

MAY 7, 2014

**WSCF Laboratory**

PO Box 650 S3-30  
Richland, WA 99352



May 7, 2014

Scot Fitzgerald  
CH2M-HILL PRC  
PO Box 1600  
Richland, WA 99352

Dear Scot Fitzgerald,

**FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF140756**

Reference: (1) SOW, Mod 2, #36587, Release 3  
(2) MSC-SD-CD-QAPP-017, current version, Waste Sampling & Characterization Facility Quality Assurance Program Plan

This letter contains the following information for sample delivery group WSCF140756

- \* Cover Sheet (Attachment 1)
- \* Narrative (Attachment 2)
- \* Analytical Results (Attachment 3)
- \* Sample Receipt Information (Attachment 4)

Very truly yours,

A handwritten signature in black ink, appearing to read "Joseph Hale", is positioned above the typed name.

Electronically signed by Joseph Hale

For Lab Manager, Dan T. Smith

WSCF Analytical Lab

(509) 373-4804

Attachments 4

CC: w/Attachments

File/LB

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

**WSCF SAF Number Cross Reference**

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Group # WSCF140756  
Data Deliverable Date 05/28/14

<b>SAF #</b>	<b>Sample ID</b>	<b>Sample #</b>	<b>Matrix</b>	<b>Sampled</b>	<b>Received</b>
F14-003	B2W2T2	140756001	WATER	04/28/14	04/28/14
F14-003	B2W2T6	140756002	WATER	04/28/14	04/28/14

ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

### Introduction

Samples were received at the WSCF laboratory as referenced on the WSCF SAF Number Cross Reference table included in the final report. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW)*, to Contract 39818, Revision 4, "WSCF ANALYTICAL SERVICES FOR GROUNDWATER."

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, C, D, J and U) may be applicable to this report, as appropriate.

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **C** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were C flagged (applies to inorganic and wet chemical analyses).
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **B (organic analyses)** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were B flagged.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.
- **o** – LCS recovery outside established laboratory acceptance limits.

### Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

### Inorganic Comments

Attachment 2  
**Narrative**  
WSCF140756

**Hexavalent Chromium** – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Blank result is high.
- All other applicable QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 8 pages  
Including cover page

**WSCF ANALYTICAL RESULTS REPORT**

For

CH2M Hill Plateau Remediation

PO Box 1600  
Richland, WA 99352

Attention: Scot Fitzgerald

**Contract #** MOA-FH-CHPRC-2008  
**Group #** WSCF140756  
**Report Date** May 7, 2014

Analytical: Electronically signed by Joseph Hale

Client Services: Electronically signed by Marisol Avila

*Solid samples results that have a 'Percent Solid' test are reported on a "dry weight basis", except results of TCLP, Percent Solid, and Total Activity. If no 'Percent Solid' test is reported then the results are reported on an "as received" basis.*

This information is intended for the use of the addressee only. If the reader of this report is not the intended recipient or is not authorized by the recipient to receive the report, you are hereby notified that any dissemination, distribution or copying of this report is strictly prohibited. If you have received this report in error, please notify WSCF Laboratory immediately by telephone at (509) 373-7005. Information designation of this report is the responsibility of the customer.

## Batch QC List

Attention Scot Fitzgerald  
Department Inorganic

Group # WSCF140756

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232469	232469	1	BLANK	109597	BLANK		Hexavalent chromium Discrete Analyzer
232469	232469	3	LCS	109599	LCS		Hexavalent chromium Discrete Analyzer
232469	232469	4	DUP	109600	B2W2T6(140756002DUP)	140756002	Hexavalent chromium Discrete Analyzer
232469	232469	5	MS	109601	B2W2T6(140756002MS)	140756002	Hexavalent chromium Discrete Analyzer
232469	232469	6	SAMPLE	140756002	B2W2T6		Hexavalent chromium Discrete Analyzer
232469	232469	7	SAMPLE	140756001	B2W2T2		Hexavalent chromium Discrete Analyzer

**Method Reference**

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**Attention** Scot Fitzgerald  
**Department** Inorganic

**Group #** WSCF140756

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The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

