RECEIVED JANUARY 18, 2008

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FLUOR

Memorandum

M4W41-SLF-08-044

To:	H. Hampt	E6-35	Date:	January 16, 2008
From:	S. L. Fitzgerald, Manager WSCF Analytical Lab			

cc: w/Attachments

T. F. Dale	S3-30	J. E. Trechter	S3-30
D. Felmy (PNNL)	K6-75	S. J. Trent	E6-35
H. K. Meznarich	S3-30	File/LB	
P. D. Mix	S3-30		

Subject: FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20072199

Reference:
1) Letter of Instruction for Analytical Services for the Groundwater Performance Assessment Project and Analytical Laboratory Transition Plan, FH-0602422, September 19, 2006
2) HNF-SD-CD-QAPP-017, Rev. 8, Waste Sampling & Characterization Facility Quality Assurance Plan

This transmittal contains the following information for sample delivery group WSCF20072199:

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

SLF/grf

Attachments 4

M4W41-SLF-08-044

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20072199
Data Deliverable Date: 21-jan-2008
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
X08-001	B1PNH2	W07P003642	WATER
	B1PNH3	W07P003643	WATER
X08-006	B1PYN3	W07P003638	WATER
	B1PYN4	W07P003639	WATER
	B1PYP7	W07P003640	WATER
	B1PYR0	W07P003641	WATER

M4W41-SLF-08-044

ATTACHMENT 2

NARRATIVE

Consisting of 3 pages
Including cover page

Introduction

Six (6) groundwater samples were received at the WSCF Laboratory on December 7, 2007. Samples were 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 through 12, for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold 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 20 through 22 for QC details. Analytical Note(s):

- Sample results that were less than the reportable limit, however greater than the method detection limit, were B flagged.

All QC controls are within the established limits.

Hexavalent Chromium – The 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 the GRP Letter of Instruction. See page 23 for QC details. Analytical Note(s):

- Sample results that were less than the reportable limit, however greater than the method detection limit, were B flagged.

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 24 through 27 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1R0H2 (SDG# 20072191).
- Antimony, Silver and Vanadium contamination detected in the Blank was evaluated and affected sample results were C flagged.
- Calcium, Magnesium and Sodium sample results were beyond effective spike range. Spike recoveries were marked "N/A". Check standards were analyzed to ensure sample result linearity.

All other QC controls are within the established limits.

Total Alkalinity – The hold time requirement for this analysis was met. A Duplicate and Laboratory Control Sample were analyzed with this delivery group per GRP Letter of Instruction. See page 28 for QC details. Analytical Note(s):

- Duplicates were analyzed on samples B1R0R5 (SDG# 20072190, SAF# F07-045) and B1R0F6 (SDG# 20072182).

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, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 31 for QC details.

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

Pauline D. Mix
WSCF Client Services

M4W41-SLF-08-044

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 25 pages
Including cover page

WSCF
ANALYTICAL RESULTS REPORT

for

GPAP
Richland, WA 99352

Attention: Steve Trent E6-35

Analytical: S. Fitzgerald 1-16-08

Client Services: P.D.Mi 1-18-2008

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

Report#: WSCF20072199
Report Date: 11-jan-2008
Report WGPP/ver. 5.2
GPAP

w13qlog v4.2 11-jan-2008 07:03:35

Department: Inorganic

W13q Worklist/Batch/QC Report for Group# WSCF20072199

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
34430	2	34830	39056	BLANK		Anions by Ion Chromatography
34430	13	34830	39056	BLANK		Anions by Ion Chromatography
34430	3	34830	39056	LCS		Anions by Ion Chromatography
34430	5	34830	39056	DUP	W07P003640	Anions by Ion Chromatography
34430	6	34830	39056	MS	W07P003640	Anions by Ion Chromatography
34430	7	34830	39056	MSD	W07P003640	Anions by Ion Chromatography
34430	4	34830	39056	SAMPLE	W07P003640	Anions by Ion Chromatography
34430	7	34830	39056	SPK-RPD	W07P003640	Anions by Ion Chromatography
34428	2	34828	39060	BLANK		Anions by Ion Chromatography
34428	13	34828	39060	BLANK		Anions by Ion Chromatography
34428	3	34828	39060	LCS		Anions by Ion Chromatography
34428	5	34828	39060	DUP	W07P003643	Anions by Ion Chromatography
34428	6	34828	39060	MS	W07P003643	Anions by Ion Chromatography
34428	7	34828	39060	MSD	W07P003643	Anions by Ion Chromatography
34428	4	34828	39060	SAMPLE	W07P003643	Anions by Ion Chromatography
34428	7	34828	39060	SPK-RPD	W07P003643	Anions by Ion Chromatography
34505	1	34904	39116	LCS		Total Alkalinity as mg/L CaCO3
34505	14	34904	39116	LCS		Total Alkalinity as mg/L CaCO3
34505	25	34904	39116	LCS		Total Alkalinity as mg/L CaCO3
34505	9	34904	39116	DUP	W07GR03205	Total Alkalinity as mg/L CaCO3
34505	3	34904	39116	DUP	W07P003580	Total Alkalinity as mg/L CaCO3
34505	22	34904	39116	SAMPLE	W07P003643	Total Alkalinity as mg/L CaCO3
34467	2	34865	39224	BLANK		Hexavalent chromium
34467	3	34865	39224	LCS		Hexavalent chromium
34467	8	34865	39224	SAMPLE	W07P003640	Hexavalent chromium
34467	5	34865	39224	DUP	W07P003641	Hexavalent chromium
34467	6	34865	39224	MS	W07P003641	Hexavalent chromium
34467	7	34865	39224	MSD	W07P003641	Hexavalent chromium
34467	4	34865	39224	SAMPLE	W07P003641	Hexavalent chromium
34467	7	34865	39224	SPK-RPD	W07P003641	Hexavalent chromium
34467	9	34865	39224	SAMPLE	W07P003643	Hexavalent chromium
34765	1	35170	39441	BLANK		ICP Metals Analysis, Grd H20 P
34765	2	35170	39441	LCS		ICP Metals Analysis, Grd H20 P
34765	4	35170	39441	MS	W07P003594	ICP Metals Analysis, Grd H20 P
34765	5	35170	39441	MSD	W07P003594	ICP Metals Analysis, Grd H20 P
34765	5	35170	39441	SPK-RPD	W07P003594	ICP Metals Analysis, Grd H20 P
34765	7	35170	39441	SAMPLE	W07P003638	ICP Metals Analysis, Grd H20 P
34765	8	35170	39441	SAMPLE	W07P003639	ICP Metals Analysis, Grd H20 P
34765	9	35170	39441	SAMPLE	W07P003642	ICP Metals Analysis, Grd H20 P
34765	10	35170	39441	SAMPLE	W07P003643	ICP Metals Analysis, Grd H20 P

