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FLUOR

Memorandum

M4W41-SLF-08-343

To: H. Hampt E6-35 Date: March 31, 2008

From: S. L. Fitzgerald, Manager
WSCF Analytical Lab

cc: w/Attachments

T. F. Dale	S3-30	J. E. Trechter	S3-30
H. K. Meznarich	S3-30	S. J. Trent	E6-35
P. D. Mix	S3-30	File/LB	

Subject: FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20080280 – SAF NUMBER F08-040

Reference:
(1) Groundwater Protection Program-Letter of Instruction, FH-EIS-2003-MEM-001, October 31, 2002

(2) HNF-SD-CD-QAPP-017, Rev. 8, Waste Sampling & Characterization Facility Quality Assurance Plan

This letter contains the following information for sample delivery group WSCF20080280:

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

SLF/cmj

Attachments 4

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ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF NUMBER CROSS REFERENCE

Group#:	WSCF20080280	
Data Deliverable Date:	28-mar-2008	
Data Deliverable:	Cover Sheet	

SAF#	Sample ID	WSCF#	Matrix
F08-040	B1T735	W08GR00301	WATER

M4W41-SLF-08-343

ATTACHMENT 2

NARRATIVE

Consisting of 3 pages
Including cover page

Attachment 2
Narrative
WSCF20080280

Introduction

One (1) S&GRP sample was received at the WSCF Laboratory on February 14, 2008. Sample was analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, 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,* pages 11-12, for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Holding time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per GRP Letter of Instruction. See pages 15-16 for QC details.

All QC controls are within the established limits.

ICP-AES 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 per the GRP Letter of Instruction. See pages 17-20 for QC details.

- Matrix Spike and Matrix Spike Duplicate analyzed on samples B1T1T7 (SDG 20080308, SAF F08-037) and B1TFL8 (SDG 20080349, SAF F08-039).
- Aluminum, Magnesium and Potassium preparation blanks showed positive values resulting in "C" flags if applicable.
- Matrix Spike recovery for sample B1TFL8 reported as part of the QC for this analytical batch, even though not submitted as a sample for this SDG, was outside acceptance limits. The Matrix Spike recovery for B1T735 (the sample submitted in this delivery group) was within acceptance limits, resulting in no flag being applied.

All QC controls are within the established limits.

ICP-MS Metals – The holding time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per the GRP Letter of Instruction. See page 21 for QC details.

- Matrix Spike and Matrix Spike Duplicate analyzed on sample B1T1T7 (SDG 20080308, SAF F08-037).
- Mercury Laboratory Control Sample recovery outside acceptance limit by ~ 4%, but all other QC acceptable resulting in acceptance of sample result.

All other QC controls are within the established limits.

Radiochemistry Comments

There are no holding times associated with WSCF's radiochemical methods.

A Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group for GEA and Gross Alpha/Beta. A Blank and Laboratory Control Sample were analyzed for Tc-99 by ICP-MS. See page 25-27 for QC details.

- Ra-226 Duplicate by GEA resulted in an RPD outside acceptance limits. All other QC was within analytical limits resulting in acceptance of sample result.

All QC controls are within the established limits.

I certify that this data package is in compliance with the LOI, 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

John E. Trechter
WSCF Client Services

M4W41-SLF-08-343

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 21 pages
Including cover page

WSCF
ANALYTICAL RESULTS REPORT

for

Groundwater Remediation Program

Richland, WA 99354

Attention: Steve Trent

Analytical: S. Fitzgerald 4/1/08

Client Services: John Trechter 3/31/08

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

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Contract#: FH-EIS-2003-MEM-001
Report#: WSCF20080280
Report Date: 28-mar-2008
Report WGPP/ver. 5.2
Groundwater Remediation Program

