

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



M4W41-SLF-09-181

June 5, 2009

Mr. M. A. Neely, Manager  
Analytical Services  
CH2M HILL Plateau Remediation Contract  
PO Box 1600 MSIN R3-60  
Richland, WA 99352

Dear Mike:

FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20090433 – SAF NUMBER F09-035

- Reference:
- (1) Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, 'FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER'
  - (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 WSCF20090433:

- 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	J. E. Trechter S3-30
	A. J. Kopriva	S3-30	S. J. Trent R3-50
	H. K. Meznarich	S3-30	File/LB
	P. D. Mix	S3-30	

M4W41-SLF-09-181

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

# WSCF SAF NUMBER CROSS REFERENCE

---

Group#: WSCF20090433  
Data Deliverable Date: 25-jun-2009  
Data Deliverable: Cover Sheet

---

SAF#	Sample ID	WSCF#	Matrix
F09-035	B20KP2	W09GR00331	SOIL

---

M4W41-SLF-09-181

ATTACHMENT 2

**NARRATIVE**

Consisting of 4 pages  
Including cover page

## Introduction

One S&GRP sample was received at the WSCF Laboratory on May 12, 2009. Sample was analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. Copies of Issue Resolution Forms #09-049 and 09-XXX (draft) are included as Attachment 3a and Attachment 3b, respectively. 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. No anomalies were identified during sample receiving.

The following generic data qualifiers (i.e., B, D, and J) 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 wetchem analyses), as appropriate.
- **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.

## Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report*, pages 16 through 18, for a complete listing of approved analytical methods.

## Inorganic Comments

**Cyanide** – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 21 for QC details. Analytical Note(s):

- Laboratory Control Sample recovery was slightly less than established laboratory limits @ 84.1% (LCL = 85%). There was no impact on sample result.

All other QC controls are within the established limits.

**ICP-AES Metals (Bismuth)** – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 22 for QC details. Analytical Note(s):

- A copy of Issue Resolution Form #09-049 documenting analytical method change from Method 200.8 to Method 6010 is included as Attachment 3a.

All QC controls are within the established limits.

**ICP-MS Metals** – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 23 through 24 for QC details.

All QC controls are within the established limits.

**Percent Solids** - Percent solids were performed for organic analyses result correction.

### **Organic Comments**

- Sample results are moisture corrected and reported on dry weight basis.

**PCB** – The hold time requirement for this analysis was not met. See comment below. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 27 through 28 for QC details. Analytical Note(s):

- Missed Hold Time – Refer to draft IRF (Attachment 3b) for detail.

All QC controls are within the established limits.

**Semi-VOA** – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 29 through 32 for QC details.

All QC controls are within the established limits.

### **Radiochemistry Comments**

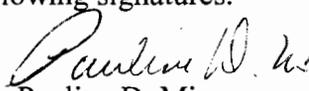
**Rad Chem** – There are no hold times associated with WSCF's radiochemical methods. A Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 36 through 40 for QC details. Analytical Note(s):

- Strontium-89/90 and 85 (tracer) – Duplicate QC was analyzed on a non-GRP sample.
- Americium-241 – Duplicate Relative Percent Difference (RPD) exceeded established laboratory limits. The RPD criterion does not apply to results near or below the minimum detectable activity.
- Uranium-233/234 and Uranium-238 – Duplicate RPDs slightly exceeded established laboratory limits due to sample homogeneity issues.

All other 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 the following signatures.

  
Scot L. Fitzgerald  
WSCF Analytical Laboratory Manager

  
Pauline D. Mix  
WSCF Client Services

M4W41-SLF-09-181

ATTACHMENT 3

**ISSUE RESOLUTION FORMS**

Consisting of 3 pages  
Including cover page

**ISSUE RESOLUTION FORM**

**CHPRC TRACKING NUMBER:** 09-049

Date : **5-12-2009**      SAF No. **F09-035**

SDG: **20090433**      LOGIN No.:      TEST: 6010 - Bismuth

Sample No.(s)      **B20KP2**

**W09GR00331**

Submitted By: PD. Mix      Submitted To: H Hampt

Phone No.      372-1488      Phone No.      376-4319

Fax No.      372-0456      Fax No

**ISSUE**

Due to a SAF error, ICP/MS – 200.8 (Add-on) was specified for Bismuth metal.

This IRF documents the correction from ICP/MS – 200.8 to ICP Metals – 6010.

**PROPOSED RESOLUTION**

Future SAFs should specify ICP Metals – 6010 for Bismuth metal analysis.

**GRP COMMENTS**

Accept proposed resolution.

Heidi Hampt 5/13/09  
Signature and Date

**ISSUE RESOLUTION FORM**

**DRAFT**

**CHPRC TRACKING NUMBER:** 00-xxx

Date : 6/3/2009

SAF No. F09-035

SDG: 20090433

LOGIN No.: TEST: PCBs – Hold Time

Sample No.(s) **B20KP2**

**W09GR00331**

Submitted By: Markus Stauffer

Submitted To: H. Hampt

Phone No. 373-7493

Phone No. 376-4319

Fax No.

Fax No.

**ISSUE**

Hold time for PCB samples:  
This sample was collected on 5/12/09 and analyzed 20 days later on 6/1/09 due to ventilation problems at WSCF; therefore the 14 day hold time specified in the S&GRP SOW of 14 days was exceeded by 6 days.

**PROPOSED RESOLUTION**

Accept results as valid. Change wording of S&GRP SOW to comply with the requirements of the Department of Ecology which says “Per the final rule, the maximum holding time for PCB analysis has been increased to one year until extraction; and one year after extraction. Per Ecology Headquarters, this increased holding time is also being applied to the SW-846 methods for PCB analysis”

Reference: J. Yokel to A.J. Stevens and R.A. Wible: *Department of Ecology's Approval of Polychlorinated Biphenyl (PCB) Method Holding Time Change*, Dept. of Ecology, 2008.

