

RECEIVED AUGUST 26, 2008

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**FLUOR****Memorandum**

M4W41-SLF-08-891

To: H. Hampt E6-35 Date: August 26, 2008

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

cc: w/Attachments

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

Subject: FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20081417

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. 9, Waste Sampling & Characterization Facility Quality Assurance Plan

This transmittal contains the following information for sample delivery group WSCF20081417:

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

SLF/grf

Attachments 4

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ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

# WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20081417  
Data Deliverable Date: 11-aug-2008  
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
I08-047	B1W1N8	W08P003453	WATER
	B1W1N9	W08P003457	WATER
	B1W1P2	W08P003455	WATER
	B1W1P3	W08P003459	WATER
	B1W1P5	W08P003449	WATER
	B1W1P6	W08P003452	WATER
	B1W1P9	W08P003454	WATER
	B1W1R0	W08P003458	WATER
	B1W1V1	W08P003465	WATER
	B1W1V2	W08P003464	WATER
S08-007	B1W225	W08P003438	WATER
	B1W226	W08P003439	WATER
	B1W228	W08P003445	WATER
	B1W229	W08P003447	WATER
	B1W243	W08P003466	WATER
	B1W244	W08P003467	WATER
	B1W246	W08P003446	WATER
	B1W247	W08P003448	WATER
	B1W249	W08P003463	WATER
	B1W250	W08P003462	WATER
	B1W254	W08P003461	WATER
	B1W255	W08P003460	WATER

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ATTACHMENT 2

**NARRATIVE**

Consisting of 4 pages  
Including cover page

### **Introduction**

Twenty-two (22) groundwater samples were received at the WSCF Laboratory on July 11, 2008. 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 14 through 15, 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 40 through 41 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.
- Nitrite-N – Matrix Spike and Matrix Spike Duplicate recoveries were less than established laboratory limits. Affected sample results were N flagged.

All other 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 42 through 48 for QC details. Analytical Note(s):

- Matrix Spikes and Matrix Spike Duplicates were analyzed on samples B1W2M2 (SDG# 20081385) and B1W229 of this SDG.

- o Batch QC - B1W2M2
  - Silver contamination detected in the Blank was evaluated and there was no affect on sample results.
  - Calcium, Magnesium and Sodium concentrations exceeded spiking levels by a factor of 4. Spike recoveries are not valid. Check standard was analyzed to ensure linearity because the sample results were greater than the calibration standard.
  
- o Batch QC - B1W229
  - Silver contamination detected in the Blank was evaluated and affected sample results were C flagged.
  - Calcium, Magnesium and Sodium concentrations exceeded spiking levels by a factor of 4. Spike recoveries are not valid. Check standard was analyzed to ensure linearity because the sample results were greater than the calibration standard.

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 49 for QC details. Analytical Note(s):

- Duplicates were analyzed on samples B1W347 (SDG# 20081373) and B1VMH3 (SDG# 20081423).

All QC controls are within the established limits.

#### **Radiochemistry Comments**

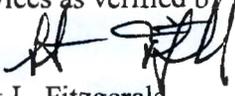
**Rad Chem** – There are no hold times associated with WSCF's radiochemical methods. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 66 through 71 for QC details. Analytical Note(s):

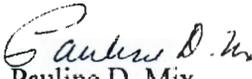
- Gross Alpha/Gross Beta – Duplicate QC was analyzed on sample# B1W523 (SDG# 20081410).
- Strontium-89/90 and 85 (tracer) – Duplicate QC was analyzed on sample# B1VKX8 (SDG# 20081406).
- Technetium-99 – Duplicate and Matrix Spike were analyzed on sample# B1VJF3 (SDG# 20081375).

- Tritium – Duplicate and Matrix Spike were analyzed on sample# B1VKX8 (SDG# 20081406). Laboratory Control Sample recovery was less than established laboratory limits.

