



Wednesday, October 09, 2019

Karen Waters-Husted  
CH2M HILL Plateau Remediation Company  
825 Jadwin Avenue  
Richland, WA 99352

Re: ALS Workorder: 1909304  
Project Name: SURV, September 2019  
Project Number: S19-009

Dear Ms. Waters-Husted:

Two water samples were received from CH2M HILL Plateau Remediation Company, on 9/17/2019. The samples were scheduled for the following analysis:

Inorganics

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the method employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Katie M. O'Brien  
Project Manager

We certify that this data 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.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 1909304

**Client Name:** CH2M HILL Plateau Remediation Company

**Client Project Name:** SURV, September 2019

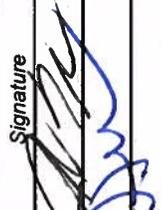
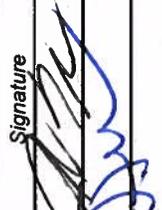
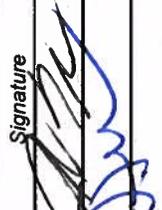
**Client Project Number:** S19-009

**Client PO Number:** BOA 54854

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3R8C9	1909304-1		WATER	16-Sep-19	10:15
B3R8F2	1909304-2		WATER	16-Sep-19	8:59

<b>CH2Mhill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> 1909304		C.O.C.# <b>S19-009-003</b> <small>Page 1 of 1</small>
<b>Collector:</b> Jeff Tucksen CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650		
<b>SAF No.:</b> S19-009	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071		
<b>Project Title:</b> SURV, September 2019	<b>Logbook No.:</b> HNF-N-506 112	<b>Ice Chest No.:</b> 6WS-690		
<b>Shipped To (Lab):</b> ALS Environmental Ft. Collins	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 76253043430		
<b>Protocol:</b> CERCLA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> 11602		
<b>POSSIBLE SAMPLE HAZARDS/REMARK</b> ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1		<b>SPECIAL INSTRUCTIONS</b> N/A		
<b>Sample No.</b> B3R8C9	<b>Filter</b> N	<b>Date</b> SEP 16 2019 1015	<b>Time</b> 1x125-mL P	<b>No/Type Container</b> 300.0 ANIONS_IC: COMMON; 300.0 ANIONS_IC: GW 02
<b>Sample Analysis</b>		<b>Holding Time</b> 48 Hours	<b>Preservative</b> Cool <=6C	

Relinquished By		Received By		Matrix *	
Print First and Last Name	Signature	Print First and Last Name	Signature	S = Soil	DS = Drum Solids
Jeff Tucksen CHPRC		Janelle Zumbel CHPRC		SE = Sediment	DL = Drum Liquids
Janelle Zumbel CHPRC		FEDEX	FEDEX	SO = Solid	T = Tissue
		Erik Evans		SL = Sludge	WI = Wipe
				W = Water	L = Liquid
				O = Oil	V = Vegetation
				A = Air	X = Other

