

RECEIVED DECEMBER 4, 2008

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**FLUOR**<sup>®</sup>

M4W41-SLF-08-1277

December 4, 2008

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

Dear Mike:

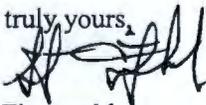
FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20082289

- 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 WSCF20082289:

- Cover Sheet (Attachment 1)
- Narrative (Attachment 2)
- Issue Resolution Form (Attachment 3)
- Analytical Results (Attachment 4)
- Sample Receipt Information (Attachment 5)

Very truly yours,

  
S. L. Fitzgerald  
WSCF Analytical Lab

SLF/grf

Attachments 5

cc: w/Attachments

T. F. Dale	S3-30
A. J. Kopriva	S3-30
H. K. Meznarich	S3-30
P. D. Mix	S3-30

J. E. Trechter	S3-30
S. J. Trent	B6-06
File/LB	

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1 of 54

M4W41-SLF-08-1277

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

## WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20082289  
Data Deliverable Date: 25-nov-2008  
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix	
I09-005	B1XHD4	W08P005138	WATER	
	B1XHD5	W08P005139	WATER	
	B1XHD9	W08P005144	WATER	
	B1XHF0	W08P005145	WATER	
	B1XHR8	W08P005147	WATER	
	B1XJ51	W08P005137	WATER	
	B1XJ55	W08P005146	WATER	
	B1XJ68	W08P005143	WATER	
	B1XJB0	W08P005140	WATER	
	B1XJB2	W08P005141	WATER	
	B1XK44	W08P005142	WATER	
	I09-006	B1XKN3	W08P005153	WATER
		B1XKN4	W08P005154	WATER
I09-009	B1XLT5	W08P005152	WATER	
	B1XLT9	W08P005151	WATER	
	B1XLV0	W08P005148	WATER	
	B1XLV1	W08P005149	WATER	
	B1XLV3	W08P005150	WATER	

M4W41-SLF-08-1277

ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

## Introduction

Eighteen (18) groundwater samples were received at the WSCF Laboratory on November 24, 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 copy of proposed Issue Resolution Form (IRF) documenting missed 24-hour hold time for Hexavalent Chromium is included as Attachment 3. A Data Summary Report (Attachment 4) 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 5.

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 12, for a complete listing of approved analytical methods.

## Inorganic Comments

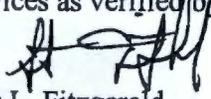
**Hexavalent Chromium** – The hold time requirement for this analysis was not met. See comment below. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 31 for QC details. Analytical Note(s):

- Missed Hold Time - A copy of proposed Issue Resolution Form (IRF) is included as Attachment 3.
- Sample results were D flagged if dilution(s) were required.
- Sample results that were less than the reportable limit, however greater than the method detection limit, were B flagged.
- Duplicate Relative Percent Difference (B1XHR8) slightly exceeded established laboratory limits.

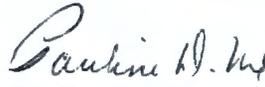
All other QC controls are within the established limits.

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



Pauline D. Mix  
WSCF Client Services

M4W41-SLF-08-1277

ATTACHMENT 3

**ISSUE RESOLUTION FORM**

Consisting of 2 pages  
Including cover page

ISSUE RESOLUTION FORM

**PNNL TRACKING NUMBER:** 08-XXX, Rev 1

**DRAFT**

Date : 12-1-2008      SAF No.      I09-005, I09-006

SDG: WSCF20082289      LOGIN No.:      TEST: Cr+6

Sample No.(s)      B1XJ51, B1XHD4, B1XHD5, B1XJB0, B1XJB2, B1XK44,  
B1XJ55, B1XHR8, B1XKN3, B1XKN4

(W08P005137, W08P005138, W08P005139, W08P005140, W08P005141, W08P005142,  
W08P005146, W08P005147, W08P005153, W08P005154)

Submitted By: WW Baird      Submitted To: H Hampt  
Phone No.      372-7189      Phone No.      376-4319  
Fax No.      372-0456      Fax No

**ISSUE**

**PROPOSED RESOLUTION**

Missed regulatory holding time for Hexavalent Chromium analysis.

Accept results (accept as-is) and document missed holding time for Hexavalent Chromium analysis in the case narrative.

Samples were collected in the field on November 23, 2008 and delivered to the WSCF Laboratory on November 24, 2008.