w13qlog v4.2 28-mar-2008 12:14:30

Department: Inorganic

W13q Worklist/Batch/QC Report for Group# WSCF20080280

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
35183	2	35587	39860	BLANK		Anions by Ion Chromatography
35183	8	35587	39860	BLANK		Anions by Ion Chromatography
35183	3	35587	39860	LCS		Anions by Ion Chromatography
35183	5	35587	39860	DUP	W08GR00301	Anions by Ion Chromatography
35183	6	35587	39860	MS	W08GR00301	Anions by Ion Chromatography
35183	7	35587	39860	MSD	W08GR00301	Anions by Ion Chromatography
35183	4	35587	39860	SAMPLE	W08GR00301	Anions by Ion Chromatography
35183	7	35587	39860	SPK-RPD	W08GR00301	Anions by Ion Chromatography
35414	1	35820	40134	BLANK		ICP Metals Analysis, Grd H20 P
35414	2	35820	40134	LCS		ICP Metals Analysis, Grd H20 P
35414	8	35820	40134	MS	W08GR00301	ICP Metals Analysis, Grd H20 P
35414	9	35820	40134	MSD	W08GR00301	ICP Metals Analysis, Grd H20 P
35414	7	35820	40134	SAMPLE	W08GR00301	ICP Metals Analysis, Grd H20 P
35414	9	35820	40134	SPK-RPD	W08GR00301	ICP Metals Analysis, Grd H20 P
35414	11	35820	40134	MS	W08GR00318	ICP Metals Analysis, Grd H20 P
35414	12	35820	40134	MSD	W08GR00318	ICP Metals Analysis, Grd H20 P
35414	12	35820	40134	SPK-RPD	W08GR00318	ICP Metals Analysis, Grd H20 P
35414	4	35820	40134	MS	W08GR00351	ICP Metals Analysis, Grd H20 P
35414	5	35820	40134	MSD	W08GR00351	ICP Metals Analysis, Grd H20 P
35414	5	35820	40134	SPK-RPD	W08GR00351	ICP Metals Analysis, Grd H20 P
35520	1	35926	40252	BLANK		ICP-200.8 MS All possible meta
35520	2	35926	40252	LCS		ICP-200.8 MS All possible meta
35520	9	35926	40252	SAMPLE	W08GR00301	ICP-200.8 MS All possible meta
35520	3	35926	40252	MS	W08GR00318	ICP-200.8 MS All possible meta
35520	4	35926	40252	MSD	W08GR00318	ICP-200.8 MS All possible meta
35520	4	35926	40252	SPK-RPD	W08GR00318	ICP-200.8 MS All possible meta

w13qlog v4.2 28-mar-2008 12:14:30

Department: Radiochemistry

W13q Worklist/Batch/QC Report for Group# WSCF20080280

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
35237	1	35641	39932	BLANK		TC99 by ICP-200.8 MS
35237	5	35641	39932	BLANK		TC99 by ICP-200.8 MS
35237	2	35641	39932	LCS		TC99 by ICP-200.8 MS
35237	6	35641	39932	LCS		TC99 by ICP-200.8 MS
35237	3	35641	39932	SAMPLE	W08GR00301	TC99 by ICP-200.8 MS
35240	1	35644	40000	BLANK		Gamma Energy Analysis-grd H2O
35240	2	35644	40000	LCS		Gamma Energy Analysis-grd H2O
35240	3	35644	40000	DUP	W08GR00301	Gamma Energy Analysis-grd H2O
35240	4	35644	40000	SAMPLE	W08GR00301	Gamma Energy Analysis-grd H2O
35732	1	36138	40435	BLANK		Gross Alpha/Gross Beta (AB32)
35732	2	36138	40435	LCS		Gross Alpha/Gross Beta (AB32)
35732	3	36138	40435	DUP	W08GR00301	Gross Alpha/Gross Beta (AB32)
35732	4	36138	40435	SAMPLE	W08GR00301	Gross Alpha/Gross Beta (AB32)

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.