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





1909304

ORIGIN ID: PSCA (309) 531-0450  
TROY BACON  
CH2M  
6287 LATAH ST.  
RICHLAND, WA 99352  
UNITED STATES US

SHIP DATE: 16SEP19  
ACTWGT: 49.00 LB  
CAD: 10706905/IN/ET4180  
BILL THIRD PARTY

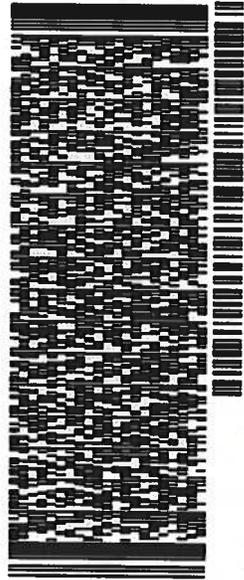
TO JULIE ELLINGSON  
ALS GLOBAL-FORT COLLINS  
225 COMMERCE DR

FORT COLLINS CO 80524  
(970) 480-1511 REF: PTR#11592  
DEPT

3.8°C

14-2

567J119D04J05A2

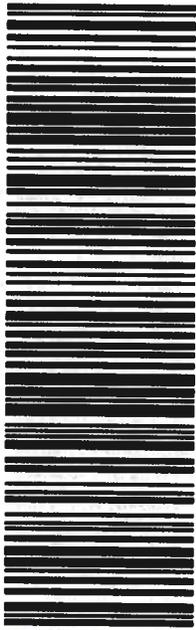


TRK# 7762 4675 7514  
0201

TUE - 17 SEP 10:30A  
PRIORITY OVERNIGHT  
DSR

XH FTCA

CO-US 80524  
DEN



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1909304

ORIGIN ID: PSCA (509) 531-0450  
TROY BACON  
CH2M  
6287 LATIHA ST.  
RICHLAND, WA 98352  
UNITED STATES US

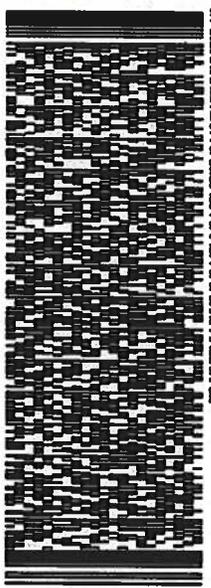
SHIP DATE: 16SEP19  
ACTWGT: 20.00 LB  
CAD: 10706895/JNET4160  
BILL THIRD PARTY

TO JULIE ELLINGSON  
ALS GLOBAL-FORT COLLINS  
225 COMMERCE DR

13-2

FORT COLLINS CO 80524  
REF: PTH#1602  
PO NV 970 480-1511  
DEPT

1.2°C



567J19D04J05A2

TRK# 7762 5304 3430  
0201

TUE - 17 SEP 10:30A  
PRIORITY OVERNIGHT  
DSR

XH FTCA

CO-US DEN  
80524



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# Inorganics

## Case Narrative

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### CH2M HILL Plateau Remediation Company

SURV, September 2019 -- S19-009

Work Order Number: 1909304

1. The samples were prepared for analysis based on Environmental Monitoring Systems Laboratory (EMSL) Rev 2.1 procedures.
2. The samples were analyzed following EMSL procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Bromide	300.0 Revision 2.1	1113
Chloride	300.0 Revision 2.1	1113
Fluoride	300.0 Revision 2.1	1113
Nitrate as N	300.0 Revision 2.1	1113
Nitrite as N	300.0 Revision 2.1	1113
Orthophosphate as P	300.0 Revision 2.1	1113
Sulfate	300.0 Revision 2.1	1113

3. All standards and solutions were used within their recommended shelf life.
4. The samples were prepared and analyzed within the established hold time for this analysis.

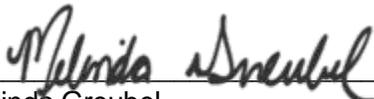
All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - A preparation (method) blank, laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) were prepared and analyzed with the samples in this preparation batch.
  - The method blank associated with this batch was below the reporting limit for the requested analytes. Sample results have been compared to the blank results and are flagged as appropriate. Nitrite as N and orthophosphate as P were detected above the MDL.

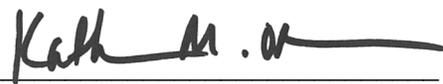


- All laboratory control sample criteria were met.
  - All initial and continuing calibration blanks were below the reporting limit for the requested analytes.
  - All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.
6. Matrix specific quality control procedures.
- Due to analyst error, an MS was not ran for CHPRC. An LCSD has been provided instead for QC.
7. It was necessary to dilute the sample 1909304-2 in order to bring the chloride concentration into the analytical range of the ion chromatograph.
8. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

  
\_\_\_\_\_  
Melinda Greubel  
Inorganics Primary Data Reviewer

10/8/19  
Date

  
\_\_\_\_\_  
Inorganics Final Data Reviewer

10/9/19  
Date



### Inorganic Data Reporting Qualifiers

The following qualifiers are used as needed by the laboratory when reporting results of inorganic analyses.

- Concentration qualifier -- A "B" is entered if the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to ALS's Method Detection Limit. If the analyte was analyzed for but not detected a "U" is entered.
- QC qualifier -- Specified entries and their meanings are as follows:
  - E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
  - M - Duplicate injection precision was not met.
  - N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
  - Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
  - \* - Duplicate analysis (relative percent difference) not within control limits.
  - S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.
  - C - The analyte was detected in both the sample and the associated QC blank, and the sample concentration was  $\leq 20X$  the blank concentration.
  - D - Analyte was reported at a secondary dilution factor, typically  $DF > 1$  (i.e., the primary preparation required dilution to either bring the analyte within the calibration range or to minimize interference). Required for organics/wetchem if the sample was diluted.

