



March 07, 2018

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

Re: CHPRC SAF W18-002
Work Order: 443647
SDG: GEL443647

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 13, 2018. 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: W18-002-071, W18-002-075, W18-002-089, W18-002-090, W18-002-109, W18-002-117,
W18-002-119 and W18-002-182
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	6
Data Review Qualifier Definitions.....	16
Laboratory Certifications.....	18
Metals Analysis.....	20
Case Narrative.....	21
Sample Data Summary.....	25
Quality Control Summary.....	28
General Chem Analysis.....	36
Case Narrative.....	37
Sample Data Summary.....	42
Quality Control Summary.....	51

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF W18-002
SDG: GEL443647**

March 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 February 13, 2018, 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:

<u>Laboratory Identification</u>	<u>Sample Description</u>
443647001	B3H3H7
443647002	B3H3J1
443647003	B3H388
443647004	B3H3B8
443647005	B3H3C3
443647006	B3HMY8
443647007	B3H387
443647008	B3H3B7

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.



Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL443647
Work Order #: 443647

Metals

Determination of Metals by ICP

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.

Determination of Metals by ICP-MS

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.

General Chemistry

Ion Chromatography

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

Holding Times

Samples (See Below) were initially analyzed within holding; however, the holding times had expired prior to reanalysis of diluted samples. The data is qualified.

Sample	Analyte	Value
1203970745 (B3H3H7DUP)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
1203970746 (B3H3H7PS)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
443647002 (B3H3J1)	Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
443647003 (B3H388)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18

443647004 (B3H3B8)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
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Sample Dilutions

The following samples 1203970745 (B3H3H7DUP), 1203970746 (B3H3H7PS), 443647001 (B3H3H7), 443647002 (B3H3J1), 443647003 (B3H388), 443647004 (B3H3B8), 443647005 (B3H3C3) and 443647006 (B3HMY8) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	443647					
	001	002	003	004	005	006
Several	10X 1X	5X 1X	10X 1X	10X 1X	10X 1X	5X 1X

Miscellaneous Information

Manual Integrations

Sample 443647002 (B3H3J1) were manually integrated to correctly position the baseline as set in the calibration standards.

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

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST <i>4472647</i>			C.O.C.# W18-002-089			
					Page 1 of 1			
Collector:	Daniel Klug CHPRC	Contact/Requester:	Karen Waters-Husted		Telephone No.: 509-376-4650			
SAF No.:	W18-002	Sampling Origin:	Hanford Site		Purchase Order/Charge Code: 300071			
Project Title:	RCRA, February 2018 <i>GEL</i>	Logbook No.:	HNF-N-506 <i>9E/94</i>		Ice Chest No.: <i>271278</i> N/A <i>GWS-556</i>			
Shipped To (Lab):	TestAmerica Incorporated, Rich	Method of Shipment	GOVERNMENT VEHICLE		Bill of Lading/Air Bill No.: <i>271278</i> N/A <i>771463708475</i>			
Protocol	RCRA <i>KS 2/8/18</i>	Priority:	30 Days		Offsite Property No.: <i>271278</i> N/A <i>PTR-9043</i>			
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
B3H3H7	N		<i>FEB 12 2018</i>	<i>1020</i>	1x125-mL P	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

3/8/2018

Relinquished By: <i>Daniel Klug</i> Print First and Last Name: Daniel Klug Signature: <i>[Signature]</i> Date/Time: FEB 12 2018 1120	Received By: Troy Bacon Print First and Last Name: Troy Bacon Signature: <i>[Signature]</i> Date/Time: FEB 12 2018 1120	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		
Relinquished By: Troy Bacon Print First and Last Name: Troy Bacon Signature: <i>[Signature]</i> Date/Time: FEB 12 2018 1400	Received By: FEDEX Print First and Last Name: FEDEX Signature: <i>[Signature]</i> Date/Time:			
Relinquished By: FedEx Print First and Last Name: FedEx Signature: <i>[Signature]</i> Date/Time:	Received By: C. Taplin Print First and Last Name: C. Taplin Signature: <i>[Signature]</i> Date/Time: 2/13/18 0900			
Relinquished By: Print First and Last Name: Signature: Date/Time:	Received By: Print First and Last Name: Signature: Date/Time:			
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

