		(0%-20%)			
Nickel		33.7	D	7.12	ug/L	5.55		(0%-20%)			
Selenium		7.40	DU	10.0	ug/L	N/A		(0%-20%)			
Silver	U	0.046	DU	1.50	ug/L	N/A		(0%-20%)			
Strontium		320	D	59.1	ug/L	7.72		(0%-20%)			
Thallium	U	0.065	DU	3.00	ug/L	N/A		(0%-20%)			
Thorium	U	0.197	DU	3.50	ug/L	N/A		(0%-20%)			
Tin	U	0.210	DU	5.00	ug/L	N/A		(0%-20%)			
Uranium		3.60	D	0.765	ug/L	6.37		(0%-20%)			
<hr/>											
Batch	1728070										
QC1203943167	LCS										
Zinc	50.0			47.4	ug/L		94.8	(80%-120%)	BAJ	12/22/17	08:32
QC1203943166	MB										
Zinc			B	3.31	ug/L					12/22/17	08:30

GEL LABORATORIES LLC

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

QC Summary

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1728070										
QC1203943168	439418001	MS									
Zinc	50.0	U	3.30	49.2	ug/L		93.8	(75%-125%)	BAJ	12/22/17	08:35
QC1203943169	439418001	MSD									
Zinc	50.0	U	3.30	51.7	ug/L	4.91	98.8	(0%-20%)		12/22/17	08:36
QC1203943170	439418001	SDILT									
Zinc		U	2.35 BD	7.71	ug/L	N/A		(0%-20%)		12/22/17	08:38
Metals Analysis-ICP											
Batch	1724495										
QC1203933967	LCS										
Boron	500			538	ug/L		108	(80%-120%)	JWJ	12/20/17	17:43
Calcium	5000			5640	ug/L		113	(80%-120%)			
Iron	5000			5460	ug/L		109	(80%-120%)			
Magnesium	5000			5730	ug/L		115	(80%-120%)			
Potassium	5000			5340	ug/L		107	(80%-120%)			
Sodium	5000			5190	ug/L		104	(80%-120%)			
Vanadium	500			485	ug/L		97	(80%-120%)			
QC1203933966	MB										
Boron			U	15.0	ug/L					12/20/17	17:40
Calcium			U	50.0	ug/L						
Iron			U	30.0	ug/L						

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QC Summary

Workorder: 439418

Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1724495										
Magnesium			U	110	ug/L				JWJ	12/20/17	17:40
Potassium			B	-53.5	ug/L						
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L						
QC1203933968 439418001 MS											
Boron	500	U	15.0	562	ug/L		111	(75%-125%)		12/20/17	17:48
Calcium	5000		53000	55700	ug/L		N/A	(75%-125%)			
Iron	5000		396	5740	ug/L		107	(75%-125%)			
Magnesium	5000		17300	22300	ug/L		101	(75%-125%)			
Potassium	5000		7580	12700	ug/L		103	(75%-125%)			
Sodium	5000	N	14700	19200	ug/L		89.8	(75%-125%)			
Vanadium	500		18.1	508	ug/L		98	(75%-125%)			
QC1203933969 439418001 MSD											
Boron	500	U	15.0	533	ug/L	5.26	105	(0%-20%)		12/20/17	17:50
Calcium	5000		53000	52700	ug/L	5.54	N/A	(0%-20%)			
Iron	5000		396	5590	ug/L	2.63	104	(0%-20%)			
Magnesium	5000		17300	21100	ug/L	5.64	76.7	(0%-20%)			

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QC Summary

Workorder: 439418

Page 10 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1724495										
Potassium	5000	7580		12100	ug/L	5.26	90.2	(0%-20%)	JWJ	12/20/17	17:50
Sodium	5000	N	14700	N	18300	ug/L	5.18	70.4*		(0%-20%)	
Vanadium	500	18.1		493	ug/L	3.07	94.9	(0%-20%)			
QC1203942669	439418001	PS									
Sodium	5000	N	14700		19000	ug/L		84.4		(75%-125%)	12/20/17 18:13
QC1203933970	439418001	SDILT									
Boron		U	8.24	DU	75.0	ug/L	N/A			(0%-20%)	12/20/17 17:52
Calcium			53000	D	11100	ug/L	5.09			(0%-20%)	
Iron			396	BD	82.9	ug/L	4.76			(0%-20%)	
Magnesium			17300	D	3720	ug/L	7.88			(0%-20%)	
Potassium			7580	D	1460	ug/L	3.72			(0%-20%)	
Sodium		N	14700	D	3090	ug/L	4.87			(0%-20%)	
Vanadium			18.1	BD	3.80	ug/L	5.02			(0%-20%)	

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- 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).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.

