



Ft. Collins, Colorado

LIMS Version: 7.531

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Wednesday, December 23, 2020

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

Re: ALS Workorder: 2012047  
Project Name: AEA/CERCLA, November 2020  
Project Number: I21-005

Dear Ms. Waters-Husted:

Two water samples were received from CH2M HILL Plateau Remediation Company, on 12/4/2020. The samples were scheduled for the following analyses:

GC/MS Volatiles

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. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

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

Sincerely,

ALS Environmental  
Katie M. O'Brien  
Project Manager

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 2012047

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

**Client Project Name:** AEA/CERCLA, November 2020

**Client Project Number:** I21-005

**Client PO Number:** BOA 74395

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3Y214	2012047-1		WATER	01-Dec-20	9:00
B3Y2F0	2012047-2		WATER	01-Dec-20	9:00

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 2012047		C.O.C.# I21-005-114 Page 1 of 1				
Collector: <u>Tim Callaway</u> ACHPRC		Contact/Requester: Karen Waters-Husted		Telephone No.: 509-376-4650				
SAF No.: I21-005		Sampling Origin: Hanford Site		Purchase Order/Charge Code: 300071				
Project Title: AEA/CERCLA, November 2020		Logbook No.: HNF-N-506-113		Ice Chest No.: <u>6WS-092</u>				
Shipped To (Lab): <u>ALS Environmental Ft. Collins</u>		Method of Shipment Commercial Carrier		Bill of Lading/Air Bill No.: <u>772236518150</u>				
Protocol: SURV		Priority: 30 Days		Offsite Property No.: <u>N/A</u>				
<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
B3Y214 ①	Y	W	DEC 01 2020	8:50 AM	1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B3Y2F0 ②	N	W			1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B3Y2F0 ③	N	W			4x40-mL aGs*	8260_VOA_GCMS: GW 03	14 Days	HCl or H2SO4 to pH <2 / Cool <=6C

Relinquished By			Received By			Matrix *	
Print First and Last Name	Signature	Date/Time	Print First and Last Name	Signature	Date/Time	S = Soil	DS = Drum Solids
Tim Callaway ACHPRC	<i>[Signature]</i>	DEC 01 2020 1:30	Janelle Zunker CHPRC	<i>[Signature]</i>	DEC 01 2020 1:30	SE = Sediment	DL = Drum Liquids
Janelle Zunker CHPRC	<i>[Signature]</i>	DEC 01 2020 1:35	SSU-1	<i>[Signature]</i>	DEC 01 2020 1:35	SO = Solid	T = Tissue
SSU-1	<i>[Signature]</i>	DEC 02 2020 11:30	Janelle Zunker CHPRC	<i>[Signature]</i>	DEC 02 2020 11:30	SL = Sludge	WI = Wipe
Janelle Zunker CHPRC	<i>[Signature]</i>	DEC 02 2020 1:40	FEDEX			W = Water	L = Liquid
FedEx			Amy Keohart			O = Oil	V = Vegetation
			12/4/20 10:35			A = Air	X = Other
FINAL SAMPLE DISPOSITION			Disposal Method (e.g., Return to customer, per lab procedure, used in process):			Disposed By:	
						Date/Time:	



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

Client Name/ID: CHPRC Workorder No: 2012047

Project Manager: KMO Initials: AXK Date: 12/20

1. Are airbills / shipping documents present and/or removable?	<input type="checkbox"/> Drop Off	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
2. Are custody seals on <b>shipping</b> containers intact?	<input type="checkbox"/> NONE	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
3. Are custody seals on <b>sample</b> containers intact?	<input type="checkbox"/> NONE	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
4. Is there a COC (chain-of-custody) present?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
6. Are short-hold samples present?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
7. Are all samples within holding times for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
8. Were all sample containers received intact? (not broken or leaking)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
9. Is there sufficient sample for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
11. Are all aqueous samples preserved correctly, if required?	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
12. Were unpreserved samples pH checked, if required?	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> YES	<input type="checkbox"/> NO
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm in diameter?	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
14. Were the samples shipped on ice?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
15. Were cooler temperatures measured at 0.1 - 6.0°C?	IR gun used: <input type="checkbox"/> #3 <input checked="" type="checkbox"/> #5 <input type="checkbox"/> Rad Only	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