9 of 56

REV.0

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 443647			C.O.C.# W18-002-090			
					Page 1 of 1			
Collector:	Daniel Klug CHPRC	Contact/Requester:	Karen Waters-Husted		Telephone No.: 509-376-4650			
SAF No.:	W18-002	Sampling Origin:	Hanford Site		Purchase Order/Charge Code: 300071			
Project Title:	RCRA, February 2018 GEL	Logbook No.:	HNF-N-506 96/94		Ice Chest No.: N/A GWS-556			
Shipped To (Lab):	TestAmerica Incorporated, Rich	Method of Shipment	GOVERNMENT VEHICLE		Bill of Lading/Air Bill No.: N/A 771463708475			
Protocol	RCRA KS 2/8/18	Priority:	30 Days		Offsite Property No.: N/A PTR-9043			
POSSIBLE SAMPLE HAZARDS/REMARK				SPECIAL INSTRUCTIONS				
** ** 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
B3H3J1	N	W	FEB 12 2018	1142	1x125-mL P	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

Relinquished By: D. Klug Daniel Klug CHPRC Print First and Last Name	FEB 12 2018 Signature	1325 Date/Time	Received By: Frank Hill Frank Hill CHPRC Print First and Last Name	FEB 12 2018 Signature	1325 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
Relinquished By: Frank Hill Frank Hill CHPRC Print First and Last Name	FEB 12 2018 Signature	1400 Date/Time	Received By: FEDEX Print First and Last Name	Signature	Date/Time	
Relinquished By: FedEx Print First and Last Name	Signature	Date/Time	Received By: C. Taylor C. Taylor Print First and Last Name	FEB 13 2018 Signature	0900 Date/Time	
Relinquished By: Print First and Last Name	Signature	Date/Time	Received By: Print First and Last Name	Signature	Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):				Disposed By:	Date/Time:

3/8/2018

REV.0

10 of 56

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 442047	C.O.C.# W18-002-109 Page 1 of 1
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Collector: IVAN SCHAEFFER CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-002	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, February 2018 CEL	Logbook No.: HNF-N-506 -98/37	Ice Chest No.: N/A GWS-556
Shipped To (Lab): TestAmerica Incorporated, Rich	Method of Shipment: GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.: N/A 721463708475
Protocol: RCRA KS 2/2/18	Priority: 30 Days	Offsite Property No.: N/A ATR-9043

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 Low Volume Wells. Do not use for QC.
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3H388	N	W	FEB 12 2018	1247	1x60-mL P me 2/12/18 125	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

Relinquished By: IVAN SCHAEFFER CHPRC <i>[Signature]</i> FEB 12 2018 1300 Print First and Last Name Signature Date/Time	Received By: <i>[Signature]</i> FEB 12 2018 ¹³⁰⁰ Print First and Last Name Signature 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
Relinquished By: <i>[Signature]</i> FEB 12 2018 ¹⁴⁰⁰ Print First and Last Name Signature Date/Time	Received By: FEDEX Print First and Last Name Signature Date/Time	
Relinquished By: FedEx Print First and Last Name Signature Date/Time	Received By: <i>[Signature]</i> 2/13/18 ⁰⁹⁰⁰ Print First and Last Name Signature Date/Time	
Relinquished By: Print First and Last Name Signature Date/Time	Received By: Print First and Last Name Signature Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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3/8/2018

REV.0

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 443647	C.O.C.# W18-002-117 Page 1 of 1
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Collector: IVAN SCHAEFFER CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-002	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, February 2018 GEL	Logbook No.: HNF-N-506-98/37	Ice Chest No.: NTA GWS-556
Shipped To (Lab): TestAmerica Incorporated, Rich	Method of Shipment: GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.: NTA 721463708475
Protocol: RCRA LS 2/3/18	Priority: 30 Days	Offsite Property No.: NTA 212-18 PTR-9043

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 Low Volume Wells. Do not use for QC.
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3H3B8	N	W	FEB 12 2018	1125	1.60-mL P 12.5	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

Relinquished By: IVAN SCHAEFFER CHPRC <i>Ivan Schaeffer</i> FEB 12 2018 1154 Print First and Last Name Signature Date/Time	Received By: Troy Bacon CHPRC <i>Troy L. Bacon</i> FEB 12 2018 1154 Print First and Last Name Signature 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
Relinquished By: Troy Bacon CHPRC <i>Troy L. Bacon</i> FEB 12 2018 1400 Print First and Last Name Signature Date/Time	Received By: FEDEX Print First and Last Name Signature Date/Time	
Relinquished By: FedEx Print First and Last Name Signature Date/Time	Received By: C. Tamplin <i>C. Tamplin</i> 2/13/18 Print First and Last Name Signature Date/Time	
Relinquished By: Print First and Last Name Signature Date/Time	Received By: Print First and Last Name Signature Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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3/8/2018

