

RECEIVED NOVEMBER 6, 2008

Fluor Hanford  
WSCF Analytical Lab  
P.O. Box 1000  
Richland, Washington 99352  
Telephone 373-7495  
Telefax 372-0456



M4W41-SLF-08-1225

November 5, 2008

Mr. M. A. Neely, Manager  
Analytical Services  
CH2M HILL Plateau Remediation Contract  
1933 Jadwin MSIN B6-06  
Richland, WA 99352

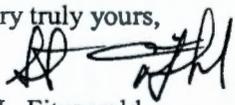
Dear Mike:

FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20082140 – SAF NUMBER F08-140

- Reference:
- (1) Memorandum of Agreement #MOA-FH-CHPRC-2008, Rev. 0, for the Performance & Payment of Services, dated October 1, 2008
  - (2) HNF-SD-CD-QAPP-017, Rev. 9, Waste Sampling & Characterization Facility Quality Assurance Plan

This letter contains the following attachments for sample delivery group WSCF20082140:

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

Very truly yours,  
  
S. L. Fitzgerald  
WSCF Analytical Lab

SLF/grf

Attachments 4

- cc:
- |                 |       |                |       |
|-----------------|-------|----------------|-------|
| w/Attachments   |       |                |       |
| T. F. Dale      | S3-30 | J. E. Trechter | S3-30 |
| A. J. Kopriva   | S3-30 | S. J. Trent    | B6-06 |
| H. K. Meznarich | S3-30 | File/LB        |       |
| P. D. Mix       | S3-30 |                |       |



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ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

# WSCF SAF NUMBER CROSS REFERENCE

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Group#: WSCF20082140  
Data Deliverable Date: 21-nov-2008  
Data Deliverable: Cover Sheet

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SAF#	Sample ID	WSCF#	Matrix
F08-140	B1XF93	W08GR03986	SOIL
	B1XF94	W08GR03985	SOIL

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ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

## Introduction

Two S&GRP samples were received at the WSCF Laboratory on October 9, 2008. Samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Memorandum of Agreement (MOA-FH-CHPRC-2008, Rev. 0)*, referenced in the cover letter.

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 stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving, indicating the presence of ice in the sample container.

## Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report*, page 10, for a complete listing of approved analytical methods.

## Inorganic Comments

**Hexavalent Chromium** – The holding time requirement for this analysis was met. A Sample Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 13 for QC details. Analytical Result(s):

- Sample Duplicate, Matrix Spike and Matrix Spike Duplicate analyzed on sample B1WXD5 (SDG# 20082122, SAF# F08-140).
- The spike recovery for two Matrix Spikes and the Matrix Spike Duplicate was below the laboratory established limit of 75% at 73.0%, 68.5%, and 65.6% respectively.

All other QC controls are within the established limits.

**ICP-MS Metals (Chromium)** – The holding time requirement for this analysis was met. A Matrix Spike and Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 14 for QC details.

- Sample Duplicate, Matrix Spike and Matrix Spike Duplicate analyzed on sample B1WXC7 (SDG# 20082115, SAF# F08-140).

All QC controls are within the established limits.

I certify that this data package is in compliance with the MOA, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager and Client Services as verified by the following signatures.



Scot L. Fitzgerald  
WSCF Analytical Laboratory Manager



Andrew J. Kopriva  
WSCF Client Services

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ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 8 pages  
Including cover page

**WSCF  
ANALYTICAL RESULTS REPORT**

for

**Groundwater Remediation Program**

**Richland, WA 99354**

**Attention: Steve Trent**

Analytical: ~~AW~~ S. Fitzgerald 11/6/08

Client Services: ~~AW~~ A. Kopriva 11/5/08

*All results are reported on an "as received" basis unless otherwise noted in the comment section.*

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) 373-7020 or (509) 531-8004. Information designation of this report is the responsibility of the customer.