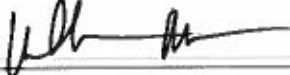
Cooler #:	1								
Temperature (°C):	1.6								
# of custody seals on cooler:	2								
External mR/hr reading:	12								
Background mR/hr reading:	10								


Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? (If no, see Form 008) ☐ N/A ☒ YES ☐ NO

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

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

If applicable, was the client contacted? ☐ YES ☐ N/A Contact Name \_\_\_\_\_ Date: \_\_\_\_\_

Project Manager Signature / Date:  12/21/20

ORIGIN ID: PSCA (509) 373-3580 JANELLE ZUNKER CH2M 8255 LAITAH ST. RICHLAND, WA 98354 UNITED STATES US		SHIP DATE: 01DEC20 ACTWGT: 97.00 LB CAD: 107066051/NET 4280
TO JULIE ELLINGSON ALS GLOBAL 225 COMMERCE DRIVE FORT COLLINS CO 80524 (970) 490-1511 NY REF: 300072/GMS-059 PO: DEPT:		BILL THIRD PARTY
		
		
WED - 02 DEC 10:30A PRIORITY OVERNIGHT DSR 7722 2647 9899 TRK# 0201 XH FTCA COUS DEN 80524 		

12-2  
1.4  
568.29196.6766

**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.
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## GC/MS Volatiles Case Narrative

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

AEA/CERCLA, November 2020 – I21-005

Work Order Number: 2012047

1. The sample was prepared according to SW-846, 3rd Edition procedures. Specifically, the water sample was prepared using purge and trap procedures based on Method 5030C.
2. The sample was analyzed using GC/MS according to the current revision of SOP 525 based on SW-846 Method 8260. All positive results were quantitated against the initial calibration standards using the internal standard technique. The identification of positive results was achieved by a comparison of the retention time and mass spectrum of the sample versus the daily calibration standard.
3. All initial calibration criteria were met.
4. All initial calibrations are verified by comparing a second source standard calibration verification (ICV) against the calibration curve. All criteria for initial calibration verification were met.
5. Per the guidance in methods 8000 and 8260, all compounds in each of the daily (continuing) calibration verifications had sufficient response to support accurate quantitation of the data included in this report.
6. Methylene chloride, acetone and 2-butanone are common laboratory contaminants. In order to minimize the levels of these compounds detected in the gc/ms analysis, ALS has designated its volatile laboratory as a restricted access area. In addition, the laboratory has been equipped with a dedicated, air intake and exhaust system that operates under positive pressure in order to minimize cross contamination of these compounds. Due to fluctuations in ambient laboratory conditions, reported sample values for common laboratory contaminants may be due to lab contamination even if the compound in question is not detected in the associated method blank.

All method blank criteria were met.



7. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
8. A matrix spike and matrix spike duplicate were not performed because of insufficient sample. A laboratory control sample and laboratory control sample duplicate were performed instead.
9. The sample was analyzed within the established holding time.
10. All surrogate recoveries were within acceptance criteria.
11. All internal standard recoveries were within acceptance criteria.
12. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Mindy Norton  
Mindy Norton  
Organics Primary Data Reviewer

12/22/20  
Date

Kath M. A.  
Organics Final Data Reviewer

12/22/20  
Date



**ALS**  
**Data Qualifier Flags**  
**Organics**

<b>U or ND:</b>	<b>This flag indicates that the compound was analyzed for but not detected.</b>
<b>J:</b>	<b>This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the retention time data indicate the presence of a compound that meets the GC identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.</b>
<b>B:</b>	<b>This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.</b>
<b>E:</b>	<b>This flag identifies compounds whose concentration exceeds the upper level of the calibration range.</b>
<b>A:</b>	<b>This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.</b>
<b>X:</b>	<b>This flag indicates that the analyte was diluted below an accurate quantitation level.</b>
<b>*:</b>	<b>This flag indicates that a spike recovery is equal to or outside the control criteria used.</b>
<b>+: </b>	<b>This flag indicates that the relative percent difference (RPD) equals or exceeds the control criteria.</b>