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

  
Pauline D. Mix  
WSCF Client Services

M4W41-SLF-08-891

ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 66 pages  
Including cover page

**WSCF  
ANALYTICAL RESULTS REPORT**

for

**GPAP  
Richland, WA 99352**

**Attention: Steve Trent E6-35**

Analytical:

*[Signature]* S Fitzgerald 8/26/08

Client Services:

*[Signature]* P.D. Mix 8/26/2008

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

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Report#: WSCF20081417  
Report Date: 25-aug-2008  
Report WGPP/ver. 5.2  
GPAP

Page 1

Department: Inorganic

## W13q Worklist/Batch/QC Report for Group# WSCF20081417

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37054	2	37477	41847	BLANK		Anions by Ion Chromatography
37054	15	37477	41847	BLANK		Anions by Ion Chromatography
37054	3	37477	41847	LCS		Anions by Ion Chromatography
37054	5	37477	41847	DUP	W08P003439	Anions by Ion Chromatography
37054	6	37477	41847	MS	W08P003439	Anions by Ion Chromatography
37054	7	37477	41847	MSD	W08P003439	Anions by Ion Chromatography
37054	4	37477	41847	SAMPLE	W08P003439	Anions by Ion Chromatography
37054	7	37477	41847	SPK-RPD	W08P003439	Anions by Ion Chromatography
37054	8	37477	41847	SAMPLE	W08P003447	Anions by Ion Chromatography
37054	9	37477	41847	SAMPLE	W08P003448	Anions by Ion Chromatography
37054	10	37477	41847	SAMPLE	W08P003452	Anions by Ion Chromatography
37054	11	37477	41847	SAMPLE	W08P003457	Anions by Ion Chromatography
37054	12	37477	41847	SAMPLE	W08P003458	Anions by Ion Chromatography
37054	13	37477	41847	SAMPLE	W08P003459	Anions by Ion Chromatography
37054	14	37477	41847	SAMPLE	W08P003467	Anions by Ion Chromatography
37135	1	37562	41899	LCS		Total Alkalinity as mg/L CaCO3
37135	13	37562	41899	LCS		Total Alkalinity as mg/L CaCO3
37135	24	37562	41899	LCS		Total Alkalinity as mg/L CaCO3
37135	36	37562	41899	LCS		Total Alkalinity as mg/L CaCO3
37135	44	37562	41899	LCS		Total Alkalinity as mg/L CaCO3
37135	4	37562	41899	DUP	W08P003351	Total Alkalinity as mg/L CaCO3
37135	15	37562	41899	SAMPLE	W08P003439	Total Alkalinity as mg/L CaCO3
37135	16	37562	41899	SAMPLE	W08P003447	Total Alkalinity as mg/L CaCO3
37135	17	37562	41899	SAMPLE	W08P003452	Total Alkalinity as mg/L CaCO3
37135	18	37562	41899	SAMPLE	W08P003457	Total Alkalinity as mg/L CaCO3
37135	19	37562	41899	SAMPLE	W08P003458	Total Alkalinity as mg/L CaCO3
37135	20	37562	41899	SAMPLE	W08P003459	Total Alkalinity as mg/L CaCO3
37135	26	37562	41899	DUP	W08P003485	Total Alkalinity as mg/L CaCO3
37679	1	37946	42524	BLANK		ICP Metals Analysis, Grd H2O P
37679	2	37946	42524	LCS		ICP Metals Analysis, Grd H2O P
37679	4	37946	42524	MS	W08P003391	ICP Metals Analysis, Grd H2O P
37679	5	37946	42524	MSD	W08P003391	ICP Metals Analysis, Grd H2O P
37679	5	37946	42524	SPK-RPD	W08P003391	ICP Metals Analysis, Grd H2O P
37679	21	37946	42524	SAMPLE	W08P003438	ICP Metals Analysis, Grd H2O P
37679	22	37946	42524	SAMPLE	W08P003439	ICP Metals Analysis, Grd H2O P
37679	23	37946	42524	SAMPLE	W08P003445	ICP Metals Analysis, Grd H2O P
37679	24	37946	42524	SAMPLE	W08P003446	ICP Metals Analysis, Grd H2O P
37680	1	37947	42525	BLANK		ICP Metals Analysis, Grd H2O P
37680	2	37947	42525	LCS		ICP Metals Analysis, Grd H2O P
37680	4	37947	42525	MS	W08P003447	ICP Metals Analysis, Grd H2O P
37680	5	37947	42525	MSD	W08P003447	ICP Metals Analysis, Grd H2O P
37680	3	37947	42525	SAMPLE	W08P003447	ICP Metals Analysis, Grd H2O P
37680	5	37947	42525	SPK-RPD	W08P003447	ICP Metals Analysis, Grd H2O P
37680	6	37947	42525	SAMPLE	W08P003448	ICP Metals Analysis, Grd H2O P
37680	7	37947	42525	SAMPLE	W08P003449	ICP Metals Analysis, Grd H2O P
37680	8	37947	42525	SAMPLE	W08P003452	ICP Metals Analysis, Grd H2O P
37680	9	37947	42525	SAMPLE	W08P003453	ICP Metals Analysis, Grd H2O P
37680	10	37947	42525	SAMPLE	W08P003454	ICP Metals Analysis, Grd H2O P
37680	11	37947	42525	SAMPLE	W08P003455	ICP Metals Analysis, Grd H2O P

