RECEIVED SEPTEMBER 23, 2008

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FLUOR

Memorandum

M4W41-SLF-08-1033

To: H. Hampt E6-35 Date: September 22, 2008

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

cc: w/Attachments

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

Subject: FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20081501 – SAF NUMBER F08-093

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

(2) HNF-SD-CD-QAPP-017, Rev. 9, Waste Sampling & Characterization Facility Quality Assurance Plan

This letter contains the following information for sample delivery group WSCF20081501:

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

SLF/grf

Attachments 4

M4W41-SLF-08-1033

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20081501
Data Deliverable Date: 04-sep-2008
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
F08-093	B1WB31	W08GR02733	SOIL

M4W41-SLF-08-1033

ATTACHMENT 2

NARRATIVE

Consisting of 4 pages
Including cover page

Introduction

One S&GRP sample was received at the WSCF Laboratory on July 21, 2008. This 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 12 through 13, for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirement for this analysis was 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 16 through 17 for QC details. Analytical Note(s):

- 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, Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WB30 (SDG# 20081484, SDG# F08-093).
- The Phosphate recovery in the MS/MSD below the laboratory requirement of 80% at 62% and 65% respectively. The Phosphate analyte in the sample was N flagged.

All other QC controls are within the established limits.

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 per GRP Letter of Instruction. See page 18 for QC details.

All QC controls are within the established limits.

ICP-AES Metals – 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 per the GRP Letter of Instruction. See pages 19 through 21 for QC details. Analytical Note(s):

- Sample results were D flagged if dilution(s) were required.
- Matrix Spikes and Matrix Spike Duplicates were analyzed on sample B1WB31 of this SDG.
- Sodium – MS/MSD recovery slightly exceeded established laboratory limits. Sample result for Sodium was N flagged.
- Calcium and Boron contamination detected in the Blank was evaluated and there was no affect on sample results.
- Aluminum, Calcium, Iron, Magnesium and Titanium – Sample concentrations exceeded the spiking levels by a factor of 4. Spike recoveries are not valid. Check and high standards were analyzed to ensure Aluminum, Calcium, Iron, Magnesium, Titanium and Potassium linearity because sample results are greater than the calibration standard.
- Boron – The result for Boron was biased high due to interference from Iron. Sample result for Boron was E flagged.
- Beryllium – The result for Beryllium was calculated due to the high Iron concentration. Sample result for Beryllium was E flagged.

All other QC controls are within the established limits.

ICP-MS Metals – 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 per the GRP Letter of Instruction. See pages 22 through 24 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1V528 (SDG# 20081326, SAF# F08-101).
- Zinc contamination detected in the Blank was evaluated and there was no affect on sample results.

All other 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 28 through 32 for QC details. Analytical Note(s):

- Americium-241 – Duplicate QC was analyzed on sample# B1VHP6 (SDG# 20081766, SAF# F08-093).
- Plutonium-238, 239/20 and 242 (tracer) – Duplicate QC was analyzed on sample# B1VHP6 (SDG# 20081766, SAF# F08-093).
- Uranium-233/234, -235, -238, -232 (tracer) – Duplicate QC was analyzed on sample# B1VHP6 (SDG# 20081766, SAF# F08-093).
- Strontium 89/90 – Duplicate QC was analyzed on sample# B1WB33 (SDG# 20081722, SAF# F08-098).
- GEA – Duplicate QC was analyzed on sample# B1WB31 of this SDG.

All other 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

Andrew J. Kopriva
WSCF Client Services

M4W41-SLF-08-1033

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 26 pages
Including cover page

WSCF
ANALYTICAL RESULTS REPORT

for

Groundwater Remediation Program

Richland, WA 99354

Attention: Steve Trent

Analytical: S. Fitzgerald 9/22/08

Client Services: A Kopriva 9/21/08

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

Contract#: FH-EIS-2003-MEM-001
Report#: WSCF20081501
Report Date: 21-sep-2008
Report WGPP/ver. 5.2
Groundwater Remediation Program

w13qlog v4.2 21-sep-2008 08:05:25

Department: Inorganic

W13q Worklist/Batch/QC Report for Group# WSCF20081501

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37238	1	37670	41986	BLANK		ICP-200.8 MS All possible meta
37238	2	37670	41986	LCS		ICP-200.8 MS All possible meta
37238	4	37670	41986	MS	W08GR02040	ICP-200.8 MS All possible meta
37238	5	37670	41986	MSD	W08GR02040	ICP-200.8 MS All possible meta
37238	5	37670	41986	SPK-RPD	W08GR02040	ICP-200.8 MS All possible meta
37238	16	37670	41986	SAMPLE	W08GR02733	ICP-200.8 MS All possible meta
37380	1	37805	42129	BLANK		Cyanide by Midi/Spectrophotom
37380	2	37805	42129	LCS		Cyanide by Midi/Spectrophotom
37380	4	37805	42129	MS	W08GR02733	Cyanide by Midi/Spectrophotom
37380	5	37805	42129	MSD	W08GR02733	Cyanide by Midi/Spectrophotom
37380	3	37805	42129	SAMPLE	W08GR02733	Cyanide by Midi/Spectrophotom
37380	5	37805	42129	SPK-RPD	W08GR02733	Cyanide by Midi/Spectrophotom
37598	2	38045	42464	BLANK		Anions by Ion Chromatography
37598	17	38045	42464	BLANK		Anions by Ion Chromatography
37598	3	38045	42464	LCS		Anions by Ion Chromatography
37598	5	38045	42464	DUP	W08GR02654	Anions by Ion Chromatography
37598	6	38045	42464	MS	W08GR02654	Anions by Ion Chromatography
37598	7	38045	42464	MSD	W08GR02654	Anions by Ion Chromatography
37598	7	38045	42464	SPK-RPD	W08GR02654	Anions by Ion Chromatography
37598	9	38045	42464	SAMPLE	W08GR02733	Anions by Ion Chromatography
37959	1	38382	42909	BLANK		ICP Metals Analysis, Grd H20 P
37959	2	38382	42909	LCS		ICP Metals Analysis, Grd H20 P
37959	4	38382	42909	MS	W08GR02733	ICP Metals Analysis, Grd H20 P
37959	5	38382	42909	MSD	W08GR02733	ICP Metals Analysis, Grd H20 P
37959	3	38382	42909	SAMPLE	W08GR02733	ICP Metals Analysis, Grd H20 P
37959	5	38382	42909	SPK-RPD	W08GR02733	ICP Metals Analysis, Grd H20 P

