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Thursday, August 04, 2016

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

Re: ALS Workorder: 1607377
Project Name: 100-HR-3 Long Term & Interim Action Monitoring - Water
Project Number: F16-039

Dear Mr. Todak:

Two water samples were received from CH2M HILL Plateau Remediation Company, on 7/21/2016. The samples were scheduled for the following analyses:

Metals
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
Julie Ellingson
Project Manager

ADDRESS 225 Commerce Drive, Fort Collins, Colorado, USA 80524 | PHONE +1 970 490 1511 | FAX +1 970 490 1522
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ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1607377
Client Name: CH2M HILL Plateau Remediation Company
Client Project Name: 100-HR-3 Long Term & Interim Action Monitoring - Water
Client Project Number: F16-039
Client PO Number: BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B35H01	1607377-1		WATER	19-Jul-16	11:24
B35FY8	1607377-2		WATER	19-Jul-16	11:24

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 1607377		F16-039-037	PAGE 1 OF 1
COLLECTOR: Curt Hoffman CHPRC	COMPANY CONTACT: TODAK, D	TELEPHONE NO.: 376-6427	PROJECT COORDINATOR: TODAK, D	PRICE CODE: 7H
SAMPLING LOCATION: C9542, SCREENED INTERVAL	PROJECT DESIGNATION: 100-HR-3 Long Term & Interim Action Monitoring - Water		SAF NO.: F16-039	AIR QUALITY ☐
ICE CHEST NO.: GWS-376	FIELD LOGBOOK NO.: HNF-N-645-4 pg 27	ACTUAL SAMPLE DEPTH: 99.24'	COA: 300115	METHOD OF SHIPMENT: FEDERAL EXPRESS
SHIPPED TO: ALS Environmental Ft. Collins	OFFSITE PROPERTY NO.: 6847		BILL OF LADING/AIR BILL NO.: 7768 0425 3386	

DATA TURNAROUND: 30 Days / 30 Days

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 be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. N/A

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2
HOLDING TIME	6 Months
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B35H01 (1)	WATER	JUL 19 2016	1124	✓

8/4/2016
ALS1607377

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Curt Hoffman CHPRC	JUL 19 2016 1125	SSU#1	JUL 19 2016 1125
SSU#1	JUL 20 2016 1000	Janelle Zunker CHPRC	JUL 20 2016 1000
Janelle Zunker CHPRC	JUL 20 2016 1000	FEDEX	
FED EX		CTMbl 7-21-16 0805	

SPECIAL INSTRUCTIONS
(1) 6020_METALS_ICPMS: COMMON {Chromium, Lead}; 6020_METALS_ICPMS: COMMON (Add-on) {Uranium}; 6010_METALS_ICP: COMMON {Calcium, Magnesium, Potassium, Sodium};

FILTER

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

3 of 27

PRINTED ON 4/29/2016 FSR ID = FSR32098 TRVL NUM = TRVL-16-133 A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 1607377		F16-039-034	PAGE 1 OF 1
COLLECTOR: Curt Hoffman CHPRC	COMPANY CONTACT: TODAK, D	TELEPHONE NO.: 376-6427	PROJECT COORDINATOR: TODAK, D	PRICE CODE: 7H
SAMPLING LOCATION: C9542, SCREENED INTERVAL	PROJECT DESIGNATION: 100-HR-3 Long Term & Interim Action Monitoring - Water		SAF NO.: F16-039	AIR QUALITY ☐
ICE CHEST NO.: GWS-374	FIELD LOGBOOK NO.: HNF-N-645-4 ps27	ACTUAL SAMPLE DEPTH: 99.24'	COA: 300115	METHOD OF SHIPMENT: FEDERAL EXPRESS
SHIPPED TO: ALS Environmental Ft. Collins	OFFSITE PROPERTY NO.: 6847		BILL OF LADING/AIR BILL NO.: 7768 0425 3356	

DATA TURNAROUND: 30 Days / 30 Days

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 be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. N/A

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2	Cool <=6C
HOLDING TIME	6 Months	14 Days
TYPE OF CONTAINER	G/P	G/P
NO. OF CONTAINER(S)	1	1
VOLUME	500mL	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B35FY8 (2)	WATER	JUL 19 2016	1124	✓	✓

8/4/2016
ALS1607377

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Curt Hoffman CHPRC	JUL 19 2016 1135	SSU#1	JUL 19 2016 1135
SSU#1	JUL 20 2016 1000	Janelle Zunker CHPRC	JUL 20 2016 1000
Janelle Zunker CHPRC	JUL 20 2016 1000	FEDEX	
FEDEX		CTrimble	7-21-16 0915