37680	12	37947	42525	SAMPLE	W08P003457	ICP Metals Analysis, Grd H20 P
37680	13	37947	42525	SAMPLE	W08P003458	ICP Metals Analysis, Grd H20 P
37680	14	37947	42525	SAMPLE	W08P003459	ICP Metals Analysis, Grd H20 P
37680	15	37947	42525	SAMPLE	W08P003466	ICP Metals Analysis, Grd H20 P
37680	16	37947	42525	SAMPLE	W08P003467	ICP Metals Analysis, Grd H20 P

Department: Radiochemistry

## W13q Worklist/Batch/QC Report for Group# WSCF20081417

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37120	1	37546	42002	BLANK		Tritium by Liq Sct column prep
37120	4	37546	42002	LCS		Tritium by Liq Sct column prep
37120	3	37546	42002	DUP	W08P003411	Tritium by Liq Sct column prep
37120	2	37546	42002	MS	W08P003411	Tritium by Liq Sct column prep
37120	6	37546	42002	SAMPLE	W08P003439	Tritium by Liq Sct column prep
37120	7	37546	42002	SAMPLE	W08P003447	Tritium by Liq Sct column prep
37120	8	37546	42002	SAMPLE	W08P003448	Tritium by Liq Sct column prep
37120	9	37546	42002	SAMPLE	W08P003452	Tritium by Liq Sct column prep
37120	10	37546	42002	SAMPLE	W08P003457	Tritium by Liq Sct column prep
37120	11	37546	42002	SAMPLE	W08P003458	Tritium by Liq Sct column prep
37120	12	37546	42002	SAMPLE	W08P003459	Tritium by Liq Sct column prep
37120	13	37546	42002	SAMPLE	W08P003464	Tritium by Liq Sct column prep
37120	14	37546	42002	SAMPLE	W08P003465	Tritium by Liq Sct column prep
37159	1	37585	42025	BLANK		Strontium 89/90
37159	2	37585	42025	LCS		Strontium 89/90
37159	3	37585	42025	DUP	W08P003411	Strontium 89/90
37159	10	37585	42025	SAMPLE	W08P003460	Strontium 89/90
37159	11	37585	42025	SURR	W08P003460	Strontium 89/90
37159	12	37585	42025	SAMPLE	W08P003461	Strontium 89/90
37159	13	37585	42025	SURR	W08P003461	Strontium 89/90
37159	14	37585	42025	SAMPLE	W08P003462	Strontium 89/90
37159	15	37585	42025	SURR	W08P003462	Strontium 89/90
37159	16	37585	42025	SAMPLE	W08P003463	Strontium 89/90
37159	17	37585	42025	SURR	W08P003463	Strontium 89/90
37159	18	37585	42025	SAMPLE	W08P003464	Strontium 89/90
37159	19	37585	42025	SURR	W08P003464	Strontium 89/90
37159	20	37585	42025	SAMPLE	W08P003465	Strontium 89/90
37159	21	37585	42025	SURR	W08P003465	Strontium 89/90
37171	1	37603	42106	BLANK		TC99 by Liquid Scin.