w13qlog v4.2 21-sep-2008 08:05:25

Department: Radiochemistry

W13q Worklist/Batch/QC Report for Group# WSCF20081501

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37175	1	37608	42131	BLANK		Gamma Energy Analysis-grd H2O
37175	2	37608	42131	LCS		Gamma Energy Analysis-grd H2O
37175	3	37608	42131	DUP	W08GR02733	Gamma Energy Analysis-grd H2O
37175	4	37608	42131	SAMPLE	W08GR02733	Gamma Energy Analysis-grd H2O
37887	1	38313	42792	BLANK		Strontium 89/90
37887	2	38313	42792	LCS		Strontium 89/90
37887	22	38313	42792	SAMPLE	W08GR02733	Strontium 89/90
37887	23	38313	42792	SURR	W08GR02733	Strontium 89/90
37887	3	38313	42792	DUP	W08GR03325	Strontium 89/90
37969	1	38393	42833	BLANK		Plutonium Isotopics by AEA
37969	2	38393	42833	LCS		Plutonium Isotopics by AEA
37969	12	38393	42833	SAMPLE	W08GR02733	Plutonium Isotopics by AEA
37969	13	38393	42833	SURR	W08GR02733	Plutonium Isotopics by AEA
37969	3	38393	42833	DUP	W08GR03388	Plutonium Isotopics by AEA
37971	2	38395	42835	BLANK		Americium by AEA
37971	3	38395	42835	LCS		Americium by AEA
37971	13	38395	42835	SAMPLE	W08GR02733	Americium by AEA
37971	1	38395	42835	SURR	W08GR02733	Americium by AEA
37971	4	38395	42835	DUP	W08GR03388	Americium by AEA
37973	1	38397	42844	BLANK		Uranium Isotopics by AEA
37973	2	38397	42844	LCS		Uranium Isotopics by AEA
37973	13	38397	42844	SAMPLE	W08GR02733	Uranium Isotopics by AEA
37973	12	38397	42844	SURR	W08GR02733	Uranium Isotopics by AEA
37973	9	38397	42844	DUP	W08GR03388	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.

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
LA-695-402	LA-695-402: DETERMINATION OF CYANIDE BY MIDIDISTILLATION AND SPECTROPHOTOMETRIC	
	EPA-600/4-79-020 335.2	Cyanide, Total
	HEIS 335.2_CYANIDE	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.

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_GS	Strontium 89/90
LA-508-471	LA-508-471: ALPHA ENERGY ANALYZER DATA ACQUISITION AND SYSTEM CHECKOUT USING ALP	
	HEIS PUISO_IE_PRECIP_AEA	Plutonium by Alpha Energy Analysis
	HEIS RAISO_AEA	Radium-226
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: F08-093
Sample # W08GR02733
Client ID: B1WB31 TRENT **Matrix:** SOIL

Group #: WSCF20081501
Department: Inorganic
Sampled: 07/17/08
Received: 07/21/08

Test Performed	CAS #	WSCF Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Anions by Ion Chromatography Prep											**08/13/08**
Anions by Ion Chromatography											
Fluoride	16984-48-8	LA-533-410	DU	< 0.300	mg/kg			50.00	0.30		08/13/08
Chloride	16887-00-6	LA-533-410	BD	1.52	mg/kg			50.00	1.5		08/13/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DU	< 0.500	mg/kg			50.00	0.50		08/13/08
Nitrogen in Nitrate	NO3-N	LA-533-410	BD	0.634	mg/kg			50.00	0.25		08/13/08
Phosphate (P) by IC	PO4-P	LA-533-410	DNU	< 2.00	mg/kg			50.00	2.0		08/13/08
Sulfate	14808-79-8	LA-533-410	BD	6.28	mg/kg			50.00	3.5		08/13/08
Cyanide											
Cyanide	57-12-5	LA-695-402	U	< 0.190	mg/kg			0.95	0.19		07/31/08
ICP Metals Analysis, Grd H20 P Prep											**09/11/08**
ICP Metals Analysis, Grd H20 P											
Aluminum	7429-90-5	LA-505-411	D	1.17e+04	mg/kg			9.95e+002	52		09/17/08
Iron	7439-89-6	LA-505-411	D	2.33e+04	mg/kg			9.95e+002	25		09/17/08
Magnesium	7439-95-4	LA-505-411		7.03e+03	mg/kg			99.52	5.0		09/17/08
Potassium	7440-09-7	LA-505-411		1.71e+03	mg/kg			99.52	17		09/17/08
Sodium	7440-23-5	LA-505-411	N	138	mg/kg			99.52	5.1		09/17/08
Barium	7440-39-3	LA-505-411		137	mg/kg			99.52	0.40		09/17/08
Calcium	7440-70-2	LA-505-411	D	1.18e+04	mg/kg			9.95e+002	73		09/17/08
Lithium	7439-93-2	LA-505-411		13.2	mg/kg			99.52	0.40		09/17/08
Molybdenum	7439-98-7	LA-505-411	B	0.736	mg/kg			99.52	0.50		09/17/08
Strontium	7440-24-6	LA-505-411		30.5	mg/kg			99.52	0.40		09/17/08
Titanium	7440-32-6	LA-505-411		846	mg/kg			99.52	0.40		09/17/08
Arsenic	7440-38-2	LA-505-411	U	< 7.76	mg/kg			99.52	7.8		09/17/08
Beryllium	7440-41-7	LA-505-411	E	1.65	mg/kg			99.52	0.40		09/17/08

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)
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)
N - Spike sample recovery is outside control limits.(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 RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR02733
Client ID: B1WB31 TRENT **Matrix:** SOIL