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<b>LA-265-403</b>	Hexavalent Chromium Analysis		
	EPA SW-846	7196A	Hexavalent Chromium
	HEIS	7196_CR6	Hexavalent Chromium

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Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at <http://www7.rl.gov/rapidweb/AS-DOL/index.cfm>

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140756

Sample # 140756001  
 SAF# F14-003  
 Sample ID B2W2T2

Matrix WATER  
 Sampled 04/28/14  
 Received 04/28/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/28/14
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403	B	0.00270		mg/L	1	0.0020	0.0050	04/28/14

MDL = Minimum Detection Limit  
 RQ = Result Qualifier  
 TP Err = Total Propagated Error  
 DF = Dilution Factor  
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)  
 C - Analyte was found in the Associated Blank. (Inorganic)  
 D - Analyte was reported at a secondary dilution factor.  
 E - Analyte is an estimate, see comment section.  
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.  
 X,Y or Z - See comment detail and/or narrative.  
 PQL is equivalent to Estimated Quantitation Limit (EQL)  
 o - LCS recovery outside established laboratory acceptance limits.

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140756

Sample # 140756002  
 SAF# F14-003  
 Sample ID B2W2T6

Matrix WATER  
 Sampled 04/28/14  
 Received 04/28/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/28/14
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403	B	0.00320		mg/L	1	0.0020	0.0050	04/28/14

MDL = Minimum Detection Limit  
 RQ = Result Qualifier  
 TP Err = Total Propagated Error  
 DF = Dilution Factor  
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)  
 C - Analyte was found in the Associated Blank. (Inorganic)  
 D - Analyte was reported at a secondary dilution factor.  
 E - Analyte is an estimate, see comment section.  
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.  
 X,Y or Z - See comment detail and/or narrative.  
 PQL is equivalent to Estimated Quantitation Limit (EQL)  
 o - LCS recovery outside established laboratory acceptance limits.

## Quality Control Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140756

Analytical Batch 232469 (QC Batch: 232469) Test Hexavalent chromium Discrete Analyzer  
 Associated Samples 140756001, 140756002

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										
Hexavalent chromium	18540-29-9		0.00220	mg/L					BX	04/28/14
<b>LCS</b>										
Hexavalent chromium	18540-29-9		0.0525	mg/L	105	90 - 110				04/28/14
<b>DUP</b>										
Hexavalent chromium	18540-29-9	0.00320	0.00270	mg/L			16.90	20	B	04/28/14
<b>MS</b>										
Hexavalent chromium	18540-29-9	0.00320	0.0386	mg/L	96.5	85 - 115				04/28/14

\* - QC result out of range

n/a - Not Applicable

**Analytical Comment Report**

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**Attention:** Scot Fitzgerald

**Group #**

WSCF140756

**Quality Control Comments**

**Department** Inorganic

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109597

BLANK for HBN 232469 [AUTO/395]

**Analyte** Hexavalent chromium - Hexavalent chromium Discrete Analyzer

[1] Blank value is incorrectly high. Reaction graphics do not show normal color development as do samples with similiar results. Result is anomalous, all other blanks run this day show normal recovery.

ATTACHMENT4

**SAMPLE RECEIPT**

Consisting of 4 pages  
Including cover page

## Sample Receipt

**Waste Sampling and Characterization Facility**  
**P.O. Box 650 S3-30, Richland WA 99352**  
**Phone: (509) 373-7005/FAX: (509) 372-0456**

## ACKNOWLEDGEMENT OF SAMPLES RECEIVED

### WSCF Laboratory

PO Box 650 S3-30  
 Richland, WA 99352

**ATTN:** Scot Fitzgerald

**Customer Code:** CHPRC  
**CA CN:** 403857  
**Work Order #:** 140756  
**Customer Work ID:** F14-003-129  
**Due Date:** 05/28/2014 **(7H)**

The following samples were received from you on 4/28/2014 12:30:00 PM. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact WSCF Client Services. Thank you for using Waste Sampling and Characterization Facility.