**CHPRC/BHI/WMH/PNNL COMMENTS**

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

M4W41-SLF-09-181

ATTACHMENT 4

**ANALYTICAL RESULTS**

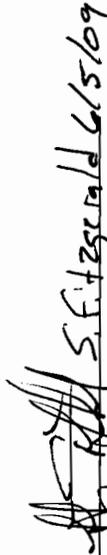
Consisting of 31 pages  
Including cover page

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

for  
**Groundwater Remediation Program**

**Richland, WA 99354**

**Attention: Steve Trent**

Analytical:  S.F. Fitzgerald 6/5/09  
Client Services:  P.D. Mc 6/5/2009

*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#: MOA-FH-CHPRC-2008  
Report#: WSCF20090433  
Report Date: 5-jun-2009  
Report WGPP/ver. 5.2  
*Groundwater Remediation Program*

Department: Inorganic

## W13q Worklist/Batch/QC Report for Group# WSCF20090433

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
				SAMPLE	W09GR00331	Percent Solids
39499	1	39923	44500	BLANK		ICP-200.8 MS All possible meta
39499	2	39923	44500	LCS		ICP-200.8 MS All possible meta
39499	4	39923	44500	MS	W09GR00331	ICP-200.8 MS All possible meta
39499	5	39923	44500	MSD	W09GR00331	ICP-200.8 MS All possible meta
39499	3	39923	44500	SAMPLE	W09GR00331	ICP-200.8 MS All possible meta
39499	5	39923	44500	SPK-RPD	W09GR00331	ICP-200.8 MS All possible meta
39507	1	39931	44510	BLANK		Cyanide by Midi/Spectrophotom
39507	2	39931	44510	LCS		Cyanide by Midi/Spectrophotom
39507	4	39931	44510	MS	W09GR00331	Cyanide by Midi/Spectrophotom
39507	5	39931	44510	MSD	W09GR00331	Cyanide by Midi/Spectrophotom
39507	3	39931	44510	SAMPLE	W09GR00331	Cyanide by Midi/Spectrophotom
39507	5	39931	44510	SPK-RPD	W09GR00331	Cyanide by Midi/Spectrophotom
39495	1	39919	44550	BLANK		ICP Metals Analysis, Grd H20 P
39495	2	39919	44550	LCS		ICP Metals Analysis, Grd H20 P
39495	14	39919	44550	MS	W09GR00331	ICP Metals Analysis, Grd H20 P
39495	15	39919	44550	MSD	W09GR00331	ICP Metals Analysis, Grd H20 P
39495	13	39919	44550	SAMPLE	W09GR00331	ICP Metals Analysis, Grd H20 P
39495	15	39919	44550	SPK-RPD	W09GR00331	ICP Metals Analysis, Grd H20 P

Department: Organic

## W13q Worklist/Batch/QC Report for Group# WSCF20090433

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
			44542	BLANK		SW-846 8270C Semi-Vols
			44542	LCS		SW-846 8270C Semi-Vols
			44542	MS	W09GR00331	SW-846 8270C Semi-Vols
			44542	MSD	W09GR00331	SW-846 8270C Semi-Vols
			44542	SAMPLE	W09GR00331	SW-846 8270C Semi-Vols
			44542	SPK-RPD	W09GR00331	SW-846 8270C Semi-Vols
			44542	SURR	W09GR00331	SW-846 8270C Semi-Vols
			44561	BLANK		PCBs complete list
			44561	LCS		PCBs complete list
			44561	MS	W09GR00331	PCBs complete list
			44561	MSD	W09GR00331	PCBs complete list
			44561	SAMPLE	W09GR00331	PCBs complete list
			44561	SPK-RPD	W09GR00331	PCBs complete list
			44561	SURR	W09GR00331	PCBs complete list

Department: Radiochemistry

## W13q Worklist/Batch/QC Report for Group# WSCF20090433

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
39490	1	39914	44499	BLANK		Gamma Energy Analysis-grd H2O
39490	2	39914	44499	LCS		Gamma Energy Analysis-grd H2O
39490	3	39914	44499	DUP	W09GR00331	Gamma Energy Analysis-grd H2O
39490	5	39914	44499	SAMPLE	W09GR00331	Gamma Energy Analysis-grd H2O
39533	1	39957	44555	BLANK		Strontium 89/90
39533	2	39957	44555	LCS		Strontium 89/90
39533	3	39957	44555	DUP	W090000200	Strontium 89/90
39533	8	39957	44555	SAMPLE	W09GR00331	Strontium 89/90
39533	9	39957	44555	SURR	W09GR00331	Strontium 89/90
39553	1	39975	44558	BLANK		Plutonium Isotopics by AEA
39553	2	39975	44558	LCS		Plutonium Isotopics by AEA
39553	3	39975	44558	DUP	W09GR00331	Plutonium Isotopics by AEA
39553	4	39975	44558	SAMPLE	W09GR00331	Plutonium Isotopics by AEA
39553	5	39975	44558	SURR	W09GR00331	Plutonium Isotopics by AEA
39552	1	39976	44559	BLANK		Americium by AEA
39552	2	39976	44559	LCS		Americium by AEA
39552	3	39976	44559	DUP	W09GR00331	Americium by AEA
39552	4	39976	44559	SAMPLE	W09GR00331	Americium by AEA
39552	5	39976	44559	SURR	W09GR00331	Americium by AEA
39554	1	39977	44570	BLANK		Uranium Isotopics by AEA
39554	2	39977	44570	LCS		Uranium Isotopics by AEA
39554	3	39977	44570	DUP	W09GR00331	Uranium Isotopics by AEA
39554	4	39977	44570	SAMPLE	W09GR00331	Uranium Isotopics by AEA
39554	5	39977	44570	SURR	W09GR00331	Uranium Isotopics by AEA

# 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-505-411</b>	<b>LA-505-411: ELEMENTAL ANALYSIS BY INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPE</b> <b>HEIS 6010_METALS_ICP</b> Inductively Coupled Plasma-Atomic Emission Spectrometry
<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> DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY COUPLED PLAS <b>HEIS 200.8_METALS_ICPMS</b> Inductively Coupled Plasma - Mass Spectrometry <b>HEIS RADISOTOPES_ICPMS</b> Radioisotopes by ICP/MS
<b>LA-519-412</b>	<b>LA-519-412: TOTAL RESIDUE/ % SOLIDS DRIED AT 103 - 105 C</b> <b>EPA-600/4-79-020 160.1</b> Residual, Filterable <b>EPA-600/4-79-020 160.3</b> RESIDUE, TOTAL <b>HEIS 160.1_TDS</b> Residual, Filterable <b>Standard Methods 2540B</b> Total Solids Dried at 103-105 C
<b>LA-695-402</b>	<b>LA-695-402: DETERMINATION OF CYANIDE BY MIDISTILLATION AND SPECTROPHOTOMETRIC</b> <b>EPA-600/4-79-020 335.2</b> Cyanide, Total <b>HEIS 335.2_CYANIDE</b> Cyanide, Total

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: 5-jun-2009  
Report#: WSCF20090433  
Report WGPPM/5.2

# WSCF METHOD REFERENCES REPORT

Department: Organic

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-523-427</b>	<b>LA-523-427: POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY</b> EPA SW-846 3510C EPA SW-846 3545 EPA SW-846 3665A EPA SW-846 8000B EPA SW-846 8082A HEIS 8082_PCB_GC	SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION PRESSURIZED FLUID EXTRACTION (PFE) SULFURIC ACID/PERMANGANATE CLEANUP DETERMINATIVE CHROMATOGRAPHIC SEPARATIONS POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY Polychlorinated Biphenyls (PCBs) by Gas Chromatography
<b>LA-523-456</b>	<b>LA-523-456: SEMIVOLATILE SAMPLE ANALYSIS BY SW-846, METHOD 8270C</b> EPA SW-846 8000B EPA SW-846 8270C HEIS 8270_SVOA_GCMS	METHOD 8270C DETERMINATIVE CHROMATOGRAPHIC SEPARATIONS SEMIVOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS) Semivolatile Organic Compounds By Gas Chromatography/Mass Spectrometry (GC/MS)