LA-505-411	LA-505-411: ELEMENTAL ANALYSIS BY INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPE	
	HEIS 6010_METALS_ICP	Inductively Coupled Plasma-Atomic Emmision Spectrometry
LA-505-412	LA-505-412: DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY	
	EPA-600/R-94-111 200.8	DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY COUPLED PLAS
	HEIS 200.8_METALS_ICPMS	Inductively Coupled Plasma - Mass Spectrometry
	HEIS RADISOTOPES_ICPMS	Radioisotopes by ICP/MS
LA-533-410	LA-533-410: ANION ANALYSIS BY ION CHROMATOGRAPHY	
	EPA-600/R-94-111 300.0	DETERMINATION OF INORGANIC ANIONS BY ION CHROMATOGRAPHY
	HEIS 300.0_ANIONS_IC	Determination of Inorganic Anions by Ion Chromatography

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.

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.

LA-508-415 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_GP	Strontium 89/90

LA-508-481 LA-508-481: GAMMA ENERGY ANALYSIS USING PROCOUNT SOFTWARE

HEIS GAMMA_GS	Gamma Emmision Spectrometry

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.

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-040
Sample # W08GR00301
Client ID: B1T735 GPP TRENT WSCF

Matrix: WATER

Group #: WSCF20080280
Department: Inorganic
Sampled: 02/14/08
Received: 02/14/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Anions by Ion Chromatography											
Fluoride	16984-48-8	LA-533-410	U	< 6.00e-03	mg/L			1.00	6.0e-03		02/15/08
Chloride	16887-00-6	LA-533-410	U	< 0.0300	mg/L			1.00	0.030		02/15/08
Nitrogen in Nitrite	NO2-N	LA-533-410	U	< 0.0100	mg/L			1.00	0.010		02/15/08
Nitrogen in Nitrate	NO3-N	LA-533-410	B	0.0541	mg/L			1.00	5.0e-03		02/15/08
Phosphate (P) by IC	PO4-P	LA-533-410	U	< 0.0400	mg/L			1.00	0.040		02/15/08
Sulfate	14808-79-8	LA-533-410	U	< 0.0700	mg/L			1.00	0.070		02/15/08
ICP Metals Analysis, Grd H20 P Prep											**03/04/08**
ICP Metals Analysis, Grd H20 P											
Aluminum	7429-90-5	LA-505-411	U	< 30.0	ug/L			1.00	30		03/05/08
Iron	7439-89-6	LA-505-411		10.4	ug/L			1.00	9.0		03/05/08
Magnesium	7439-95-4	LA-505-411	U	< 6.00	ug/L			1.00	6.0		03/05/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		03/05/08
Potassium	7440-09-7	LA-505-411	C	100	ug/L			1.00	45		03/05/08
Sodium	7440-23-5	LA-505-411	U	< 27.0	ug/L			1.00	27		03/05/08
Calcium	7440-70-2	LA-505-411		41.5	ug/L			1.00	34		03/05/08
Selenium	7782-49-2	LA-505-411	U	< 30.0	ug/L			1.00	30		03/05/08
ICP-200.8 MS All possible meta Prep											**03/12/08**
ICP-200.8 MS All possible meta											
Mercury	7439-97-6	LA-505-412	U	< 0.0500	ug/L			1.00	0.0500		03/12/08

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)

C - The Analyte was found in the Associated Blank.(inorg)
U - Analyzed for but not detected above limiting criteria.

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

WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent
Project Number F08-040

Group #: WSCF20080280
Department: Inorganic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		W08GR00301/Ra226 is flagged for poor RPD. Since all the other QC checks came out fine, this batch has been approved. lmh ICP-AES: High aluminum, magnesium, and potassium preparation blank results; "C" flag if applicable.

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

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

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20080280
Matrix: WATER
Test: Anions by Ion Chromatography