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QC Summary

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
M											
N											
S											
U											
W											
X											
Y											
Z											

M Duplicate precision not met.

N Spike Sample recovery is outside control limits.

S Reported value determined by the Method of Standard Additions (MSA)

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

W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.

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.

^ 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.

* Indicates that a Quality Control parameter was not within specifications.

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.

General Chem Analysis

Case Narrative

**General Chemistry
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL439418
 Work Order #: 439418**

Product: Cyanide, Free

Analytical Method: 9014_CYANIDE

Analytical Procedure: GL-GC-E-073 REV# 8

Analytical Batch: 1724576

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
439418003	B3FKK0
439418004	B3FKK3
439418005	B3FK83
439418006	B3FK86
1203934171	Method Blank (MB)
1203934172	Laboratory Control Sample (LCS)
1203934173	439417001(NonSDG) Sample Duplicate (DUP)
1203937489	439741003(B3FKH6) Sample Duplicate (DUP)

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.

Miscellaneous Information

Additional Comments

Total CN levels above the MDL for Free CN were detected in samples . Free CN was performed per SOP (GL-GC-E-073).

Product: Cyanide, Amenable to Chlorination

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-107 REV# 10

Analytical Batches: 1724575, 1724574 and 1724573

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
439418003	B3FKK0
439418004	B3FKK3
439418005	B3FK83
439418006	B3FK86

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: Cyanide, Total

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-095 REV# 21

Analytical Batches: 1723975 and 1723974

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
439418003	B3FKK0
439418004	B3FKK3
439418005	B3FK83
439418006	B3FK86
1203932634	Method Blank (MB)
1203932635	Laboratory Control Sample (LCS)
1203934166	439417001(NonSDG) Sample Duplicate (DUP)
1203934167	439417001(NonSDG) Matrix Spike (MS)

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: Cyanide, Chlorinated

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-095 REV# 21

Analytical Batches: 1724574 and 1724573

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
439418003	B3FKK0
439418004	B3FKK3
439418005	B3FK83
439418006	B3FK86
1203934168	Method Blank (MB)
1203934169	Laboratory Control Sample (LCS)
1203934170	439417001(NonSDG) Sample Duplicate (DUP)

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-analysis

Samples 1203934168 (MB) and 1203934169 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported. Samples 439418003 (B3FKK0), 439418004 (B3FKK3), 439418005 (B3FK83) and 439418006 (B3FK86) were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported.

Product: Alkalinity**Analytical Method:** 2320_ALKALINITY**Analytical Procedure:** GL-GC-E-033 REV# 13**Analytical Batch:** 1723767

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
439418001	B3FKF7
439418007	B3FK88
1203932138	Laboratory Control Sample (LCS)

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

Data Summary:

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

Certification Statement

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

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL439418 GEL Work Order: 439418

The Qualifiers in this report are defined as follows:

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).

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: Aubrey Kingsbury

Date: 14 DEC 2017

Title: Analyst I

Sample Data Summary

Certificate of Analysis

Report Date: December 14, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-012

Client Sample ID: B3FKF7	Project: CPRCOW18012
Sample ID: 439418001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 06-DEC-17 08:13	
Receive Date: 07-DEC-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3		106000	1450	4000	ug/L			RXB5	12/07/17	1630	1723767	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	2320_ALKALINITY		

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: December 14, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-012

Client Sample ID: B3FKK0	Project: CPRCOW18012
Sample ID: 439418003	Client ID: CPRC001
Matrix: WATER	
Collect Date: 06-DEC-17 09:01	
Receive Date: 07-DEC-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		5.05	1.67	5.00	ug/L	1.00	1	AXH3	12/08/17	0819	1723975	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	12/14/17	1057	1724576	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	1.67	1.67	5.00	ug/L		1	AXH3	12/08/17	1037	1724575	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	12/08/17	0718	1723974
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	12/08/17	0718	1724573

