



Monday, June 25, 2018

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

Re: ALS Workorder: 1805652
Project Name: SURV, May 2018
Project Number: S18-005

Dear Ms. Waters-Husted:

Four water samples were received from CH2M HILL Plateau Remediation Company, on 5/31/2018. 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 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, 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: 1805652

Client Name: CH2M HILL Plateau Remediation Company

Client Project Name: SURV, May 2018

Client Project Number: S18-005

Client PO Number: BOA 54854

| Client Sample Number | Lab Sample Number | COC Number | Matrix | Date Collected | Time Collected |
|----------------------|-------------------|------------|--------|----------------|----------------|
| B3J0V0 | 1805652-1 | | WATER | 30-May-18 | 11:31 |
| B3J0V3 | 1805652-2 | | WATER | 30-May-18 | 11:31 |
| B3J0V5 | 1805652-3 | | WATER | 30-May-18 | 10:24 |
| B3J0V9 | 1805652-4 | | WATER | 30-May-18 | 10:24 |

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company

1805652
C.O.C.# S18-005-007
Page 1 of 1

Collector: Dan Woehle
SAF No.: S18-005
Project Title: SURV, May 2018
Shipped To (Lab): ALS Environmental Ft. Collins
Protocol: SURV

Contact/Requester: Karen Waters-Husted
Sampling Origin: Hanford Site
Logbook No.: HNF-N-506 -99-44
Method of Shipment: Commercial Carrier
Priority: 30 Days

Telephone No.: 509-376-4650
Purchase Order/Charge Code: 300071
Ice Chest No.: GWS-75722
Bill of Lading/Air Bill No.: 772355504837
Offsite Property No.: 9499

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

SPECIAL INSTRUCTIONS
 N/A

| Sample No. | Filter | * | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|------------|--------|---|---------|------|-------------------|---------------------------------|--------------|---------------|
| B3J0V5 | N | W | 5-30-18 | 1024 | 1x500-mL G/P | 6020_METALS_ICPMS: Chromium (1) | 6 Months | HNO3 to pH <2 |
| B3J0V9 | Y | W | 5-30-18 | 1024 | 1x500-mL G/P | 6020_METALS_ICPMS: Chromium (1) | 6 Months | HNO3 to pH <2 |

| | | |
|---|---|--|
| Relinquished By: Dan Woehle Signature: <i>Dan Woehle</i> Date/Time: MAY 30 2018 1050 | Received By: Leah Walsh Signature: <i>Leah Walsh</i> Date/Time: MAY 30 2018 1050 | Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other |
| Relinquished By: Dan Woehle Signature: <i>Dan Woehle</i> Date/Time: MAY 30 2018 1400 | Received By: FEDEX Signature: _____ Date/Time: _____ | |
| Relinquished By: KFO EX Signature: _____ Date/Time: _____ | Received By: C Trimble Signature: <i>C Trimble</i> Date/Time: 5-31-18 0950 | |
| Relinquished By: _____ Signature: _____ Date/Time: _____ | Received By: _____ Signature: _____ Date/Time: _____ | |
| FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process): Disposed By: _____ Date/Time: _____ | | |

06/25/2018

REV.0



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC

Workorder No: 1805652

Project Manager: [Signature]

Initials: CDJ Date: 5-31-18

| | | | |
|---|--------------------------------------|--------------------------------------|-------------------------------------|
| 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) | N/A | <input checked="" type="radio"/> 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 | N/A | YES | <input checked="" type="radio"/> NO |
| 16. Were the samples shipped on ice? | | YES | <input checked="" type="radio"/> NO |
| 17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 #4 RAD ONLY | | 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>13</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 / 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: [Signature] 6/1/19

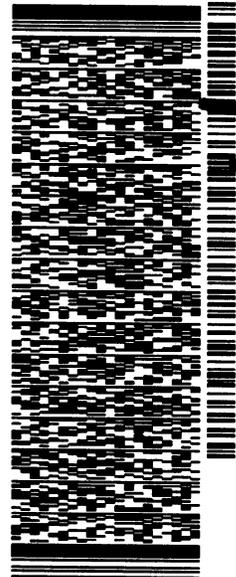
ORIGIN ID: PSCA (509) 373-3580
JANELLE ZUNKER
CH2M
6269 LATAH ST.
RICHLAND, WA 99354
UNITED STATES US

SHIP DATE: 30MAY18
ACTWTG: 24.00 LB
CAD: 10706605/INNET3980
BILL THIRD PARTY

TO JULIE ELLINGSON
ALS GLOBAL
225 COMMERCE DRIVE

32

FORT COLLINS CO 80524
(970) 490-1111
INV F: 949
PO. DEPT.