Sample Date: 02/14/08
Receive Date:02/14/08

Lab ID: W08GR00301
BATCH QC ASSOCIATED WITH SAMPLE

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
DUP	Chloride	16887-00-6	<3e-2		RPD			n/a	20.000	U	02/15/08
DUP	Fluoride	16984-48-8	<6e-3		RPD			n/a	20.000	U	02/15/08
DUP	Nitrogen in Nitrite	NO2-N	<1e-2		RPD			n/a	20.000	U	02/15/08
DUP	Nitrogen in Nitrate	NO3-N	5.5e-2		RPD			1.650	20.000		02/15/08
DUP	Phosphate (P) by IC	PO4-P	<4e-2		RPD			n/a	20.000	U	02/15/08
DUP	Sulfate	14808-79-8	<7e-2		RPD			n/a	20.000	U	02/15/08
MS	Chloride	16887-00-6	0.9203	92.492	% Recov	75.000	125.000				02/15/08
MS	Fluoride	16984-48-8	0.4644	94.199	% Recov	75.000	125.000				02/15/08
MS	Nitrogen in Nitrite	NO2-N	0.4685	95.224	% Recov	75.000	125.000				02/15/08
MS	Nitrogen in Nitrate	NO3-N	0.4486	100.583	% Recov	75.000	125.000				02/15/08
MS	Phosphate (P) by IC	PO4-P	0.8949	93.511	% Recov	75.000	125.000				02/15/08
MS	Sulfate	14808-79-8	1.8432	94.041	% Recov	75.000	125.000				02/15/08
MSD	Chloride	16887-00-6	0.9549	95.970	% Recov	75.000	125.000				02/15/08
MSD	Fluoride	16984-48-8	0.4706	95.456	% Recov	75.000	125.000				02/15/08
MSD	Nitrogen in Nitrite	NO2-N	0.4856	98.699	% Recov	75.000	125.000				02/15/08
MSD	Nitrogen in Nitrate	NO3-N	0.4463	100.067	% Recov	75.000	125.000				02/15/08
MSD	Phosphate (P) by IC	PO4-P	0.9028	94.336	% Recov	75.000	125.000				02/15/08
MSD	Sulfate	14808-79-8	1.8523	94.505	% Recov	75.000	125.000				02/15/08
SPK-RPD	Chloride	16887-00-6	95.970		RPD			3.691	20.000		02/15/08
SPK-RPD	Fluoride	16984-48-8	95.456		RPD			1.326	20.000		02/15/08
SPK-RPD	Nitrogen in Nitrite	NO2-N	98.699		RPD			3.584	20.000		02/15/08
SPK-RPD	Nitrogen in Nitrate	NO3-N	100.067		RPD			0.514	20.000		02/15/08
SPK-RPD	Phosphate (P) by IC	PO4-P	94.336		RPD			0.878	20.000		02/15/08
SPK-RPD	Sulfate	14808-79-8	94.505		RPD			0.492	20.000		02/15/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20080280
Matrix: WATER
Test: Anions by Ion Chromatography

Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
BATCH QC											
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	02/15/08
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	02/15/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	02/15/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	02/15/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	02/15/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	02/15/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	02/15/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	02/15/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	02/15/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	02/15/08
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	02/15/08
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	02/15/08
LCS	Chloride	16887-00-6	193.813	96.424	% Recov	80.000	120.000				02/15/08
LCS	Fluoride	16984-48-8	103.3874	103.803	% Recov	80.000	120.000				02/15/08
LCS	Nitrogen in Nitrite	NO2-N	99.4388	100.039	% Recov	80.000	120.000				02/15/08
LCS	Nitrogen in Nitrate	NO3-N	90.9479	100.941	% Recov	80.000	120.000				02/15/08
LCS	Phosphate (P) by IC	PO4-P	194.1161	100.370	% Recov	80.000	120.000				02/15/08
LCS	Sulfate	14808-79-8	383.8499	96.932	% Recov	80.000	120.000				02/15/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20080280
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 02/14/08
Receive Date:02/14/08

