



Ft. Collins, Colorado

LIMS Version: 6.907

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Sunday, August 25, 2019

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

Re: ALS Workorder: 1908422
Project Name: Apatite Barrier, September 201
Project Number: I19-029

Dear Ms. Waters-Husted:

One water sample was received from CH2M HILL Plateau Remediation Company, on 8/20/2019. The sample was 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 methods 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

OrderNum: 1908422

Client Name: CH2M HILL Plateau Remediation Company

Client Project Name: Apatite Barrier, September 201

Client Project Number: I19-029

Client PO Number: BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3R5V6	1908422-1		WATER	19-Aug-19	8:02

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		1908422	C.O.C.# I19-029-027 Page 1 of 1.	
Collector: Juan Aguilar /CHPRC Telephone No.: 509-376-4650		Contact/Requester: Karen Waters-Husted Telephone No.: 509-376-4650		Purchase Order/Charge Code: 303064		
SAF No.: I19-029 Sampling Origin: Hanford Site		Logbook No.: HNF-N-506 ~ 103146 Ice Chest No.: GWS-707		Bill of Lading/Air Bill No.: 776021170663		
Project Title: Apatite Barrier, September 201 Method of Shipment Commercial Carrier		Priority: 30 Days Offsite Property No.: 11475				
Shipped To (Lab): ALS Environmental Ft. Collins Protocol: CERCLA		SPECIAL INSTRUCTIONS N/A				
POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1						
Sample No.	Filter	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3R5V6 ①	N	W 8-19-19 0802	1x125-mL P	300.0_ANTIONS_IC: COMMON	48 Hours	Cool <=6C

Relinquished By		Received By		Matrix *	
Print First and Last Name	Signature	Print First and Last Name	Signature	S = Soil	DS = Drum Solids
Juan Aguilar /CHPRC		Lady Wal /CHPRC		SE = Sediment	DL = Drum Liquids
Lady Wal /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

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



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC

Workorder No: 1908422

Project Manager: KMO

Initials: EE

Date: 8/20/19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<input checked="" type="checkbox"/>	NO			
2. Are custody seals on shipping containers intact?		NONE	<input checked="" type="checkbox"/>	NO *			
3. Are custody seals on sample containers intact?		NONE	<input checked="" type="checkbox"/>	NO *			
4. Is there a COC (chain-of-custody) present?			<input checked="" type="checkbox"/>	NO *			
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<input checked="" type="checkbox"/>	NO *			
6. Are short-hold samples present?			<input checked="" type="checkbox"/>	NO			
7. Are all samples within holding times for the requested analyses?			<input checked="" type="checkbox"/>	NO *			
8. Were all sample containers received intact? (not broken or leaking)			<input checked="" type="checkbox"/>	NO *			
9. Is there sufficient sample for the requested analyses?			<input checked="" type="checkbox"/>	NO *			
10. Are all samples in the proper containers for the requested analyses?			<input checked="" type="checkbox"/>	NO *			
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<input checked="" type="checkbox"/>	NO *			
12. Are all aqueous non-preserved samples pH 4-9?		N/A	<input checked="" type="checkbox"/>	NO *			
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		N/A	<input checked="" type="checkbox"/>	NO			
14. Were the samples shipped on ice?			<input checked="" type="checkbox"/>	NO			
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*:	#1	#3	#4	RAD ONLY	<input checked="" type="checkbox"/>	NO
Cooler #: <u>1</u>							
Temperature (°C): <u>5.8</u>							
No. of custody seals on cooler: <u>2</u>							
External µR/hr reading: <u>12</u>							
Background µR/hr reading: <u>13</u>							
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="checkbox"/> YES / NO / NA (If no, see Form 008.)							

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: EE

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 8/20/19

1908422

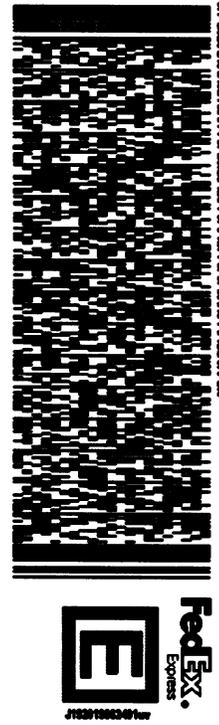
ORIGIN ID: PSCA (509) 531-0450
 TROY BACON
 CH2M
 6267 LAIHA ST.
 RICHLAND, WA 99352
 UNITED STATES US

SHP DATE: 19AUG19
 ACTWGT: 12.00 LB
 CAD: 10700005/IN/ET/4160

TO **JULIE ELLINGSON**
ALS GLOBAL-FORT COLLINS
225 COMMERCE DR

FORT COLLINS CO 80524
 (970) 400-1511
 REF: PTR#1475
 DEPT.

5.8°C



TRK# 7760 2117 0663
 0201

TUE - 20 AUG 10:30A
 PRIORITY OVERNIGHT
 DSR

XH FTCA
 CO-US DEN

80524

567.3AE9E7.05A2

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Inorganics

Case Narrative

CH2M HILL Plateau Remediation Company

Apatite Barrier, September 201 -- I19-029

Work Order Number: 1908422

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

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
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
Sulfate	300.0 Revision 2.1	1113

3. All standards and solutions were used within their recommended shelf life.
4. The sample was prepared and analyzed within the established hold time for this analysis except Nitrate as N and Nitrite as N which were analyzed outside of hold time.

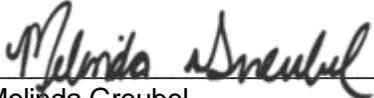
All in house quality control procedures were followed, as described below.