7181118012801ur

TRK# 7723 5550 4837
0201
THU - 31 MAY 10:30A
PRIORITY OVERNIGHT
DSR

XH FTCA
CO-US 80524
DEN



1805652

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.

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Metals

Case Narrative

CH2M HILL Plateau Remediation Company

SURV, May 2018 – S18-005

Work Order Number: 1805652

1. The samples were prepared and analyzed based on SW-846, 3rd 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. Chromium was 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 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 1805652-1 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 indicated above. All acceptance criteria for accuracy were met.
 - A serial dilution was analyzed with each 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 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.



Emily Lyons
Inorganics Primary Data Reviewer

6/18/18
Date



Inorganics Final Data Reviewer

6/21/18
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.

Dissolved CHROMIUM

Method SW6020A

Sample Results

Lab Name: ALS -- Fort Collins
Client Name: CH2M HILL Plateau Remediation Company
Client Project ID: SURV, May 2018 S18-005
Work Order Number: 1805652 **Final Volume:** 50 ml
Reporting Basis: As Received **Matrix:** WATER
Analyst: Brent A. Stanfield **Result Units:** UG/L

| Client Sample ID | Lab ID | Date Collected | Date Prepared | Date Analyzed | Percent Moisture | Dilution Factor | Result | RptLimit/ LOQ/LOD | MDL/DL | Flag | Sample Aliquot |
|------------------|-----------|----------------|---------------|---------------|------------------|-----------------|--------|-------------------|--------|------|----------------|
| B3J0V3 | 1805652-2 | 5/30/2018 | 6/5/2018 | 06/11/2018 | N/A | 10 | 70 | 10 | 0.46 | | 50 ml |
| B3J0V9 | 1805652-4 | 5/30/2018 | 6/5/2018 | 06/11/2018 | N/A | 10 | 9.5 | 10 | 0.46 | BC | 50 ml |

Comments:

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

Data Package ID: *IM1805652-1*

Total Recoverable CHROMIUM

Method SW6020A

Sample Results

Lab Name: ALS -- Fort Collins

Client Name: CH2M HILL Plateau Remediation Company

Client Project ID: SURV, May 2018 S18-005

Work Order Number: 1805652

Final Volume: 50 ml

Reporting Basis: As Received

Matrix: WATER

Analyst: Brent A. Stanfield

Result Units: UG/L

| Client Sample ID | Lab ID | Date Collected | Date Prepared | Date Analyzed | Percent Moisture | Dilution Factor | Result | RptLimit/ LOQ/LOD | MDL/DL | Flag | Sample Aliquot |
|------------------|-----------|----------------|---------------|---------------|------------------|-----------------|--------|-------------------|--------|------|----------------|
| B3J0V0 | 1805652-1 | 5/30/2018 | 6/5/2018 | 06/11/2018 | N/A | 10 | 72 | 10 | 0.46 | | 50 ml |
| B3J0V5 | 1805652-3 | 5/30/2018 | 6/5/2018 | 06/11/2018 | N/A | 10 | 9.3 | 10 | 0.46 | BC | 50 ml |

Comments:

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

Data Package ID: *IM1805652-1*

06/25/2018

REV.0

ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1805652

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, May 2018 S18-005

Lab ID: IP180605-2MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 05-Jun-18

Date Analyzed: 11-Jun-18

Prep Batch: IP180605-2

QCBatchID: IP180605-2-2

Run ID: IM180611-10A4

Cleanup: NONE

Basis: N/A

File Name: 111SMPL_

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 |
|-----------|----------------|----|--------|------------------|-----------------|------|
| 7440-47-3 | CHROMIUM | 10 | 1.1 | B | 10 | 0.46 |

Data Package ID: IM1805652-1

06/25/2018

REV.0

ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS -- Fort Collins

Work Order Number: 1805652

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, May 2018 S18-005

Lab ID: IM180605-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 06/05/2018

Date Analyzed: 06/11/2018

Prep Method: SW3005A

Prep Batch: IP180605-2

QCBatchID: IP180605-2-2

Run ID: IM180611-10A4

Cleanup: NONE

Basis: N/A

File Name: 112SMPL_

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 | 460 | 10 | | 92 | 80 - 120% |

