

Friday, May 20, 2016

Dave Todak  
CH2M HILL Plateau Remediation Company  
2420 Stevens Center  
Richland, WA 99352

Re: ALS Workorder: 1605215  
Project Name: 100-HR-3 Long Term & Interim Action Monitoring - Soil  
Project Number: F16-040

Dear Mr. Todak:

Two soil samples were received from CH2M HILL Plateau Remediation Company, on 5/11/2016. The samples were scheduled for the following analysis:

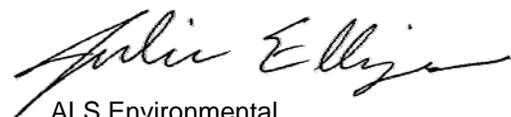
Metals

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 methods employed.

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

Sincerely,



ALS Environmental  
Julie Ellingson  
Project Manager

May 20, 2016

ALS1605215

# ALS Environmental -- FC

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 1605215

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

**Client Project Name:** 100-HR-3 Long Term & Interim Action Monitoring - Soil

**Client Project Number:** F16-040

**Client PO Number:** BOA 54854

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B35KJ4	1605215-1		SOIL	10-May-16	9:30
B35KJ6	1605215-2		SOIL	10-May-16	9:30

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** *1605215* **PAGE 1 OF 1**

**CH2M Hill Plateau Remediation Company**  
**COLLECTOR** J.R. Aguilar/CHPRC  
**SAMPLING LOCATION** C9584, I-002  
**ICE CHEST NO.** GWS-098  
**SHIPPED TO** ALS Environmental Ft. Collins

**COMPANY CONTACT** TODAY, D  
**TELEPHONE NO.** 376-6427  
**PROJECT COORDINATOR** TODAY, D  
**PRICE CODE** 8C  
**AIR QUALITY**   
**METHOD OF SHIPMENT** FEDERAL EXPRESS  
**DATA TURNAROUND** 15 Days / 15 Days  
**ORIGINAL**

**PROJECT DESIGNATION** 100-HR-3 Long Term & Interim Action Monitoring - Soil  
**FIELD LOGBOOK NO.** IANF-N-645-3/67  
**ACTUAL SAMPLE DEPTH** 45.5' - 48.0'  
**OFFSITE PROPERTY NO.** 6625  
**SAF NO.** F16-040  
**COA** 300115  
**BILL OF LADING/AIR BILL NO.** 77630809 1350

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS	SAMPLE DATE	SAMPLE TIME
A=Air DL=Drum L=Liquids DS=Drum S=Soil SF=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. N/A	None	6 Months	G/P	1	250ml	6020_METALS, ICPMS, COMMON {Chromium}	5-10-16	0930
<b>SPECIAL HANDLING AND/OR STORAGE</b>									
<b>SAMPLE NO.</b> B35KJ4 ①	<b>MATRIX*</b> SOIL								

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM J.R. Aguilar/CHPRC		Troy Bacon CHPRC	MAY 10 2016 1100	
RELINQUISHED BY/REMOVED FROM Troy Bacon		FEDEX	MAY 10 2016 1400	
RELINQUISHED BY/REMOVED FROM FEDEX		CTrimble	5-11-16 0930	
RELINQUISHED BY/REMOVED FROM				
RELINQUISHED BY/REMOVED FROM				
RELINQUISHED BY/REMOVED FROM				
RELINQUISHED BY/REMOVED FROM				
RELINQUISHED BY/REMOVED FROM				
RELINQUISHED BY/REMOVED FROM				

**LABORATORY SECTION** RECEIVED BY  
**FINAL SAMPLE DISPOSITION** DISPOSAL METHOD

**PRINTED ON** 5/5/2016 **FSR ID = FSR32171** **TRVL NUM = TRVL-16-138** **A-6003-618 (REV 2)**

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 1605215		PAGE 1 OF 1	
COLLECTOR J.R. Aguilar/CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9584, I-002 DUP	PROJECT DESIGNATION 100-HR-3 Long Term & Interim Action Monitoring - Soil	FIELD LOGBOOK NO. 14NF-N-645.3/47	SAF NO. F16-040	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. GWS-098	ACTUAL SAMPLE DEPTH 45.5' - 48.0'	OFFSITE PROPERTY NO. 6625	COA 300115	BILL OF LADING/AIR BILL NO. 776308091350	
SHIPPED TO ALS Environmental Ft. Collins	ORIGINAL				