37171	4	37603	42106	LCS		TC99 by Liquid Scin.
37171	3	37603	42106	DUP	W08P003355	TC99 by Liquid Scin.
37171	2	37603	42106	MS	W08P003355	TC99 by Liquid Scin.
37171	10	37603	42106	SAMPLE	W08P003439	TC99 by Liquid Scin.
37171	11	37603	42106	SAMPLE	W08P003447	TC99 by Liquid Scin.
37171	12	37603	42106	SAMPLE	W08P003452	TC99 by Liquid Scin.
37171	13	37603	42106	SAMPLE	W08P003457	TC99 by Liquid Scin.
37171	14	37603	42106	SAMPLE	W08P003458	TC99 by Liquid Scin.
37171	15	37603	42106	SAMPLE	W08P003459	TC99 by Liquid Scin.
37368	1	37793	42146	BLANK		Gross Alpha/Gross Beta (AB32)
37368	2	37793	42146	LCS		Gross Alpha/Gross Beta (AB32)
37368	3	37793	42146	DUP	W08P003421	Gross Alpha/Gross Beta (AB32)
37368	5	37793	42146	SAMPLE	W08P003439	Gross Alpha/Gross Beta (AB32)
37368	6	37793	42146	SAMPLE	W08P003447	Gross Alpha/Gross Beta (AB32)
37368	7	37793	42146	SAMPLE	W08P003448	Gross Alpha/Gross Beta (AB32)
37368	8	37793	42146	SAMPLE	W08P003460	Gross Alpha/Gross Beta (AB32)
37368	9	37793	42146	SAMPLE	W08P003461	Gross Alpha/Gross Beta (AB32)
37368	10	37793	42146	SAMPLE	W08P003462	Gross Alpha/Gross Beta (AB32)
37368	11	37793	42146	SAMPLE	W08P003463	Gross Alpha/Gross Beta (AB32)
37368	12	37793	42146	SAMPLE	W08P003467	Gross Alpha/Gross Beta (AB32)

37401	1	37826	42159	BLANK		Gross Alpha on Alpha Plateau
37401	2	37826	42159	LCS		Gross Alpha on Alpha Plateau
37401	3	37826	42159	DUP	W08P003421	Gross Alpha on Alpha Plateau
37401	5	37826	42159	SAMPLE	W08P003439	Gross Alpha on Alpha Plateau
37401	6	37826	42159	SAMPLE	W08P003447	Gross Alpha on Alpha Plateau
37401	7	37826	42159	SAMPLE	W08P003448	Gross Alpha on Alpha Plateau
37401	8	37826	42159	SAMPLE	W08P003460	Gross Alpha on Alpha Plateau
37401	9	37826	42159	SAMPLE	W08P003461	Gross Alpha on Alpha Plateau
37401	10	37826	42159	SAMPLE	W08P003462	Gross Alpha on Alpha Plateau
37401	11	37826	42159	SAMPLE	W08P003463	Gross Alpha on Alpha Plateau
37401	12	37826	42159	SAMPLE	W08P003467	Gross Alpha on Alpha Plateau

# WSCF

## METHOD REFERENCES REPORT

Department: Inorganic

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory or industry methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though the WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