REV.0

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CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			C.O.C.# W18-002-119			
		442647			Page 1 of 1			
Collector: IVAN SCHAEFFER CHPRC		Contact/Requester: Karen Waters-Husted		Telephone No.: 509-376-4650				
SAF No.: W18-002		Sampling Origin: Hanford Site		Purchase Order/Charge Code: 300071				
Project Title: RCRA, February 2018 GEL		Logbook No.: HNF-N-506-98/37		Ice Chest No.: N/A 2-12-18 CWS-556				
Shipped To (Lab): TestAmerica Incorporated, Rich RS 2/8/18		Method of Shipment: GOVERNMENT VEHICLE		Bill of Lading/Air Bill No.: N/A 771463708425				
Protocol: RCRA		Priority: 30 Days		Offsite Property No.: N/A PTR-9043				
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 Low Volume Wells. Do not use for QC.					
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3H3C3	N	W	FEB 12 2018	0947	125 mL P	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

3/8/2018

Relinquished By: IVAN SCHAEFFER CHPRC <i>Ivan Schaeffer</i> Print First and Last Name Signature Date/Time: FEB 12 2018 1154	Received By: Troy Bacon CHPRC <i>Troy L. Bacon</i> Print First and Last Name Signature Date/Time: FEB 12 2018 1154	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		
Relinquished By: Troy Bacon CHPRC <i>Troy L. Bacon</i> Print First and Last Name Signature Date/Time: FEB 12 2018 1400	Received By: FEDEX Print First and Last Name Signature Date/Time:			
Relinquished By: FedEx Print First and Last Name Signature Date/Time:	Received By: C. Farber Print First and Last Name Signature Date/Time: 2/13/18 0900			
Relinquished By: Print First and Last Name Signature Date/Time:	Received By: Print First and Last Name Signature Date/Time:			
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

13 of 56

REV.0

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			C.O.C.# W18-002-182			
		443647			Page 1 of 1			
Collector: Daniel Klug CHPRC	Contact/Requester: Karen Waters-Husted		Telephone No.: 509-376-4650					
SAF No.: W18-002	Sampling Origin: Hanford Site		Purchase Order/Charge Code: 300071					
Project Title: RCRA, February 2018	Logbook No.: HNF-N-506 -96/94		Ice Chest No.: N/A CWS-556					
Shipped To (Lab): TestAmerica Incorporated, Rich	Method of Shipment: GOVERNMENT VEHICLE		Bill of Lading/Air Bill No.: N/A 771463708475					
Protocol: RCRA	Priority: 30 Days		Offsite Property No.: N/A JTR-9043					
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
B3HMY8	N		FEB 12 2018	0924	1x125-mL P	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

Relinquished By: Daniel Klug CHPRC	<i>D. Klug</i>	FEB 12 2018	1120	Received By: Troy Bacon CHPRC	<i>Troy L. Bacon</i>	FEB 12 2018	1120	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
Relinquished By: Troy Bacon CHPRC	<i>Troy L. Bacon</i>	FEB 12 2018	1400	Received By: FEDEX				
Relinquished By: FedEx				Received By: C. Tarplin	<i>C. Tarplin</i>	2/13/18	0900	
Relinquished By:				Received By:				
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):					Disposed By:		Date/Time:

3/8/2018

REV.0

14 of 56

CH2MHill Plateau
Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#
W18-002-071

Page 1 of 1

443647

Collector: IVAN SCHAEFFER CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-002	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, February 2018	Logbook No.: HNF-N-506 - 98/37	Ice Chest No.: GWS-556
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 771463708475
Protocol: RCRA	Priority: 30 Days	Offsite Property No.: PTR-9043

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
 Low Volume Wells. Do not use for QC.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3H387	N	W	FEB 12 2018	1247	1x125-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3H387	N	W	FEB 12 2018	1247	1x125-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2

Relinquished By: IVAN SCHAEFFER CHPRC Signature: [Signature] Date/Time: FEB 12 2018 / 1300	Received By: Frank Hall CHPRC Signature: [Signature] Date/Time: FEB 12 2018 / 1300	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
Relinquished By: Frank Hall CHPRC Signature: [Signature] Date/Time: FEB 12 2018 / 1400	Received By: FEDEX Signature: [Signature] Date/Time: [Signature]	
Relinquished By: FedEx Signature: [Signature] Date/Time: [Signature]	Received By: C. Tardlin Signature: [Signature] Date/Time: 2/13/18 / 0900	
Relinquished By: [Signature] Signature: [Signature] Date/Time: [Signature]	Received By: [Signature] Signature: [Signature] Date/Time: [Signature]	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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3/8/2018