Group #: WSCF20081501
Department: Inorganic
Sampled: 07/17/08
Received: 07/21/08

WSCF

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Boron	7440-42-8	LA-505-411	E	15.9	mg/kg			99.52	2.0		09/17/08
Bismuth	7440-69-9	LA-505-411	U	< 3.48	mg/kg			99.52	3.5		09/17/08
ICP-200.8 MS All possible meta Prep											**07/23/08**
ICP-200.8 MS All possible meta											
Manganese	7439-96-5	LA-505-412		392	mg/kg			0.95	0.0954		07/23/08
Nickel	7440-02-0	LA-505-412		15.6	mg/kg			0.95	0.191		07/23/08
Silver	7440-22-4	LA-505-412	U	< 0.0954	mg/kg			0.95	0.0954		07/23/08
Antimony	7440-36-0	LA-505-412	U	< 0.286	mg/kg			0.95	0.286		07/23/08
Cadmium	7440-43-9	LA-505-412		0.110	mg/kg			0.95	0.0954		07/23/08
Chromium	7440-47-3	LA-505-412		18.6	mg/kg			0.95	0.477		07/23/08
Cobalt	7440-48-4	LA-505-412		8.25	mg/kg			0.95	0.0477		07/23/08
Copper	7440-50-8	LA-505-412		20.7	mg/kg			0.95	0.0954		07/23/08
Vanadium	7440-62-2	LA-505-412		33.7	mg/kg			0.95	0.191		07/23/08
Zinc	7440-66-6	LA-505-412		51.1	mg/kg			0.95	0.763		07/23/08
Lead	7439-92-1	LA-505-412		11.7	mg/kg			0.95	0.0954		07/23/08
Mercury	7439-97-6	LA-505-412	U	< 0.0477	mg/kg			0.95	0.0477		07/23/08
Uranium	7440-61-1	LA-505-412		0.940	mg/kg			0.95	0.0477		07/23/08
Selenium	7782-49-2	LA-505-412		0.470	mg/kg			0.95	0.286		07/23/08
Thallium	7440-28-0	LA-505-412	U	< 0.0954	mg/kg			0.95	0.0954		07/23/08

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)
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)
N - Spike sample recovery is outside control limits.(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 LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
Test: Anions by Ion Chromatography

Sample Date: 07/17/08
Receive Date:07/17/08

Lab ID: W08GR02654
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	6.8869		RPD			3.940	20.000		08/13/08
DUP	Fluoride	16984-48-8	<0.294		RPD			n/a	20.000	U	08/13/08
DUP	Nitrogen in Nitrite	NO2-N	<0.49		RPD			n/a	20.000	U	08/13/08
DUP	Nitrogen in Nitrate	NO3-N	10.7851		RPD			3.749	20.000		08/13/08
DUP	Phosphate (P) by IC	PO4-P	<1.96		RPD			n/a	20.000	U	08/13/08
DUP	Sulfate	14808-79-8	20.0165		RPD			2.643	20.000		08/13/08
MS	Chloride	16887-00-6	0.921339	92.134	% Recov	80.000	120.000				08/13/08
MS	Fluoride	16984-48-8	0.405486	81.423	% Recov	80.000	120.000				08/13/08
MS	Nitrogen in Nitrite	NO2-N	0.464916	93.544	% Recov	80.000	120.000				08/13/08
MS	Nitrogen in Nitrate	NO3-N	0.442016	98.226	% Recov	80.000	120.000				08/13/08
MS	Phosphate (P) by IC	PO4-P	0.602543	62.311	% Recov	80.000	120.000		•		08/13/08
MS	Sulfate	14808-79-8	1.78702	90.254	% Recov	80.000	120.000				08/13/08
MSD	Chloride	16887-00-6	0.941067	94.107	% Recov	80.000	120.000				08/13/08
MSD	Fluoride	16984-48-8	0.416655	83.666	% Recov	80.000	120.000				08/13/08
MSD	Nitrogen in Nitrite	NO2-N	0.474196	95.412	% Recov	80.000	120.000				08/13/08
MSD	Nitrogen in Nitrate	NO3-N	0.444441	98.765	% Recov	80.000	120.000				08/13/08
MSD	Phosphate (P) by IC	PO4-P	0.630473	65.199	% Recov	80.000	120.000		•		08/13/08
MSD	Sulfate	14808-79-8	1.802712	91.046	% Recov	80.000	120.000				08/13/08
SPK-RPD	Chloride	16887-00-6	94.107		RPD			2.119	20.000		08/13/08
SPK-RPD	Fluoride	16984-48-8	83.666		RPD			2.717	20.000		08/13/08
SPK-RPD	Nitrogen in Nitrite	NO2-N	95.412		RPD			1.977	20.000		08/13/08
SPK-RPD	Nitrogen in Nitrate	NO3-N	98.765		RPD			0.547	20.000		08/13/08
SPK-RPD	Phosphate (P) by IC	PO4-P	65.199		RPD			4.530	20.000		08/13/08
SPK-RPD	Sulfate	14808-79-8	91.046		RPD			0.874	20.000		08/13/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
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	08/13/08
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	08/13/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	08/13/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	08/13/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	08/13/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	08/13/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	08/13/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	08/13/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	08/13/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	08/13/08
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	08/13/08
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	08/13/08
LCS	Chloride	16887-00-6	194.8642	96.947	% Recov	80.000	120.000				08/13/08
LCS	Fluoride	16984-48-8	101.1852	101.592	% Recov	80.000	120.000				08/13/08
LCS	Nitrogen in Nitrite	NO2-N	100.2192	100.824	% Recov	80.000	120.000				08/13/08
LCS	Nitrogen in Nitrate	NO3-N	92.3934	102.545	% Recov	80.000	120.000				08/13/08
LCS	Phosphate (P) by IC	PO4-P	187.1067	96.746	% Recov	80.000	120.000				08/13/08
LCS	Sulfate	14808-79-8	367.7256	92.860	% Recov	80.000	120.000				08/13/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
Test: Cyanide by Midi/Spectrophotom