# Ion Chromatography

## Method EPA300.0 Revision 2.1

### Sample Results

**Lab Name:** ALS -- Fort Collins

**Work Order Number:** 1909304

**Client Name:** CH2M HILL Plateau Remediation Company

**ClientProject ID:** SURV, September 2019 S19-009

<b>Field ID:</b>	B3R8C9
<b>Lab ID:</b>	1909304-1

**Sample Matrix:** WATER

**% Moisture:** N/A

**Date Collected:** 16-Sep-19

**Date Extracted:** 17-Sep-19

**Date Analyzed:** 18-Sep-19

**Prep Method:** NONE

**Prep Batch:** IC190917-2

**QCBatchID:** IC190917-2-1

**Run ID:** IC190917-1a3

**Cleanup:** NONE

**Basis:** As Received

**File Name:** 190917IC3LIMS

**Analyst:** Keli J. Smith

**Sample Aliquot:** 5 ml

**Final Volume:** 5 ml

**Result Units:** MG/L

**Clean DF:** 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
16984-48-8	FLUORIDE AnalysisTime: 01:42	1	0.084	B	0.1	0.03
16887-00-6	CHLORIDE AnalysisTime: 01:42	1	14		0.2	0.06
14797-65-0	NITRITE AS N AnalysisTime: 01:42	1	0.03	U	0.1	0.03
24959-67-9	BROMIDE AnalysisTime: 01:42	1	0.078	B	0.2	0.06
14797-55-8	NITRATE AS N AnalysisTime: 01:42	1	11		0.2	0.06
14265-44-2	ORTHOPHOSPHATE AS P AnalysisTime: 01:42	1	0.15	U	0.5	0.15
14808-79-8	SULFATE AnalysisTime: 01:42	1	70		1	0.3

**Data Package ID:** IC1909304-1

**Date Printed:** Tuesday, October 08, 2019

**ALS -- Fort Collins**

Page 1 of 2

LIMS Version: 6.912

# Ion Chromatography

## Method EPA300.0 Revision 2.1

### Sample Results

**Lab Name:** ALS -- Fort Collins

**Work Order Number:** 1909304

**Client Name:** CH2M HILL Plateau Remediation Company

**ClientProject ID:** SURV, September 2019 S19-009

<b>Field ID:</b>	B3R8F2
<b>Lab ID:</b>	1909304-2

**Sample Matrix:** WATER

**% Moisture:** N/A

**Date Collected:** 16-Sep-19

**Date Extracted:** 17-Sep-19

**Date Analyzed:** 18-Sep-19

**Prep Method:** NONE

**Prep Batch:** IC190917-2

**QCBatchID:** IC190917-2-1

**Run ID:** IC190917-1a3

**Cleanup:** NONE

**Basis:** As Received

**File Name:** 190917IC3LIMS

**Analyst:** Keli J. Smith

**Sample Aliquot:** 5 ml

**Final Volume:** 5 ml

**Result Units:** MG/L

**Clean DF:** 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
16984-48-8	FLUORIDE AnalysisTime: 01:55	1	0.12		0.1	0.03
16887-00-6	CHLORIDE AnalysisTime: 09:58	10	38		2	0.6
14797-65-0	NITRITE AS N AnalysisTime: 01:55	1	0.03	U	0.1	0.03
24959-67-9	BROMIDE AnalysisTime: 01:55	1	0.19	B	0.2	0.06
14797-55-8	NITRATE AS N AnalysisTime: 01:55	1	6.1		0.2	0.06
14265-44-2	ORTHOPHOSPHATE AS P AnalysisTime: 01:55	1	0.15	U	0.5	0.15
14808-79-8	SULFATE AnalysisTime: 01:55	1	94		1	0.3