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: 5-jun-2009  
Report#: WSCF20090433  
Report WGPMM/5.2

# WSCF

## METHOD REFERENCES REPORT

Department: Radiochemistry

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-508-415</b>	<b>LA-508-415: OPERATION OF THE PROTEAN 2-INCH ALPHA/BETA COUNTING SYSTEM FOR GROSS HEIS ALPHA_GPC GROSS ALPHA GPC HEIS BETA_GPC GROSS BETA GPC HEIS SRTOT_SEP_PRECIP_GPC</b> ontium 89/90
<b>LA-508-471</b>	<b>LA-508-471: ALPHA ENERGY ANALYZER DATA ACQUISITION AND SYSTEM CHECKOUT USING ALP HEIS PUIISO_IE_PRECIP_AEA</b> Plutonium by Alpha Energy Analysis HEIS RAISO_AEA Radium-226
<b>LA-508-481</b>	<b>LA-508-481: GAMMA ENERGY ANALYSIS USING PROCOUNT SOFTWARE HEIS GAMMA_GS</b> Gamma Emission Spectrometry

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

Report Date: 5-jun-2009  
Report#: WSCF20090433  
Report WGPPI/5.2

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F09-035  
**Sample #** W09GR00331  
**Client ID:** B20KP2 GPP  
WSCF  
**Group #:** WSCF20090433  
**Department:** Inorganic  
**Sampled:** 05/12/09  
**Received:** 05/12/09

**Matrix:** SOIL

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Cyanide</b>											
	57-12-5	LA-695-402	U	< 0.200	mg/kg			1.00	0.20		05/14/09
<b>ICP Metals Analysis, Grd H2O P Prep</b>											<b>05/14/09</b>
<b>ICP Metals Analysis, Grd H2O P</b>											
	7440-69-9	LA-505-411	U	< 2.30	mg/kg			99.94	2.3		05/24/09
<b>ICP-200.8 MS All possible meta Prep</b>											<b>05/14/09</b>
<b>ICP-200.8 MS All possible meta</b>											
	7440-02-0	LA-505-412		9.71	mg/kg			0.99	0.198		05/14/09
Nickel								0.99	0.0991		05/14/09
Silver	7440-22-4	LA-505-412	U	< 0.0991	mg/kg			0.99	0.0991		05/14/09
Cadmium	7440-43-9	LA-505-412	U	< 0.0991	mg/kg			0.99	0.0991		05/14/09
Chromium	7440-47-3	LA-505-412		7.56	mg/kg			0.99	0.495		05/14/09
Lead	7439-92-1	LA-505-412		4.89	mg/kg			0.99	0.0991		05/14/09
Mercury	7439-97-6	LA-505-412	U	< 0.0495	mg/kg			0.99	0.0495		05/14/09
<b>Total solids</b>											
Total solids	TS	LA-519-412		95.4	Percent			1.00	0.0		05/20/09

**MDL = Minimum Detection Limit** U - Analyzed for but not detected above limiting criteria.(inorg)  
**RQ = Result Qualifier** U - Analyzed for but not detected above limiting criteria.(org)  
**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 COMMENT REPORT

**Attention:** Steve Trent  
**Project Number** F09-035

**Group #:** WSCF20090433  
**Department:** Inorganic

Sample #	Client ID	Lab Area	Test	Comment
----------	-----------	----------	------	---------

VALGROUP

Organics: All results are moisture corrected and reported on a dry weight basis. cgc

PCB: Sample holding time (HT) exceeded contractual HT, but EPA has removed the HT requirement for PCB samples. gar

W09GR00331 U Am-241 is flagged for poor RPD but the sample activity is near detection. RPD does not apply. lnh  
W09GR00331/U-238 & U-234 duplicate is flagged for poor RPD due to the inhomogeneity of the sample. lnh  
Cyanide: LCS for solids has been put in use with a acceptance range of 21 to 88.4 mg/kg. Result is acceptable.

**Lab Areas:** VALGROUP - Group Validation      VALTEST - Test Validation      TESTDATA - Test Data Entry  
LOGSAMP - Login for Sample      LOGTEST - Login for Tests

This report may not be reproduced, except in its entirety without the written approval of the WSCF Laboratory.

wgppc/5.2    Report#: WSCF20090433    Report Date: 5-jun-2009

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: Cyanide by Midi/Spectrophotom

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date	
<b>Lab ID: W09GR00331</b>												
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>												
MS	Cyanide by Midi/Spectrophotom	57-12-5	1.88	94.567	% Recov	75.000	125.000				05/14/09	
MSD	Cyanide by Midi/Spectrophotom	57-12-5	1.79	90.131	% Recov	75.000	125.000				05/14/09	
SPK-RPD	Cyanide by Midi/Spectrophotom	57-12-5	90.131		RPD			4.804	20.000		05/14/09	
<b>BATCH QC</b>												
BLANK	Cyanide by Midi/Spectrophotom	57-12-5	-0.2	-0.200	ug/L	-4.000	4.000				05/14/09	
LCS	Cyanide by Midi/Spectrophotom	57-12-5	46	84.095	% Recov	85.000	115.000			*	05/14/09	

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20090433

Matrix: SOLID

Test: ICP Metals Analysis, Grd H20 P

Sample Date: 05/12/09  
Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W09GR00331</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
MS	Bismuth	7440-69-9	207	102.985	% Recov	75.000	125.000				05/24/09
MSD	Bismuth	7440-69-9	203.8	103.452	% Recov	75.000	125.000				05/24/09
SPK-RPD	Bismuth	7440-69-9	103.452		RPD			0.452	20.000		05/24/09
<b>BATCH QC</b>											
BLANK	Bismuth	7440-69-9	<2.3e-2	n/a	ug/mL					U	05/24/09
LCS	Bismuth	7440-69-9	99.74	100.040	% Recov	80.000	120.000				05/24/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: ICP-200.8 MS All possible meta