Sample Date: 07/17/08
Receive Date:07/21/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR02733											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Cyanide by Midi/Spectrophotom	57-12-5	1.75	95.628	% Recov	75.000	125.000				07/31/08
MSD	Cyanide by Midi/Spectrophotom	57-12-5	2.09	103.980	% Recov	75.000	125.000				07/31/08
SPK-RPD	Cyanide by Midi/Spectrophotom	57-12-5	103.980		RPD			8.368	20.000		07/31/08
BATCH QC											
BLANK	Cyanide by Midi/Spectrophotom	57-12-5	< 4	n/a	ug/L	-4.000	4.000			U	07/31/08
LCS	Cyanide by Midi/Spectrophotom	57-12-5	54.8	109.600	% Recov	85.000	115.000				07/31/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 07/17/08
Receive Date:07/21/08

Lab ID: W08GR02733
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	3350	3350.000	% Recov	75.000	125.000			•	09/17/08
MS	Arsenic	7440-38-2	102	102.000	% Recov	75.000	125.000				09/17/08
MS	Boron	7440-42-8	97.73	97.730	% Recov	75.000	125.000				09/17/08
MS	Barium	7440-39-3	55.2	110.400	% Recov	75.000	125.000				09/17/08
MS	Beryllium	7440-41-7	51.99	103.980	% Recov	75.000	125.000				09/17/08
MS	Bismuth	7440-69-9	95.78	95.780	% Recov	75.000	125.000				09/17/08
MS	Calcium	7440-70-2	1050	1050.000	% Recov	75.000	125.000			•	09/17/08
MS	Iron	7439-89-6	-1570	-1570.000	% Recov	75.000	125.000			•	09/17/08
MS	Potassium	7440-09-7	907	86.381	% Recov	75.000	125.000				09/17/08
MS	Lithium	7439-93-2	48.75	97.500	% Recov	70.000	130.000				09/17/08
MS	Magnesium	7439-95-4	447	447.000	% Recov	75.000	125.000			•	09/17/08
MS	Molybdenum	7439-98-7	91.4236	91.424	% Recov	75.000	125.000				09/17/08
MS	Sodium	7440-23-5	129.5	129.500	% Recov	75.000	125.000			•	09/17/08
MS	Strontium	7440-24-6	49.65	99.300	% Recov	75.000	125.000				09/17/08
MS	Titanium	7440-32-6	192.2	192.200	% Recov	75.000	125.000			•	09/17/08
MSD	Aluminum	7429-90-5	3130	3133.133	% Recov	75.000	125.000			•	09/17/08
MSD	Arsenic	7440-38-2	99.88	99.980	% Recov	75.000	125.000				09/17/08
MSD	Boron	7440-42-8	95.73	95.826	% Recov	75.000	125.000				09/17/08
MSD	Barium	7440-39-3	52.7	105.400	% Recov	75.000	125.000				09/17/08
MSD	Beryllium	7440-41-7	51.49	102.980	% Recov	75.000	125.000				09/17/08
MSD	Bismuth	7440-69-9	93.47	93.564	% Recov	75.000	125.000				09/17/08
MSD	Calcium	7440-70-2	1010	1011.011	% Recov	75.000	125.000			•	09/17/08
MSD	Iron	7439-89-6	-1880	-1881.882	% Recov	75.000	125.000			•	09/17/08
MSD	Potassium	7440-09-7	853	86.162	% Recov	75.000	125.000				09/17/08
MSD	Lithium	7439-93-2	47.43	94.860	% Recov	75.000	125.000				09/17/08
MSD	Magnesium	7439-95-4	375	375.375	% Recov	75.000	125.000			•	09/17/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 07/17/08
Receive Date:07/21/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Molybdenum	7439-98-7	89.4236	89.513	% Recov	75.000	125.000				09/17/08
MSD	Sodium	7440-23-5	125.4	125.526	% Recov	75.000	125.000		*		09/17/08
MSD	Strontium	7440-24-6	48.77	97.540	% Recov	75.000	125.000				09/17/08
MSD	Titanium	7440-32-6	191.2	191.391	% Recov	75.000	125.000		*		09/17/08
SPK-RPD	Aluminum	7429-90-5	3133.133		RPD			6.690	20.000		09/17/08
SPK-RPD	Arsenic	7440-38-2	99.980		RPD			2.000	20.000		09/17/08
SPK-RPD	Boron	7440-42-8	95.826		RPD			1.967	20.000		09/17/08
SPK-RPD	Barium	7440-39-3	105.400		RPD			4.634	20.000		09/17/08
SPK-RPD	Beryllium	7440-41-7	102.980		RPD			0.966	20.000		09/17/08
SPK-RPD	Bismuth	7440-69-9	93.564		RPD			2.341	20.000		09/17/08
SPK-RPD	Calcium	7440-70-2	1011.011		RPD			3.783	20.000		09/17/08
SPK-RPD	Iron	7439-89-6	-1881.882		RPD			-18.070	20.000 *		09/17/08
SPK-RPD	Potassium	7440-09-7	86.162		RPD			0.254	20.000		09/17/08
SPK-RPD	Lithium	7439-93-2	94.860		RPD			2.745	20.000		09/17/08
SPK-RPD	Magnesium	7439-95-4	375.375		RPD			17.419	20.000		09/17/08
SPK-RPD	Molybdenum	7439-98-7	89.513		RPD			2.112	20.000		09/17/08
SPK-RPD	Sodium	7440-23-5	125.526		RPD			3.117	20.000		09/17/08
SPK-RPD	Strontium	7440-24-6	97.540		RPD			1.788	20.000		09/17/08
SPK-RPD	Titanium	7440-32-6	191.391		RPD			0.422	20.000		09/17/08
BATCH QC											
BLANK	Aluminum	7429-90-5	<5.2e-2	n/a	ug/mL					U	09/17/08
BLANK	Arsenic	7440-38-2	<7.8e-2	n/a	ug/mL					U	09/17/08
BLANK	Boron	7440-42-8	<2e-2	n/a	ug/mL					U	09/17/08
BLANK	Barium	7440-39-3	8.1e-3	0.008	ug/mL						09/17/08
BLANK	Beryllium	7440-41-7	<4e-3	n/a	ug/mL					U	09/17/08
BLANK	Bismuth	7440-69-9	<3.5e-2	n/a	ug/mL					U	09/17/08
BLANK	Calcium	7440-70-2	0.1061	0.106	ug/mL						09/17/08
BLANK	Iron	7439-89-6	<2.5e-2	n/a	ug/mL					U	09/17/08
BLANK	Potassium	7440-09-7	<0.17	n/a	ug/mL					U	09/17/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
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
BLANK	Lithium	7439-93-2	<4e-3	n/a	ug/mL					U	09/17/08
BLANK	Magnesium	7439-95-4	<5e-2	n/a	ug/mL					U	09/17/08
BLANK	Molybdenum	7439-98-7	<5e-3	n/a	ug/mL					U	09/17/08
BLANK	Sodium	7440-23-5	<5.1e-2	n/a	ug/mL					U	09/17/08
BLANK	Strontium	7440-24-6	<4e-3	n/a	ug/mL					U	09/17/08
BLANK	Titanium	7440-32-6	<4e-3	n/a	ug/mL					U	09/17/08
LCS	Aluminum	7429-90-5	7287	88.220	% Recov	44.000	157.000				09/17/08
LCS	Arsenic	7440-38-2	129	97.727	% Recov	79.000	121.000				09/17/08
LCS	Boron	7440-42-8	129.2	112.348	% Recov	45.000	156.000				09/17/08
LCS	Barium	7440-39-3	319	100.000	% Recov	80.000	120.000				09/17/08
LCS	Beryllium	7440-41-7	92	102.793	% Recov	81.000	119.000				09/17/08
LCS	Bismuth	7440-69-9	95.54	94.594	% Recov	80.000	120.000				09/17/08
LCS	Calcium	7440-70-2	4034	102.908	% Recov	76.000	124.000				09/17/08
LCS	Iron	7439-89-6	12510	93.358	% Recov	47.000	152.000				09/17/08
LCS	Potassium	7440-09-7	2884	83.353	% Recov	64.000	136.000				09/17/08
LCS	Lithium	7439-93-2	<0.40264	n/a	% Recov	80.000	120.000			U	09/17/08
LCS	Magnesium	7439-95-4	2559	98.046	% Recov	71.000	129.000				09/17/08
LCS	Molybdenum	7439-98-7	49.43	101.499	% Recov	79.000	121.000				09/17/08
LCS	Sodium	7440-23-5	515.6	87.687	% Recov	51.000	149.000				09/17/08
LCS	Strontium	7440-24-6	52.62	96.728	% Recov	74.000	126.000				09/17/08
LCS	Titanium	7440-32-6	301.7	113.421	% Recov	9.000	191.000				09/17/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
Test: ICP-200.8 MS All possible meta