REV.0

15 of 56

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 443647	C.O.C.# W18-002-075 Page 1 of 1
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Collector: IVAN SCHAEFFER CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-002	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, February 2018	Logbook No.: HNF-N-506-98/37	Ice Chest No.: GWS-556
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 771463708495
Protocol: RCRA	Priority: 30 Days	Offsite Property No.: PTR-9043

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
 Low Volume Wells. Do not use for QC.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3H3B7	N	W	FEB 12 2018	1125	1x125-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3H3B7	N	W	FEB 12 2018	1125	1x125-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2

3/8/2018

Relinquished By: IVAN SCHAEFFER CHPRC <i>Ivan Schaeffer</i> FEB 12 2018 1154 <small>Print First and Last Name Signature Date/Time</small>	Received By: Troy Bacon CHPRC <i>Troy L Bacon</i> FEB 12 2018 1154 <small>Print First and Last Name Signature Date/Time</small>	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	
Relinquished By: Troy Bacon CHPRC <i>Troy L Bacon</i> FEB 12 2018 1400 <small>Print First and Last Name Signature Date/Time</small>	Received By: FEDEX <small>Print First and Last Name Signature Date/Time</small>		
Relinquished By: FedEx <small>Print First and Last Name Signature Date/Time</small>	Received By: <i>C. Tomlin</i> <small>Print First and Last Name Signature Date/Time</small>		
Relinquished By: <small>Print First and Last Name Signature Date/Time</small>	Received By: <small>Print First and Last Name Signature Date/Time</small>		
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

16 of 56

REV.0

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 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 March 2018

State	Certification
Alaska	17-018
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	T104704235-18-13
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 #: GEL443647
Work Order #: 443647

Product: Determination of Metals by ICP**Analytical Method:** SW846 3005A/6010D**Analytical Procedure:** GL-MA-E-013 REV# 30**Analytical Batch:** 1738794**Product: Determination of Metals by ICP-MS****Analytical Method:** SW846 3005A/6020B**Analytical Procedure:** GL-MA-E-014 REV# 32**Analytical Batch:** 1738797**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 14**Preparation Batches:** 1738793 and 1738796

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443647007	B3H387
443647008	B3H3B7
1203970595	Method Blank (MB) ICP
1203970596	Laboratory Control Sample (LCS)
1203970599	443644008(NonSDGL) Serial Dilution (SD)
1203970597	443644008(NonSDGS) Matrix Spike (MS)
1203970598	443644008(NonSDGSD) Matrix Spike Duplicate (MSD)
1203970604	Method Blank (MB) ICP-MS
1203970605	Laboratory Control Sample (LCS)
1203970608	443647007(B3H387L) Serial Dilution (SD)
1203970606	443647007(B3H387S) Matrix Spike (MS)
1203970607	443647007(B3H387SD) 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**ICSA/ICSAB Statement**

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

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: GEL443647 GEL Work Order: 443647

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).
- 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: 07 MAR 2018****Title: Data Validator**

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL443647

CONTRACT: CPRCOW18002

METHOD TYPE: SW846

SAMPLE ID: 443647007

BASIS: As Received

DATE COLLECTED 12-FEB-18

CLIENT ID: B3H387

LEVEL: Low

DATE RECEIVED 13-FEB-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-38-2	Arsenic	6.83	ug/L	B	5	30	30	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-39-3	Barium	9.18	ug/L		1	5	5	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-70-2	Calcium	4810	ug/L		50	200	200	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-47-3	Chromium	27.9	ug/L		1	5	5	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-47-3	Chromium	29.3	ug/L		3	10	10	1	MS	SKJ	02/16/18 00:07	180215-2	1738797
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/02/18 14:47	030218-1	1738794
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/02/18 14:47	030218-1	1738794
7439-95-4	Magnesium	1470	ug/L		110	300	300	1	P	HSC	03/02/18 14:47	030218-1	1738794
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-09-7	Potassium	2140	ug/L		50	150	150	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-23-5	Sodium	120000	ug/L		100	300	300	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-62-2	Vanadium	56.4	ug/L		1	5	5	1	P	HSC	03/02/18 14:47	030218-1	1738794
7440-66-6	Zinc	25.2	ug/L		3.3	10	10	1	P	HSC	03/02/18 14:47	030218-1	1738794

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1738794	1738793	SW846 3005A	50	mL	50	mL	02/13/18	JXM8
1738797	1738796	SW846 3005A	25	mL	25	mL	02/13/18	JXM8

