



Tuesday, January 15, 2019

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

Re: ALS Workorder: 1812378  
Project Name: SURV, AUGUST 2018  
Project Number: S18-008

Dear Ms. Waters-Husted:

One water sample was received from CH2M HILL Plateau Remediation Company, on 12/28/2018. The sample was scheduled for the following analysis:

Metals

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.

**SAMPLE ISSUE RESOLUTION (SIR) REPORT**

**SIR Number:** SIR19-0376  
**Rev. Number:** 0  
**Date Initiated:** 12/28/2018

**SAMPLE EVENT INFORMATION**

**SAF NUM(S):** S18-008  
**LABORATORY:** ALS

**SAMPLING INFORMATION**

**NUMBER OF SAMPLES:** 1  
**SAMPLE NUMBERS:** B3JYF2  
**SAMPLE MATRIX:** WATER  
**SDG NUM(S):** ALS1812378

**ISSUE BACKGROUND**

**CLASS:** Sample Management Issues  
**TYPE:** Turnaround Time and Due Date Modification  
**DESCRIPTION:** The TAT (Priority) on COC S18-008-021 incorrectly indicates 30 days. The TAT will be changed to 15 days to meet project reporting deadlines.

**RESOLUTION**

**PROPOSED RESOLUTION:** Document and close.

**FINAL RESOLUTION:** Document and close.

**SUBMITTED BY:**

CUTSFORTH, EC

12/31/2018

**ACCEPTED BY:**

O'BRIEN, KATIE

12/31/2018

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

---

**OrderNum:** 1812378

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

**Client Project Name:** SURV, AUGUST 2018

**Client Project Number:** S18-008

**Client PO Number:** BOA 54854

---

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3JYF2	1812378-1		WATER	26-Dec-18	9:09

8/105

CH2MHill Plateau  
Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#  
S18-008-021

Page 1 of 1

<b>Collector:</b> Chris Fulton /CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> S18-008	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> SURV, AUGUST 2018	<b>Logbook No.:</b> HNF-N-506-105	<b>Ice Chest No.:</b> GWS-556856
<b>Shipped To (Lab):</b> ALS Environmental Ft. Collins	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 7740706910099
<b>Protocol:</b> SURV	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> 10448

<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
---	------------------------------------

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3JYF2	N	W	12/26/18	0909	1x500-mL G/P	6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2

ALS1812378  
January 15, 2019

Relinquished By: Chris Fulton /CHPRC <i>[Signature]</i> Print First and Last Name Signature Date/Time: DEC 26 2018 1040	Received By: SSU-1 <i>[Signature]</i> Print First and Last Name Signature Date/Time: DEC 26 2018 1048	<b>Matrix *</b> S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: SSU-1 <i>[Signature]</i> Print First and Last Name Signature Date/Time: DEC 27 2018 1130	Received By: Malcom Chunn /CHPRC <i>[Signature]</i> Print First and Last Name Signature Date/Time: DEC 27 2018 1130	
Relinquished By: Malcom Chunn /CHPRC <i>[Signature]</i> Print First and Last Name Signature Date/Time: DEC 27 2018 1400	Received By: FEDEX <i>[Signature]</i> Print First and Last Name Signature Date/Time:	
Relinquished By: Fed EX <i>[Signature]</i> Print First and Last Name Signature Date/Time:	Received By: Erik Evans <i>[Signature]</i> Print First and Last Name Signature Date/Time: 12/28/18 0120	

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

Page 4 of 14

Rev 0



ALS Environmental - Fort Collins  
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC

Workorder No: 1812378

Project Manager: KMO

Initials: EE

Date: 12/28/18

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

Additional Information: Please provide details here for any NO responses to gray-shaded boxes above, or any other issues noted:

---

---

---

---

---

---

---

---

---

---

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

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

Project Manager Signature / Date: [Signature] 12/28/18

18175 18

ORIGIN ID:PSCA (509) 373-3580  
JANELLE ZUNKER  
CH2M  
6269 LATAH ST.