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date	
<b>Lab ID: W09GR00331</b>												
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>												
MS	Silver	7440-22-4	168.5	84.250	% Recov	70.000	130.000				05/14/09	
MS	Cadmium	7440-43-9	199.4	99.700	% Recov	70.000	130.000				05/14/09	
MS	Chromium	7440-47-3	187.74	93.870	% Recov	70.000	130.000				05/14/09	
MS	Mercury	7439-97-6	1.9	95.000	% Recov	70.000	130.000				05/14/09	
MS	Nickel	7440-02-0	186.59	93.295	% Recov	70.000	130.000				05/14/09	
MS	Lead	7439-92-1	200.31	100.155	% Recov	70.000	130.000				05/14/09	
MSD	Silver	7440-22-4	194.3	97.150	% Recov	70.000	130.000				05/14/09	
MSD	Cadmium	7440-43-9	199.8	99.900	% Recov	70.000	130.000				05/14/09	
MSD	Chromium	7440-47-3	190.94	95.470	% Recov	70.000	130.000				05/14/09	
MSD	Mercury	7439-97-6	1.84	92.000	% Recov	70.000	130.000				05/14/09	
MSD	Nickel	7440-02-0	188.79	94.395	% Recov	70.000	130.000				05/14/09	
MSD	Lead	7439-92-1	201.51	100.755	% Recov	70.000	130.000				05/14/09	
SPK-RPD	Silver	7440-22-4	97.150		RPD			14.223	20.000		05/14/09	
SPK-RPD	Cadmium	7440-43-9	99.900		RPD			0.200	20.000		05/14/09	
SPK-RPD	Chromium	7440-47-3	95.470		RPD			1.690	20.000		05/14/09	
SPK-RPD	Mercury	7439-97-6	92.000		RPD			3.209	20.000		05/14/09	
SPK-RPD	Nickel	7440-02-0	94.395		RPD			1.172	20.000		05/14/09	
SPK-RPD	Lead	7439-92-1	100.755		RPD			0.597	20.000		05/14/09	
<b>BATCH QC</b>												
BLANK	Silver	7440-22-4	<0.1	n/a	ug/L					U	05/14/09	
BLANK	Cadmium	7440-43-9	<0.1	n/a	ug/L					U	05/14/09	
BLANK	Chromium	7440-47-3	<0.5	n/a	ug/L					U	05/14/09	
BLANK	Mercury	7439-97-6	<5e-2	n/a	ug/L					U	05/14/09	
BLANK	Nickel	7440-02-0	<0.2	n/a	ug/L					U	05/14/09	
BLANK	Lead	7439-92-1	<0.1	n/a	ug/L					U	05/14/09	

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: ICP-200.8 MS All possible meta

Sample Date:  
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
LCS	Silver	7440-22-4	107.2	106.139	% Recov	98.000	134.000				05/14/09
LCS	Cadmium	7440-43-9	68.27	102.662	% Recov	95.000	124.000				05/14/09
LCS	Chromium	7440-47-3	69.97	95.981	% Recov	77.000	125.000				05/14/09
LCS	Mercury	7439-97-6	7.64	92.271	% Recov	71.000	132.000				05/14/09
LCS	Nickel	7440-02-0	57.62	103.633	% Recov	90.000	121.000				05/14/09
LCS	Lead	7439-92-1	133.5	102.692	% Recov	92.000	123.000				05/14/09



# WSCF TENTATIVELY IDENTIFIED PEAK REPORT

**Attention:** Steve Trent  
**Project Number:** F09-035 :F09-035  
**Group #:** WSCF20090433  
**Department:** Organic

Sample #	Client ID	Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W09GR00331	B20KP2	GPP	SW-846 8270C Semi-Vols					
			SMP 16.674 bis(2-Ethylhexyl)phtha	117-81-7	16.6742		2.2e+02	ug/kg

**RQ=Result Qualifier**

This report may not be reproduced, except in its entirety without the written approval of the WSCF Laboratory.  
*Groundwater Remediation Program*  
 WGPPE v 5.2 Report#: WSCF20090433 Report Date: 5-jun-2009

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: PCBs complete list

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date	
<b>Lab ID: W09GR00331</b>												
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>												
MS	Aroclor-1260	11096-82-5	182.93	88.700	% Recov	75.000	125.000				06/01/09	
MS	Decachlorobiphenyl	2051-24-3	186.28	90.300	% Recov	50.000	150.000				06/01/09	
MS	Tetrachloro-m-xylene	877-09-8	181.75	88.100	% Recov	50.000	150.000				06/01/09	
MSD	Aroclor-1260	11096-82-5	194.44	95.700	% Recov	75.000	125.000				06/01/09	
MSD	Decachlorobiphenyl	2051-24-3	192.18	94.500	% Recov	50.000	150.000				06/01/09	
MSD	Tetrachloro-m-xylene	877-09-8	178.35	87.700	% Recov	50.000	150.000				06/01/09	
SPK-RPD	Aroclor-1260	11096-82-5	95.700		RPD			7.592	25.000		06/03/09	
SPK-RPD	Decachlorobiphenyl	2051-24-3	94.500		RPD			4.545	20.000		06/03/09	
SPK-RPD	Tetrachloro-m-xylene	877-09-8	87.700		RPD			0.455	20.000		06/03/09	
SURR	Decachlorobiphenyl	2051-24-3	184.14	89.900	% Recov	50.000	150.000				06/01/09	
SURR	Tetrachloro-m-xylene	877-09-8	183.53	89.600	% Recov	50.000	150.000				06/01/09	
<b>BATCH QC</b>												
BLANK	Aroclor-1016	12674-11-2	< 10	n/a	UGKG					U	06/01/09	
BLANK	Aroclor-1221	11104-28-2	< 20	n/a	ug/Kg					U	06/01/09	
BLANK	Aroclor-1232	11141-16-5	< 10	n/a	ug/Kg					U	06/01/09	
BLANK	Aroclor-1242	53469-21-9	< 10	n/a	ug/Kg					U	06/01/09	
BLANK	Aroclor-1248	12672-29-6	< 10	n/a	ug/Kg					U	06/01/09	
BLANK	Aroclor-1254	11097-69-1	< 10	n/a	ug/Kg					U	06/01/09	
BLANK	Aroclor-1260	11096-82-5	< 10	n/a	ug/Kg					U	06/01/09	
BLANK	Aroclor-1262	37324-23-5	< 10	n/a	ug/Kg					U	06/01/09	
BLANK	Aroclor-1268	11100-14-4	< 10	n/a	ug/Kg					U	06/01/09	
BLANK	Decachlorobiphenyl	2051-24-3	185.42	92.700	% Recov	50.000	150.000				06/01/09	
BLANK	Tetrachloro-m-xylene	877-09-8	184.16	92.100	% Recov	50.000	150.000				06/01/09	
LCS	Aroclor-1260	11096-82-5	184.04	92.000	% Recov	70.000	130.000				06/01/09	
LCS	Decachlorobiphenyl	2051-24-3	184.00	92.000	% Recov	50.000	150.000				06/01/09	

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: PCBs complete list

Sample Date:  
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units % Recov	Lower Limit	Upper Limit	RPD (%)	RPD Limit	RQ	Analysis Date
LCS	Tetrachloro-m-xylene	877-09-8	177.96	89.000	% Recov	50.000	150.000				06/01/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: SW-846 8270C Semi-Vols