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL443647

CONTRACT: CPRCOW18002

METHOD TYPE: SW846

SAMPLE ID:443647008

BASIS: As Received

DATE COLLECTED 12-FEB-18

CLIENT ID: B3H3B7

LEVEL: Low

DATE RECEIVED 13-FEB-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-38-2	Arsenic	15.7	ug/L	B	5	30	30	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-39-3	Barium	19.5	ug/L		1	5	5	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-70-2	Calcium	6500	ug/L		50	200	200	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-47-3	Chromium	27.2	ug/L		1	5	5	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-47-3	Chromium	28.8	ug/L		3	10	10	1	MS	SKJ	02/16/18 00:27	180215-2	1738797
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/02/18 14:50	030218-1	1738794
7439-89-6	Iron	210	ug/L		30	100	100	1	P	HSC	03/02/18 14:50	030218-1	1738794
7439-95-4	Magnesium	2700	ug/L		110	300	300	1	P	HSC	03/02/18 14:50	030218-1	1738794
7439-96-5	Manganese	6.39	ug/L	B	2	10	10	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-02-0	Nickel	5.57	ug/L		1.5	5	5	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-09-7	Potassium	2870	ug/L		50	150	150	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-23-5	Sodium	106000	ug/L		100	300	300	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-62-2	Vanadium	125	ug/L		1	5	5	1	P	HSC	03/02/18 14:50	030218-1	1738794
7440-66-6	Zinc	39.9	ug/L		3.3	10	10	1	P	HSC	03/02/18 14:50	030218-1	1738794

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1738794	1738793	SW846 3005A	50	mL	50	mL	02/13/18	JXM8
1738797	1738796	SW846 3005A	25	mL	25	mL	02/13/18	JXM8

***Analytical Methods:**

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

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: March 7, 2018

Page 1 of 7

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 443647

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1738797										
QC1203970605		LCS									
Chromium	50.0			45.4	ug/L		90.8	(80%-120%)	SKJ	02/16/18	00:03
QC1203970604		MB									
Chromium			U	3.00	ug/L					02/15/18	23:59
QC1203970606		443647007	MS								
Chromium	50.0		29.3	73.7	ug/L		88.7	(75%-125%)		02/16/18	00:11
QC1203970607		443647007	MSD								
Chromium	50.0		29.3	75.0	ug/L	1.81	91.4	(0%-20%)		02/16/18	00:15
QC1203970608		443647007	SDILT								
Chromium			29.3	BD	5.26	ug/L	10.3	(0%-20%)		02/16/18	00:23
Metals Analysis-ICP											
Batch	1738794										
QC1203970596		LCS									
Antimony	500			468	ug/L		93.6	(80%-120%)	HSC	03/02/18	14:21
Arsenic	500			470	ug/L		94.1	(80%-120%)			
Barium	500			467	ug/L		93.3	(80%-120%)			
Cadmium	500			460	ug/L		92	(80%-120%)			
Calcium	5000			4640	ug/L		92.8	(80%-120%)			
Chromium	500			463	ug/L		92.5	(80%-120%)			

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QC Summary

Workorder: 443647

Page 2 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1738794										
Cobalt	500			469	ug/L		93.8	(80%-120%)	HSC	03/02/18	14:21
Copper	500			467	ug/L		93.4	(80%-120%)			
Iron	5000			4550	ug/L		90.9	(80%-120%)			
Magnesium	5000			4590	ug/L		91.8	(80%-120%)			
Manganese	500			471	ug/L		94.2	(80%-120%)			
Nickel	500			457	ug/L		91.3	(80%-120%)			
Potassium	5000			4900	ug/L		98.1	(80%-120%)			
Silver	500			462	ug/L		92.4	(80%-120%)			
Sodium	5000			4600	ug/L		92.1	(80%-120%)			
Vanadium	500			467	ug/L		93.4	(80%-120%)			
Zinc	500			460	ug/L		92	(80%-120%)			
QC1203970595	MB										
Antimony			U	3.50	ug/L					03/02/18	14:18
Arsenic			U	5.00	ug/L						
Barium			U	1.00	ug/L						
Cadmium			U	1.00	ug/L						

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QC Summary

Workorder: 443647

Page 3 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1738794										
Calcium			U	50.0	ug/L				HSC	03/02/18	14:18
Chromium			U	1.00	ug/L						
Cobalt			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Manganese			U	2.00	ug/L						
Nickel			U	1.50	ug/L						
Potassium			U	50.0	ug/L						
Silver			U	1.00	ug/L						
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L						
Zinc			U	3.30	ug/L						
QC1203970597 443644008 MS											
Antimony	500	U	3.50	467	ug/L		92.9	(75%-125%)		03/02/18	14:26
Arsenic	500	U	5.00	483	ug/L		96.7	(75%-125%)			