SPECIAL INSTRUCTIONS
(1) 6020_METALS_ICPMS: COMMON {Chromium, Lead};
6020_METALS_ICPMS: COMMON (Add-on) {Uranium};
6010_METALS_ICP: COMMON {Calcium, Magnesium, Potassium, Sodium};
(2) 2320_ALKALINITY: COMMON (Add-on) {Bicarbonate};

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 4/29/2016 FSR ID = FSR32098 TRVL NUM = TRVL-16-133 A-6003-618 (REV 2)

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC Workorder No: 1607377

Project Manager: JK Initials: CDT Date: 7-21-16

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody seals on sample containers intact?	NONE	(YES)	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	(YES)	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(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	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 (#4)	RAD ONLY	(YES)	NO

Cooler #: 1

Temperature (°C): 3.0

No. of custody seals on cooler: 2

DOT Survey/ Acceptance Information

External µR/hr reading: 12

Background µR/hr reading: 11

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? (YES) NO / NA (If no, see Form 008.)

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

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

Project Manager Signature / Date: 7/22/16

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

ALS1607377

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

100-HR-3 Long Term & Interim Action Monitoring - Water – F16-039

Work Order Number: 1607377

1. This report consists of 2 water samples for total recoverable or dissolved metals.

2. The samples were received cool and intact by ALS on 07/21/16.

3. The sample for dissolved metals had been filtered prior to receipt. Both samples had a pH less than 2 upon receipt.

4. The samples were prepared and analyzed based on SW-846, 3rd Edition procedures.

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

5. Analysis by Trace ICP followed method 6010B and the current revision of SOP 834.

   Analysis by ICP-MS followed method 6020A and the current revision of SOP 827.

6. All standards and solutions are NIST traceable and were used within their recommended shelf life.

7. The samples were prepared and analyzed within the established hold times.

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

8. General quality control procedures.

   - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in each digestion batch.
   - The preparation (method) blank associated with each digestion batch was below the reporting limit for the requested analytes. Lead was detected above the MDL. 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 analytes.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.
- The interference check samples and high standard readbacks associated with Method 6010B were within acceptance criteria.
- The interference check samples associated with Method 6020A were analyzed.

9. Matrix specific quality control procedures.

   Sample 1607377-1 was designated as the quality control sample for each 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 each batch. All acceptance criteria for accuracy were met.
   - A serial dilution was analyzed with each ICP batch. All acceptance criteria were met.

10. 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 — 7/31/16
Jill Latelle — Date
Inorganics Primary Data Reviewer

7/31/16
Inorganics Final Data Reviewer — 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 <=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.

Dissolved ICP Metals

Method SW6010B

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Field ID: B35H01
Lab ID: 1607377-1

Analysis ReqCode: **6010_METALS_I**

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-1
Run ID: IP160728-1A2
Cleanup: NONE
Basis: As Received
File Name:

Analyst: Nathan A. Quatier
Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	80000	1000	51		
7439-95-4	MAGNESIUM	1	21000	750	58		
7440-09-7	POTASSIUM	1	5800	1000	86		
7440-23-5	SODIUM	1	15000	1000	61		

Data Package ID: *IP1607377-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Field ID: B35FY8
Lab ID: 1607377-2

Analysis ReqCode: 6010_METALS_I

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-1
Run ID: IP160728-1A2
Cleanup: NONE
Basis: As Received
File Name:

Analyst: Nathan A. Quatier
Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	79000	1000	51		
7439-95-4	MAGNESIUM	1	21000	750	58		
7440-09-7	POTASSIUM	1	5700	1000	86		
7440-23-5	SODIUM	1	15000	1000	61		

Data Package ID: *IP1607377-1*

Dissolved ICPMS Metals

Method SW6020A

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Field ID: B35H01
Lab ID: 1607377-1

Analysis ReqCode: **6020_METALS_I**

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-2
Run ID: IM160728-12A4
Cleanup: NONE
Basis: As Received
File Name: 120SMPL_

Analyst: Brent A. Stanfield
Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-47-3	CHROMIUM	10	53	10	1.1		
7439-92-1	LEAD	10	0.61	2	0.16	BC	
7440-61-1	URANIUM	10	2.8	0.1	0.027		

Data Package ID: *IM1607377-1*

Total Recoverable ICPMS Metals

Method SW6020A

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Field ID: B35FY8
Lab ID: 1607377-2

Analysis ReqCode: **6020_METALS_I**

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-2
Run ID: IM160728-12A4
Cleanup: NONE
Basis: As Received
File Name: 125SMPL_