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	1,2,4-Trichlorobenzene	120-82-1	4023.6	97.700	% Recov	75.000	121.000				05/26/09
MS	1,4-Dichlorobenzene	106-46-7	3968.5	96.400	% Recov	68.000	121.000				05/26/09
MS	2,4-Dinitrotoluene	121-14-2	3668.3	89.100	% Recov	66.000	113.000				05/26/09
MS	2-Fluorophenol(Surr)	367-12-4	4193.5	102.000	% Recov	72.000	120.000				05/26/09
MS	Acenaphthene	83-32-9	3789.7	92.100	% Recov	69.000	125.000				05/26/09
MS	4-Chloro-3-methylphenol	59-50-7	5756.3	93.200	% Recov	68.000	116.000				05/26/09
MS	2-Chlorophenol	95-57-8	5838.1	94.500	% Recov	65.000	124.000				05/26/09
MS	N-Nitrosodi-n-dipropylamine	621-64-7	4107.5	99.800	% Recov	69.000	127.000				05/26/09
MS	2-Fluorobiphenyl(Surr)	321-60-8	4211.7	102.000	% Recov	66.000	122.000				05/26/09
MS	Phenol	108-95-2	6038.8	97.800	% Recov	71.000	122.000				05/26/09
MS	Nitrobenzene-d5(Surr)	4165-60-0	4035.2	98.000	% Recov	63.000	125.000				05/26/09
MS	4-Nitrophenol	100-02-7	5301.3	85.900	% Recov	55.000	113.000				05/26/09
MS	Pentachlorophenol	87-86-5	5797.8	93.900	% Recov	50.000	113.000				05/26/09
MS	Phenol-d5(Surr)	4165-62-2	4246.0	103.000	% Recov	66.000	124.000				05/26/09
MS	Pyrene	129-00-0	4109.7	99.800	% Recov	67.000	125.000				05/26/09
MS	2,4,6-Tribromophenol(Surr)	118-79-6	4032.9	98.000	% Recov	49.000	120.000				05/26/09
MS	Terphenyl-d14(Surr)	98904-43-9	4301.3	104.000	% Recov	58.000	128.000				05/26/09
MSD	1,2,4-Trichlorobenzene	120-82-1	4091.6	99.300	% Recov	75.000	121.000				05/26/09
MSD	1,4-Dichlorobenzene	106-46-7	3974.2	96.500	% Recov	68.000	121.000				05/26/09
MSD	2,4-Dinitrotoluene	121-14-2	3756.0	91.200	% Recov	66.000	113.000				05/26/09
MSD	2-Fluorophenol(Surr)	367-12-4	4181.7	102.000	% Recov	72.000	120.000				05/26/09
MSD	Acenaphthene	83-32-9	4028.8	97.800	% Recov	69.000	125.000				05/26/09
MSD	4-Chloro-3-methylphenol	59-50-7	5957.6	96.400	% Recov	68.000	116.000				05/26/09
MSD	2-Chlorophenol	95-57-8	5934.3	96.000	% Recov	65.000	124.000				05/26/09
MSD	N-Nitrosodi-n-dipropylamine	621-64-7	4151.4	101.000	% Recov	69.000	127.000				05/26/09
MSD	2-Fluorobiphenyl(Surr)	321-60-8	4207.5	102.000	% Recov	66.000	122.000				05/26/09

Lab ID: W09GR00331  
 BATCH QC ASSOCIATED WITH SAMPLE

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: SW-846 8270C Semi-Vols

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Phenol	108-95-2	6177.8	100.000	% Recov	71.000	122.000				05/26/09
MSD	Nitrobenzene-d5(Surr)	4165-60-0	4166.6	101.000	% Recov	63.000	125.000				05/26/09
MSD	4-Nitrophenol	100-02-7	5254.3	85.000	% Recov	55.000	113.000				05/26/09
MSD	Pentachlorophenol	87-86-5	5917.3	95.800	% Recov	50.000	113.000				05/26/09
MSD	Phenol-d5(Surr)	4165-62-2	4255.2	103.000	% Recov	66.000	124.000				05/26/09
MSD	Pyrene	129-00-0	4121.0	100.000	% Recov	67.000	125.000				05/26/09
MSD	2,4,6-Tribromophenol(Surr)	118-79-6	4097.7	99.500	% Recov	49.000	120.000				05/26/09
MSD	Terphenyl-d14(Surr)	98904-43-9	4450.3	108.000	% Recov	58.000	128.000				05/26/09
SPK-RPD	1,2,4-Trichlorobenzene	120-82-1	99.300		RPD			1.624	20.000		05/26/09
SPK-RPD	1,4-Dichlorobenzene	106-46-7	96.500		RPD			0.104	20.000		05/26/09
SPK-RPD	2,4-Dinitrotoluene	121-14-2	91.200		RPD			2.329	20.000		05/26/09
SPK-RPD	2-Fluorophenol(Surr)	367-12-4	102.000		RPD			0.000	20.000		05/26/09
SPK-RPD	Acenaphthene	83-32-9	97.800		RPD			6.003	20.000		05/26/09
SPK-RPD	4-Chloro-3-methylphenol	59-50-7	96.400		RPD			3.376	20.000		05/26/09
SPK-RPD	2-Chlorophenol	95-57-8	96.000		RPD			1.575	20.000		05/26/09
SPK-RPD	N-Nitrosodi-n-dipropylamine	621-64-7	101.000		RPD			1.195	20.000		05/26/09
SPK-RPD	2-Fluorobiphenyl(Surr)	321-60-8	102.000		RPD			0.000	20.000		05/26/09
SPK-RPD	Phenol	108-95-2	100.000		RPD			2.224	20.000		05/26/09
SPK-RPD	Nitrobenzene-d5(Surr)	4165-60-0	101.000		RPD			3.015	20.000		05/26/09
SPK-RPD	4-Nitrophenol	100-02-7	85.000		RPD			1.053	20.000		05/26/09
SPK-RPD	Pentachlorophenol	87-86-5	95.800		RPD			2.003	20.000		05/26/09
SPK-RPD	Phenol-d5(Surr)	4165-62-2	103.000		RPD			0.000	20.000		05/26/09
SPK-RPD	Pyrene	129-00-0	100.000		RPD			0.200	20.000		05/26/09
SPK-RPD	2,4,6-Tribromophenol(Surr)	118-79-6	99.500		RPD			1.519	20.000		05/26/09
SPK-RPD	Terphenyl-d14(Surr)	98904-43-9	108.000		RPD			3.774	20.000		05/26/09
SURR	2-Fluorophenol(Surr)	367-12-4	3508.7	85.300	% Recov	72.000	120.000				05/26/09
SURR	2-Fluorobiphenyl(Surr)	321-60-8	3515.8	85.400	% Recov	66.000	122.000				05/26/09
SURR	Nitrobenzene-d5(Surr)	4165-60-0	3450.5	83.900	% Recov	63.000	125.000				05/26/09
SURR	Phenol-d5(Surr)	4165-62-2	3493.7	84.900	% Recov	66.000	124.000				05/26/09
SURR	2,4,6-Tribromophenol(Surr)	118-79-6	3142.2	76.400	% Recov	49.000	120.000				05/26/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: SW-846 8270C Semi-Vols