Sample Date: 06/30/08
Receive Date:07/02/08

Lab ID: W08GR02040
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	Silver	7440-22-4	179.2	89.600	% Recov	70.000	130.000				07/23/08
MS	Cadmium	7440-43-9	190.9	95.450	% Recov	70.000	130.000				07/23/08
MS	Cobalt	7440-48-4	172.35	86.175	% Recov	70.000	130.000				07/23/08
MS	Chromium	7440-47-3	186.99	93.495	% Recov	70.000	130.000				07/23/08
MS	Copper	7440-50-8	170.77	85.385	% Recov	70.000	130.000				07/23/08
MS	Mercury	7439-97-6	1.85	92.500	% Recov	70.000	130.000				07/23/08
MS	Manganese	7439-96-5	177.3	88.650	% Recov	70.000	130.000				07/23/08
MS	Nickel	7440-02-0	174.89	87.445	% Recov	70.000	130.000				07/23/08
MS	Lead	7439-92-1	192.92	96.460	% Recov	70.000	130.000				07/23/08
MS	Antimony	7440-36-0	175.8	87.900	% Recov	70.000	130.000				07/23/08
MS	Selenium	7782-49-2	189.4	94.700	% Recov	70.000	130.000				07/23/08
MS	Thallium	7440-28-0	183.2	91.600	% Recov	70.000	130.000				07/23/08
MS	Uranium	7440-61-1	197.97	98.985	% Recov	70.000	130.000				07/23/08
MS	Vanadium	7440-62-2	189.84	94.920	% Recov	70.000	130.000				07/23/08
MS	Zinc	7440-66-6	179.9	89.950	% Recov	70.000	130.000				07/23/08
MSD	Silver	7440-22-4	175.3	87.650	% Recov	70.000	130.000				07/23/08
MSD	Cadmium	7440-43-9	185.6	92.800	% Recov	70.000	130.000				07/23/08
MSD	Cobalt	7440-48-4	167.75	83.875	% Recov	70.000	130.000				07/23/08
MSD	Chromium	7440-47-3	180.19	90.095	% Recov	70.000	130.000				07/23/08
MSD	Copper	7440-50-8	164.27	82.135	% Recov	70.000	130.000				07/23/08
MSD	Mercury	7439-97-6	1.86	93.000	% Recov	70.000	130.000				07/23/08
MSD	Manganese	7439-96-5	180.8	90.400	% Recov	70.000	130.000				07/23/08
MSD	Nickel	7440-02-0	168.79	84.395	% Recov	70.000	130.000				07/23/08
MSD	Lead	7439-92-1	183.62	91.810	% Recov	70.000	130.000				07/23/08
MSD	Antimony	7440-36-0	168.9	84.450	% Recov	70.000	130.000				07/23/08
MSD	Selenium	7782-49-2	181.8	90.900	% Recov	70.000	130.000				07/23/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
Matrix: SOLID
Test: ICP-200.8 MS All possible meta