w13qlog v4.2 11-jan-2008 07:03:35

Department: Radiochemistry

W13q Worklist/Batch/QC Report for Group# WSCF20072199

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
34656	1	35058	39413	BLANK		Tritium by Liq Sct column prep
34656	2	35058	39413	LCS		Tritium by Liq Sct column prep
34656	4	35058	39413	DUP	W07P003640	Tritium by Liq Sct column prep
34656	3	35058	39413	MS	W07P003640	Tritium by Liq Sct column prep
34656	5	35058	39413	SAMPLE	W07P003640	Tritium by Liq Sct column prep

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-265-403	LA-265-403: Hexavalent Chromium analysis by Spectrophotometer	
	EPA SW-846 7196A	HEXAVALENT CHROMIUM
	HEIS 7196_CR6	Hexavalent Chromium
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-531-411	LA-531-411: ALKALINITY (TITRIMETRIC)	
	HEIS 2320B	Alkalinity
	Standard Methods 2320B	Alkalinity
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-508-421 LA-508-421: OPERATION OF THE TRI-CARB MODEL 2500TR LIQUID SCINTILLATION ANALYZER

HEIS ALPHA_LSC	A/B Liquid Scintililation
HEIS BETA_LSC	A/B Liquid Scintilallation
HEIS TC99_3MDSK_LSC	TC99 by Liquid Scintillation
HEIS TRITIUM_EIE_LSC	Tritium Liquid Scintillation

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 E6-35
SAF Number: X08-006
Sample # W07P003638
Client ID: B1PYN3 PNNL-GPP WSCF
Matrix: WATER
Group #: WSCF20072199
Department: Inorganic
Sampled: 12/07/07
Received: 12/07/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H20 P Prep											**01/09/08**
ICP Metals Analysis, Grd H20 P											
Iron	7439-89-6	LA-505-411		10.3	ug/L			1.00	9.0		01/09/08
Magnesium	7439-95-4	LA-505-411		4.41e+03	ug/L			1.00	6.0		01/09/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Potassium	7440-09-7	LA-505-411		716	ug/L			1.00	45		01/09/08
Silver	7440-22-4	LA-505-411	C	7.20	ug/L			1.00	5.0		01/09/08
Sodium	7440-23-5	LA-505-411		2.41e+03	ug/L			1.00	27		01/09/08
Antimony	7440-36-0	LA-505-411	U	< 32.0	ug/L			1.00	32		01/09/08
Barium	7440-39-3	LA-505-411		14.4	ug/L			1.00	4.0		01/09/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Chromium	7440-47-3	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Copper	7440-50-8	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Vanadium	7440-62-2	LA-505-411	U	< 7.00	ug/L			1.00	7.0		01/09/08
Zinc	7440-66-6	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Calcium	7440-70-2	LA-505-411		2.86e+04	ug/L			1.00	34		01/09/08
Strontium	7440-24-6	LA-505-411		83.1	ug/L			1.00	4.0		01/09/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08