Sample #	Sample ID	Matrix	Collected	Received
140756001	B2W2T2	WATER	4/28/2014 09:27	4/28/2014 12:30
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		Cr6		
Sample #	Sample ID	Matrix	Collected	Received
140756002	B2W2T6	WATER	4/28/2014 09:27	4/28/2014 12:30
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		Cr6		

Sample Receipt

Chain of Custody

CHEMHIll Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-003-129	PAGE 1 OF 1
COLLECTOR Robert Crew	COMPANY CONTACT TODAK, D	TELEPHONE NO. 370-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION CR716, I-009	PROJECT DESIGNATION P20-4 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	FIELD LOGBOOK NO. HNF-N-507-28-21	SAP NO. F14-003	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT GOVERNMENT VEHICLE <b>ORIGINAL</b>
ICE CHEST NO. (N/A)	OFFSITE PROPERTY NO. N/A	ACTUAL SAMPLE DEPTH 415.1	COA 302938ES10	BILL OF LADING/AIR BILL NO. N/A	
SHIPPED TO Waste Sampling & Characterization					

MATRIX* A-Air DL-Drum Liquids DS-Drum Solids L-Liquid O-oil S-Soil SC-Sediment T-Tissue V-Vegetation W-Water W-Waste X-Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may or may not be regulatory for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION Cooling	HOLDING TIME 24 Hours	NO. OF CONTAINER(S) 1	VOLUME 500ML	SAMPLE ANALYSIS /TIC Lab COMMON
SAMPLE NO. B2W212	MATRIX* 1 WATER	SAMPLE DATE APR 28 2014	SAMPLE TIME 0927			
SPECIAL HANDLING AND/OR STORAGE 140756						

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Robert Crew	DATE/TIME APR 28 2014 / 1730	RECEIVED BY/STORAGE F14-003	DATE/TIME APR 28 2014 / 1730	** The OACN for all analytical work at WSCF laboratory is 403857.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAP. ** VOA analysis will be conducted with a 24 hour turnaround time on preliminary data. The VOA samples will be placed on a separate COC. ** Cr-VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The laboratory is to report all TICs for Method 8260. TT:VL 14 059	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORAGE IN	DATE/TIME	TRVL 14 - 059	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORAGE IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORAGE IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORAGE IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORAGE IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORAGE IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	

PRINTED ON 2/10/2014 A-603-618 (REV 2)

Sample Receipt

Chain of Custody

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		PAGE 1 OF 1	
COLLECTOR Robert Crow	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8716, 1-009 DUP	PROJECT DESIGNATION P2014 200-ZE-1 Remedial Action Wells Sampling and Analysis - Water	FIELD LOGBOOK NO. HMF-N-857-28-21	SAF NO. T14-003	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT GOVERNMENT VEHICLE
ICE CHEST NO. (N/A)	OFFSITE PROPERTY NO. N/A	ACTUAL SAMPLE DEPTH 415.6	COA 3029B8E510	BILL OF LADING/AIR BILL NO. N/A	ORIGINAL
SHIPPED TO Waste Sampling & Characterization					

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS
A=Air DL=Drum Liquids DS=Drum SO=Sol L=Liquid D=Oil S=Soil DE=Cediment T=Tissue V=Vegetation W=Water WT=Water X=Other	Corrosive Radioactive Material &/or constituents that may or may not be regulated for transportation per 49 CFR/17A Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	COOL-1C	24 HOURS	g/c	1	300 mL		7.196 COB; CUMENUR;
B2W2T6	2 WATER							

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	SIGN/ PRINT NAMES
RELINQUISHED BY/REMOVED FROM Robert Crow	APR 28 2014 1230	RECEIVED BY/STORED IN KEVIN	APR 28 2014 1230	
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN		
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN		
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN		
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN		
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN		

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

PRINTED ON 2/10/2014

4-6003-608 (REV 2)

**SPECIAL INSTRUCTIONS**  
 \*\* The CACN for all analytical work at WSCF Laboratory is 403857. \*\*  
 The 200 Area S3GRP Characterization and Monitoring Sampling and Analysis OKI applies to this SAF. \*\* VOA analysis will be conducted with a 24 hour turnaround time on preliminary data. The VOA samples will be placed on a separate COC. \*\* Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. \*\* The laboratory is to report all TICs for Method 8260. TRVL-14-055

TRVL-14-059