The 24-hour regulatory hold time was not met on samples, identified above, which were collected in the morning of November 23, 2008.

All QC controls were within established laboratory limits.

**GRP COMMENTS**

\_\_\_\_\_  
Signature and Date

M4W41-SLF-08-1277

ATTACHMENT 4

**ANALYTICAL RESULTS**

Consisting of 24 pages  
Including cover page

**WSCF**  
**ANALYTICAL RESULTS REPORT**

for

**GPAP**  
**Richland, WA 99352**

**Attention: Steve Trent E6-35**

Analytical:

*S. Fitzgerald 12/4/08*

Client Services:

*P.D. Miller 12/4/2008*

*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.

Report#: WSCF20082289  
Report Date: 2-dec-2008  
Report WGPP/ver. 5.2  
GPAP

Page 1

## W13q Worklist/Batch/QC Report for Group# WSCF20082289

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
38681	2	39062	43588	BLANK		Hexavalent chromium
38681	16	39062	43588	BLANK		Hexavalent chromium
38681	28	39062	43588	BLANK		Hexavalent chromium
38681	3	39062	43588	LCS		Hexavalent chromium
38681	4	39062	43588	SAMPLE	W08P005137	Hexavalent chromium
38681	5	39062	43588	SAMPLE	W08P005138	Hexavalent chromium
38681	6	39062	43588	SAMPLE	W08P005139	Hexavalent chromium
38681	8	39062	43588	DUP	W08P005140	Hexavalent chromium
38681	9	39062	43588	MS	W08P005140	Hexavalent chromium
38681	7	39062	43588	SAMPLE	W08P005140	Hexavalent chromium
38681	10	39062	43588	SAMPLE	W08P005141	Hexavalent chromium
38681	11	39062	43588	SAMPLE	W08P005142	Hexavalent chromium
38681	12	39062	43588	SAMPLE	W08P005143	Hexavalent chromium
38681	13	39062	43588	SAMPLE	W08P005144	Hexavalent chromium
38681	14	39062	43588	SAMPLE	W08P005145	Hexavalent chromium
38681	15	39062	43588	SAMPLE	W08P005146	Hexavalent chromium
38681	18	39062	43588	DUP	W08P005147	Hexavalent chromium
38681	19	39062	43588	MS	W08P005147	Hexavalent chromium
38681	17	39062	43588	SAMPLE	W08P005147	Hexavalent chromium
38681	21	39062	43588	SAMPLE	W08P005148	Hexavalent chromium
38681	22	39062	43588	SAMPLE	W08P005149	Hexavalent chromium
38681	23	39062	43588	SAMPLE	W08P005150	Hexavalent chromium
38681	24	39062	43588	SAMPLE	W08P005151	Hexavalent chromium
38681	25	39062	43588	SAMPLE	W08P005152	Hexavalent chromium
38681	26	39062	43588	SAMPLE	W08P005153	Hexavalent chromium
38681	27	39062	43588	SAMPLE	W08P005154	Hexavalent chromium

# WSCF

## METHOD REFERENCES REPORT

Department: Inorganic

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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 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.

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<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>

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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: 2-dec-2008  
Report#: WSCF20082289  
Report WGPPM/5.2

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005137

Client ID: B1XJ51 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium	18540-29-9	LA-265-403	D	0.568	mg/L			10.00	0.020		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

13 of 54

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005138

Client ID: B1XHD4 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium	18540-29-9	LA-285-403		0.439	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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+ - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

GPAP

14 OF 54

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005139

Client ID: B1XHD5 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium	18540-29-9	LA-285-403	U	< 2.00e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

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Report WGPP/ver. 5.2

GPAP

15 of 54

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005140

Client ID: B1XJB0 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium											
Hexavalent Chromium	18540-29-9	LA-265-403	B	6.00e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL = Minimum Detection Limit**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

D - Analyte was identified at a secondary dilution factor (inorg)

**RQ = Result Qualifier**

U - Analyzed for but not detected above limiting criteria (inorg)

**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

GPAP

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005141

Client ID: B1XJB2 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		6.90e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

17 of 54

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005142

Client ID: B1XK44

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		0.0768	mg/L			1.00	2.0e-03		11/24/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria (inorg)

D - Analyte was identified at a secondary dilution factor (inorg)

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+ - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

GPAP

18 of 54

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005143

Client ID: B1XJ68 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		0.0127	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but >= the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005144