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

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

Report WGPP/ver. 5.2
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WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: X08-006
Sample # W07P003639
Client ID: B1PYN4 PNNL-GPP WSCF
Matrix: WATER
Group #: WSCF20072199
Department: Inorganic
Sampled: 12/07/07
Received: 12/07/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H20 P Prep											**01/09/08**
ICP Metals Analysis, Grd H20 P											
Iron	7439-89-6	LA-505-411		129	ug/L			1.00	9.0		01/09/08
Magnesium	7439-95-4	LA-505-411		4.52e+03	ug/L			1.00	6.0		01/09/08
Manganese	7439-96-5	LA-505-411		11.9	ug/L			1.00	4.0		01/09/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Potassium	7440-09-7	LA-505-411		691	ug/L			1.00	45		01/09/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		01/09/08
Sodium	7440-23-5	LA-505-411		2.45e+03	ug/L			1.00	27		01/09/08
Antimony	7440-36-0	LA-505-411	U	< 32.0	ug/L			1.00	32		01/09/08
Barium	7440-39-3	LA-505-411		16.9	ug/L			1.00	4.0		01/09/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Chromium	7440-47-3	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Copper	7440-50-8	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Vanadium	7440-62-2	LA-505-411	C	7.40	ug/L			1.00	7.0		01/09/08
Zinc	7440-66-6	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Calcium	7440-70-2	LA-505-411		2.96e+04	ug/L			1.00	34		01/09/08
Strontium	7440-24-6	LA-505-411		85.6	ug/L			1.00	4.0		01/09/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08

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

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

Report WGPP/ver. 5.2
GPAP

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: X08-006
Sample # W07P003640
Client ID: B1PYP7 PNNL-GPP WSCF
Matrix: WATER
Group #: WSCF20072199
Department: Inorganic
Sampled: 12/07/07
Received: 12/07/07

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		0.0969	mg/L			1.00	6.0e-03		12/07/07
Chloride	16887-00-6	LA-533-410		0.692	mg/L			1.00	0.030		12/07/07
Nitrogen in Nitrite	NO2-N	LA-533-410	U	< 0.0100	mg/L			1.00	0.010		12/07/07
Nitrogen in Nitrate	NO3-N	LA-533-410		0.201	mg/L			1.00	5.0e-03		12/07/07
Sulfate	14808-79-8	LA-533-410		14.1	mg/L			1.00	0.070		12/07/07
Hexavalent Chromium											
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 2.00e-03	mg/L			1.00	2.0e-03		12/07/07

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

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

Report WGPP/ver. 5.2
GPAP

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: X08-006
Sample # W07P003641
Client ID: B1PYR0 PNNL-GPP WSCF
Matrix: WATER

Group #: WSCF20072199
Department: Inorganic
Sampled: 12/07/07
Received: 12/07/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium											
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 2.00e-03	mg/L			1.00	2.0e-03		12/07/07

MDL=Minimum Detection Limit
RQ=Result Qualifier
TP Err=Total Propagated Error
DF=Dilution Factor

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

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WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: X08-001
Sample # W07P003642
Client ID: B1PNH2 PNNL-GPP WSCF
Matrix: WATER
Group #: WSCF20072199
Department: Inorganic
Sampled: 12/07/07
Received: 12/07/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H20 P Prep											**01/09/08**
ICP Metals Analysis, Grd H20 P											
Iron	7439-89-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		01/09/08
Magnesium	7439-95-4	LA-505-411		6.15e+03	ug/L			1.00	6.0		01/09/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Potassium	7440-09-7	LA-505-411		1.49e+03	ug/L			1.00	45		01/09/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		01/09/08
Sodium	7440-23-5	LA-505-411		3.49e+03	ug/L			1.00	27		01/09/08
Antimony	7440-36-0	LA-505-411	U	< 32.0	ug/L			1.00	32		01/09/08
Barium	7440-39-3	LA-505-411		16.0	ug/L			1.00	4.0		01/09/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Chromium	7440-47-3	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Copper	7440-50-8	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Vanadium	7440-62-2	LA-505-411	C	11.5	ug/L			1.00	7.0		01/09/08
Zinc	7440-66-6	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Calcium	7440-70-2	LA-505-411		4.16e+04	ug/L			1.00	34		01/09/08
Strontium	7440-24-6	LA-505-411		177	ug/L			1.00	4.0		01/09/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08

MDL = Minimum Detection Limit
RQ = Result Qualifier
TP Err = Total Propagated Error
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B - The analyte < the RDL but > = the IDL/MDL (inorg)
C - The Analyte was found in the Associated Blank.(inorg)
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WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: X08-001
Sample # W07P003643
Client ID: B1PNH3 PNNL-GPP WSCF
Matrix: WATER
Group #: WSCF20072199
Department: Inorganic
Sampled: 12/07/07
Received: 12/07/07

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	B	0.0623	mg/L			1.00	6.0e-03		12/08/07
Chloride	16887-00-6	LA-533-410		3.36	mg/L			1.00	0.030		12/08/07
Nitrogen in Nitrite	NO2-N	LA-533-410	U	< 0.0100	mg/L			1.00	0.010		12/08/07
Nitrogen in Nitrate	NO3-N	LA-533-410		2.20	mg/L			1.00	5.0e-03		12/08/07
Sulfate	14808-79-8	LA-533-410		23.4	mg/L			1.00	0.070		12/08/07
Hexavalent Chromium											
Hexavalent Chromium	18540-29-9	LA-265-403	U	< 2.00e-03	mg/L			1.00	2.0e-03		12/07/07
ICP Metals Analysis, Grd H20 P Prep											**01/09/08**
ICP Metals Analysis, Grd H20 P											
Iron	7439-89-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		01/09/08
Magnesium	7439-95-4	LA-505-411		6.04e+03	ug/L			1.00	6.0		01/09/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Potassium	7440-09-7	LA-505-411		1.44e+03	ug/L			1.00	45		01/09/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		01/09/08
Sodium	7440-23-5	LA-505-411		3.40e+03	ug/L			1.00	27		01/09/08
Antimony	7440-36-0	LA-505-411	C	42.3	ug/L			1.00	32		01/09/08
Barium	7440-39-3	LA-505-411		15.4	ug/L			1.00	4.0		01/09/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Chromium	7440-47-3	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Copper	7440-50-8	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Vanadium	7440-62-2	LA-505-411	U	< 7.00	ug/L			1.00	7.0		01/09/08
Zinc	7440-66-6	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08