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
SURR	Terphenyl-d14(Surr)	98904-43-9	3810.8	92.600	% Recov	58.000	128.000				05/26/09
<b>BATCH QC</b>											
BLANK	1,2,4-Trichlorobenzene	120-82-1	< 150	n/a	ug/Kg					U	05/26/09
BLANK	1,4-Dichlorobenzene	106-46-7	< 250	n/a	ug/Kg					U	05/26/09
BLANK	2,4-Dinitrotoluene	121-14-2	< 150	n/a	ug/Kg					U	05/26/09
BLANK	2-Fluorophenol(Surr)	367-12-4	3895.8	97.400	% Recov	72.000	120.000			U	05/26/09
BLANK	Acenaphthene	83-32-9	< 150	n/a	ug/Kg					U	05/26/09
BLANK	4-Chloro-3-methylphenol	59-50-7	< 150	n/a	ug/Kg					U	05/26/09
BLANK	2-Chlorophenol	95-57-8	< 150	n/a	ug/Kg					U	05/26/09
BLANK	N-Nitrosodi-n-dipropylamine	621-64-7	< 150	n/a	ug/Kg					U	05/26/09
BLANK	2-Fluorobiphenyl(Surr)	321-60-8	4014.5	100.000	% Recov	66.000	122.000			U	05/26/09
BLANK	Phenol	108-95-2	< 150	n/a	ug/Kg					U	05/26/09
BLANK	Nitrobenzene-d5(Surr)	4165-60-0	3823.1	95.600	% Recov	63.000	125.000			U	05/26/09
BLANK	4-Nitrophenol	100-02-7	< 330	n/a	ug/Kg					U	05/26/09
BLANK	Pentachlorophenol	87-86-5	< 400	n/a	ug/Kg					U	05/26/09
BLANK	Phenol-d5(Surr)	4165-62-2	3955.9	98.900	% Recov	66.000	124.000			U	05/26/09
BLANK	Pyrene	129-00-0	< 150	n/a	ug/Kg					U	05/26/09
BLANK	Tributyl phosphate	126-73-8	< 150	n/a	ug/Kg					U	05/26/09
BLANK	2,4,6-Tribromophenol(Surr)	118-79-6	3224.4	80.600	% Recov	49.000	120.000			U	05/26/09
BLANK	Terphenyl-d14(Surr)	98904-43-9	4379.0	109.000	% Recov	58.000	128.000			U	05/26/09
LCS	1,2,4-Trichlorobenzene	120-82-1	3762.1	94.100	% Recov	76.000	118.000			U	05/26/09
LCS	1,4-Dichlorobenzene	106-46-7	3625.8	90.600	% Recov	68.000	121.000			U	05/26/09
LCS	2,4-Dinitrotoluene	121-14-2	3393.7	84.800	% Recov	68.000	112.000			U	05/26/09
LCS	2-Fluorophenol(Surr)	367-12-4	3903.4	97.600	% Recov	50.000	110.000			U	05/26/09
LCS	Acenaphthene	83-32-9	3711.9	92.800	% Recov	75.000	121.000			U	05/26/09
LCS	4-Chloro-3-methylphenol	59-50-7	5355.7	89.300	% Recov	68.000	117.000			U	05/26/09
LCS	2-Chlorophenol	95-57-8	5441.5	90.700	% Recov	84.000	114.000			U	05/26/09
LCS	N-Nitrosodi-n-dipropylamine	621-64-7	3782.4	94.600	% Recov	76.000	119.000			U	05/26/09
LCS	2-Fluorobiphenyl(Surr)	321-60-8	3889.2	97.200	% Recov	58.000	109.000			U	05/26/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: SW-846 8270C Semi-Vols

Sample Date:  
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
LCS	Phenol	108-95-2	5546.4	92.400	% Recov	80.000	113.000				05/26/09
LCS	Nitrobenzene-d5(Surr)	4165-60-0	3859.4	96.500	% Recov	60.000	118.000				05/26/09
LCS	4-Nitrophenol	100-02-7	4439.1	74.000	% Recov	42.000	123.000				05/26/09
LCS	Pentachlorophenol	87-86-5	5320.7	88.700	% Recov	55.000	120.000				05/26/09
LCS	Phenol-d5(Surr)	4165-62-2	3863.8	96.600	% Recov	59.000	116.000				05/26/09
LCS	Pyrene	129-00-0	3925.0	98.100	% Recov	67.000	122.000				05/26/09
LCS	2,4,6-Tribromophenol(Surr)	118-79-6	3658.5	91.500	% Recov	60.000	120.000				05/26/09
LCS	Terphenyl-d14(Surr)	98904-43-9	4298.2	107.000	% Recov	60.000	120.000				05/26/09

# WSCF ANALYTICAL COMMENT REPORT

**Attention:** Steve Trent  
**Project Number** F09-035

**Group #:** WSCF20090433  
**Department:** Organic

Sample #	Client ID	Lab Area	Test	Comment
----------	-----------	----------	------	---------

VALGROUP

Organics: All results are moisture corrected and reported on a dry weight basis. cgc

PCB: Sample holding time (HT) exceeded contractual HT, but EPA has removed the HT requirement for PCB samples. gar

W09GR00331 U Am-241 is flagged for poor RPD but the sample activity is near detection. RPD does not apply. lnh  
W09GR00331/U-238 & U-234 duplicate is flagged for poor RPD due to the inhomogeneity of the sample. lnh  
Cyanide: LCS for solids has been put in use with a acceptance range of 21 to 88.4 mg/kg. Result is acceptable.