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/REMARKS *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	PRESERVATION None	HOLDING TIME 6 Months	TYPE OF CONTAINER G/P	NO. OF CONTAINER(S) 1	VOLUME 250ml	SAMPLE ANALYSIS 6020_METALS, ICPMS: COMMON (Chromium);
SPECIAL HANDLING AND/OR STORAGE							
SAMPLE NO. B35KJ6 (2)	MATRIX* SOIL	SAMPLE DATE 5-10-16	SAMPLE TIME 0930				

CHAIN OF POSSESSION	SIGN/PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM J.R. Aguilar/CHPRC	RECEIVED BY/STORED IN Troy Bacon / Troy L. Bacon	DATE/TIME MAY 10 2016 1100
RELINQUISHED BY/REMOVED FROM Troy Bacon / Troy L. Bacon	RECEIVED BY/STORED IN FEDEX	DATE/TIME MAY 10 2016 1100
RELINQUISHED BY/REMOVED FROM FED EX	RECEIVED BY/STORED IN C Trimble C	DATE/TIME 5-11-16 0930
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME



**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client: CHPRC  
Project Manager: JE

Workorder No: 1605215  
Initials: COT Date: 5-11-16

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES	NO
3. Are Custody seals on sample containers intact?	NONE	<input checked="" type="radio"/> YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible?		<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ___ < green pea ___ > green pea	<input checked="" type="radio"/> N/A	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ___ dusting ___ moderate ___ heavy	<input checked="" type="radio"/> N/A	YES	NO
16. Were the samples shipped on ice?		<input checked="" type="radio"/> YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 <input checked="" type="radio"/> #4	RAD ONLY	<input checked="" type="radio"/> YES	NO
Cooler #: <u>1</u>			
Temperature (°C): <u>1.4</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>12</u>			
Background µR/hr reading: <u>11</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no, see Form 008.)			

**Additional Information:** PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

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If applicable, was the client contacted? YES / NO /  Contact: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Project Manager Signature / Date: [Signature] 5-11-16

ORIGIN ID:PSCA (509) 528-9428  
LESLEY WALL  
CHIZM  
6267 LATAH ST.  
6269 LATAH ST.  
RICHLAND, WA 99354  
UNITED STATES US

SHIP DATE: 10MAY16  
ACT WGT: 39.00 LB  
CAD: 107056051/INETS3730  
BILL THIRD PARTY

1605215

TO JULIE ELLINGSON  
ALS GLOBAL  
225 COMMERCE DRIVE

FORT COLLINS CO 80524  
(970) 490-1511  
INV/

REF: PTR# 6625

PO DEPT

12  
-2

540J16323/727F



J18181802691uv

TRK# 7763 0809 1350  
0201

WED - 11 MAY 10:30A  
PRIORITY OVERNIGHT

1.40z

XH FTCA

DSR 80524  
CO-US DEN



**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
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## Metals Case Narrative

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

100-HR-3 Long Term & Interim Action Monitoring – Soil – F16-040

Work Order Number: 1605215

1. This report consists of 2 soil samples.
2. The samples were received cool and intact by ALS on 05/11/16.
3. 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 3050B and the current revision of SOP 806.

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

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

7. 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 analytes. Sample results have been compared to the blank results.
  - 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.
8. Matrix specific quality control procedures.

Sample 1605215-1 was designated as the quality control sample for this analysis.

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 with the following exception:

<u>Analyte</u>	<u>Sample ID</u>
Chromium	1605215-1MSD

The native sample result is flagged for matrix spike failure and an analytical post spike were performed. The result of the spike was acceptable indicating that the matrix was not significantly affecting quantitation of this analyte.

- A sample duplicate and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
  - A serial dilution was analyzed with this ICP batch. All acceptance criteria were met.
9. 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 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.

  
\_\_\_\_\_  
Jill Latelle  
Inorganics Primary Data Reviewer

5/20/16  
Date

  
\_\_\_\_\_  
Julie Ellinger  
Inorganics Final Data Reviewer

5/20/16  
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  $\leq 5X$  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.

# Total CHROMIUM

Method SW6020A

## Sample Results

**Lab Name:** ALS Environmental -- FC  
**Client Name:** CH2M HILL Plateau Remediation Company  
**Client Project ID:** 100-HR-3 Long Term & Interim Action Monitoring - Soil F16-040  
**Work Order Number:** 1605215      **Final Volume:** 100 ml  
**Reporting Basis:** Dry Weight      **Matrix:** SOIL  
**Analyst:** Brent A. Stanfield      **Result Units:** UG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Flag	Sample Aliquot
B35KJ4	1605215-1	5/10/2016	5/14/2016	05/16/2016	20.69	10	9200	1100	87	N	1.179 g
B35KJ6	1605215-2	5/10/2016	5/14/2016	05/16/2016	19.83	10	22000	1200	97		1.057 g