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

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

Report WGPP/ver. 5.2
GPAP

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: X08-001
Sample # W07P003643
Client ID: B1PNH3 PNNL-GPP WSCF
Matrix: WATER

Group #: WSCF20072199
Department: Inorganic
Sampled: 12/07/07
Received: 12/07/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Calcium	7440-70-2	LA-505-411		4.09e+04	ug/L			1.00	34		01/09/08
Strontium	7440-24-6	LA-505-411		173	ug/L			1.00	4.0		01/09/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		01/09/08
Total Alkalinity as mg/L CaCO3											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		95.0	mg/L			1.00	1.0		12/12/07

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

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

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
Matrix: WATER
Test: Anions by Ion Chromatography

Sample Date: 12/07/07
Receive Date: 12/07/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W07P003640											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Chloride	16887-00-6	0.6962		RPD			0.591	20.000		12/07/07
DUP	Fluoride	16984-48-8	8.84e-2		RPD			9.174	20.000		12/07/07
DUP	Nitrogen in Nitrite	NO2-N	<1e-2		RPD			n/a	20.000	U	12/07/07
DUP	Nitrogen in Nitrate	NO3-N	0.1975		RPD			1.955	20.000		12/07/07
DUP	Sulfate	14808-79-8	13.865		RPD			1.381	20.000		12/07/07
MS	Chloride	16887-00-6	0.9614	97.111	% Recov	75.000	125.000				12/07/07
MS	Fluoride	16984-48-8	0.4596	91.554	% Recov	75.000	125.000				12/07/07
MS	Nitrogen in Nitrite	NO2-N	0.4633	93.032	% Recov	75.000	125.000				12/07/07
MS	Nitrogen in Nitrate	NO3-N	0.448	99.335	% Recov	75.000	125.000				12/07/07
MS	Sulfate	14808-79-8	1.9139	96.662	% Recov	75.000	125.000				12/07/07
MSD	Chloride	16887-00-6	1.0067	101.687	% Recov	75.000	125.000				12/07/07
MSD	Fluoride	16984-48-8	0.4765	94.920	% Recov	75.000	125.000				12/07/07
MSD	Nitrogen in Nitrite	NO2-N	0.4749	95.361	% Recov	75.000	125.000				12/07/07
MSD	Nitrogen in Nitrate	NO3-N	0.4504	99.867	% Recov	75.000	125.000				12/07/07
MSD	Sulfate	14808-79-8	1.8699	94.439	% Recov	75.000	125.000				12/07/07
SPK-RPD	Chloride	16887-00-6	101.687		RPD			4.604	20.000		12/08/07
SPK-RPD	Fluoride	16984-48-8	94.920		RPD			3.610	20.000		12/08/07
SPK-RPD	Nitrogen in Nitrite	NO2-N	95.361		RPD			2.472	20.000		12/08/07
SPK-RPD	Nitrogen in Nitrate	NO3-N	99.867		RPD			0.534	20.000		12/08/07
SPK-RPD	Sulfate	14808-79-8	94.439		RPD			2.327	20.000		12/08/07
BATCH QC											
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	12/07/07
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	12/08/07
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	12/07/07
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	12/08/07