Client ID: B1XHD9 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 2.00e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but >= the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005145

Client ID: B1XHF0

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 2.00e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria (inorg)

D - Analyte was identified at a secondary dilution factor (inorg)

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

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005146

Client ID: B1XJ55 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	D	1.37	mg/L			10.00	0.020		11/24/08

**MDL = Minimum Detection Limit**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

D - Analyte was identified at a secondary dilution factor (inorg)

**RQ = Result Qualifier**

U - Analyzed for but not detected above limiting criteria (inorg)

**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

GPAP

22 of 54

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-005

Sample # W08P005147

Client ID: B1XHR8 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	B	4.10e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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Report WGPP/ver. 5.2

GPAP

23 of 54

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-009

Sample # W08P005148

Client ID: B1XLV0 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		0.0525	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

24 of 54

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-009

Sample # W08P005149

Client ID: B1XLV1

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	B	2.80e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

25 of 54

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-009

Sample # W08P005150

Client ID: B1XLV3 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		0.0228	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-009

Sample # W08P005151

Client ID: B1XLT9 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 2.00e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**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

GPAP

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-009

Sample # W08P005152

Client ID: B1XLT5

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium	18540-29-9	LA-265-403		0.155	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-006

Sample # W08P005153

Client ID: B1XKN3

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	B	3.40e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria (inorg)

D - Analyte was identified at a secondary dilution factor (inorg)

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

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I09-006

Sample # W08P005154

Client ID: B1XKN4 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20082289

Department: Inorganic

Sampled: 11/23/08

Received: 11/24/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium	18540-29-9	LA-265-403	B	3.70e-03	mg/L			1.00	2.0e-03		11/24/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)

U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)

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

Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20082289  
 Matrix: WATER  
 Test: Hexavalent chromium

Sample Date: 11/23/08  
 Receive Date: 11/24/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P005140</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Hexavalent chromium	18540-29-9	.006		RPD			0.000	15.000		11/24/08
MS	Hexavalent chromium	18540-29-9	.0425	106.250	% Recov	85.000	115.000				11/24/08
<b>Lab ID: W08P005147</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Hexavalent chromium	18540-29-9	.0034		RPD			18.667	15.000		11/24/08
MS	Hexavalent chromium	18540-29-9	.0419	104.750	% Recov	85.000	115.000				11/24/08
<b>BATCH QC</b>											
BLANK	Hexavalent chromium	18540-29-9	<0.002	n/a	mg/L	0.000	2.000			U	11/24/08
BLANK	Hexavalent chromium	18540-29-9	<0.002	n/a	mg/L	0.000	2.000			U	11/24/08
BLANK	Hexavalent chromium	18540-29-9	<0.002	n/a	mg/L	0.000	2.000			U	11/24/08
LCS	Hexavalent chromium	18540-29-9	.0527	104.980	% Recov	80.000	120.000				11/24/08

# WSCF ANALYTICAL COMMENT REPORT

Attention: Steve Trent E6-35

Group #: WSCF20082289  
Department: Inorganic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		Cr(VI) duplicate on sample W08P005147 is out-of-limit. This sample concentration is less than the low cal range of 0.005 and out-of-limit RPD is expected.

Lab Areas: VALGROUP - Group Validation  
LOGSAMP - Login for Sample

VALTEST - Test Validation  
LOGTEST - Login for Tests

TESTDATA - Test Data Entry

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wgppc/5.2 Report#: WSCF20082289

Report Date: 2-dec-2008

Page 1

M4W41-SLF-08-1277

ATTACHMENT 5

**SAMPLE RECEIPT INFORMATION**

Consisting of 22 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

ACKNOWLEDGMENT OF SAMPLES RECEIVED

GPAP

Richland, WA 99352  
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP  
PO#: 122543  
Group#: 20082289