**Lab Areas:** VALGROUP - Group Validation      VALTEST - Test Validation      TESTDATA - Test Data Entry  
LOGSAMP - Login for Sample      LOGTEST - Login for Tests

This report may not be reproduced, except in its entirety without the written approval of the WSCF Laboratory.

wgppcc/5.2      Report #: WSCF20090433      Report Date: 5-jun-2009

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F09-035  
**Sample #:** W09GR00331  
**Client ID:** B20KP2

**Group #:** WSCF20090433  
**Department:** Radiochemistry  
**Sampled:** 05/12/09  
**Received:** 05/12/09

**Matrix:** SOIL

**GPP**  
WSCF

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Americium by AEA</b>											
Americium-241	14596-10-2	LA-508-471		0.0470	pCi/g	+0.0240	pCi/g	1.00	0.016		05/29/09
Am-243 tracer by AEA	AM243	LA-508-471		4.00	pCi/g			1.00	0.016		05/29/09
<b>Gamma Energy Analysis-grd H2O</b>											
Antimony-125	14234-35-6	LA-508-481	U	2.74e-03	pCi/g	+0.0181	pCi/g	1.00	0.030		05/13/09
Cobalt-60	10198-40-0	LA-508-481	U	2.39e-03	pCi/g	+5.78e-03	pCi/g	1.00	0.010		05/13/09
Cesium-134	13967-70-9	LA-508-481	U	0.0316	pCi/g	+0.0131	pCi/g	1.00	0.014		05/13/09
Cesium-137	10045-97-3	LA-508-481	U	0.583	pCi/g	+0.0944	pCi/g	1.00	0.010		05/13/09
Europium-152	14683-23-9	LA-508-481	U	-8.83e-03	pCi/g	+0.0208	pCi/g	1.00	0.033		05/13/09
Europium-154	15585-10-1	LA-508-481	U	-0.0125	pCi/g	+0.0186	pCi/g	1.00	0.031		05/13/09
Europium-155	14391-16-3	LA-508-481	U	0.0610	pCi/g	+0.0378	pCi/g	1.00	0.046		05/13/09
Radium-226	13982-63-3	LA-508-481	U	0.430	pCi/g	+0.0724	pCi/g	1.00	0.021		05/13/09
Radium-228	15262-20-1	LA-508-481	U	0.726	pCi/g	+0.124	pCi/g	1.00	0.032		05/13/09
<b>Plutonium Isotopics by AEA</b>											
Plutonium-238	13981-16-3	LA-508-471	U	-0.0110	pCi/g	+0.0421	pCi/g	1.00	0.074		05/29/09
Pu-239/240 by AEA	PU-239/240	LA-508-471	U	0.0110	pCi/g	+0.0102	pCi/g	1.00	0.016		05/29/09
Pu-242	13982-10-0	LA-508-471	U	6.20	pCi/g			1.00	0.020		05/29/09
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-0.810	pCi/g	+0.810	pCi/g	1.00	0.32		05/26/09
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		97.6	Percent			1.00	0.0		05/26/09
<b>Uranium Isotopics by AEA</b>											
Uranium-233/234	U-233/234	LA-508-471	U	0.120	pCi/g	+0.0432	pCi/g	1.00	0.013		06/01/09
Uranium-235	15117-96-1	LA-508-471	U	0.0140	pCi/g	+0.0112	pCi/g	1.00	5.2e-03		06/01/09
Uranium-238	U-238	LA-508-471	U	0.110	pCi/g	+0.0396	pCi/g	1.00	4.8e-03		06/01/09
U-232 tracer by AEA	U232	LA-508-471	U	4.10	pCi/g			1.00	0.037		06/01/09

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

\* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols  
 Report WGP/ver. 5.2

Groundwater Remediation Program

# WSCF TENTATIVELY IDENTIFIED PEAK REPORT

**Attention:** Steve Trent  
**Project Number:** F09-035 :F09-035  
**Group #:** WSCF20090433  
**Department:** Radiochemistry

Sample #	Client ID	Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.61	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				18	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.53	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				19	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.59	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				13	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				14	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				13	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.83	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				8.9	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.90	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				22	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.13	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				26	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.92	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				25	%
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				0.24	pCi/g
W09GR00331	B20KP2	GPP	Gamma Energy Analysis-grd H2O				14	%

RQ = Result Qualifier

This report may not be reproduced, except in its entirety without the written approval of the WSCF Laboratory.

*Groundwater Remediation Program*

WGPE v 5.2 Report#: WSCF20090433 Report Date: 5-jun-2009

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: Gamma Energy Analysis-grd H2O

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Cobalt-60	10198-40-0	U1.587e-3		RPD			n/a	20.000		05/14/09
DUP	Cesium-134	13967-70-9	U3.49e-2		RPD			n/a	20.000		05/14/09
DUP	Cesium-137	10045-97-3	0.5787		RPD			0.775	20.000		05/14/09
DUP	Europium-152	14683-23-9	U-3.29e-3		RPD			n/a	20.000		05/14/09
DUP	Europium-154	15585-10-1	U1.628e-2		RPD			n/a	20.000		05/14/09
DUP	Europium-155	14391-16-3	U6.574e-2		RPD			n/a	20.000		05/14/09
DUP	Radium-226	13982-63-3	0.4642		RPD			7.533	20.000		05/14/09
DUP	Radium-228	15262-20-1	0.7349		RPD			1.177	20.000		05/14/09
DUP	Antimony-125	14234-35-6	U-7.894e-3		RPD			n/a	20.000		05/14/09
<b>BATCH QC</b>											
BLANK	Cobalt-60	10198-40-0	U-2.168e-3	n/a	pCi/g	-10.000	1000.000				05/14/09
BLANK	Cesium-134	13967-70-9	U2.763e-3	n/a	pCi/g	-10.000	1000.000				05/14/09
BLANK	Cesium-137	10045-97-3	U-1.062e-3	n/a	pCi/g	-10.000	1000.000				05/14/09
BLANK	Europium-152	14683-23-9	U-1.245e-4	n/a	pCi/g	-10.000	1000.000				05/14/09
BLANK	Europium-154	15585-10-1	U-7.215e-3	n/a	pCi/g	-10.000	1000.000				05/14/09
BLANK	Europium-155	14391-16-3	U-5.725e-3	n/a	pCi/g	-10.000	1000.000				05/14/09
BLANK	Radium-226	13982-63-3	3.718e-2	0.037	pCi/g	-10.000	1000.000				05/14/09
BLANK	Radium-228	15262-20-1	5.441e-2	0.054	pCi/g	-10.000	1000.000				05/14/09
BLANK	Antimony-125	14234-35-6	U-8.435e-4	n/a	pCi/g	-10.000	1000.000				05/14/09
LCS	Cobalt-60	10198-40-0	10270	103.320	% Recov	80.000	120.000				05/14/09
LCS	Cesium-137	10045-97-3	6113	101.209	% Recov	80.000	120.000				05/14/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: Americium by AEA

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD (%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W09GR00331</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Americium-241	14596-10-2	3.2e-2		RPD			37.975	20.000 *		05/29/09
DUP	Am-243 tracer by AEA	AM243	3.969	58.310	% Recov	30.000	105.000				05/29/09
SURR	Am-243 tracer by AEA	AM243	3.969	60.710	% Recov	30.000	105.000				05/29/09
<b>BATCH QC</b>											
BLANK	Americium-241	14596-10-2	2.9e-2	0.029	pCi/g	-10.000	1000.000				05/29/09
BLANK	Am-243 tracer by AEA	AM243	3.969	73.420	% Recov	30.000	105.000				05/29/09
LCS	Americium-241	14596-10-2	12.32	103.966	% Recov	80.000	120.000				05/29/09
LCS	Am-243 tracer by AEA	AM243	11.1	78.030	% Recov	30.000	105.000				05/29/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: Plutonium Isotopics by AEA