# GC/MS Volatiles

Method SW8260\_25C

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Lab ID: VL201208-3MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 08-Dec-20

Date Analyzed: 08-Dec-20

Prep Batch: VL201208-3

QCBatchID: VL201208-3-2

Run ID: VL201208-3A

Cleanup: NONE

Basis: N/A

File Name: C950206

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
75-09-2	METHYLENE CHLORIDE	1	1	U	2	1
67-66-3	CHLOROFORM	1	0.31	U	1	0.31
56-23-5	CARBON TETRACHLORIDE	1	0.38	U	1	0.38
79-01-6	TRICHLOROETHENE	1	0.5	U	1	0.5

## Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	24.6		25	98	70 - 130
1868-53-7	DIBROMOFLUOROMETHANE	25.1		25	100	70 - 130
2037-26-5	TOLUENE-D8	24.6		25	99	70 - 130

Data Package ID: VL2012047-1

# GC/MS Volatiles

Method SW8260\_25C

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Field ID: B3Y2F0

Lab ID: 2012047-2

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 01-Dec-20

Date Extracted: 08-Dec-20

Date Analyzed: 08-Dec-20

Prep Method: SW5030 Rev C

Prep Batch: VL201208-3

QCBatchID: VL201208-3-2

Run ID: VL201208-3A

Cleanup: NONE

Basis: As Received

File Name: C950210

Analyst: Audrey E. Wolfgang

Sample Aliquot: 10 ml

Final Volume: 10 ml

Result Units: UG/L

Clean DF: 1

Analysis ReqCode: 8260\_VOA\_GCM

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
75-09-2	METHYLENE CHLORIDE	1	1	U	2	1
67-66-3	CHLOROFORM	1	0.31	U	1	0.31
56-23-5	CARBON TETRACHLORIDE	1	0.38	U	1	0.38
79-01-6	TRICHLOROETHENE	1	3.7		1	0.5

## Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	25.1		25	101	70 - 130
1868-53-7	DIBROMOFLUOROMETHANE	25.5		25	102	70 - 130
2037-26-5	TOLUENE-D8	24.8		25	99	70 - 130

Data Package ID: VL2012047-1

# GC/MS Volatiles

## Method SW8260\_25C

### Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Lab ID: VL201208-3LCS

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: N/A  
Date Extracted: 12/08/2020  
Date Analyzed: 12/08/2020  
Prep Method: SW5030C

Prep Batch: VL201208-3  
QCBatchID: VL201208-3-2  
Run ID: VL201208-3A  
Cleanup: NONE  
Basis: N/A  
File Name: C950203

Sample Aliquot: 10 ml  
Final Volume: 10 ml  
Result Units: UG/L  
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
75-09-2	METHYLENE CHLORIDE	10	9.27	2		93	70 - 130%
67-66-3	CHLOROFORM	10	9.79	1		98	70 - 130%
56-23-5	CARBON TETRACHLORIDE	10	10	1		100	70 - 130%
79-01-6	TRICHLOROETHENE	10	10	1		100	70 - 130%

Lab ID: VL201208-3LCSD

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: N/A  
Date Extracted: 12/08/2020  
Date Analyzed: 12/08/2020  
Prep Method: SW5030C

Prep Batch: VL201208-3  
QCBatchID: VL201208-3-2  
Run ID: VL201208-3A  
Cleanup: NONE  
Basis: N/A  
File Name: C950204

Sample Aliquot: 10 ml  
Final Volume: 10 ml  
Result Units: UG/L  
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
75-09-2	METHYLENE CHLORIDE	10	9.99	2		100	20	7
67-66-3	CHLOROFORM	10	10.7	1		107	20	9
56-23-5	CARBON TETRACHLORIDE	10	10.8	1		108	20	7
79-01-6	TRICHLOROETHENE	10	10.6	1		106	20	5

### Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	25	100		100		70 - 130
1868-53-7	DIBROMOFLUOROMETHANE	25	103		103		70 - 130
2037-26-5	TOLUENE-D8	25	100		99		70 - 130