SHIP DATE: 27DEC18  
ACTWGT: 8.00 LB  
CAD: 107066051/NET4040

RICHLAND, WA 99354  
UNITED STATES US

BILL THIRD PARTY

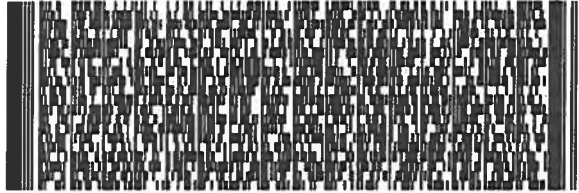
TO **JULIE ELLINGSON**  
**ALS GLOBAL**  
**225 COMMERCE DRIVE**

10-2

582,0E4AFDC46

**FORT COLLINS CO 80524**

(970) 490-1511 REF: 10448  
INV. PO: DEPT:



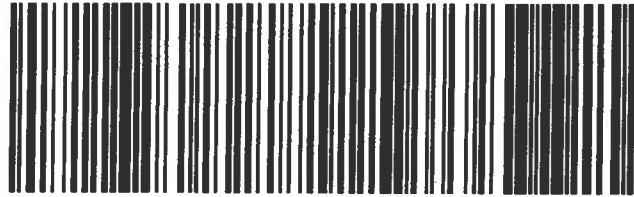
TRK# 7740 7069 6099  
0201

FRI - 28 DEC 10:30A  
PRIORITY OVERNIGHT

AMB

DSR 80524  
CO-US DEN

**XH FTCA**



**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

**Warning:** Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



# Metals

## Case Narrative

---

### **CH2M HILL Plateau Remediation Company**

**SURV, AUGUST 2018 -- S18-008**

Work Order Number: 1812378

1. The samples were prepared and analyzed based on SW-846, 3<sup>rd</sup> Edition procedures.

For analysis by ICP-MS, the samples were digested following method 3005A and the current revision of SOP 806.

2. Analysis by ICP-MS followed method 6020A and the current revision of SOP 827.
3. All standards and solutions are NIST traceable and were used within their recommended shelf life.
4. The samples were prepared and analyzed within the established hold time.

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

5. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch.
  - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analyte. 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 analyte.
  - All initial and continuing calibration verifications were within the acceptance criteria for the requested analyte.



- The interference check samples associated with Method 6020A were analyzed.

6. Matrix specific quality control procedures.

Sample 1812377-1 was designated as the quality control sample for this analysis. Results for the shared quality control samples 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.

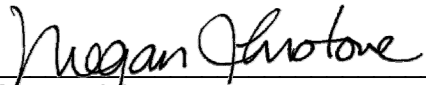
- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- Matrix spike recoveries could not be evaluated for the following analyte:

<u>Analyte</u>	<u>Sample ID</u>
Uranium	1812377-1


The concentration of this analyte in the native sample was greater than four times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The laboratory control sample indicates that the digestion and analysis were in control.

- A serial dilution was analyzed with the ICP batch. All acceptance criteria were met.
7. It is a standard practice that samples for ICP-MS are analyzed at a dilution. The 10X factor can be considered an artifact of the prep and does not indicate a secondary dilution and is therefore not flagged as a dilution. The sample was further diluted in order to bring uranium into the analytical range of the instrument.

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.

  
\_\_\_\_\_  
Megan Johnstone  
Inorganics Primary Data Reviewer

1/11/19  
Date

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

1/15/19  
Date



### Inorganic Data Reporting Qualifiers

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

- Result 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 the Method Detection Limit (MDL). If the analyte was analyzed for but not detected a "U" is entered. For samples, negative values are reported as non-detects ("U" flagged). For blanks, if the absolute value of the negative value is above the MDL and below the reporting limit, then the result is "B" flagged.
- 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.