Contract#: FH-EIS-2003-MEM-001  
Report#: WSCF20082140  
Report Date: 29-oct-2008  
Report WGPP/ver. 5.2  
Groundwater Remediation Program

Department: Inorganic

## W13q Worklist/Batch/QC Report for Group# WSCF20082140

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
38413	1	38835	43312	BLANK		ICP-200.8 MS All possible meta
38413	2	38835	43312	LCS		ICP-200.8 MS All possible meta
38413	4	38835	43312	MS	W08GR03961	ICP-200.8 MS All possible meta
38413	5	38835	43312	MSD	W08GR03961	ICP-200.8 MS All possible meta
38413	5	38835	43312	SPK-RPD	W08GR03961	ICP-200.8 MS All possible meta
38413	15	38835	43312	SAMPLE	W08GR03986	ICP-200.8 MS All possible meta
38416	2	38838	43314	BLNK-PREP		Hexavalent chromium
38416	3	38838	43314	LCS		Hexavalent chromium
38416	5	38838	43314	DUP	W08GR03970	Hexavalent chromium
38416	6	38838	43314	MS	W08GR03970	Hexavalent chromium
38416	7	38838	43314	MSD	W08GR03970	Hexavalent chromium
38416	9	38838	43314	SPK-POST	W08GR03970	Hexavalent chromium
38416	7	38838	43314	SPK-RPD	W08GR03970	Hexavalent chromium
38416	22	38838	43314	SAMPLE	W08GR03985	Hexavalent chromium
38416	23	38838	43314	SAMPLE	W08GR03986	Hexavalent chromium

# WSCF

## METHOD REFERENCES REPORT

Department: Inorganic

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 or industry 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 the 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.

<b>LA-265-403</b>	<b>LA-265-403: Hexavalent Chromium analysis by Spectrophotometer</b> <b>EPA SW-846 7196A</b> <b>HEXAVALENT CHROMIUM</b> <b>HEIS 7196_CR6</b> <b>Hexavalent Chromium</b>
<b>LA-505-412</b>	<b>LA-505-412: DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY</b> <b>EPA-600/R-94-111 200.8</b> <b>DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY COUPLED PLAS</b> <b>HEIS 200.8_METALS_ICPMS</b> <b>Inductively Coupled Plasma - Mass Spectrometry</b> <b>HEIS RADISOTOPES_ICPMS</b> <b>Radioisotopes by ICP/MS</b>

Note: A complete list of WSCF analytical procedures and referenced regulatory or industry methods is available online at <http://www2.rl.gov/phmc/as-dol>.

Report Date: 29-oct-2008  
Report#: WSCF20082140  
Report WGPPM/5.2

Page 1

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F08-140  
**Sample #** W08GR03985  
**Client ID:** B1XF94

**TRENT**  
**WSCF**

**Matrix:** SOIL

**Group #:** WSCF20082140  
**Department:** Inorganic  
**Sampled:** 10/09/08  
**Received:** 10/09/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium Prep</b>											
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 0.300	mg/kg			1.00	0.30		10/15/08

**MDL = Minimum Detection Limit**      U - Analyzed for but not detected above limiting criteria(Inorg)  
**RQ = Result Qualifier**  
**TP Err = Total Propagated Error**  
**DF = Dilution Factor**

\* - Indicates results that have NOT been validated;      + - Indicates more than six qualifier symbols

*Report WGPP/ver. 5.2*  
*Groundwater Remediation Program*

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F08-140  
**Sample #** W08GR03986  
**Client ID:** B1XF93

**TRENT**  
**WSCF**

**Matrix:** SOIL

**Group #:** WSCF20082140  
**Department:** Inorganic  
**Sampled:** 10/09/08  
**Received:** 10/09/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium Prep</b>											
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 0.300	mg/kg			1.00	0.30		10/15/08
<b>ICP-200.8 MS All possible meta Prep</b>											
<b>ICP-200.8 MS All possible meta</b>											
Chromium	7440-47-3	LA-505-412		19.7	mg/kg			0.97	0.483		10/15/08

**MDL=Minimum Detection Limit**    U - Analyzed for but not detected above limiting criteria(inorg)  
**RQ=Result Qualifier**  
**TP Err=Total Propagated Error**  
**DF=Dilution Factor**

\* - Indicates results that have NOT been validated;    + - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2  
 Groundwater Remediation Program

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20082140  
 Matrix: SOLID  
 Test: Hexavalent chromium

Sample Date: 10/06/08  
 Receive Date: 10/06/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08GR03970</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Hexavalent chromium	18540-29-9	< 0.3		RPD			n/a	15.000	U	10/15/08
MS	Hexavalent chromium	18540-29-9	263	73.056	% Recov	75.000	125.000				10/15/08
MS	Hexavalent chromium	18540-29-9	11.1	68.519	% Recov	75.000	125.000				10/15/08
MSD	Hexavalent chromium	18540-29-9	10.5	65.625	% Recov	75.000	125.000				10/15/08
SPK-POST	Hexavalent chromium	18540-29-9	0.0520	97.378	% Recov	75.000	125.000				10/15/08
SPK-RPD	Hexavalent chromium	18540-29-9	65.625		RPD			4.315	20.000		10/15/08
<b>BATCH QC</b>											
BLNK-PREP	Hexavalent chromium	18540-29-9	< 0.3	n/a	ug/g	0.000	2.000			U	10/15/08
LCS	Hexavalent chromium	18540-29-9	16.8	87.958	% Recov	80.000	120.000				10/15/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20082140  
 Matrix: SOLID  
 Test: ICP-200.8 MS All possible meta