**Comments:**

1. ND or U = Not Detected at or above the client requested detection limit.

**Data Package ID:** *im1605215-1*

May 20, 2016  
ALS1605215  
ICPMS Metals

Method SW6020A  
Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1605215

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Soil F16-040

Lab ID: IP160514-1MB

Sample Matrix: SOIL

% Moisture: N/A

Date Collected: N/A

Date Extracted: 14-May-16

Date Analyzed: 16-May-16

Prep Batch: IP160514-1

QCBatchID: IP160514-1-4

Run ID: IM160516-10A15

Cleanup: NONE

Basis: N/A

File Name: 044SMPL\_

Sample Aliquot: 1 g

Final Volume: 100 ml

Result Units: UG/KG

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-47-3	CHROMIUM	10	82	1000	82	U	

Data Package ID: im1605215-1

May 20, 2016  
ALS1605215  
ICPMS Metals

Method SW6020A  
Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1605215

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Soil F16-040

Lab ID: IM160514-1LCS

Sample Matrix: SOIL

% Moisture: N/A

Date Collected: N/A

Date Extracted: 05/14/2016

Date Analyzed: 05/16/2016

Prep Method: SW3050B

Prep Batch: IP160514-1

QCBatchID: IP160514-1-4

Run ID: IM160516-10A15

Cleanup: NONE

Basis: N/A

File Name: 045SMPL\_

Sample Aliquot: 1 g

Final Volume: 100 ml

Result Units: UG/KG

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-47-3	CHROMIUM	50000	52500	1000		105	80 - 120%

Data Package ID: *im1605215-1*

**May 20, 2016**  
**ALS1605215**  
**ICPMS Metals**

**Method SW6020A**  
**Matrix Spike And Matrix Spike Duplicate**

**Lab Name:** ALS Environmental -- FC  
**Work Order Number:** 1605215  
**Client Name:** CH2M HILL Plateau Remediation Company  
**ClientProject ID:** 100-HR-3 Long Term & Interim Action Monitoring - Soil F16-0

<b>Field ID:</b> B35KJ4
<b>LabID:</b> 1605215-1MS

<b>Sample Matrix:</b> SOIL	<b>Prep Batch:</b> IP160514-1	<b>Sample Aliquot:</b> 1.185 g
<b>% Moisture:</b> 20.7	<b>QCBatchID:</b> IP160514-1-4	<b>Final Volume:</b> 100 ml
<b>Date Collected:</b> 10-May-16	<b>Run ID:</b> IM160516-10A15	<b>Result Units:</b> UG/KG
<b>Date Extracted:</b> 14-May-16	<b>Cleanup:</b> NONE	<b>File Name:</b> 052SMPL_
<b>Date Analyzed:</b> 16-May-16	<b>Basis:</b> Dry Weight	
<b>Prep Method:</b> SW3050 Rev B		

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-47-3	CHROMIUM	9200		67000		1060	53200	109	75 - 125%

<b>Field ID:</b> B35KJ4
<b>LabID:</b> 1605215-1MSD

<b>Sample Matrix:</b> SOIL	<b>Prep Batch:</b> IP160514-1	<b>Sample Aliquot:</b> 1.182 g
<b>% Moisture:</b> 20.7	<b>QCBatchID:</b> IP160514-1-4	<b>Final Volume:</b> 100 ml
<b>Date Collected:</b> 10-May-16	<b>Run ID:</b> IM160516-10A15	<b>Result Units:</b> UG/KG
<b>Date Extracted:</b> 14-May-16	<b>Cleanup:</b> NONE	<b>File Name:</b> 053SMPL_
<b>Date Analyzed:</b> 16-May-16	<b>Basis:</b> Dry Weight	
<b>Prep Method:</b> SW3050 Rev B		

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-47-3	CHROMIUM	78400	N	53300	130	1070	20	16

**Data Package ID:** *im1605215-1*

May 20, 2016  
ALS1605215  
ICPMS Metals

Method SW6020  
Analytical Spike Sample Recovery

Lab Name: ALS Environmental -- FC

Work Order Number: 1605215

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Soil F16-040

Field ID:	B35KJ4
LabID:	1605215-1A

Run ID: IM160516-10A15  
Date Analyzed: 5/16/2016  
Result Units: ug/l

Target Analyte	Sample Result	Samp Qual	PS Result	PS Qual	Spike Added	PS % Rec.	Control Limits
CHROMIUM	8.58		59.8		50	102	75 - 125%

Data Package ID: *im1605215-1*