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: December 14, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-012

Client Sample ID: B3FKK3	Project: CPRCOW18012
Sample ID: 439418004	Client ID: CPRC001
Matrix: WATER	
Collect Date: 06-DEC-17 09:01	
Receive Date: 07-DEC-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	B	4.54	1.67	5.00	ug/L	1.00	1	AXH3	12/08/17	0820	1723975	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	12/14/17	1057	1724576	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	1.67	1.67	5.00	ug/L		1	AXH3	12/08/17	1037	1724575	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	12/08/17	0718	1723974
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	12/08/17	0718	1724573

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: December 14, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-012

Client Sample ID: B3FK83	Project: CPRCOW18012
Sample ID: 439418005	Client ID: CPRC001
Matrix: WATER	
Collect Date: 06-DEC-17 10:39	
Receive Date: 07-DEC-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		14.3	1.67	5.00	ug/L	1.00	1	AXH3	12/08/17	0828	1723975	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	12/14/17	1057	1724576	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	B	3.20	1.67	5.00	ug/L		1	AXH3	12/08/17	1037	1724575	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	12/08/17	0718	1723974
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	12/08/17	0718	1724573

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: December 14, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-012

Client Sample ID: B3FK86	Project: CPRCOW18012
Sample ID: 439418006	Client ID: CPRC001
Matrix: WATER	
Collect Date: 06-DEC-17 10:39	
Receive Date: 07-DEC-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		12.8	1.67	5.00	ug/L	1.00	1	AXH3	12/08/17	0829	1723975	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	12/14/17	1057	1724576	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	B	3.08	1.67	5.00	ug/L		1	AXH3	12/08/17	1037	1724575	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	12/08/17	0718	1723974
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	12/08/17	0718	1724573

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: December 14, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-012

Client Sample ID: B3FK88	Project: CPRCOW18012
Sample ID: 439418007	Client ID: CPRC001
Matrix: WATER	
Collect Date: 06-DEC-17 10:05	
Receive Date: 07-DEC-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3		87000	1450	4000	ug/L			RXB5	12/07/17	1633	1723767	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	2320_ALKALINITY		

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Quality Control Summary

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QC Summary

Report Date: December 14, 2017

Page 1 of 2

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Flow Injection Analysis											
Batch	1723975										
QC1203934166	439417001	DUP									
Cyanide, Total		B	3.77	B	3.74	ug/L	0.799 ^	(+/-5.00)	AXH3	12/08/17	08:14
QC1203932635	LCS										
Cyanide, Total	50.0				51.5	ug/L		(80%-120%)		12/08/17	07:59
QC1203932634	MB										
Cyanide, Total				U	1.67	ug/L				12/08/17	07:58
QC1203934167	439417001	MS									
Cyanide, Total	100	B	3.77		105	ug/L		(75%-125%)		12/08/17	08:15
Batch	1724574										
QC1203934170	439417001	DUP									
Cyanide, Chlorinated			13.3		12.7	ug/L	4.62 ^	(+/-5.00)	AXH3	12/08/17	08:49
QC1203934169	LCS										
Cyanide, Chlorinated	50.0			U	1.67	ug/L		(-200%-200%)		12/08/17	10:05
QC1203934168	MB										
Cyanide, Chlorinated				U	1.67	ug/L				12/08/17	10:04
Batch	1724576										
QC1203934173	439417001	DUP									
Free Cyanide		U	3.00	U	3.00	ug/L	N/A		AXH3	12/14/17	10:57
QC1203937489	439741003	DUP									
Free Cyanide		U	3.00	U	3.00	ug/L	N/A			12/14/17	10:57

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QC Summary

Workorder: 439418

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Flow Injection Analysis											
Batch	1724576										
QC1203934172		LCS									
Free Cyanide	100			99.8	ug/L		99.8	(80%-120%)	AXH3	12/14/17	10:57
QC1203934171		MB									
Free Cyanide			U	3.00	ug/L					12/14/17	10:57
Titration and Ion Analysis											
Batch	1723767										
QC1203932138		LCS									
Alkalinity, Total as CaCO3	100000			107000	ug/L		107	(80%-120%)	RXB5	12/07/17	15:35

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- 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).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- 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.
- 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.
 ^ 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.

* Indicates that a Quality Control parameter was not within specifications.
 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.