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
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
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	12/07/07
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	12/08/07
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	12/08/07
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	12/07/07
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	12/07/07
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	12/08/07
LCS	Chloride	16887-00-6	199.1559	99.578	% Recov	80.000	120.000				12/07/07
LCS	Fluoride	16984-48-8	104.4417	103.408	% Recov	80.000	120.000				12/07/07
LCS	Nitrogen in Nitrite	NO2-N	100.372	100.372	% Recov	80.000	120.000				12/07/07
LCS	Nitrogen in Nitrate	NO3-N	91.8593	100.723	% Recov	80.000	120.000				12/07/07
LCS	Sulfate	14808-79-8	392.7417	98.185	% Recov	80.000	120.000				12/07/07
Lab ID: W07P003643											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Chloride	16887-00-6	3.3076		RPD			1.566	20.000		12/08/07
DUP	Fluoride	16984-48-8	5.7e-2		RPD			8.885	20.000		12/08/07
DUP	Nitrogen in Nitrite	NO2-N	<1e-2		RPD			n/a	20.000	U	12/08/07
DUP	Nitrogen in Nitrate	NO3-N	2.1804		RPD			0.818	20.000		12/08/07
DUP	Sulfate	14808-79-8	23.329		RPD			0.243	20.000		12/08/07
MS	Chloride	16887-00-6	1.0186	102.889	% Recov	75.000	125.000				12/08/07
MS	Fluoride	16984-48-8	0.516	102.789	% Recov	75.000	125.000				12/08/07
MS	Nitrogen in Nitrite	NO2-N	0.4645	93.273	% Recov	75.000	125.000				12/08/07
MS	Nitrogen in Nitrate	NO3-N	0.4654	103.193	% Recov	75.000	125.000				12/08/07
MS	Sulfate	14808-79-8	1.9442	98.192	% Recov	75.000	125.000				12/08/07
MSD	Chloride	16887-00-6	1.047	105.758	% Recov	75.000	125.000				12/08/07
MSD	Fluoride	16984-48-8	0.5286	105.299	% Recov	75.000	125.000				12/08/07
MSD	Nitrogen in Nitrite	NO2-N	0.4644	93.253	% Recov	75.000	125.000				12/08/07
MSD	Nitrogen in Nitrate	NO3-N	0.4364	96.763	% Recov	75.000	125.000				12/08/07
MSD	Sulfate	14808-79-8	1.8614	94.010	% Recov	75.000	125.000				12/08/07
SPK-RPD	Chloride	16887-00-6	105.758		RPD			2.750	20.000		12/08/07

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
Matrix: WATER
Test: Anions by Ion Chromatography

Sample Date: 12/07/07
Receive Date:12/07/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
SPK-RPD	Fluoride	16984-48-8	105.299		RPD			2.412	20.000		12/08/07
SPK-RPD	Nitrogen in Nitrite	NO2-N	93.253		RPD			0.021	20.000		12/08/07
SPK-RPD	Nitrogen in Nitrate	NO3-N	96.763		RPD			6.431	20.000		12/08/07
SPK-RPD	Sulfate	14808-79-8	94.010		RPD			4.352	20.000		12/08/07
BATCH QC											
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	12/08/07
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	12/08/07
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	12/08/07
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	12/08/07
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	12/08/07
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	12/08/07
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	12/08/07
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	12/08/07
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	12/08/07
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	12/08/07
LCS	Chloride	16887-00-6	202.1778	101.089	% Recov	80.000	120.000				12/08/07
LCS	Fluoride	16984-48-8	108.3285	107.256	% Recov	80.000	120.000				12/08/07
LCS	Nitrogen in Nitrite	NO2-N	102.9114	102.911	% Recov	80.000	120.000				12/08/07
LCS	Nitrogen in Nitrate	NO3-N	93.7011	102.742	% Recov	80.000	120.000				12/08/07
LCS	Sulfate	14808-79-8	396.3764	99.094	% Recov	80.000	120.000				12/08/07

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
Matrix: WATER
Test: Hexavalent chromium

Sample Date: 12/07/07
Receive Date:12/07/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W07P003641											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Hexavalent chromium	18540-29-9	<0.002		RPD			n/a	15.000	U	12/07/07
MS	Hexavalent chromium	18540-29-9	0.0505	95.825	% Recov	85.000	115.000				12/07/07
MSD	Hexavalent chromium	18540-29-9	0.0517	98.102	% Recov	85.000	115.000				12/07/07
SPK-RPD	Hexavalent chromium	18540-29-9	98.102		RPD			2.348	20.000		12/07/07
BATCH QC											
BLANK	Hexavalent chromium	18540-29-9	<0.002	n/a	mg/L	0.000	2.000			U	12/07/07
LCS	Hexavalent chromium	18540-29-9	0.0492	99.394	% Recov	80.000	120.000				12/07/07