Analyst: Brent A. Stanfield
Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-47-3	CHROMIUM	10	57	10	1.1		
7439-92-1	LEAD	10	0.52	2	0.16	BC	
7440-61-1	URANIUM	10	2.8	0.1	0.027		

Data Package ID: *IM1607377-1*

ICP Metals

Method SW6010B

Method Blank

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Lab ID: IP160727-3MB

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16

Prep Batch: IP160727-3
QCBatchID: IP160727-3-1
Run ID: IP160728-1A2
Cleanup: NONE
Basis: N/A
File Name:

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	51	1000	51	U	
7440-09-7	POTASSIUM	1	86	1000	86	U	
7440-23-5	SODIUM	1	61	1000	61	U	

Data Package ID: *IP1607377-1*

ICP Metals

Method SW6010B

Method Blank

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Lab ID: IP160727-3MB

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 27-Jul-16
Date Analyzed: 29-Jul-16

Prep Batch: IP160727-3
QCBatchID: IP160727-3-1
Run ID: IP160729-1A5
Cleanup: NONE
Basis: N/A
File Name:

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7439-95-4	MAGNESIUM	1	58	750	58	U	

Data Package ID: *IP1607377-1*

ICP Metals

Method SW6010B

Laboratory Control Sample

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Lab ID: IP160727-3LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 07/27/2016
Date Analyzed: 07/28/2016
Prep Method: SW3005A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-1
Run ID: IP160728-1A2
Cleanup: NONE
Basis: N/A
File Name:

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
7440-70-2	CALCIUM	40000	42200	1000		105	80 - 120%
7439-95-4	MAGNESIUM	40000	38300	750		96	80 - 120%
7440-09-7	POTASSIUM	40000	39900	1000		100	80 - 120%
7440-23-5	SODIUM	40000	41400	1000		104	80 - 120%

Data Package ID: *IP1607377-1*

ICP Metals

Method SW6010B

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F1

Field ID: B35H01
LabID: 1607377-1MS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-1
Run ID: IP160728-1A2
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
File Name:

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-70-2	CALCIUM	80000		120000		1000	40000	101	80 - 120%
7439-95-4	MAGNESIUM	21000		58800		750	40000	95	80 - 120%
7440-09-7	POTASSIUM	5800		46100		1000	40000	101	80 - 120%
7440-23-5	SODIUM	15000		55800		1000	40000	102	80 - 120%

Field ID: B35H01
LabID: 1607377-1MSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-1
Run ID: IP160728-1A2
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
File Name:

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-70-2	CALCIUM	120000		40000	101	1000	20	0
7439-95-4	MAGNESIUM	59400		40000	97	750	20	1
7440-09-7	POTASSIUM	46500		40000	102	1000	20	1
7440-23-5	SODIUM	56500		40000	104	1000	20	1

Data Package ID: *IP1607377-1*

ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Lab ID: IP160727-3MB

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16

Prep Batch: IP160727-3
QCBatchID: IP160727-3-2
Run ID: IM160728-12A4
Cleanup: NONE
Basis: N/A
File Name: 118SMPL_

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-47-3	CHROMIUM	10	1.1	10	1.1	U	
7439-92-1	LEAD	10	0.63	2	0.16	B	
7440-61-1	URANIUM	10	0.027	0.1	0.027	U	

Data Package ID: *IM1607377-1*

ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-03

Lab ID: IM160727-3LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 07/27/2016
Date Analyzed: 07/28/2016
Prep Method: SW3005A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-2
Run ID: IM160728-12A4
Cleanup: NONE
Basis: N/A
File Name: 119SMPL_

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
7440-47-3	CHROMIUM	500	519	10		104	80 - 120%
7439-92-1	LEAD	50	51.7	2		103	80 - 120%
7440-61-1	URANIUM	10	10.3	0.1		103	80 - 120%

Data Package ID: *IM1607377-1*

ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F1

Field ID: B35H01
LabID: 1607377-1MS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-2
Run ID: IM160728-12A4
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
File Name: 123SMPL_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-47-3	CHROMIUM	53		568		10	500	103	75 - 125%
7439-92-1	LEAD	0.61	BC	50.6		2	50	100	75 - 125%
7440-61-1	URANIUM	2.8		13.2		0.1	10	104	75 - 125%

Field ID: B35H01
LabID: 1607377-1MSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Jul-16
Date Extracted: 27-Jul-16
Date Analyzed: 28-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160727-3
QCBatchID: IP160727-3-2
Run ID: IM160728-12A4
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
File Name: 124SMPL_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-47-3	CHROMIUM	554		500	100	10	20	3
7439-92-1	LEAD	50.5		50	100	2	20	0
7440-61-1	URANIUM	13		10	101	0.1	20	2