Data Package ID: VL2012047-1

Date Printed: Tuesday, December 22, 2020

ALS -- Fort Collins

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LIMS Version: 7.012

**Prep Batch ID: VL201208-3****Start Date:** 12/08/20**End Date:** 12/08/20**Concentration Method:** NONE**Batch Created By:** aew**Start Time:** 13:22**End Time:** 23:47**Extract Method:** SW5030C**Date Created:** 12/08/20**Prep Analyst:** Audrey E. Wolfgang**Initial Volume Units:** ml**Time Created:** 13:12**Comments:****Final Volume Units:** ml**Validated By:** twk**Date Validated:** 12/16/20**Time Validated:** 3:49**QC Batch ID:** VL201208-3-2

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
VL201208-3	MB	XXXXXX	WATER	XXXXXX	10	10	NONE	1	2012047
VL201208-3	LCS	XXXXXX	WATER	XXXXXX	10	10	NONE	1	2012047
VL201208-3	LCSD	XXXXXX	WATER	XXXXXX	10	10	NONE	1	2012047
2012047-2	SMP	B3Y2F0	WATER	12/1/2020	10	10	NONE	1	2012047

**QC Types**

CAR	Carrier reference sample	DLS	Detection Limit Standard
DUP	Laboratory Duplicate	LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate	LODV	Limit of Detection Verification
LOQV	Limit of Quantitation Verification	MB	Method Blank
MS	Laboratory Matrix Spike	MSD	Laboratory Matrix Spike Duplicate
REP	Sample replicate	RVS	Reporting Level Verification Standar
SMP	Field Sample	SYS	Sample Yield Spike



# Metals

## Case Narrative

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

AEA/CERCLA, November 2020 – I21-005

Work Order Number: 2012047

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

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

2. Analysis by Trace ICP followed method 6010D and the current revision of SOP 834.
3. Analysis by ICP-MS followed method 6020B and the current revision of SOP 827.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.
5. The samples were prepared and analyzed within the established hold time.

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

6. 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 and are flagged as appropriate.
  - All laboratory control sample criteria were met.
  - All initial and continuing calibration blanks were below the reporting limit for the requested analytes.
  - All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.



- The interference check samples and high standard read-backs associated with Method 6010D were within acceptance criteria.
- The interference check samples associated with Method 6020B were analyzed.

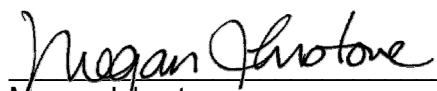
7. Matrix specific quality control procedures.

Sample 2011487-3 was designated as the quality control sample for the ICP Trace analysis. Sample 2011487-6 was designated as the quality control sample for the ICPMS analysis. Results for the shared quality control samples from the batch are included at the client's request.

Similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

- A matrix spike and matrix spike duplicate were digested and analyzed with each batch. All acceptance criteria for accuracy and precision were met.
  - A serial dilution was analyzed with each ICP batch. All acceptance criteria were met.
8. It is a standard practice that samples for ICP-MS are analyzed at a dilution. The 5X 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.

  
Megan Johnstone  
Inorganics Primary Data Reviewer

12/23/20  
Date

  
Kath M. A.  
Inorganics Final Data Reviewer

12/23/20  
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 ICP Metals

## Method SW6010D

### Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Field ID: B3Y214

Lab ID: 2012047-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 01-Dec-20

Date Extracted: 09-Dec-20

Date Analyzed: 09-Dec-20

Prep Method: SW3005 Rev A

Prep Batch: IP201209-3

QCBatchID: IP201209-3-2

Run ID: IT201209-2A5

Cleanup: NONE

Basis: As Received

File Name: 201209A.