Lab ID: W08GR00301
BATCH QC ASSOCIATED WITH SAMPLE

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	Aluminum	7429-90-5	948.6	94.860	% Recov	75.000	125.000				03/05/08
MS	Calcium	7440-70-2	1037.5	103.750	% Recov	75.000	125.000				03/05/08
MS	Iron	7439-89-6	977	97.700	% Recov	75.000	125.000				03/05/08
MS	Potassium	7440-09-7	10029.9	100.299	% Recov	75.000	125.000				03/05/08
MS	Magnesium	7439-95-4	948.1	94.810	% Recov	75.000	125.000				03/05/08
MS	Manganese	7439-96-5	993.2	99.320	% Recov	75.000	125.000				03/05/08
MS	Sodium	7440-23-5	993.2	99.320	% Recov	75.000	125.000				03/05/08
MS	Selenium	7782-49-2	980.3	98.030	% Recov	75.000	125.000				03/05/08
MSD	Aluminum	7429-90-5	941.6	94.160	% Recov	75.000	125.000				03/05/08
MSD	Calcium	7440-70-2	1039.5	103.950	% Recov	75.000	125.000				03/05/08
MSD	Iron	7439-89-6	976.9	97.690	% Recov	75.000	125.000				03/05/08
MSD	Potassium	7440-09-7	9949.9	99.499	% Recov	75.000	125.000				03/05/08
MSD	Magnesium	7439-95-4	942.7	94.270	% Recov	75.000	125.000				03/05/08
MSD	Manganese	7439-96-5	990.2	99.020	% Recov	75.000	125.000				03/05/08
MSD	Sodium	7440-23-5	994.1	99.410	% Recov	75.000	125.000				03/05/08
MSD	Selenium	7782-49-2	1011	101.100	% Recov	75.000	125.000				03/05/08
SPK-RPD	Aluminum	7429-90-5	94.160		RPD			0.741	20.000		03/05/08
SPK-RPD	Calcium	7440-70-2	103.950		RPD			0.193	20.000		03/05/08
SPK-RPD	Iron	7439-89-6	97.690		RPD			0.010	20.000		03/05/08
SPK-RPD	Potassium	7440-09-7	99.499		RPD			0.801	20.000		03/05/08
SPK-RPD	Magnesium	7439-95-4	94.270		RPD			0.571	20.000		03/05/08
SPK-RPD	Manganese	7439-96-5	99.020		RPD			0.303	20.000		03/05/08
SPK-RPD	Sodium	7440-23-5	99.410		RPD			0.091	20.000		03/05/08
SPK-RPD	Selenium	7782-49-2	101.100		RPD			3.083	20.000		03/05/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20080280
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 02/20/08
Receive Date:02/20/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR00318											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Aluminum	7429-90-5	910.6	91.060	% Recov	75.000	125.000				03/05/08
MS	Calcium	7440-70-2	1016	101.600	% Recov	75.000	125.000				03/05/08
MS	Iron	7439-89-6	945	94.500	% Recov	75.000	125.000				03/05/08
MS	Potassium	7440-09-7	9471.3	94.713	% Recov	75.000	125.000				03/05/08
MS	Magnesium	7439-95-4	897.5	89.750	% Recov	75.000	125.000				03/05/08
MS	Sodium	7440-23-5	979.1	97.910	% Recov	75.000	125.000				03/05/08
MSD	Aluminum	7429-90-5	933.4	93.340	% Recov	75.000	125.000				03/05/08
MSD	Calcium	7440-70-2	1027	102.700	% Recov	75.000	125.000				03/05/08
MSD	Iron	7439-89-6	945.6	94.560	% Recov	75.000	125.000				03/05/08
MSD	Potassium	7440-09-7	9682.3	96.823	% Recov	75.000	125.000				03/05/08
MSD	Magnesium	7439-95-4	917.5	91.750	% Recov	75.000	125.000				03/05/08
MSD	Sodium	7440-23-5	993.1	99.310	% Recov	75.000	125.000				03/05/08