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 12/06/07
Receive Date:12/06/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W07P003594											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Silver	7440-22-4	998.8	99.880	% Recov	75.000	125.000				01/09/08
MS	Barium	7440-39-3	500.9	100.180	% Recov	75.000	125.000				01/09/08
MS	Beryllium	7440-41-7	533.4	106.680	% Recov	75.000	125.000				01/09/08
MS	Calcium	7440-70-2	NA	n/a	% Recov	75.000	125.000				01/09/08
MS	Cadmium	7440-43-9	1016	101.600	% Recov	75.000	125.000				01/09/08
MS	Cobalt	7440-48-4	1021	102.100	% Recov	75.000	125.000				01/09/08
MS	Chromium	7440-47-3	1023	102.300	% Recov	75.000	125.000				01/09/08
MS	Copper	7440-50-8	986.7	98.670	% Recov	75.000	125.000				01/09/08
MS	Iron	7439-89-6	1032.6	103.260	% Recov	75.000	125.000				01/09/08
MS	Potassium	7440-09-7	10118	101.180	% Recov	75.000	125.000				01/09/08
MS	Magnesium	7439-95-4	NA	n/a	% Recov	75.000	125.000				01/09/08
MS	Manganese	7439-96-5	1016	101.600	% Recov	75.000	125.000				01/09/08
MS	Sodium	7440-23-5	NA	n/a	% Recov	75.000	125.000				01/09/08
MS	Nickel	7440-02-0	1005	100.500	% Recov	75.000	125.000				01/09/08
MS	Antimony	7440-36-0	1060	106.000	% Recov	75.000	125.000				01/09/08
MS	Strontium	7440-24-6	515.9	103.180	% Recov	75.000	125.000				01/09/08
MS	Vanadium	7440-62-2	984.6	98.460	% Recov	75.000	125.000				01/09/08
MS	Zinc	7440-66-6	1029	102.900	% Recov	75.000	125.000				01/09/08
MSD	Silver	7440-22-4	982.3	98.230	% Recov	75.000	125.000				01/09/08
MSD	Barium	7440-39-3	491.9	98.380	% Recov	75.000	125.000				01/09/08
MSD	Beryllium	7440-41-7	524.9	104.980	% Recov	75.000	125.000				01/09/08
MSD	Calcium	7440-70-2	NA	n/a	% Recov	75.000	125.000				01/09/08
MSD	Cadmium	7440-43-9	1013	101.300	% Recov	75.000	125.000				01/09/08
MSD	Cobalt	7440-48-4	1008	100.800	% Recov	75.000	125.000				01/09/08
MSD	Chromium	7440-47-3	1003	100.300	% Recov	75.000	125.000				01/09/08
MSD	Copper	7440-50-8	974	97.400	% Recov	75.000	125.000				01/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 12/06/07
Receive Date: 12/06/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Iron	7439-89-6	1013.6	101.360	% Recov	75.000	125.000				01/09/08
MSD	Potassium	7440-09-7	9948	99.480	% Recov	75.000	125.000				01/09/08
MSD	Magnesium	7439-95-4	NA	n/a	% Recov	75.000	125.000				01/09/08
MSD	Manganese	7439-96-5	1004	100.400	% Recov	75.000	125.000				01/09/08
MSD	Sodium	7440-23-5	NA	n/a	% Recov	75.000	125.000				01/09/08
MSD	Nickel	7440-02-0	994	99.400	% Recov	75.000	125.000				01/09/08
MSD	Antimony	7440-36-0	1064	106.400	% Recov	75.000	125.000				01/09/08
MSD	Strontium	7440-24-6	500.4	100.080	% Recov	75.000	125.000				01/09/08
MSD	Vanadium	7440-62-2	972.5	97.250	% Recov	75.000	125.000				01/09/08
MSD	Zinc	7440-66-6	1019	101.900	% Recov	75.000	125.000				01/09/08
SPK-RPD	Silver	7440-22-4	98.230		RPD			1.666	20.000		01/09/08
SPK-RPD	Barium	7440-39-3	98.380		RPD			1.813	20.000		01/09/08
SPK-RPD	Beryllium	7440-41-7	104.980		RPD			1.606	20.000		01/09/08
SPK-RPD	Calcium	7440-70-2			RPD			n/a	20.000		01/09/08
SPK-RPD	Cadmium	7440-43-9	101.300		RPD			0.296	20.000		01/09/08
SPK-RPD	Cobalt	7440-48-4	100.800		RPD			1.281	20.000		01/09/08
SPK-RPD	Chromium	7440-47-3	100.300		RPD			1.974	20.000		01/09/08
SPK-RPD	Copper	7440-50-8	97.400		RPD			1.295	20.000		01/09/08
SPK-RPD	Iron	7439-89-6	101.360		RPD			1.857	20.000		01/09/08
SPK-RPD	Potassium	7440-09-7	99.480		RPD			1.694	20.000		01/09/08
SPK-RPD	Magnesium	7439-95-4			RPD			n/a	20.000		01/09/08
SPK-RPD	Manganese	7439-96-5	100.400		RPD			1.188	20.000		01/09/08
SPK-RPD	Sodium	7440-23-5			RPD			n/a	20.000		01/09/08
SPK-RPD	Nickel	7440-02-0	99.400		RPD			1.101	20.000		01/09/08
SPK-RPD	Antimony	7440-36-0	106.400		RPD			0.377	20.000		01/09/08
SPK-RPD	Strontium	7440-24-6	100.080		RPD			3.050	20.000		01/09/08
SPK-RPD	Vanadium	7440-62-2	97.250		RPD			1.237	20.000		01/09/08
SPK-RPD	Zinc	7440-66-6	101.900		RPD			0.977	20.000		01/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
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
BATCH QC											
BLANK	Silver	7440-22-4	5	5.000	ug/L						01/09/08
BLANK	Barium	7440-39-3	<4	n/a	ug/L					U	01/09/08
BLANK	Beryllium	7440-41-7	<4	n/a	ug/L					U	01/09/08
BLANK	Calcium	7440-70-2	<34	n/a	ug/L					U	01/09/08
BLANK	Cadmium	7440-43-9	<4	n/a	ug/L					U	01/09/08
BLANK	Cobalt	7440-48-4	<4	n/a	ug/L					U	01/09/08
BLANK	Chromium	7440-47-3	<4	n/a	ug/L					U	01/09/08
BLANK	Copper	7440-50-8	<4	n/a	ug/L					U	01/09/08
BLANK	Iron	7439-89-6	<9	n/a	ug/L					U	01/09/08
BLANK	Potassium	7440-09-7	<45	n/a	ug/L					U	01/09/08
BLANK	Magnesium	7439-95-4	<6	n/a	ug/L					U	01/09/08
BLANK	Manganese	7439-96-5	<4	n/a	ug/L					U	01/09/08
BLANK	Sodium	7440-23-5	<27	n/a	ug/L					U	01/09/08
BLANK	Nickel	7440-02-0	<4	n/a	ug/L					U	01/09/08
BLANK	Antimony	7440-36-0	45.3	45.300	ug/L						01/09/08
BLANK	Strontium	7440-24-6	<4	n/a	ug/L					U	01/09/08
BLANK	Vanadium	7440-62-2	8.5	8.500	ug/L						01/09/08
BLANK	Zinc	7440-66-6	<4	n/a	ug/L					U	01/09/08
LCS	Silver	7440-22-4	989.3	98.930	% Recov	80.000	120.000				01/09/08
LCS	Barium	7440-39-3	489	97.800	% Recov	80.000	120.000				01/09/08
LCS	Beryllium	7440-41-7	535.5	107.100	% Recov	80.000	120.000				01/09/08
LCS	Calcium	7440-70-2	1124	112.400	% Recov	80.000	120.000				01/09/08
LCS	Cadmium	7440-43-9	1017	101.700	% Recov	80.000	120.000				01/09/08
LCS	Cobalt	7440-48-4	1021	102.100	% Recov	80.000	120.000				01/09/08
LCS	Chromium	7440-47-3	1024	102.400	% Recov	80.000	120.000				01/09/08
LCS	Copper	7440-50-8	986.4	98.640	% Recov	80.000	120.000				01/09/08
LCS	Iron	7439-89-6	1018	101.800	% Recov	80.000	120.000				01/09/08
LCS	Potassium	7440-09-7	9542	95.420	% Recov	80.000	120.000				01/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
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	Magnesium	7439-95-4	985.8	98.580	% Recov	80.000	120.000				01/09/08
LCS	Manganese	7439-96-5	1004	100.400	% Recov	80.000	120.000				01/09/08
LCS	Sodium	7440-23-5	920.2	92.020	% Recov	80.000	120.000				01/09/08
LCS	Nickel	7440-02-0	1021	102.100	% Recov	80.000	120.000				01/09/08
LCS	Antimony	7440-36-0	1082	108.200	% Recov	80.000	120.000				01/09/08
LCS	Strontium	7440-24-6	487.2	97.440	% Recov	80.000	120.000				01/09/08
LCS	Vanadium	7440-62-2	977.7	97.770	% Recov	80.000	120.000				01/09/08
LCS	Zinc	7440-66-6	1012	101.200	% Recov	80.000	120.000				01/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20072199
Matrix: WATER
Test: Total Alkalinity as mg/L CaCO3