Analyst: Steve Workman

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
7440-42-8	BORON	1	10	B	50	9.4
7440-70-2	CALCIUM	1	69000		1000	94
7439-89-6	IRON	1	44	U	100	44
7439-95-4	MAGNESIUM	1	16000		750	86
7440-09-7	POTASSIUM	1	8200		1000	330
7440-23-5	SODIUM	1	19000		1000	360
7440-62-2	VANADIUM	1	9.6	B	10	1.7

Data Package ID: IT2012047-1

# Total Recoverable ICP Metals

**Method SW6010D****Sample Results****Lab Name:** ALS -- Fort Collins**Work Order Number:** 2012047**Client Name:** CH2M HILL Plateau Remediation Company**ClientProject ID:** AEA/CERCLA, November 2020 I21-005**Field ID:** B3Y2F0**Lab ID:** 2012047-2**Sample Matrix:** WATER**% Moisture:** N/A**Date Collected:** 01-Dec-20**Date Extracted:** 09-Dec-20**Date Analyzed:** 09-Dec-20**Prep Method:** SW3005 Rev A**Prep Batch:** IP201209-3**QCBatchID:** IP201209-3-2**Run ID:** IT201209-2A5**Cleanup:** NONE**Basis:** As Received**File Name:** 201209A.**Analyst:** Steve Workman**Sample Aliquot:** 50 ml**Final Volume:** 50 ml**Result Units:** UG/L**Clean DF:** 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
7440-42-8	BORON	1	9.5	B	50	9.4
7440-70-2	CALCIUM	1	70000		1000	94
7439-89-6	IRON	1	44	U	100	44
7439-95-4	MAGNESIUM	1	17000		750	86
7440-09-7	POTASSIUM	1	8200		1000	330
7440-23-5	SODIUM	1	19000		1000	360
7440-62-2	VANADIUM	1	9.4	B	10	1.7

**Data Package ID:** IT2012047-1

Dissolved CHROMIUM

Method SW6020B

Sample Results

Lab Name: ALS -- Fort Collins

Client Name: CH2M HILL Plateau Remediation Company

Client Project ID: AEA/CERCLA, November 2020 I21-005

Work Order Number: 2012047

Reporting Basis: As Received

Analyst: Jill M. Latelle

Final Volume: 50 ml

Matrix: WATER

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
B3Y214	2012047-1	12/1/2020	12/9/2020	12/10/2020	N/A	5	2.4	5	2.4	U	50 ml

Comments:

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

Data Package ID: IM2012047-1

Total Recoverable CHROMIUM

Method SW6020B

Sample Results

Lab Name: ALS -- Fort Collins

Client Name: CH2M HILL Plateau Remediation Company

Client Project ID: AEA/CERCLA, November 2020 I21-005

Work Order Number: 2012047

Reporting Basis: As Received

Analyst: Jill M. Latelle

Final Volume: 50 ml

Matrix: WATER

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
B3Y2F0	2012047-2	12/1/2020	12/9/2020	12/10/2020	N/A	5	2.4	5	2.4	U	50 ml

Comments:

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

Data Package ID: IM2012047-1

ICP Metals

Method SW6010D

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Lab ID: IP201209-3MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Dec-20

Date Analyzed: 09-Dec-20

Prep Batch: IP201209-3

QCBatchID: IP201209-3-2

Run ID: IT201209-2A5

Cleanup: NONE

Basis: N/A

File Name: 201209A.

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
7440-42-8	BORON	1	9.4	U	50	9.4
7440-70-2	CALCIUM	1	94	U	1000	94
7439-89-6	IRON	1	44	U	100	44
7439-95-4	MAGNESIUM	1	86	U	750	86
7440-09-7	POTASSIUM	1	330	U	1000	330
7440-23-5	SODIUM	1	360	U	1000	360
7440-62-2	VANADIUM	1	1.7	U	10	1.7

Data Package ID: IT2012047-1

# ICP Metals

## Method SW6010D

### Laboratory Control Sample

**Lab Name:** ALS -- Fort Collins**Work Order Number:** 2012047**Client Name:** CH2M HILL Plateau Remediation Company**ClientProject ID:** AEA/CERCLA, November 2020 I21-005**Lab ID:** IP201209-3LCS**Sample Matrix:** WATER**% Moisture:** N/A**Date Collected:** N/A**Date Extracted:** 12/09/2020**Date Analyzed:** 12/09/2020**Prep Method:** SW3005A**Prep Batch:** IP201209-3**QCBatchID:** IP201209-3-2**Run ID:** IT201209-2A5**Cleanup:** NONE**Basis:** N/A**File Name:** 201209A.**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
7440-42-8	BORON	1000	1030	50		103	80 - 120%
7440-70-2	CALCIUM	40000	37700	1000		94	80 - 120%
7439-89-6	IRON	1000	967	100		97	80 - 120%
7439-95-4	MAGNESIUM	40000	39600	750		99	80 - 120%
7440-09-7	POTASSIUM	40000	39000	1000		98	80 - 120%
7440-23-5	SODIUM	40000	39100	1000		98	80 - 120%
7440-62-2	VANADIUM	500	513	10		103	80 - 120%