SPK-RPD	Aluminum	7429-90-5	93.340		RPD			2.473	20.000		03/05/08
SPK-RPD	Calcium	7440-70-2	102.700		RPD			1.077	20.000		03/05/08
SPK-RPD	Iron	7439-89-6	94.560		RPD			0.063	20.000		03/05/08
SPK-RPD	Potassium	7440-09-7	96.823		RPD			2.203	20.000		03/05/08
SPK-RPD	Magnesium	7439-95-4	91.750		RPD			2.204	20.000		03/05/08
SPK-RPD	Sodium	7440-23-5	99.310		RPD			1.420	20.000		03/05/08
Lab ID: W08GR00351											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Aluminum	7429-90-5	1326	132.600	% Recov	75.000	125.000				03/05/08
MS	Calcium	7440-70-2	NA	n/a	% Recov	75.000	125.000				03/05/08
MS	Iron	7439-89-6	780.7	78.070	% Recov	75.000	125.000				03/05/08
MS	Potassium	7440-09-7	9509	95.090	% Recov	75.000	125.000				03/05/08
MS	Magnesium	7439-95-4	NA	n/a	% Recov	75.000	125.000				03/05/08
MS	Manganese	7439-96-5	867.1	86.710	% Recov	75.000	125.000				03/05/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20080280
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 02/25/08
Receive Date:02/25/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	Sodium	7440-23-5	NA	n/a	% Recov	75.000	125.000				03/05/08
MSD	Aluminum	7429-90-5	1225	122.500	% Recov	75.000	125.000				03/05/08
MSD	Calcium	7440-70-2	NA	n/a	% Recov	75.000	125.000				03/05/08
MSD	Iron	7439-89-6	917	91.700	% Recov	75.000	125.000				03/05/08
MSD	Potassium	7440-09-7	10719	107.190	% Recov	75.000	125.000				03/05/08
MSD	Magnesium	7439-95-4	NA	n/a	% Recov	75.000	125.000				03/05/08
MSD	Manganese	7439-96-5	875.3	87.530	% Recov	75.000	125.000				03/05/08
MSD	Sodium	7440-23-5	NA	n/a	% Recov	75.000	125.000				03/05/08
SPK-RPD	Aluminum	7429-90-5	122.500		RPD			7.918	20.000		03/05/08
SPK-RPD	Calcium	7440-70-2			RPD			n/a	20.000		03/05/08
SPK-RPD	Iron	7439-89-6	91.700		RPD			16.057	20.000		03/05/08
SPK-RPD	Potassium	7440-09-7	107.190		RPD			11.964	20.000		03/05/08
SPK-RPD	Magnesium	7439-95-4			RPD			n/a	20.000		03/05/08
SPK-RPD	Manganese	7439-96-5	87.530		RPD			0.941	20.000		03/05/08
SPK-RPD	Sodium	7440-23-5			RPD			n/a	20.000		03/05/08
BATCH QC											
BLANK	Aluminum	7429-90-5	34.3	34.300	ug/L						03/05/08
BLANK	Calcium	7440-70-2	<34	n/a	ug/L					U	03/05/08
BLANK	Iron	7439-89-6	<9	n/a	ug/L					U	03/05/08
BLANK	Potassium	7440-09-7	107	107.000	ug/L						03/05/08
BLANK	Magnesium	7439-95-4	21.8	21.800	ug/L						03/05/08
BLANK	Manganese	7439-96-5	<4	n/a	ug/L					U	03/05/08
BLANK	Sodium	7440-23-5	<27	n/a	ug/L					U	03/05/08
BLANK	Selenium	7782-49-2	<30	n/a	ug/L					U	03/05/08
LCS	Aluminum	7429-90-5	969.8	96.980	% Recov	80.000	120.000				03/05/08
LCS	Calcium	7440-70-2	1048	104.800	% Recov	80.000	120.000				03/05/08
LCS	Iron	7439-89-6	1019	101.900	% Recov	80.000	120.000				03/05/08
LCS	Potassium	7440-09-7	10350	103.500	% Recov	80.000	120.000				03/05/08
LCS	Magnesium	7439-95-4	979.2	97.920	% Recov	80.000	120.000				03/05/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Inorganic**