Data Package ID: *IM1607377-1*

Inorganics

Case Narrative

CH2M HILL Plateau Remediation Company

100-HR-3 Long Term & Interim Action Monitoring - Water - Water -- F16-039

Work Order Number: 1607377

1. This report consists of 1 water sample.
2. The sample was received cool and intact by ALS on 07/21/16.
3. The sample was prepared for analysis based on Standard Methods for the Examination of Water and Wastewater, 20th Edition 1998 procedures.
4. The sample was analyzed following Standard Method procedures for the current revision of the following SOP and method:

Analyte	Method	SOP #
Bicarbonate	SM2320B	1106

5. All standards and solutions were used within their recommended shelf life.
6. The sample was prepared and analyzed within the established hold time for this analysis.

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

7. 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 analyte.
- All laboratory control sample criteria were met.

8. Matrix specific quality control procedures.

   Sample 1607377-2 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 sample duplicate was prepared and analyzed with this batch. All guidance criteria for precision were met.

9. A reduced aliquot was taken of the sample for the bicarbonate analysis. Reporting limits were elevated accordingly.

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 — 7/30/16
Megan Johnstone — Date
Inorganics Primary Data Reviewer

Julie Ellis — 7/31/16
Inorganics Final Data Reviewer — Date

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.

  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.

  C - The analyte was detected in both the sample and the associated QC blank, and the sample concentration was <=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.

BICARBONATE AS CACO3

Method SM2320BM

Sample Results

Lab Name: **ALS -- Fort Collins**
Client Name: CH2M HILL Plateau Remediation Company
Client Project ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-039
Work Order Number: 1607377 **Final Volume:** 100 ml
Reporting Basis: As Received **Matrix:** WATER
Prep Method: NONE **Result Units:** UG/L
Analyst: Kristina L. Peters

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit/ LOQ/LOD	Flag	Sample Aliquot
B35FY8	1607377-2	07/19/2016	07/27/2016	07/27/2016	N/A	1	90000	20000		25 ml

Comments:

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

Data Package ID: *ak1607377-1*

BICARBONATE AS CACO3

Method SM2320BM

Method Blank

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-0

Lab ID: AK160727-1MB

Sample Matrix: WATER
% Moisture: N/A

Prep Batch: AK160727-1
QCBatchID: AK160727-1-2
Run ID: AK160727-1A1
Cleanup: NONE
Basis: N/A

Sample Aliquot: 100 ml
Final Volume: 100 ml
Result Units: UG/L

Lab ID	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit/ LOQ	Flag
AK160727-1MB	7/27/2016	07/27/2016	N/A	1	5000	5000	U

Comments:

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

Data Package ID: *ak1607377-1*

TOTAL ALKALINITY AS CaCO3

Method SM2320BM

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS -- Fort Collins
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-0

Lab ID: AK160727-1LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 27-Jul-16
Date Analyzed: 27-Jul-16
Prep Method: NONE

Prep Batch: AK160727-1
QCBatchID: AK160727-1-2
Run ID: AK160727-1A1
Cleanup: NONE
Basis: N/A

Sample Aliquot: 100 ml
Final Volume: 100 ml
Result Units: UG/L

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
	TOTAL ALKALINITY AS CaCO3	100000	99500	5000		99	85 - 115

Lab ID: AK160727-1LCSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 27-Jul-16
Date Analyzed: 27-Jul-16
Prep Method: NONE

Prep Batch: AK160727-1
QCBatchID: AK160727-1-2
Run ID: AK160727-1A1
Cleanup: NONE
Basis: N/A

Sample Aliquot: 100 ml
Final Volume: 100 ml
Result Units: UG/L

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
	TOTAL ALKALINITY AS CaCO3	100000	99300	5000		99	15	0

Data Package ID: *ak1607377-1*

BICARBONATE AS CACO3

Method SM2320BM

Duplicate Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1607377
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: 100-HR-3 Long Term & Interim Action Monitoring - Water F16-0

Reporting Basis: As Received
Sample Aliquot: 25 ml
Final Volume: 100ml
Matrix: WATER
Result Units UG/L

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Dup Qual	Sample Result	Samp Qual	Reporting Limit	RPD	RPD Limit
B35FY8	1607377-2D	07/27/2016	07/27/2016	1	87800		90000		20000		15

Comments:

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

Data Package ID: *ak1607377-1*