**Data Package ID:** IT2012047-1

# ICP Metals

## Method SW6010D

### Matrix Spike And Matrix Spike Duplicate

**Lab Name:** ALS -- Fort Collins**Work Order Number:** 2012047**Client Name:** CH2M HILL Plateau Remediation Company**ClientProject ID:** AEA/CERCLA, November 2020 I21-005**Field ID:** SHARED QC**LabID:** 2011487-3MS**Sample Matrix:** WATER**% Moisture:** N/A**Date Collected:** 20-Nov-20**Date Extracted:** 09-Dec-20**Date Analyzed:** 09-Dec-20**Prep Method:** SW3005 Rev A**Prep Batch:** IP201209-3**QCBatchID:** IP201209-3-2**Run ID:** IT201209-2A5**Cleanup:** NONE**Basis:** As Received**Sample Aliquot:** 50 ml**Final Volume:** 50 ml**Result Units:** UG/L**File Name:** 201209A.

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-42-8	BORON	13	B	1040		50	1000	103	80 - 120%
7440-70-2	CALCIUM	72000		109000		1000	40000	94	80 - 120%
7439-89-6	IRON	44	U	976		100	1000	98	80 - 120%
7439-95-4	MAGNESIUM	17000		55600		750	40000	98	80 - 120%
7440-09-7	POTASSIUM	7900		46000		1000	40000	95	80 - 120%
7440-23-5	SODIUM	20000		55700		1000	40000	89	80 - 120%
7440-62-2	VANADIUM	6.7	B	507		10	500	100	80 - 120%

**Field ID:** SHARED QC**LabID:** 2011487-3MSD**Sample Matrix:** WATER**% Moisture:** N/A**Date Collected:** 20-Nov-20**Date Extracted:** 09-Dec-20**Date Analyzed:** 09-Dec-20**Prep Method:** SW3005 Rev A**Prep Batch:** IP201209-3**QCBatchID:** IP201209-3-2**Run ID:** IT201209-2A5**Cleanup:** NONE**Basis:** As Received**Sample Aliquot:** 50 ml**Final Volume:** 50 ml**Result Units:** UG/L**File Name:** 201209A.

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-42-8	BORON	1050		1000	104	50	20	1
7440-70-2	CALCIUM	110000		40000	95	1000	20	0
7439-89-6	IRON	984		1000	98	100	20	1
7439-95-4	MAGNESIUM	56000		40000	98	750	20	1
7440-09-7	POTASSIUM	46300		40000	96	1000	20	1
7440-23-5	SODIUM	56000		40000	89	1000	20	0
7440-62-2	VANADIUM	513		500	101	10	20	1

**Data Package ID:** IT2012047-1



# Prep Batch ID: IP201209-3

Start Date: 12/09/20

End Date: 12/09/20

Concentration Method: NONE

Batch Created By: jml

Start Time: 12:24

End Time: 18:00

Extract Method: SW3005A

Date Created: 12/09/20

Prep Analyst: Tyler S. Sabo

Initial Volume Units: ml

Time Created: 12:25

Comments:

Final Volume Units: ml

Validated By: jml

Date Validated: 12/09/20

Time Validated: 13:36

## QC Batch ID: IP201209-3-2

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP201209-3	MB	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
IP201209-3	LCS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-3	MS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-3	MSD	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-3	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-4	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2012017-2	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2012017
2012017-3	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2012017
2012047-1	SMP	B3Y214	WATER	12/1/2020	50	50	NONE	1	2012047
2012047-2	SMP	B3Y2F0	WATER	12/1/2020	50	50	NONE	1	2012047