Sample Date: 12/06/07
Receive Date:12/06/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W07GR03205											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Total Alkalinity as mg/L CaCO3	ALKALINITY	119.2		RPD			0.927	20.000		12/12/07
Lab ID: W07P003580											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Total Alkalinity as mg/L CaCO3	ALKALINITY	112.9		RPD			2.450	20.000		12/12/07
BATCH QC											
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	55.24	104.226	%Recove	80.000	120.000				12/12/07
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	55.94	105.547	%Recove	80.000	120.000				12/12/07
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	54.80	103.396	%Recove	80.000	120.000				12/12/07

WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent E6-35

Group #: WSCF20072199
Department: Inorganic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		ICP-AES: High antimony, silver, and vanadium preparation blank results; "C" flag if applicable. Magnesium, sodium, and calcium sample results beyond effective spike range (spike recoveries marked "NA"). Check and high standards used to ensure magnesium, sodium, and calcium linearity because sample results are greater than the calibration standard.

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

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: X08-006
Sample # W07P003640
Client ID: B1PYP7 PNNL-GPP WSCF
Matrix: WATER

Group #: WSCF20072199
Department: Radiochemistry
Sampled: 12/07/07
Received: 12/07/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Tritium by Liq Sct column prep											
Tritium	10028-17-8	LA-508-421	U	180	pCi/L	+-130	pCi/L	1.00	2.2e+02		01/07/08

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

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

Report WGPP/ver. 5.2
GPAP

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20072199
Matrix: WATER
Test: Tritium by Liq Sct column prep

Sample Date: 12/07/07
Receive Date: 12/07/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W07P003640											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Tritium	10028-17-8	0		RPD			0.000	20.000		01/07/08
MS	Tritium	10028-17-8	24415.0	91.644	% Recov	75.000	125.000				01/07/08
BATCH QC											
BLANK	Tritium	10028-17-8	U-2.3E+01	n/a	pCi/L	-10.000	1000.000				01/07/08
LCS	Tritium	10028-17-8	2310.0	91.605	% Recov	80.000	120.000				01/07/08

M4W41-SLF-08-044

ATTACHMENT 4

SAMPLE RECEIPT INFORMATION

Consisting of 5 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
01/21/08

ACKNOWLEDGMENT OF SAMPLES RECEIVED

GPAP

Richland, WA 99352
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP
PO#: 122543
Group#: 20072199