Sample Date: 06/30/08
Receive Date:07/02/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Thallium	7440-28-0	175.6	87.800	% Recov	70.000	130.000				07/23/08
MSD	Uranium	7440-61-1	189.67	94.835	% Recov	70.000	130.000				07/23/08
MSD	Vanadium	7440-62-2	183.24	91.620	% Recov	70.000	130.000				07/23/08
MSD	Zinc	7440-66-6	172.1	86.050	% Recov	70.000	130.000				07/23/08
SPK-RPD	Silver	7440-22-4	87.650		RPD			2.200	20.000		07/23/08
SPK-RPD	Cadmium	7440-43-9	92.800		RPD			2.815	20.000		07/23/08
SPK-RPD	Cobalt	7440-48-4	83.875		RPD			2.705	20.000		07/23/08
SPK-RPD	Chromium	7440-47-3	90.095		RPD			3.704	20.000		07/23/08
SPK-RPD	Copper	7440-50-8	82.135		RPD			3.880	20.000		07/23/08
SPK-RPD	Mercury	7439-97-6	93.000		RPD			0.539	20.000		07/23/08
SPK-RPD	Manganese	7439-96-5	90.400		RPD			1.955	20.000		07/23/08
SPK-RPD	Nickel	7440-02-0	84.395		RPD			3.550	20.000		07/23/08
SPK-RPD	Lead	7439-92-1	91.810		RPD			4.940	20.000		07/23/08
SPK-RPD	Antimony	7440-36-0	84.450		RPD			4.003	20.000		07/23/08
SPK-RPD	Selenium	7782-49-2	90.900		RPD			4.095	20.000		07/23/08
SPK-RPD	Thallium	7440-28-0	87.800		RPD			4.236	20.000		07/23/08
SPK-RPD	Uranium	7440-61-1	94.835		RPD			4.282	20.000		07/23/08
SPK-RPD	Vanadium	7440-62-2	91.620		RPD			3.538	20.000		07/23/08
SPK-RPD	Zinc	7440-66-6	86.050		RPD			4.432	20.000		07/23/08
BATCH QC											
BLANK	Silver	7440-22-4	<0.1	n/a	ug/L					U	07/23/08
BLANK	Cadmium	7440-43-9	<0.1	n/a	ug/L					U	07/23/08
BLANK	Cobalt	7440-48-4	<5e-2	n/a	ug/L					U	07/23/08
BLANK	Chromium	7440-47-3	<0.5	n/a	ug/L					U	07/23/08
BLANK	Copper	7440-50-8	<0.1	n/a	ug/L					U	07/23/08
BLANK	Mercury	7439-97-6	<5e-2	n/a	ug/L					U	07/23/08
BLANK	Manganese	7439-96-5	<0.1	n/a	ug/L					U	07/23/08
BLANK	Nickel	7440-02-0	<0.2	n/a	ug/L					U	07/23/08
BLANK	Lead	7439-92-1	<0.1	n/a	ug/L					U	07/23/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081501
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
BLANK	Antimony	7440-36-0	<0.3	n/a	ug/L					U	07/23/08
BLANK	Selenium	7782-49-2	<0.3	n/a	ug/L					U	07/23/08
BLANK	Thallium	7440-28-0	<0.1	n/a	ug/L					U	07/23/08
BLANK	Uranium	7440-61-1	<5e-2	n/a	ug/L					U	07/23/08
BLANK	Vanadium	7440-62-2	<0.2	n/a	ug/L					U	07/23/08
BLANK	Zinc	7440-66-6	0.83	0.830	ug/L						07/23/08
LCS	Silver	7440-22-4	104.4	103.366	% Recov	98.000	134.000				07/23/08
LCS	Cadmium	7440-43-9	68.8	103.459	% Recov	95.000	124.000				07/23/08
LCS	Cobalt	7440-48-4	70.02	95.787	% Recov	88.000	119.000				07/23/08
LCS	Chromium	7440-47-3	69.96	95.987	% Recov	77.000	125.000				07/23/08
LCS	Copper	7440-50-8	64.67	94.409	% Recov	84.000	122.000				07/23/08
LCS	Mercury	7439-97-6	8.04	97.101	% Recov	71.000	132.000				07/23/08
LCS	Manganese	7439-96-5	440.1	97.152	% Recov	83.000	118.000				07/23/08
LCS	Nickel	7440-02-0	54.64	98.273	% Recov	90.000	121.000				07/23/08
LCS	Lead	7439-92-1	132	101.538	% Recov	92.000	123.000				07/23/08
LCS	Antimony	7440-36-0	145.5	161.308	% Recov	114.000	260.000				07/23/08
LCS	Selenium	7782-49-2	171.8	106.708	% Recov	52.000	157.000				07/23/08
LCS	Thallium	7440-28-0	130.6	98.195	% Recov	92.000	123.000				07/23/08
LCS	Uranium	7440-61-1	399.9	99.975	% Recov	81.000	125.000				07/23/08
LCS	Vanadium	7440-62-2	77.82	93.759	% Recov	81.000	122.000				07/23/08
LCS	Zinc	7440-66-6	187.5	105.932	% Recov	85.000	130.000				07/23/08

WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent
Project Number F08-093

Group #: WSCF20081501
Department: Inorganic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		Zinc prep blank above the MDL but < 5% of sample results. No flag ICP-AES: High barium and calcium preparation blank results; "C" flag if applicable. All elements having results <5X MDL; "B" flag. No zirconium and lithium present in the LCS standard. Magnesium, aluminum, calcium, titanium, and iron sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check and high standards used to ensure magnesium, calcium, iron, aluminum, and potassium linearity because sample results are greater than the calibration standard. High sodium spike recoveries; "N" flag. Boron results biased high due to iron interference; "E" flag Calculated beryllium result due to iron interference; "E" flag.