**Data Package ID:** IC1909304-1

**Date Printed:** Tuesday, October 08, 2019

**ALS -- Fort Collins**

Page 2 of 2

LIMS Version: 6.912

# Ion Chromatography

## Method EPA300.0 Revision 2.1

### Method Blank

**Lab Name:** ALS -- Fort Collins

**Work Order Number:** 1909304

**Client Name:** CH2M HILL Plateau Remediation Company

**ClientProject ID:** SURV, September 2019 S19-009

**Lab ID:** IC190917-2MB

**Sample Matrix:** WATER

**% Moisture:** N/A

**Date Collected:** N/A

**Date Extracted:** 17-Sep-19

**Date Analyzed:** 17-Sep-19

**Prep Batch:** IC190917-2

**QCBatchID:** IC190917-2-1

**Run ID:** IC190917-1a3

**Cleanup:** NONE

**Basis:** N/A

**File Name:** 190917IC3LIMS

**Sample Aliquot:** 5 ml

**Final Volume:** 5 ml

**Result Units:** MG/L

**Clean DF:** 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
16984-48-8	FLUORIDE	1	0.03	U	0.1	0.03
16887-00-6	CHLORIDE	1	0.06	U	0.2	0.06
14797-65-0	NITRITE AS N	1	0.066	B	0.1	0.03
24959-67-9	BROMIDE	1	0.06	U	0.2	0.06
14797-55-8	NITRATE AS N	1	0.06	U	0.2	0.06
14265-44-2	ORTHOPHOSPHATE AS P	1	0.32	B	0.5	0.15
14808-79-8	SULFATE	1	0.3	U	1	0.3

**Data Package ID:** IC1909304-1

# Ion Chromatography

## Method EPA300.0 Revision 2.1

### Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1909304

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, September 2019 S19-009

Lab ID: IC190917-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/17/2019

Date Analyzed: 09/17/2019

Prep Method: NONE

Prep Batch: IC190917-2

QCBatchID: IC190917-2-1

Run ID: IC190917-1a3

Cleanup: NONE

Basis: N/A

File Name: 190917IC3LIMS

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
16984-48-8	FLUORIDE	5	5.16	0.1		103	90 - 110%
16887-00-6	CHLORIDE	10	10.3	0.2		103	90 - 110%
14797-65-0	NITRITE AS N	5	5.17	0.1		103	90 - 110%
24959-67-9	BROMIDE	10	10.2	0.2		102	90 - 110%
14797-55-8	NITRATE AS N	10	10.2	0.2		102	90 - 110%
14265-44-2	ORTHOPHOSPHATE AS P	10	10.8	0.5		108	90 - 110%
14808-79-8	SULFATE	50	51.2	1		102	90 - 110%

Lab ID: IC190917-2LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09/17/2019

Date Analyzed: 09/17/2019

Prep Method: NONE

Prep Batch: IC190917-2

QCBatchID: IC190917-2-1

Run ID: IC190917-1a3

Cleanup: NONE

Basis: N/A

File Name: 190917IC3LIMS

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
16984-48-8	FLUORIDE	5	5.17	0.1		103	15	0
16887-00-6	CHLORIDE	10	10.3	0.2		103	15	0
14797-65-0	NITRITE AS N	5	5.17	0.1		103	15	0
24959-67-9	BROMIDE	10	10.3	0.2		103	15	1
14797-55-8	NITRATE AS N	10	10.2	0.2		102	15	0
14265-44-2	ORTHOPHOSPHATE AS P	10	10.5	0.5		105	15	2
14808-79-8	SULFATE	50	51.8	1		104	15	1

Data Package ID: IC1909304-1

Prep Batch ID: IC190917-2

Start Date: 09/17/19	End Date: 09/17/19	Concentration Method: NONE	Batch Created By: lml
Start Time: 8:00	End Time: 17:00	Extract Method: NONE	Date Created: 09/17/19
Prep Analyst: Lainey M. Lloyd		Initial Volume Units: ml	Time Created: 13:26
<b>Comments:</b>		Final Volume Units: ml	Validated By: kjs
			Date Validated: 09/20/19
			Time Validated: 12:21

QC Batch ID: IC190917-2-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IC190917-2	MB	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908661
IC190917-2	LCS	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908661
IC190917-2	LCSD	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908661
1908661-1	MS	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908661
1908661-1	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908661
1908661-3	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908661
1908661-5	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908661
1908731-1	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908731
1908731-3	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908731
1908731-4	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908731
1909304-1	SMP	B3R8C9	WATER	9/16/2019	5	5	NONE	1	1909304
1909304-2	SMP	B3R8F2	WATER	9/16/2019	5	5	NONE	1	1909304
1909305-1	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1909305

**QC Types**

CAR	Carrier reference sample		DLS	Detection Limit Standard
DUP	Laboratory Duplicate		LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicat		LODV	Limit of Detection Verification
LOQV	Limit of Quantitation Verification		MB	Method Blank
MS	Laboratory Matrix Spike		MSD	Laboratory Matrix Spike Duplicate
REP	Sample replicate		RVS	Reporting Level Verification Standar
SMP	Field Sample		SYS	Sample Yield Spike