SDG Number: WSCF20080280
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
LCS	Manganese	7439-96-5	1015	101.500	% Recov	80.000	120.000				03/05/08
LCS	Sodium	7440-23-5	991.9	99.190	% Recov	80.000	120.000				03/05/08
LCS	Selenium	7782-49-2	997.7	99.770	% Recov	80.000	120.000				03/05/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20080280
Matrix: WATER
Test: ICP-200.8 MS All possible meta

Sample Date: 02/20/08
Receive Date:02/20/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR00318											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Mercury	7439-97-6	2.32	116.000	% Recov	70.000	130.000				03/12/08
MSD	Mercury	7439-97-6	2.29	114.500	% Recov	70.000	130.000				03/12/08
SPK-RPD	Mercury	7439-97-6	114.500		RPD			1.302	20.000		03/12/08
BATCH QC											
BLANK	Mercury	7439-97-6	<5e-2	n/a	ug/l-					U	03/12/08
LCS	Mercury	7439-97-6	2.31	115.500	% Recov	85.000	115.000				03/12/08

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-040
Sample # W08GR00301
Client ID: B1T735 GPP TRENT WSCF
Matrix: WATER

Group #: WSCF20080280
Department: Radiochemistry
Sampled: 02/14/08
Received: 02/14/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Gamma Energy Analysis-grd H2O											
Cobalt-60	10198-40-0	LA-508-481	U	-3.06	pCi/L	+-4.10	pCi/L	1.00	6.9		02/22/08
Cesium-137	10045-97-3	LA-508-481	U	-1.14	pCi/L	+-4.38	pCi/L	1.00	7.6		02/22/08
Radium-226	13982-63-3	LA-508-481		77.1	pCi/L	+-27.2	pCi/L	1.00	15		02/22/08
Gross Alpha/Gross Beta (AB32)											
Gross alpha	12587-46-1	LA-508-415	U	-0.802	pCi/L	+-0.962	pCi/L	1.00	2.1		03/28/08
Gross beta	12587-47-2	LA-508-415	U	-3.00	pCi/L	+-3.00	pCi/L	1.00	3.5		03/28/08
TC99 by ICP-200.8 MS											
Technetium by ICP-MS	14133-76-7	LA-505-412	U	< 1.00e-03	ug/L			1.00	1.0e-03		02/19/08

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)

C - The Analyte was found in the Associated Blank(inorg)
U - Analyzed for but not detected above limiting criteria.

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

WSCF
TENTATIVELY IDENTIFIED PEAK REPORT

Attention: Steve Trent
Project Number F08-040 :F08-040

Group #: WSCF20080280
Department: Radiochemistry

Sample #	Client ID			Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W08GR00301	B1T735	GPP	TRENT	Gamma Energy Analysis-grd H2O	BI-214				1.2e+02	pCi/L
W08GR00301	B1T735	GPP	TRENT	Gamma Energy Analysis-grd H2O	BI-214 Count Error				36	%

RQ=Result Qualifier

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WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent
Project Number F08-040

Group #: WSCF20080280
Department: Radiochemistry

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		W08GR00301/Ra226 is flagged for poor RPD. Since all the other QC checks came out fine, this batch has been approved. lmh ICP-AES: High aluminum, magnesium, and potassium preparation blank results; "C" flag if applicable.

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

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WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20080280
Matrix: WATER
Test: Gamma Energy Analysis-grd H2O

Sample Date: 02/14/08
Receive Date:02/14/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR00301											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Cobalt-60	10198-40-0	U-0.7152		RPD			n/a	20.000		02/21/08
DUP	Cesium-137	10045-97-3	U-0.149		RPD			n/a	20.000		02/21/08
DUP	Radium-226	13982-63-3	363.9		RPD			130.061	20.000 *		02/21/08
BATCH QC											
BLANK	Cobalt-60	10198-40-0	U3.389	n/a	pCi/L	-10.000	1000.000				02/22/08
BLANK	Cesium-137	10045-97-3	U-8.319	n/a	pCi/L	-10.000	1000.000				02/22/08
BLANK	Radium-226	13982-63-3	82.08	82.080	pCi/L	-10.000	1000.000				02/22/08
LCS	Cobalt-60	10198-40-0	10180	102.414	% Recov	80.000	120.000				02/27/08
LCS	Cesium-137	10045-97-3	6567	108.725	% Recov	80.000	120.000				02/27/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Radiochemistry**

SDG Number: WSCF20080280
Matrix: WATER
Test: Gross Alpha/Gross Beta (AB32)