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

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR02733
Client ID: B1WB31 TRENT **Matrix:** SOIL

Group #: WSCF20081501
Department: Radiochemistry
Sampled: 07/17/08
Received: 07/21/08

WSCF

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Americium by AEA											
Americium-241	14596-10-2	LA-508-471		0.0510	pCi/g	+-0.0326	pCi/g	1.00	0.043		09/12/08
Am-243 tracer by AEA	AM243	LA-508-471		3.90	pCi/g			1.00	0.028		09/12/08
Gamma Energy Analysis-grd H2O											
Cesium-137	10045-97-3	LA-508-481	U	-0.0148	pCi/g	+-0.0148	pCi/g	1.00	0.022		07/23/08
Europium-154	15585-10-1	LA-508-481	U	7.93e-03	pCi/g	+-0.0463	pCi/g	1.00	0.080		07/23/08
Plutonium Isotopics by AEA											
Plutonium-238	13981-16-3	LA-508-471	U	0.0300	pCi/g	+-0.0378	pCi/g	1.00	0.060		09/12/08
Pu-239/240 by AEA	PU-239/240	LA-508-471	U	2.10e-03	pCi/g	+-2.10e-03	pCi/g	1.00	0.016		09/12/08
Pu-242 tracer by AEA	PU242	LA-508-471		6.00	pCi/g			1.00	0.023		09/12/08
Strontium 89/90											
Strontium-89/90	SR-RAD	LA-508-415	U	-0.780	pCi/g	+-0.897	pCi/g	1.00	0.39		09/08/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		85.1	Percent			1.00	0.0		09/08/08
Uranium Isotopics by AEA											
Uranium-233/234	U-233/234	LA-508-471		0.270	pCi/g	+-0.0864	pCi/g	1.00	0.025		09/14/08
Uranium-235	15117-96-1	LA-508-471	U	0.0110	pCi/g	+-0.0135	pCi/g	1.00	0.021		09/14/08
Uranium-238	U-238	LA-508-471		0.320	pCi/g	+-0.0960	pCi/g	1.00	5.6e-03		09/14/08
U-232 tracer by AEA	U232	LA-508-471		3.90	pCi/g			1.00	0.027		09/14/08

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)
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)

D - Analyte was identified at a secondary dilution factor(inorg)
N - Spike sample recovery is outside control limits.(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 F08-093 :F08-093

Group #: WSCF20081501
Department: Radiochemistry

Sample #	Client ID		Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	AC-228				0.87	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	AC-228 Count Error				24	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	BI-212				0.73	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	BI-212 Count Error				28	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	BI-214				0.75	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	BI-214 Count Error				19	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	CS-134				0.057	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	CS-134 Count Error				49	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	K-40				19	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	K-40 Count Error				14	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	PB-212				1.1	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	PB-212 Count Error				11	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	PB-214				1.4	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	PB-214 Count Error				24	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	RA-226				0.54	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	RA-226 Count Error				20	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	RA-228				1.0	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	RA-228 Count Error				20	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	SN-126				0.16	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	SN-126 Count Error				31	%
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	TL-208				0.28	pCi/g
W08GR02733	B1WB31	TRENT	Gamma Energy Analysis-grd H2O	TL-208 Count Error				17	%

RQ=Result Qualifier

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081501
Matrix: SOLID
Test: Americium by AEA

Sample Date: 07/17/08
Receive Date:07/21/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR02733											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Am-243 tracer by AEA	AM243	3.856	101.060	% Recov	30.000	105.000				09/12/08
Lab ID: W08GR03388											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Americium-241	14596-10-2	U2.1e-2		RPD			n/a	20.000		09/12/08
DUP	Am-243 tracer by AEA	AM243	3.947	92.550	% Recov	30.000	105.000				09/12/08
BATCH QC											
BLANK	Americium-241	14596-10-2	U-2.1e-3	n/a	pCi/g	-10.000	1000.000				09/12/08
BLANK	Am-243 tracer by AEA	AM243	4.003	78.130	% Recov	30.000	105.000				09/12/08
LCS	Americium-241	14596-10-2	13.17	111.139	% Recov	80.000	120.000				09/12/08
LCS	Am-243 tracer by AEA	AM243	11.11	89.540	% Recov	30.000	105.000				09/12/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081501
Matrix: SOLID
Test: Gamma Energy Analysis-grd H2O

Sample Date: 07/17/08
Receive Date:07/21/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR02733											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Cesium-137	10045-97-3	U-1.148e-2		RPD			n/a	20.000		07/24/08
DUP	Europium-154	15585-10-1	U-2.905e-2		RPD			n/a	20.000		07/24/08
BATCH QC											
BLANK	Cesium-137	10045-97-3	U-6.676e-3	n/a	pCi/g	-10.000	1000.000				07/23/08
BLANK	Europium-154	15585-10-1	U-1.354e-2	n/a	pCi/g	-10.000	1000.000				07/23/08
LCS	Cesium-137	10045-97-3	6328	104.768	% Recov	80.000	120.000				07/23/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081501
Matrix: SOLID
Test: Plutonium Isotopics by AEA

Sample Date: 07/17/08
Receive Date:07/21/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR02733											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Pu-242 tracer by AEA	PU242	6.008	78.430	% Recov	30.000	105.000				09/12/08
Lab ID: W08GR03388											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Plutonium-238	13981-16-3	U6.9e-3		RPD			n/a	20.000		09/12/08
DUP	Pu-239/240 by AEA	PU-239/240	3.9e-2		RPD			n/a	20.000		09/12/08
DUP	Pu-242 tracer by AEA	PU242	6.15	72.120	% Recov	30.000	105.000				09/12/08
BATCH QC											
BLANK	Plutonium-238	13981-16-3	U-1.5e-2	n/a	pCi/g	-10.000	1000.000				09/12/08
BLANK	Pu-239/240 by AEA	PU-239/240	U2.1e-3	n/a	pCi/g	-10.000	1000.000				09/12/08
BLANK	Pu-242 tracer by AEA	PU242	6.236	73.920	% Recov	30.000	105.000				09/12/08
LCS	Pu-239/240 by AEA	PU-239/240	13.14	102.297	% Recov	80.000	120.000				09/12/08
LCS	Pu-242 tracer by AEA	PU242	17.3	74.800	% Recov	30.000	105.000				09/12/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081501
Matrix: SOLID
Test: Strontium 89/90