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QC Summary

Workorder: 443647

Page 4 of 7

Paramname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1738794										
Barium	500	100		568	ug/L		93.5	(75%-125%)	HSC	03/02/18	14:26
Cadmium	500	U	1.00	460	ug/L		92	(75%-125%)			
Calcium	5000		62900	67300	ug/L		N/A	(75%-125%)			
Chromium	500	B	1.49	462	ug/L		92.2	(75%-125%)			
Cobalt	500	U	1.00	460	ug/L		91.9	(75%-125%)			
Copper	500	U	3.00	472	ug/L		94.4	(75%-125%)			
Iron	5000	B	63.9	4600	ug/L		90.7	(75%-125%)			
Magnesium	5000		12100	16900	ug/L		95.4	(75%-125%)			
Manganese	500		31.6	494	ug/L		92.6	(75%-125%)			
Nickel	500	U	1.50	447	ug/L		89.2	(75%-125%)			
Potassium	5000		4830	9730	ug/L		98	(75%-125%)			
Silver	500	U	1.00	469	ug/L		93.6	(75%-125%)			
Sodium	5000		30700	35600	ug/L		N/A	(75%-125%)			
Vanadium	500	B	2.13	472	ug/L		94	(75%-125%)			
Zinc	500	B	3.42	462	ug/L		91.7	(75%-125%)			

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QC Summary

Workorder: 443647

Page 5 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1738794										
	QC1203970598 443644008 MSD										
Antimony	500	U	3.50	465	ug/L	0.397	92.5	(0%-20%)	HSC	03/02/18	14:28
Arsenic	500	U	5.00	480	ug/L	0.771	95.9	(0%-20%)			
Barium	500		100	558	ug/L	1.74	91.5	(0%-20%)			
Cadmium	500	U	1.00	453	ug/L	1.45	90.7	(0%-20%)			
Calcium	5000		62900	65700	ug/L	2.51	N/A	(0%-20%)			
Chromium	500	B	1.49	458	ug/L	0.893	91.3	(0%-20%)			
Cobalt	500	U	1.00	453	ug/L	1.51	90.6	(0%-20%)			
Copper	500	U	3.00	468	ug/L	0.911	93.5	(0%-20%)			
Iron	5000	B	63.9	4550	ug/L	1.14	89.7	(0%-20%)			
Magnesium	5000		12100	16400	ug/L	2.64	86.6	(0%-20%)			
Manganese	500		31.6	489	ug/L	1.18	91.4	(0%-20%)			
Nickel	500	U	1.50	442	ug/L	1.19	88.1	(0%-20%)			
Potassium	5000		4830	9550	ug/L	1.93	94.3	(0%-20%)			
Silver	500	U	1.00	463	ug/L	1.13	92.5	(0%-20%)			
Sodium	5000		30700	34200	ug/L	4.01	N/A	(0%-20%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 443647

Page 6 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1738794										
Vanadium	500	B	2.13		469	ug/L	0.733	93.3	(0%-20%)	HSC	03/02/18 14:28
Zinc	500	B	3.42		456	ug/L	1.15	90.6	(0%-20%)		
QC1203970599 443644008 SDILT											
Antimony		U	2.29	DU	17.5	ug/L	N/A	(0%-20%)			03/02/18 14:30
Arsenic		U	-0.0714	DU	25.0	ug/L	N/A	(0%-20%)			
Barium			100	D	20.3	ug/L	1.04	(0%-20%)			
Cadmium		U	0.0449	DU	5.00	ug/L	N/A	(0%-20%)			
Calcium			62900	D	12700	ug/L	.688	(0%-20%)			
Chromium		B	1.49	DU	5.00	ug/L	N/A	(0%-20%)			
Cobalt		U	-0.0771	DU	5.00	ug/L	N/A	(0%-20%)			
Copper		U	-1.87	DU	15.0	ug/L	N/A	(0%-20%)			
Iron		B	63.9	DU	150	ug/L	N/A	(0%-20%)			
Magnesium			12100	D	2510	ug/L	3.74	(0%-20%)			
Manganese			31.6	BD	6.50	ug/L	2.9	(0%-20%)			
Nickel		U	0.857	DU	7.50	ug/L	N/A	(0%-20%)			
Potassium			4830	D	953	ug/L	1.47	(0%-20%)			