11/25/08  




The following samples were received from you on 11/24/08. 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
W08P005137	B1XJ51	PNNL-GPP CR+6	Water	11/23/08
W08P005138	B1XHD4	PNNL-GPP CR+6	Water	11/23/08
W08P005139	B1XHD5	PNNL-GPP CR+6	Water	11/23/08
W08P005140	B1XJB0	PNNL-GPP CR+6	Water	11/23/08
W08P005141	B1XJB2	PNNL-GPP CR+6	Water	11/23/08
W08P005142	B1XK44	PNNL-GPP CR+6	Water	11/23/08
W08P005143	B1XJ68	PNNL-GPP CR+6	Water	11/23/08
W08P005144	B1XHD9	PNNL-GPP CR+6	Water	11/23/08
W08P005145	B1XHFO	PNNL-GPP CR+6	Water	11/23/08
W08P005146	B1XJ55	PNNL-GPP CR+6	Water	11/23/08
W08P005147	B1XHR8	PNNL-GPP CR+6	Water	11/23/08
W08P005148	B1XLV0	PNNL-GPP CR+6	Water	11/23/08
W08P005149	B1XLV1	PNNL-GPP CR+6	Water	11/23/08
W08P005150	B1XLV3	PNNL-GPP CR+6	Water	11/23/08
W08P005151	B1XLT9	PNNL-GPP CR+6	Water	11/23/08

GPAP

Richland, WA 99352  
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP  
PO#: 122543  
Group#: 20082289

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
W08P005152	B1XLT5	PNNL-GPP CR+6	Water	11/23/08
W08P005153	B1XKN3	PNNL-GPP CR+6	Water	11/23/08
W08P005154	B1XKN4	PNNL-GPP CR+6	Water	11/23/08

Test Acronym Description

Test Acronym	Description
CR+6	Hexavalent chromium



CHPRC

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

109-005-72

Page 1 of 1

Collector <i>L. Wall</i>	Contact/Requester Mike Neely	Telephone No. 509-373-0654	MSIN	FAX
SAF No. 109-005	Sampling Origin Hanford Site	Purchase Order/Charge Code		
Project Title 100HR31AM(1/2) NOVEMBER 2008	<i>HNF-N-506-20/23</i>	Ice Chest No.	Temp.	
Shipped To (Lab) Waste Sampling & Characterization	Method of Shipment Govt Vehicle	Bill of Lading/Air Bill No.		
Protocol CERCLA	Priority: 24 Hours <b>PRIORITY</b>	Offsite Property No.		

POSSIBLE SAMPLE HAZARDS/REMARKS .. ..	SPECIAL INSTRUCTIONS FY08 and FY09 samples cannot be in the same SDG. 100 Area Generator Knowledge Information Form applies.	Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	--	-----------	---

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B1XHD4	S138	W	11-23-08	1037	1x250-mL aG	7196_CR6: Hexavalent Chromium (1)	24 Hours	Cool-4C
<b>ICED</b>								

Relinquished By <i>L. Wall</i> <i>L.D. Wall</i>	Date/Time 11-24-08 0800	Received By <i>F. Wall</i> <i>H. Wall</i>	Date/Time 11-24-08 0830	Matrix *
Relinquished By <i>F. Wall</i> <i>H. Wall</i>	Date/Time 11-24-08 0850	Received By <i>[Signature]</i> <i>[Signature]</i>	Date/Time 11-24-08 0850	
Relinquished By	Date/Time	Received By	Date/Time	
Relinquished By	Date/Time	Received By	Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time	

37 of 54

CHPRC

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

I09-005-73

Page 1 of 1

Collector <b>L. WALL</b>	Contact/Requester Mike Neely	Telephone No. 509-373-0654	MSIN FAX
SAF No. I09-005	Sampling Origin Hanford Site	Purchase Order/Charge Code	
Project Title 100HR31AM(1/2) NOVEMBER 2008	<b>HNF-N-502-20/23</b>	Ice Chest No.	Temp.
Shipped To (Lab) Waste Sampling & Characterization	Method of Shipment Govt. Vehicle	Bill of Lading/Air Bill No.	
Protocol CERCLA	Priority: 24 Hours <b>PRIORITY</b>	Offsite Property No.	

**POSSIBLE SAMPLE HAZARDS/REMARKS**  
 \*\* \*\* Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

**SPECIAL INSTRUCTIONS** Hold Time  
 FY08 and FY09 samples cannot be in the same SDG.  
 100 Area Generator Knowledge Information Form applies.