Sample Date: 07/17/08
Receive Date:07/21/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR02733											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	85.1	85.100	% Recov	30.000	105.000				09/08/08
Lab ID: W08GR03325											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Sr-85 Tracer by Beta Counting	SR85	95.9	95.900	% Recov	30.000	105.000				09/08/08
DUP	Strontium-89/90	SR-RAD	-2.0		RPD			n/a	20.000		09/08/08
BATCH QC											
BLANK	Sr-85 Tracer by Beta Counting	SR85	85.7	85.700	% Recov	30.000	105.000				09/08/08
BLANK	Strontium-89/90	10098-97-2	U-1.3	n/a	pCi/g	-10.000	300.000				09/08/08
LCS	Sr-85 Tracer by Beta Counting	SR85	75.7	75.700	% Recov	30.000	105.000				09/08/08
LCS	Strontium-89/90	10098-97-2	78.4	112.936	% Recov	80.000	120.000				09/08/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081501
Matrix: SOLID
Test: Uranium Isotopics by AEA

Sample Date: 07/17/08
Receive Date:07/21/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR02733											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	U-232 tracer by AEA	U232	3.939	82.550	% Recov	30.000	105.000				09/14/08
Lab ID: W08GR03388											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	U-232 tracer by AEA	U232	4.033	85.020	% Recov	30.000	105.000				09/14/08
DUP	Uranium-233/234	U-233/234	0.27		RPD			0.000	20.000		09/14/08
DUP	Uranium-235	15117-96-1	1.9e-2		RPD			5.128	20.000		09/14/08
DUP	Uranium-238	U-238	0.34		RPD			12.500	20.000		09/14/08
BATCH QC											
BLANK	U-232 tracer by AEA	U232	4.089	62.430	% Recov	30.000	105.000				09/14/08
BLANK	Uranium-233/234	13966-29-5	4.7e-2	0.047	pCi/g	-10.000	1000.000				09/14/08
BLANK	Uranium-235	15117-96-1	U5.7e-3	n/a	pCi/g	-10.000	1000.000				09/14/08
BLANK	Uranium-238	24678-82-8	1.3e-2	0.013	pCi/g	-10.000	1000.000				09/14/08
LCS	U-232 tracer by AEA	U232	11.35	74.430	% Recov	30.000	105.000				09/14/08
LCS	Uranium-233/234	13966-29-5	n/a	n/a	% Recov	75.000	125.000				09/14/08
LCS	Uranium-235	15117-96-1	n/a	n/a	% Recov	75.000	125.000				09/14/08
LCS	Uranium-238	24678-82-8	20.87	110.103	% Recov	80.000	120.000				09/14/08

WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent
Project Number F08-093

Group #: WSCF20081501
Department: Radiochemistry

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		Zinc prep blank above the MDL but < 5% of sample results. No flag ICP-AES: High barium and calcium preparation blank results; "C" flag if applicable. All elements having results <5X MDL; "B" flag. No zirconium and lithium present in the LCS standard. Magnesium, aluminum, calcium, titanium, and iron sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check and high standards used to ensure magnesium, calcium, iron, aluminum, and potassium linearity because sample results are greater than the calibration standard. High sodium spike recoveries; "N" flag. Boron results biased high due to iron interference; "E" flag Calculated beryllium result due to iron interference; "E" flag.

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

M4W41-SLF-08-1033

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
Due CA
9/4/08

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Groundwater Remediation Program

Richland, WA 99354
Attn: Steve Trent

Customer Code: GPP
PO#: 123123ES10
Group#: 20081501
Project#: F08-093
Proj Mgr: Steve Trent
Phone: 373-5869

The following samples were received from you on 07/21/08. 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	Matrix	Sample Date
	Tests Scheduled		
W08GR02733	B1WB31	TRENT Solid, or handle as if solid	07/17/08
	@2008 @AEA-30 @AEA-31 @AEA-32 @GEA-GPP		
	@GPP6010 @IC-30 @SR89_90 CN-02		

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 H20 P
@IC-30	Anions by Ion Chromatography
@SR89_90	Strontium 89/90
CN-02	Cyanide by Midi/Spectrophotom

Fluor Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | F08-093-075 | PAGE 1 OF 1

COLLECTOR: Kaul 9/4	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 8N; DATA TURNAROUND: 45 Days / 45 Days; AIR QUALITY: ☐
SAMPLING LOCATION: C5721 I-003	PROJECT DESIGNATION: 200-CW-1 Model Group 5 Sampling - Large Ponds and Waste Sites		SAF NO.: F08-093	
ICE CHEST NO.: GWS-020	FIELD LOGBOOK NO.: HNF-N-585-1 P98	ACTUAL SAMPLE DEPTH: 87.3 to 89.3	COA: 123117ES10	METHOD OF SHIPMENT: FEDERAL EXPRESS
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: PTR		BILL OF LADING/AIR BILL NO.: PTR	

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
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

2008150 1

SPECIAL HANDLING AND/OR STORAGE
Radioactive Tie to B1WB46

PRESERVATION	Cool~4C	None	
TYPE OF CONTAINER	G/P	G/P	
NO. OF CONTAINER(S)	1	1	
VOLUME	120mL	120mL	
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS: 024875	SEE ITEM (2) IN SPECIAL INSTRUCTIONS: 024875	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B1WB31 W0704170733	SOIL	07-17-08	1451	✓	✓	ICED

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Ed Kaul / [illegible]	7-17-08 1660	MO 413 Ref #2	7-17-08 1600
MO 413 Ref #2	7-21-8 0800	DConnin DC	7-21-8 0800
DConnin DC	7-21-8 0825	A Hudson	7-21-8 0825

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP Metals - 6010B (Add-On) {Arsenic, Beryllium, Bismuth, Boron, Lithium, Molybdenum, Strontium, Titanium} ICP Metals - 6010B (TAL) {Aluminum, Barium, Calcium, Iron, Magnesium, Potassium, Sodium} ICP/MS - 200.8 (Add-on) {Lead, Selenium, Thallium, Uranium} ICP/MS - 200.8 (TAL) {Antimony, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc} 200.8 ICPMS {Mercury} IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in phosphate, Sulfate} Cyanide (Total) - 335.2 {Cyanide}
(2)Gamma Spectroscopy {Cesium-137, Europium-154} Americium-241 {Americium-241} Isotopic Plutonium {Plutonium-239/240} Isotopic Uranium {Uranium-238} Strontium-89,90 - Total Sr {Total beta radiostrontium}

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

A-6003-618(01/06)