# Total Recoverable ICPMS Metals

## Method SW6020A

### Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1812378

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, AUGUST 2018 S18-008

Field ID: B3JYF2	Sample Matrix: WATER	Prep Batch: IP190104-3	Analyst: Nicole C. Chirban
Lab ID: 1812378-1	% Moisture: N/A	QC Batch ID: IP190104-3-4	Sample Aliquot: 50 ml
	Date Collected: 26-Dec-18	Run ID: IM190109-10A8	Final Volume: 50 ml
	Date Extracted: 04-Jan-19	Cleanup: NONE	Result Units: UG/L
Analysis ReqCode: 6020_METALS_I	Date Analyzed: 09-Jan-19	Basis: As Received	Clean DF: 1
	Prep Method: SW3005 Rev A	File Name: 028SMPL_	

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
7440-61-1	URANIUM	10000	34000	D	100	4.9

Data Package ID: IM1812378-1

# ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1812378

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, AUGUST 2018 S18-008

Lab ID: IP190104-3MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 04-Jan-19

Date Analyzed: 09-Jan-19

Prep Batch: IP190104-3

QCBatchID: IP190104-3-4

Run ID: IM190109-10A8

Cleanup: NONE

Basis: N/A

File Name: 009SMPL\_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
7440-61-1	URANIUM	10	0.0049	U	0.1	0.0049

Data Package ID: IM1812378-1

**ICPMS Metals**  
**Method SW6020A**  
**Laboratory Control Sample**

Lab Name: ALS -- Fort Collins

Work Order Number: 1812378

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, AUGUST 2018 S18-008

Lab ID: IM190104-3LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 01/04/2019

Date Analyzed: 01/09/2019

Prep Method: SW3005A

Prep Batch: IP190104-3

QCBatchID: IP190104-3-4

Run ID: IM190109-10A8

Cleanup: NONE

Basis: N/A

File Name: 010SMPL\_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-61-1	URANIUM	10	9.79	0.1		98	80 - 120%

Data Package ID: IM1812378-1

# ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1812378

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, AUGUST 2018 S18-008

Field ID: SHARED QC
LabID: 1812377-1MS

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: 27-Dec-18  
Date Extracted: 04-Jan-19  
Date Analyzed: 09-Jan-19  
Prep Method: SW3005 Rev A

Prep Batch: IP190104-3  
QCBatchID: IP190104-3-4  
Run ID: IM190109-10A8  
Cleanup: NONE  
Basis: As Received

Sample Aliquot: 50 ml  
Final Volume: 50 ml  
Result Units: UG/L  
File Name: 026SMPL\_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-61-1	URANIUM	65		79.3		0.1	10	138	75 - 125%

Field ID: SHARED QC
LabID: 1812377-1MSD

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: 27-Dec-18  
Date Extracted: 04-Jan-19  
Date Analyzed: 09-Jan-19  
Prep Method: SW3005 Rev A

Prep Batch: IP190104-3  
QCBatchID: IP190104-3-4  
Run ID: IM190109-10A8  
Cleanup: NONE  
Basis: As Received

Sample Aliquot: 50 ml  
Final Volume: 50 ml  
Result Units: UG/L  
File Name: 027SMPL\_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-61-1	URANIUM	78.2		10	127	0.1	20	1

Data Package ID: IM1812378-1

**Prep Batch ID: IP190104-3**

<b>Start Date:</b> 01/04/19	<b>End Date:</b> 01/04/19	<b>Concentration Method:</b> NONE	<b>Batch Created By:</b> jml
<b>Start Time:</b> 10:32	<b>End Time:</b> 18:00	<b>Extract Method:</b> SW3005A	<b>Date Created:</b> 01/04/19
<b>Prep Analyst:</b> Jill M. Latelle		<b>Initial Volume Units:</b> ml	<b>Time Created:</b> 10:34
<b>Comments:</b>		<b>Final Volume Units:</b> ml	<b>Validated By:</b> jml
<div style="border: 1px solid black; height: 30px; width: 100%;"></div>			<b>Date Validated:</b> 01/04/19
			<b>Time Validated:</b> 11:00

QC Batch ID: IP190104-3-4

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP190104-3	MB	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812377
IM190104-3	LCS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812377
1812377-1	MS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812377
1812377-1	MSD	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812377
1812377-1	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812377
1812378-1	SMP	B3JYF2	WATER	12/26/2018	50	50	NONE	1	1812378
1812402-3	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812402
1812402-4	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812402
1812402-5	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1812402

**QC Types**

CAR	Carrier reference sample	DUP	Laboratory Duplicate
LCS	Laboratory Control Sample	LCSD	Laboratory Control Sample Duplicat
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		