QC Types

CAR	Carrier reference sample	DLS	Detection Limit Standard
DUP	Laboratory Duplicate	LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicat	LODV	Limit of Detection Verification
LOQV	Limit of Quantitation Verification	MB	Method Blank
MS	Laboratory Matrix Spike	MSD	Laboratory Matrix Spike Duplicate
REP	Sample replicate	RVS	Reporting Level Verification Standar
SMP	Field Sample	SYS	Sample Yield Spike

ICPMS Metals

Method SW6020B

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Lab ID: IP201209-3MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 09-Dec-20

Date Analyzed: 10-Dec-20

Prep Batch: IP201209-3

QCBatchID: IP201209-3-1

Run ID: IM201210-10A6

Cleanup: NONE

Basis: N/A

File Name: 022SMPL\_

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	5	2.4	U	5	2.4

Data Package ID: IM2012047-1

ICPMS Metals

Method SW6020B

Laboratory Control Sample

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Lab ID: IM201209-3LCS	Sample Matrix: WATER	Prep Batch: IP201209-3	Sample Aliquot: 50 ml
	% Moisture: N/A	QCBatchID: IP201209-3-1	Final Volume: 50 ml
	Date Collected: N/A	Run ID: IM201210-10A6	Result Units: UG/L
	Date Extracted: 12/09/2020	Cleanup: NONE	Clean DF: 1
	Date Analyzed: 12/10/2020	Basis: N/A	
	Prep Method: SW3005A	File Name: 023SMPL_	

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-47-3	CHROMIUM	500	512	5		102	80 - 120%

Data Package ID: IM2012047-1

## ICPMS Metals

Method SW6020B

## Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 2012047

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA/CERCLA, November 2020 I21-005

Field ID: SHARED QC

LabID: 2011487-6MS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 20-Nov-20

Date Extracted: 09-Dec-20

Date Analyzed: 10-Dec-20

Prep Method: SW3005 Rev A

Prep Batch: IP201209-3

QCBatchID: IP201209-3-1

Run ID: IM201210-10A6

Cleanup: NONE

Basis: As Received

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

File Name: 029SMPL\_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-47-3	CHROMIUM	73		570		5	500	99	75 - 125%

Field ID: SHARED QC

LabID: 2011487-6MSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 20-Nov-20

Date Extracted: 09-Dec-20

Date Analyzed: 10-Dec-20

Prep Method: SW3005 Rev A

Prep Batch: IP201209-3

QCBatchID: IP201209-3-1

Run ID: IM201210-10A6

Cleanup: NONE

Basis: As Received

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

File Name: 030SMPL\_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-47-3	CHROMIUM	574		500	100	5	20	1

Data Package ID: IM2012047-1

# Prep Batch ID: IP201209-3

Start Date: 12/09/20

End Date: 12/09/20

Concentration Method: NONE

Batch Created By: jml

Start Time: 12:24

End Time: 18:00

Extract Method: SW3005A

Date Created: 12/09/20

Prep Analyst: Tyler S. Sabo

Initial Volume Units: ml

Time Created: 12:25

Comments:

Final Volume Units: ml

Validated By: jml

Date Validated: 12/09/20

Time Validated: 13:36

QC Batch ID: IP201209-3-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP201209-3	MB	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
IM201209-3	LCS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-6	MS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-6	MSD	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-10	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-12	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-13	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-3	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-4	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-5	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-6	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-7	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2011487-9	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2011487
2012017-2	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2012017
2012017-3	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	2012017
2012047-1	SMP	B3Y214	WATER	12/1/2020	50	50	NONE	1	2012047
2012047-2	SMP	B3Y2F0	WATER	12/1/2020	50	50	NONE	1	2012047

QC Types

CAR	Carrier reference sample	DLS	Detection Limit Standard
DUP	Laboratory Duplicate	LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicat	LODV	Limit of Detection Verification
LOQV	Limit of Quantitation Verification	MB	Method Blank
MS	Laboratory Matrix Spike	MSD	Laboratory Matrix Spike Duplicate
REP	Sample replicate	RVS	Reporting Level Verification Standar
SMP	Field Sample	SYS	Sample Yield Spike