Total Activity Exemption: Yes  No

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B1XHDS	5139	W	11/23/08	0900	1x250-mL aG	7196_CR6: Hexavalent Chromium (1)	24 Hours	Cool-4C
<div style="position: absolute; left: 20%; top: 20%; transform: rotate(-45deg); opacity: 0.5;"> <p><i>L. Wall</i> 11/23/08</p> </div> <div style="position: absolute; right: 10%; top: 50%; font-size: 4em; font-weight: bold;">ICED</div>								

Relinquished By <i>L. Wall</i> <i>L. Wall</i>	Date/Time 11-24-08 0800	Received By <i>F. Wall</i> <i>H. Wall</i> <i>E. Wall</i>	Date/Time 11-24-08 0800	<b>Matrix *</b> S = Soil DS = Drum Solid SE = Sediment DL = Drum Limb SO = Solid T = Tissue SL = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By <i>F. Wall</i> <i>H. Wall</i> <i>E. Wall</i>	Date/Time 11-24-08 0830	Received By <i>R. Bode</i> <i>K. Bode</i>	Date/Time 11-24-08 0830	
Relinquished By	Date/Time	Received By	Date/Time	
Relinquished By	Date/Time	Received By	Date/Time	

**FINAL SAMPLE DISPOSITION** Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

38 of 54



















CHPRC

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

U.C.C. #  
109-009-180  
Page 1 of 1

Collector <i>L. WALL</i>	Contact/Requester Mike Neely	Telephone No. 509-373-0654	MSIN FAX
SAF No. 109-009	Sampling Origin Hanford Site	Purchase Order/Charge Code	
Project Title ISRM NOVEMBER 2008	<i>HNF-N-506-20/23</i>	Ice Chest No.	Temp.
Shipped To (Lab) Waste Sampling & Characterization	Method of Shipment Govt. Vehicle	Bill of Lading/Air Bill No.	
Protocol CERCLA	Priority: 24 Hours <b>PRIORITY</b>	Offsite Property No.	

**POSSIBLE SAMPLE HAZARDS/REMARKS**  
 \*\* \*\* Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

**SPECIAL INSTRUCTIONS** Hold Time  
 FY08 and FY09 samples cannot be in the same SDG.  
 200 Area Generator Knowledge Information Form applies.  
 Total Activity Exemption: Yes  No

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B1XLV1	<i>S149</i>	<i>W</i>	<i>11-23-08</i>	<i>1230</i>	1x250-mL aG	7196_CR6: Hexavalent Chromium (1)	24 Hours	Cool-4C
<b>3 CED</b>								

Relinquished By <i>L. WALL</i> <i>L. Wall</i>	Print <i>L. Wall</i>	Sign	Date/Time <i>11-24-08 0800</i>	Received By <i>FUM HALL</i>	Print <i>FUM HALL</i>	Sign <i>[Signature]</i>	Date/Time <i>11-24-08 0800</i>	<b>Matrix *</b> S = Soil DS = Drum Solid SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By <i>FUM HALL</i>	Print <i>FUM HALL</i>	Sign <i>[Signature]</i>	Date/Time <i>11-24-08 0850</i>	Received By <i>[Signature]</i>	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time <i>11-24-08 0850</i>	
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	
<b>FINAL SAMPLE DISPOSITION</b>			Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By			Date/Time	

48 of 54











Appendix C. Example of Notice of Improper Sample

WASTE SAMPLING AND CHARACTERIZATION FACILITY

NOTICE OF IMPROPER SAMPLE SUBMITTAL

Customer Name: GPP - PINNL

Sample ID: See Below Date Received: 11-24-08

Project Contact: STEVE TRENT Phone Number: \_\_\_\_\_

- Sample not iced
- Sample does not pass radiological screening
- Sample not accompanied by a Chain of Custody (COC) or Request for Special Analysis (RSA)
- Improperly completed COC or RSA
- Sample information does not agree with documentation
- Handwriting is illegible
- Sample container broken/leaking
- Sample container not labeled/label unreadable
- Sample received with custody seal broken
- Sample improperly packaged
- Preservatives not used correctly
- Improper sample container for analyses requested
- Insufficient sample quantity for requested analyses
- Holding time extended
- Other (See below)
- 

Comments:

B1XKN3, B1XKN4, B1XJBU, B1XJBU, B1XJ51, B1XHDS, B1XHR8

MISSED HOLD TIME FOR CR+6 B1XHR8 11-24-08

For information on proper sample submittal procedures, contact WSCF Sample Custodian at 373-7423 or Sample Receiving at 373-7019.

Signature (Print/Sign) Steve Trent Date: 11-24-08

Use Type	Document No.	Rev/Mod	Release Date	Page
REFERENCE	LO-090-403	I-1	01/21/2008	19 of 25