Sample Date: 10/03/08  
 Receive Date: 10/03/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08GR03961</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
MS	Chromium	7440-47-3	193.01	96.505	% Recov	70.000	130.000				10/15/08
MSD	Chromium	7440-47-3	191.41	95.705	% Recov	70.000	130.000				10/15/08
SPK-RPD	Chromium	7440-47-3	95.705		RPD			0.832	20.000		10/15/08
<b>BATCH QC</b>											
BLANK	Chromium	7440-47-3	<0.5	n/a	ug/L					U	10/15/08
LCS	Chromium	7440-47-3	75.98	104.225	% Recov	77.000	125.000				10/15/08

M4W41-SLF-08-1225

ATTACHMENT 4

**SAMPLE RECEIPT INFORMATION**

Consisting of 4 pages  
Including cover page

**Waste Sampling and Characterization Facility**  
P.O. BOX 1970 S3-30, Richland, WA 99352  
PHONE: (509) 373-7004/FAX: (509) 373-7134

*File*  
*11/21/08*  
*[Signature]*

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Groundwater Remediation Program

Richland, WA 99354  
Attn: Steve Trent

Customer Code: GPP  
PO#: 123445/ES10  
Group#: 20082140  
Project#: F08-140  
Proj Mgr: Steve Trent E6-35  
Phone: 373-5869

The following samples were received from you on 10/09/08. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
W08GR03985	B1XF94	TRENT CR+6	Solid, or handle as if solid	10/09/08
W08GR03986	B1XF93	TRENT @2008 CR+6	Solid, or handle as if solid	10/09/08

Test Acronym Description

Test Acronym	Description
@2008 CR+6	ICP-200.8 MS All possible meta Hexavalent chromium

<b>COLLECTOR</b>	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 8N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> C6387 I-028	<b>PROJECT DESIGNATION</b> Chromium Source Investigation - North Plume		<b>SAF NO.</b> F08-140	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-576-5 pg 18	<b>ACTUAL SAMPLE DEPTH</b> 112.4	<b>COA</b> 301478E510	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> Waste Sampling & Characterization 20082140		<b>OFFSITE PROPERTY NO.</b> SEE PTR		<b>BILL OF LADING/AIR BILL NO.</b> SEE PTR	

<b>MATRIX*</b> A=Air DL=Drum L=Liquid DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b>	Cool~4C																		
		<b>TYPE OF CONTAINER</b>	G/P																		
		<b>NO. OF CONTAINER(S)</b>	1																		
		<b>VOLUME</b>	1000mL																		
<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b>	Chromium Hex - 7196;																		

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME																	
B1XF94	SOIL	10-9-08	1445																	

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	<div style="font-size: 48px; text-align: center;">ICD</div>			
ARMC 102 Dept	10-9-08/1515	TA Ruzar	10/9/08/1515				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				

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

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COLLECTOR <i>Rosanne McEntyre Rust</i>	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C6387 1-028	PROJECT DESIGNATION Chromium Source Investigation - North Plume		SAF NO. F08-140	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO.	FIELD LOGBOOK NO. <i>HNF-W-576-3 p418</i>	ACTUAL SAMPLE DEPTH <i>112.4</i>	COA 301478ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. SEE PTR	BILL OF LADING/AIR BILL NO. SEE PTR			

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION Cool-4C								
		TYPE OF CONTAINER G/P								
		NO. OF CONTAINER(S) 1								
		VOLUME 120ml								
SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS							

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B1XF93	<i>3986</i> SOIL	<i>10-9-08</i>	<i>1445</i>						

*9340010*  
*023192*

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM <i>AR McEntyre</i>	DATE/TIME <i>10-9-08/1445</i>	RECEIVED BY/STORED IN <i>Arthur</i>	DATE/TIME <i>10/9/08/15</i>
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

**SPECIAL INSTRUCTIONS**  
(1)ICP/MS - 200.8 (TAL) {Chromium} Chromium Hex - 7196;

**ICED**

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

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