The following samples were received from you on 12/07/07. 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
W07P003638	B1PYN3	PNNL-GPP @GPP6010	Water	12/07/0
W07P003639	B1PYN4	PNNL-GPP @GPP6010	Water	12/07/0
W07P003640	B1PYP7	PNNL-GPP @H3-33 @IC-30 CR+6	Water	12/07/0
W07P003641	B1PYR0	PNNL-GPP CR+6	Water	12/07/0
W07P003642	B1PNH2	PNNL-GPP @GPP6010	Water	12/07/0
W07P003643	B1PNH3	PNNL-GPP @GPP6010 @IC-30 ALKALI CR+6	Water	12/07/0

Test Acronym Description

Test Acronym	Description
@GPP6010	ICP Metals Analysis, Grd H20 P
@H3-33	Tritium by Liq Sct column prep
@IC-30	Anions by Ion Chromatography
ALKALI	Total Alkalinity as mg/L CaCO3
CR+6	Hexavalent chromium

FLUOR HANFORD

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

01/21/08 20072199

X08-006-40

Page 1 of 1

Collector K.J. Young	**Contact/Requester** Steve Trent	**Telephone No.** 3735869 **MSIN** **FAX**
SAF No. X08-006	**Sampling Origin** Hanford Site	**Purchase Order/Charge Code**
Project Title AQUIFER TUBES NOVEMBER 2007		**Ice Chest No.** **Temp.**
Shipped To (Lab) Waste Sampling & Characterization	**Method of Shipment** Govt. Vehicle	**Bill of Lading/Air Bill No.**
Protocol CERCLA	**Priority:** 45 Days	**Offsite Property No.**

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐
Do not combine X SAF samples with other sets. Need SDG to be stand alone.
FY07 and FY08 samples cannot be in the same SD

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1PYN3 (F) WDT	P003638	W	12/7/7	1110	1x500-mL G/P	6010_METALS_ICP: List-3 (18)	HNO3 to pH <2
B1PYN4	3639	W			1x500-mL G/P	6010_METALS_ICP: List-3 (18)	HNO3 to pH <2
B1PYP7	3640	W			1x500-mL aG	7196_CR6: Hexavalent Chromium (1)	Cool~4C
B1PYP7		W			1x500-mL P	300.0_ANIONS_IC: List-1 (5)	Cool~4C
B1PYP7		W			1x250-mL G	TRITIUM_EIE_LSC: Tritium (1)	None

ICED

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. Young	K.J. Young	K.J. Young	12/7/7 1240	JA PRAZIN	JA PRAZIN		12/7/7 1240
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

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

FLUOR HANFORD

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

X08-006-43

Page 1 of 1

Collector KJ Young	**Contact/Requester** Steve Trent	**Telephone No.** 3735869 **MSIN** **FAX**
SAF No. X08-006	**Sampling Origin** Hanford Site	**Purchase Order/Charge Code**
Project Title AQUIFER TUBES, NOVEMBER 2007		**Ice Chest No.** **Temp.**
Shipped To (Lab) Waste Sampling & Characterization	**Method of Shipment** Govt. Vehicle	**Bill of Lading/Air Bill No.**
Protocol CERCLA	**Priority:** 45 Days	**Offsite Property No.**

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐
Do not combine X SAF samples with other sets. Need SDG to be stand alone.
FY07 and FY08 samples cannot be in the same SD

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1PYR0	3641	W	12/7/7	1130	1x500-mL aG	7196_CR6: Hexavalent Chromium (1)	Cool~4C

ICED

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
KJ. Young	KJ Young	12/7/7	1240	JA Analyst			12/7/7 1240
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

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

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FLUOR HANFORD

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

X08-001-217

Page 1 of 1

Collector	**Contact/Requester** Steve Trent	**Telephone No.** 509-373-5869 **MSIN** **FAX**
SAF No. X08-001	**Sampling Origin** Hanford Site	**Purchase Order/Charge Code**
Project Title AQUIFER TUBES, OCTOBER 2007		**Ice Chest No.** **Temp.**
Shipped To (Lab) Waste Sampling & Characterization	**Method of Shipment** Govt. Vehicle	**Bill of Lading/Air Bill No.**
Protocol CERCLA	**Priority:** 45 Days	**Offsite Property No.**

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐
Do not combine X SAF samples with other sets. Need SDG to be stand alone.
FY07 and FY08 samples cannot be in the same SDG
Submit deliverables & invoices to Steve Trent, FH

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1PNH2 (F)	3642	W	12/7/7	0928	1x500-mL G/P	6010_METALS_ICP: List-3 (18)	HNO3 to pH <2
B1PNH3	3643	W			1x500-mL G/P	6010_METALS_ICP: List-3 (18)	HNO3 to pH <2
B1PNH3	↓	W			1x500-mL P	300.0_ANIONS_IC: List-1 (5)	Cool~4C
B1PNH3		W			1x500-mL aG	7196_CR6: Hexavalent Chromium (1)	Cool~4C
B1PNH3		W			1x500-mL G/P	2320_ALKALINITY: Alkalinity (1)	Cool~4C

ICED

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. Young	K.J. Young	K.J. Young	12/7/7 1240	JA Rivazin	Jesse Rivazin	Jesse Rivazin	12/7/07 1240
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wipe	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

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