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QC Summary

Workorder: 443647

Page 7 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1738794										
Silver	U	0.599	DU	5.00	ug/L	N/A		(0%-20%)	HSC	03/02/18	14:30
Sodium		30700	D	6230	ug/L	1.42		(0%-20%)			
Vanadium	B	2.13	DU	5.00	ug/L	N/A		(0%-20%)			
Zinc	B	3.42	DU	16.5	ug/L	N/A		(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 \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.
- E Reported value is estimated due to interferences. See comment in narrative.
- 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 #: GEL443647
 Work Order #: 443647**

Product: Ion Chromatography**Analytical Method:** 9056_ANIONS_IC**Analytical Procedure:** GL-GC-E-086 REV# 25**Analytical Batch:** 1738842

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443647001	B3H3H7
443647002	B3H3J1
443647003	B3H388
443647004	B3H3B8
443647005	B3H3C3
443647006	B3HMY8
1203970743	Method Blank (MB)
1203970744	Laboratory Control Sample (LCS)
1203970745	443647001(B3H3H7) Sample Duplicate (DUP)
1203970746	443647001(B3H3H7) Post Spike (PS)

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**Holding Times**

Samples (See Below) were initially analyzed within holding; however, the holding times had expired prior to reanalysis of diluted samples. The data is qualified.

Sample	Analyte	Value
1203970745 (B3H3H7DUP)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
1203970746 (B3H3H7PS)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
443647002 (B3H3J1)	Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
443647003 (B3H388)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18
443647004 (B3H3B8)	Chloride, Nitrate and Sulfate	Received 13-FEB-18, within holding, analyzed 14-FEB-18, out of holding 14-FEB-18

Sample Dilutions

The following samples 1203970745 (B3H3H7DUP), 1203970746 (B3H3H7PS), 443647001 (B3H3H7), 443647002 (B3H3J1), 443647003 (B3H388), 443647004 (B3H3B8), 443647005 (B3H3C3) and 443647006 (B3HMY8) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	443647					
	001	002	003	004	005	006
Several	10X 1X	5X 1X	10X 1X	10X 1X	10X 1X	5X 1X

Miscellaneous Information

Manual Integrations

Sample 443647002 (B3H3J1) were manually integrated to correctly position the baseline as set in the calibration standards.

Product: Alkalinity**Analytical Method:** 2320_ALKALINITY**Analytical Procedure:** GL-GC-E-033 REV# 13**Analytical Batch:** 1740628

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443647007	B3H387
443647008	B3H3B7
1203975520	Laboratory Control Sample (LCS)
1203975521	443644008(NonSDG) Sample Duplicate (DUP)
1203975522	443936013(B3H375) Sample Duplicate (DUP)

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.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL443647 GEL Work Order: 443647

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).

D Results are reported from a diluted aliquot of sample.

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

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: Kristen Mizzell****Date: 01 MAR 2018****Title: Team Leader**

Sample Data Summary

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Certificate of Analysis

Report Date: March 1, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-002

Client Sample ID: B3H3H7 Project: CPRCOW18002
 Sample ID: 443647001 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 12-FEB-18 10:20
 Receive Date: 13-FEB-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	236	33.0	500	ug/L		1	MAR1	02/13/18	2145	1738842	1
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Chloride	D	11500	670	2000	ug/L		10	MAR1	02/14/18	1251	1738842	2
Nitrate-N	D	16500	330	1000	ug/L		10					
Sulfate	D	109000	1330	4000	ug/L		10					

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	9056_ANIONS_IC		
2	9056_ANIONS_IC		

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: March 1, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-002

Client Sample ID: B3H3J1 Project: CPRCOW18002
 Sample ID: 443647002 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 12-FEB-18 11:42
 Receive Date: 13-FEB-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Chloride		6730	67.0	200	ug/L		1	MAR1	02/13/18	2318	1738842	1
Fluoride	B	225	33.0	500	ug/L		1					
Nitrite-N	B	34.0	33.0	250	ug/L		1					
Nitrate-N	DX	5090	165	500	ug/L		5	MAR1	02/14/18	1455	1738842	2
Sulfate	D	56600	665	2000	ug/L		5					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

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

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Certificate of Analysis

Report Date: March 1, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-002

Client Sample ID: B3H388 Project: CPRCOW18002
 Sample ID: 443647003 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 12-FEB-18 12:47
 Receive Date: 13-FEB-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride		5120	33.0	500	ug/L		1	MAR1	02/13/18	2348	1738842	1
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Chloride	D	17300	670	2000	ug/L		10	MAR1	02/14/18	1728	1738842	2
Nitrate-N	DX	25900	330	1000	ug/L		10					
Sulfate	D	53900	1330	4000	ug/L		10					