Data Package ID: IM1805652-1

ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1805652

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, May 2018 S18-005

| | | | |
|--------------------|---------------------------|-------------------------|-----------------------|
| Field ID: B3J0V0 | Sample Matrix: WATER | Prep Batch: IP180605-2 | Sample Aliquot: 50 ml |
| LabID: 1805652-1MS | % Moisture: N/A | QCBatchID: IP180605-2-2 | Final Volume: 50 ml |
| | Date Collected: 30-May-18 | Run ID: IM180611-10A4 | Result Units: UG/L |
| | Date Extracted: 05-Jun-18 | Cleanup: NONE | File Name: 116SMPL_ |
| | Date Analyzed: 11-Jun-18 | Basis: As Received | |
| | Prep Method: SW3005 Rev A | | |

| CASNO | Target Analyte | Sample Result | Samp Qual | MS Result | MS Qual | Reporting Limit | Spike Added | MS % Rec. | Control Limits |
|-----------|----------------|---------------|-----------|-----------|---------|-----------------|-------------|-----------|----------------|
| 7440-47-3 | CHROMIUM | 72 | | 543 | | 10 | 500 | 94 | 75 - 125% |

| | | | |
|---------------------|---------------------------|-------------------------|-----------------------|
| Field ID: B3J0V0 | Sample Matrix: WATER | Prep Batch: IP180605-2 | Sample Aliquot: 50 ml |
| LabID: 1805652-1MSD | % Moisture: N/A | QCBatchID: IP180605-2-2 | Final Volume: 50 ml |
| | Date Collected: 30-May-18 | Run ID: IM180611-10A4 | Result Units: UG/L |
| | Date Extracted: 05-Jun-18 | Cleanup: NONE | File Name: 117SMPL_ |
| | Date Analyzed: 11-Jun-18 | Basis: As Received | |
| | Prep Method: SW3005 Rev A | | |

| CASNO | Target Analyte | MSD Result | MSD Qual | Spike Added | MSD % Rec. | Reporting Limit | RPD Limit | RPD |
|-----------|----------------|------------|----------|-------------|------------|-----------------|-----------|-----|
| 7440-47-3 | CHROMIUM | 548 | | 500 | 95 | 10 | 20 | 1 |

Data Package ID: IM1805652-1

Prep Batch ID: IP180605-2

| | | | |
|--------------------------------------|---------------------------|-----------------------------------|---------------------------------|
| Start Date: 06/05/18 | End Date: 06/05/18 | Concentration Method: NONE | Batch Created By: jml |
| Start Time: 9:23 | End Time: 18:00 | Extract Method: SW3005A | Date Created: 06/05/18 |
| Prep Analyst: Jill M. Latelle | | Initial Volume Units: ml | Time Created: 9:39 |
| Comments: | | Final Volume Units: ml | Validated By: jml |
| | | | Date Validated: 06/06/18 |
| | | | Time Validated: 7:13 |

QC Batch ID: IP180605-2-2

| Lab ID | QC Type | Field ID | Matrix | Date Collected | Initial Wt/Vol | Final Wt/Vol | Cleanup Method | Cleanup DF | Order Number |
|------------|---------|----------|--------|----------------|----------------|--------------|----------------|------------|--------------|
| IP180605-2 | MB | XXXXXX | WATER | XXXXXX | 50 | 50 | NONE | 1 | 1805652 |
| IM180605-2 | LCS | XXXXXX | WATER | XXXXXX | 50 | 50 | NONE | 1 | 1805652 |
| 1805652-1 | MS | B3J0V0 | WATER | 5/30/2018 | 50 | 50 | NONE | 1 | 1805652 |
| 1805652-1 | MSD | B3J0V0 | WATER | 5/30/2018 | 50 | 50 | NONE | 1 | 1805652 |
| 1805652-1 | DUP | B3J0V0 | WATER | 5/30/2018 | 50 | 50 | NONE | 1 | 1805652 |
| 1805652-1 | SMP | B3J0V0 | WATER | 5/30/2018 | 50 | 50 | NONE | 1 | 1805652 |
| 1805652-2 | SMP | B3J0V3 | WATER | 5/30/2018 | 50 | 50 | NONE | 1 | 1805652 |
| 1805652-3 | SMP | B3J0V5 | WATER | 5/30/2018 | 50 | 50 | NONE | 1 | 1805652 |
| 1805652-4 | SMP | B3J0V9 | WATER | 5/30/2018 | 50 | 50 | NONE | 1 | 1805652 |

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 | | |