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 sample 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.
 - 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.
- Sample 1908366-7 was designated as the quality control sample for this analysis. Results for the shared quality control samples from the batch are included at the client's request.
- Similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.
- A matrix spike (MS) was prepared and analyzed with this batch. All guidance criteria for precision and accuracy were met.
7. It was necessary to dilute the sample in order to bring the anion concentrations 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

8/21/19
Date



Kath M. O.
Inorganics Final Data Reviewer

8/25/19
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 $\leq 5X$ 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: 1908422

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: Apatite Barrier, September 201 I19-029

Field ID:	B3R5V6
Lab ID:	1908422-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 19-Aug-19

Date Extracted: 20-Aug-19

Date Analyzed: 20-Aug-19

Prep Method: NONE

Prep Batch: IC190820-3

QCBatchID: IC190820-3-1

Run ID: IC190820-1A2

Cleanup: NONE

Basis: As Received

File Name: 190820ic3lims

Analyst: Lainey M. Lloyd

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: 20:02	2	0.11	JD	0.2	0.06
16887-00-6	CHLORIDE AnalysisTime: 20:15	10	58	D	2	0.6
14797-65-0	NITRITE AS N AnalysisTime: 20:02	2	0.06	UD	0.2	0.06
14797-55-8	NITRATE AS N AnalysisTime: 20:02	2	15	D	0.4	0.12
14808-79-8	SULFATE AnalysisTime: 20:02	2	110	D	2	0.6

Data Package ID: IC1908422-1

Ion Chromatography

Method EPA300.0 Revision 2.1

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1908422

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: Apatite Barrier, September 201 I19-029

Lab ID: IC190820-3MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 20-Aug-19

Date Analyzed: 20-Aug-19

Prep Batch: IC190820-3

QCBatchID: IC190820-3-1

Run ID: IC190820-1A2

Cleanup: NONE

Basis: N/A

File Name: 190820ic3lims

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	0.04	J	0.1	0.03
14797-55-8	NITRATE AS N	1	0.06	U	0.2	0.06
14808-79-8	SULFATE	1	0.3	U	1	0.3

Data Package ID: IC1908422-1

Ion Chromatography

Method EPA300.0 Revision 2.1

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1908422

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: Apatite Barrier, September 201 I19-029

Lab ID: IC190820-3LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 08/20/2019

Date Analyzed: 08/20/2019

Prep Method: NONE

Prep Batch: IC190820-3

QCBatchID: IC190820-3-1

Run ID: IC190820-1A2

Cleanup: NONE

Basis: N/A

File Name: 190820ic3lims

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	5.05	0.1		101	90 - 110%
16887-00-6	CHLORIDE	10	10	0.2		100	90 - 110%
14797-65-0	NITRITE AS N	5	5.13	0.1		103	90 - 110%
14797-55-8	NITRATE AS N	10	10	0.2		100	90 - 110%
14808-79-8	SULFATE	50	50.4	1		101	90 - 110%

Lab ID: IC190820-3LCSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 08/20/2019

Date Analyzed: 08/20/2019

Prep Method: NONE

Prep Batch: IC190820-3

QCBatchID: IC190820-3-1

Run ID: IC190820-1A2

Cleanup: NONE

Basis: N/A

File Name: 190820ic3lims

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	0.1		100	15	1
16887-00-6	CHLORIDE	10	10	0.2		100	15	0
14797-65-0	NITRITE AS N	5	5.12	0.1		102	15	0
14797-55-8	NITRATE AS N	10	9.98	0.2		100	15	0
14808-79-8	SULFATE	50	50	1		100	15	1

Data Package ID: IC1908422-1

Ion Chromatography

Method EPA300.0 Revision 2.1

Matrix Spike

Lab Name: ALS -- Fort Collins

Work Order Number: 1908422

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: Apatite Barrier, September 201 I19-029

Field ID:	SHARED QC
LabID:	1908366-7MS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 15-Aug-19

Date Extracted: 20-Aug-19

Date Analyzed: 20-Aug-19

Prep Batch: IC190820-3

QCBatchID: IC190820-3-1

Run ID: IC190820-1A2

Cleanup: NONE

Basis: As Received

Sample Aliquot: 5 ml

Final Volume: 5 ml

Result Units: MG/L

File Name: 190820ic3lims

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
16984-48-8	FLUORIDE	0.069	J	1.95		0.1	2	94	85 - 115%
16887-00-6	CHLORIDE	0.84		5.61		0.2	5	95	85 - 115%
14797-65-0	NITRITE AS N	100	U	2200		100	2000	110	85 - 115%
14797-55-8	NITRATE AS N	200	U	4820		200	5000	96	85 - 115%
14808-79-8	SULFATE	18		34.5		1	20	85	85 - 115%

Data Package ID: IC1908422-1

Prep Batch ID: IC190820-3

Start Date: 08/20/19	End Date: 08/20/19	Concentration Method: NONE	Batch Created By: lml
Start Time: 9:00	End Time: 19:00	Extract Method: NONE	Date Created: 08/20/19
Prep Analyst: Lainey M. Lloyd		Initial Volume Units: ml	Time Created: 9:59
Comments:		Final Volume Units: ml	Validated By: kjs
			Date Validated: 08/21/19
			Time Validated: 10:58

QC Batch ID: IC190820-3-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IC190820-3	MB	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
IC190820-3	LCS	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
IC190820-3	LCSD	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908366-7	MS	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908366-1	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908366-7	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908422-1	SMP	B3R5V6	WATER	8/19/2019	5	5	NONE	1	1908422

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	