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	9056_ANIONS_IC		
2	9056_ANIONS_IC		

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

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Certificate of Analysis

Report Date: March 1, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-002

Client Sample ID: B3H3B8 Project: CPRCOW18002
 Sample ID: 443647004 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 12-FEB-18 11:25
 Receive Date: 13-FEB-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride		5170	33.0	500	ug/L		1	MAR1	02/14/18	0019	1738842	1
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Chloride	D	12200	670	2000	ug/L		10	MAR1	02/14/18	1759	1738842	2
Nitrate-N	DX	22800	330	1000	ug/L		10					
Sulfate	D	41600	1330	4000	ug/L		10					

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	9056_ANIONS_IC		
2	9056_ANIONS_IC		

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

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Certificate of Analysis

Report Date: March 1, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-002

Client Sample ID: B3HMY8 Project: CPRCOW18002
 Sample ID: 443647006 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 12-FEB-18 09:26
 Receive Date: 13-FEB-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Chloride		6240	67.0	200	ug/L		1	MAR1	02/14/18	0121	1738842	1
Fluoride	B	244	33.0	500	ug/L		1					
Nitrate-N		2760	33.0	250	ug/L		1					
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Sulfate	D	49300	665	2000	ug/L		5	MAR1	02/14/18	1830	1738842	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 1, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-002

Client Sample ID:	B3H387	Project:	CPRCOW18002
Sample ID:	443647007	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	12-FEB-18 12:47		
Receive Date:	13-FEB-18		
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		130000	1450	4000	ug/L			RXB5	02/23/18	1414	1740628	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

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Certificate of Analysis

Report Date: March 1, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W18-002

Client Sample ID: B3H3B7 Project: CPRCOW18002
 Sample ID: 443647008 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 12-FEB-18 11:25
 Receive Date: 13-FEB-18
 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		139000	1450	4000	ug/L			RXB5	02/23/18	1507	1740628	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

GEL LABORATORIES LLC

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QC Summary

Report Date: March 1, 2018

Page 1 of 3

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 443647

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1738842										
QC1203970745	443647001	DUP									
Chloride	D	11500	D	11500	ug/L	0.305		(0%-20%)	MAR1	02/14/18	13:22
Fluoride	B	236	B	270	ug/L	13.5	^	(+/-500)		02/13/18	22:16
Nitrate-N	D	16500	DX	16500	ug/L	0.291		(0%-20%)		02/14/18	13:22
Nitrite-N	U	33.0	U	33.0	ug/L	N/A				02/13/18	22:16
Sulfate	D	109000	D	110000	ug/L	0.515		(0%-20%)		02/14/18	13:22
QC1203970744	LCS										
Chloride	5000			4640	ug/L		92.7	(80%-120%)		02/13/18	21:14
Fluoride	2500			2510	ug/L		100	(80%-120%)			
Nitrate-N	2500			2390	ug/L		95.7	(80%-120%)			
Nitrite-N	2500			2420	ug/L		96.8	(80%-120%)			
Sulfate	10000			9630	ug/L		96.3	(80%-120%)			
QC1203970743	MB										
Chloride			U	67.0	ug/L					02/13/18	20:43
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						

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QC Summary

Workorder: 443647

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1738842										
Nitrite-N			U	33.0	ug/L				MAR1	02/13/18	20:43
Sulfate			U	133	ug/L						
QC1203970746 443647001 PS											
Chloride	5.00	D	1.15 D	6.13	mg/L		99.6	(75%-125%)		02/14/18	13:53
Fluoride	2.50	B	0.236	2.75	mg/L		101	(75%-125%)		02/13/18	22:47
Nitrate-N	2.50	D	1.65 DX	4.34	mg/L		108	(75%-125%)		02/14/18	13:53
Nitrite-N	2.50	U	0.00	2.46	mg/L		98.5	(75%-125%)		02/13/18	22:47
Sulfate	10.0	D	10.9 D	22.0	mg/L		110	(75%-125%)		02/14/18	13:53
Titration and Ion Analysis											
Batch	1740628										
QC1203975521 443644008 DUP											
Alkalinity, Total as CaCO3			174000	175000	ug/L	0.344		(0%-20%)	RXB5	02/23/18	13:41
QC1203975522 443936013 DUP											
Alkalinity, Total as CaCO3			118000	118000	ug/L	0		(0%-20%)		02/23/18	16:46
QC1203975520 LCS											
Alkalinity, Total as CaCO3	100000			108000	ug/L		108	(80%-120%)		02/23/18	13:37

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.

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QC Summary

Workorder: 443647

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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.