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W09GR00331</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Plutonium-238	13981-16-3	U-1.7e-3		RPD			n/a	20.000		05/29/09
DUP	Pu-239/240 by AEA	PU-239/240	U6.7e-3		RPD			n/a	20.000		05/29/09
DUP	Pu-242	13982-10-0	6.2	97.806	% Recov	30.000	105.000				05/29/09
SURR	Pu-242	13982-10-0	6.211	79.650	% Recov	30.000	105.000				05/29/09
<b>BATCH QC</b>											
BLANK	Plutonium-238	13981-16-3	U1.5e-2	n/a	pCi/g	-10.000	1000.000				05/29/09
BLANK	Pu-239/240 by AEA	PU-239/240	2.2e-2	0.022	pCi/g	-10.000	1000.000				05/29/09
BLANK	Pu-242	PU242	6.211	99.200	% Recov	30.000	105.000				05/29/09
LCS	Pu-239/240 by AEA	PU-239/240	14	108.992	% Recov	80.000	120.000				05/29/09
LCS	Pu-242	PU242	17.34	90.470	% Recov	30.000	105.000				05/29/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: Strontium 89/90

Sample Date: 05/07/09  
 Receive Date: 05/07/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W090000200</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Sr-85 Tracer by Beta Counting	SR85	103.2	103.200	% Recov	30.000	105.000				05/26/09
DUP	Strontium-89/90	SR-RAD	U-8.1E-01		RPD			n/a	20.000		05/26/09
<b>Lab ID: W09GR00331</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
SURR	Sr-85 Tracer by Beta Counting	SR85	97.6	97.600	% Recov	30.000	105.000				05/26/09
<b>BATCH QC</b>											
BLANK	Sr-85 Tracer by Beta Counting	SR85	103.3	103.300	% Recov	30.000	105.000				05/26/09
BLANK	Strontium-89/90	10098-97-2	2.9E-01	0.290	pCi/g	-10.000	300.000				05/26/09
LCS	Sr-85 Tracer by Beta Counting	SR85	100.9	100.900	% Recov	30.000	105.000				05/26/09
LCS	Strontium-89/90	10098-97-2	70.6	99.521	% Recov	80.000	120.000				05/26/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20090433  
 Matrix: SOLID  
 Test: Uranium Isotopics by AEA

Sample Date: 05/12/09  
 Receive Date: 05/12/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W09GR00331</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	U-232 tracer by AEA	U232	4.064	96.180	% Recov	30.000	105.000				06/01/09
DUP	Uranium-233/234	U-233/234	0.15		RPD			22.222	20.000 *		06/01/09
DUP	Uranium-235	15117-96-1	1.5e-2		RPD			6.897	20.000		06/01/09
DUP	Uranium-238	U-238	0.14		RPD			24.000	20.000 *		06/01/09
SURR	U-232 tracer by AEA	U232	4.072	91.770	% Recov	30.000	105.000				06/01/09
<b>BATCH QC</b>											
BLANK	U-232 tracer by AEA	U232	4.097	83.440	% Recov	30.000	105.000				06/01/09
BLANK	Uranium-233/234	13966-29-5	2.1e-2	0.021	pCi/g	-10.000	1000.000				06/01/09
BLANK	Uranium-235	15117-96-1	U6.4e-3	n/a	pCi/g	-10.000	1000.000				06/01/09
BLANK	Uranium-238	24678-82-8	9.7e-3	0.010	pCi/g	-10.000	1000.000				06/01/09
LCS	U-232 tracer by AEA	U232	11.37	90.760	% Recov	30.000	105.000				06/01/09
LCS	Uranium-233/234	13966-29-5	n/a	n/a	% Recov	75.000	125.000				06/01/09
LCS	Uranium-235	15117-96-1	n/a	n/a	% Recov	75.000	125.000				06/01/09
LCS	Uranium-238	24678-82-8	22.11	116.645	% Recov	80.000	120.000				06/01/09

# WSCF ANALYTICAL COMMENT REPORT

**Attention:** Steve Trent  
**Project Number** F09-035

**Group #:** WSCF20090433  
**Department:** Radiochemistry

Sample #	Client ID	Lab Area	Test	Comment
----------	-----------	----------	------	---------

VALGROUP

Organics: All results are moisture corrected and reported on a dry weight basis. cgc

PCB: Sample holding time (HT) exceeded contractual HT, but EPA has removed the HT requirement for PCB samples. gar

W09GR00331 U Am-241 is flagged for poor RPD but the sample activity is near detection. RPD does not apply. lmh  
W09GR00331/U-238 & U-234 duplicate is flagged for poor RPD due to the inhomogeneity of the sample. lmh  
Cyanide: LCS for solids has been put in use with a acceptance range of 21 to 88.4 mg/kg. Result is acceptable.

**Lab Areas:** VALGROUP - Group Validation      VALTEST - Test Validation      TESTDATA - Test Data Entry  
LOGSAMP - Login for Sample      LOGTEST - Login for Tests

This report may not be reproduced, except in its entirety without the written approval of the WSCF Laboratory.

wgppc/5.2      Report#: WSCF20090433      Report Date: 5-jun-2009

M4W41-SLF-09-181

ATTACHMENT 5

**SAMPLE RECEIPT INFORMATION**

Consisting of 3 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

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Groundwater Remediation Program

Richland, WA 99354  
Attn: Steve Trent

Customer Code: GPP  
PO#: 301382/ES10  
Group#: 20090433  
Project#: F09-035  
Proj Mgr: STEVE TRENT  
Phone: 373-5869

The following samples were received from you on 05/12/09. 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
W09GR00331	B20KP2	GPP @2008 @AEA-30 @AEA-31 @AEA-32 @GPP6010 @PCBGPP @SR89_90 @SVOCGPP	Solid, or handle as if solid @GEA-GPP CN-02	05/12/09 PERSO

Test Acronym Description

Test Acronym	Description
@2008	ICP-200.8 MS All possible meta
@AEA-30	Plutonium Isotopics by AEA
@AEA-31	Americium by AEA
@AEA-32	Uranium Isotopics by AEA
@GEA-GPP	Gamma Energy Analysis-grd H2O
@GPP6010	ICP Metals Analysis, Grd H2O P
@PCBGPP	PCBs complete list
@SR89_90	Strontium 89/90
@SVOCGPP	SW-846 8270C Semi-Vols
CN-02	Cyanide by Midi/Spectrophotom
PERSOLID	Percent Solids