Sample Date: 02/14/08
Receive Date:02/14/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR00301											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Gross alpha	12587-46-1	U-1.2		RPD			n/a	20.000		03/28/08
DUP	Gross beta	12587-47-2	U-5.4E-2		RPD			n/a	20.000		03/28/08
BATCH QC											
BLANK	Gross alpha	12587-46-1	U3.6E-01	n/a	pCi/L	-10.000	10.000				03/28/08
BLANK	Gross beta	12587-47-2	U-1.4	n/a	pCi/L	-10.000	10.000				03/28/08
LCS	Gross alpha	12587-46-1	79.5	102.581	% Recov	80.000	120.000				03/28/08
LCS	Gross beta	12587-47-2	255.0	113.687	% Recov	80.000	120.000				03/28/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20080280
Matrix: WATER
Test: TC99 by ICP-200.8 MS

Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
BATCH QC											
BLANK	Technetium by ICP-MS	14133-76 7	<1e-3	n/a	ug/L					U	02/13/08
BLANK	Technetium by ICP MS	14133-76-7	<1e-3	n/a	ug/L					U	02/01/08
LCS	Technetium by ICP-MS	14133-76-7	0.1413	98.811	% Recov	49.000	125.000				02/01/08
LCS	Technetium by ICP-MS	14133-76-7	0.1423	98.819	% Recov	49.000	125.000				02/13/08

M4W41-SLF-08-343

ATTACHMENT 4

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

File
3/28/0

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Groundwater Remediation Program
Richland, WA 99354
Attn: Steve Trent

Customer Code: GPP
PO#: 122727/ES10
Group#: 20080280
Project#: F08-040
Proj Mgr: Steve Trent E6-35
Phone: 373-5869

The following samples were received from you on 02/14/08. 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
W08GR00301	B1T735	GPP TRENT @2008 @AB-32 @GEA-GPP @GPP6010 @IC-30 @TC99-MS	Water	02/14/0

Test Acronym Description

Test Acronym	Description
@2008	ICP-200.8 MS All possible meta
@AB-32	Gross Alpha/Gross Beta (AB32)
@GEA-GPP	Gamma Energy Analysis-grd H2O
@GPP6010	ICP Metals Analysis, Grd H20 P
@IC-30	Anions by Ion Chromatography
@TC99-MS	TC99 screen by ICP-200.8 MS

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
NCO SAMPLER BAILEY/MOKLER	TRENT, SJ	373-5869	WIDRIG, DL		
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**	**AIR QUALITY** ☐	45 Days / 45 Days
I-13-EB / C5923	BC Cribs & Trenches - HRR QC Sampling		F08-040		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
			122727ES10	GOVERNMENT VEHICLE	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Waste Sampling & Characterization	N/A		N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS

SPECIAL HANDLING AND/OR STORAGE: 20080280

PRESERVATION	HNO3 to pH <2(ULTREX)	HNO3 to pH <2	HNO3 to pH <2	Cool~4C	
TYPE OF CONTAINER	G/P	G/P	Square Bottle - Poly	P	
NO. OF CONTAINER(S)	1	1	1	1	
VOLUME	1L	500mL	~~1L~~ 500mL ~~500mL~~	1L	
SAMPLE ANALYSIS	Tc-99 by ICPMS (Technetium-99)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B1T735 W0S6R00301	WATER	2/14/08	0930	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME 1250 2/14/08	RECEIVED BY/STORED IN T A Frazier	DATE/TIME 1250 2/14/08
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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

(1)ICP Metals - 6010B (Add-On) {Selenium} ICP Metals - 6010B (TAL) {Aluminum, Calcium, Iron, Magnesium, Manganese, Potassium, Sodium} 200.8_HG - ICPMS {Mercury}
(2)Gamma Spectroscopy(Water) {Cesium-137, Cobalt-60} Gamma Spec - Add-on {Radium-226} Gross Alpha {Gross alpha} Gross Beta {Gross beta}
(3)IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in phosphate, Sulfate}

ICED

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

A-6003-618(01/06)