<b>LA-505-411</b>	<b>LA-505-411: ELEMENTAL ANALYSIS BY INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPE</b> <b>HEIS 6010_METALS_ICP</b> Inductively Coupled Plasma-Atomic Emmission Spectrometry
<b>LA-531-411</b>	<b>LA-531-411: ALKALINITY (TITRIMETRIC)</b> <b>HEIS 2320B</b> Alkalinity <b>Standard Methods 2320B</b> Alkalinity
<b>LA-533-410</b>	<b>LA-533-410: ANION ANALYSIS BY ION CHROMATOGRAPHY</b> <b>EPA-600/R-94-111 300.0</b> DETERMINATION OF INORGANIC ANIONS BY ION CHROMATOGRAPHY <b>HEIS 300.0_ANIONS_IC</b> 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>.

Report Date: 25-aug-2008  
Report #: WSCF20081417  
Report WGPPM/5.2

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# WSCF METHOD REFERENCES REPORT

Department: Radiochemistry

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory or industry methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though the WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

<b>LA-508-415</b>	<b>LA-508-415: OPERATION OF THE PROTEAN 2-INCH ALPHA/BETA COUNTING SYSTEM FOR GROSS</b>
<b>HEIS ALPHA_GPC</b>	<b>GROSS ALPHA GPC</b>
<b>HEIS BETA_GPC</b>	<b>GROSS BETA GPC</b>
<b>HEIS SRTOT_SEP_PRECIP_GPC</b>	<b>Protium 89/90</b>
<b>LA-508-421</b>	<b>LA-508-421: OPERATION OF THE TRI-CARB MODEL 2500TR LIQUID SCINTILLATION ANALYZER</b>
<b>HEIS ALPHA_LSC</b>	<b>A/B Liquid Scintillation</b>
<b>HEIS BETA_LSC</b>	<b>A/B Liquid Scintillation</b>
<b>HEIS TC99_3MDSK_LSC</b>	<b>TC99 by Liquid Scintillation</b>
<b>HEIS TRITIUM_EIE_LSC</b>	<b>Tritium Liquid Scintillation</b>

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

Report Date: 25-aug-2008  
Report#: WSCF20081417  
Report WGPPM/5.2

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OF  
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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003438

Client ID: B1W225 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H2O P Prep											
ICP Metals Analysis, Grd H2O P											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		8.72e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		5.24e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		9.26e+03	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 58.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		12.2	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-8	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		3.84e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		204	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**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)

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

GPAP

061091

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003439

Client ID: B1W226 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	D	0.135	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	D	8.66	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	BDN	0.125	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	1.70	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	D	32.8	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H20 P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		9.37e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		5.66e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		9.96e+03	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		13.1	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411		13.4	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		4.12e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		219	ug/L			1.00	4.0		08/20/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

Report WGPP/ver. 5.2

GPAP

0690

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003439

Client ID: B1W226 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		120	mg/L			1.00	1.0		07/16/08

**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)

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

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

Report WGPP/ver. 5.2

GPAP

061081

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003445

Client ID: B1W228

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H20 P Prep											
ICP Metals Analysis, Grd H20 P											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		9.94e + 03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411		8.80	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		6.05e + 03	ug/L			1.00	1.7e + 02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.06e + 04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		13.5	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		50.5	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411		4.40	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411		13.3	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		4.50e + 04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		239	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

Report WGPP/ver. 5.2

GPAP

06106L

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003446

Client ID: B1W246 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>ICP Metals Analysis, Grd H20 P Prep</b>											
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		6.04e + 03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		3.19e + 03	ug/L			1.00	1.7e + 02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.54e + 04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		21.8	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		56.5	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411		6.80	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411		14.6	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		5.82e + 04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		350	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

061007

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003447

Client ID: B1W229 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	BD	0.126	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	D	8.87	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	BDN	0.126	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	1.81	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	D	38.4	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H20 P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411		25.9	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		9.48e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411		4.70	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		5.76e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	C	7.80	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.00e+04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		13.6	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		52.5	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		4.23e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		227	ug/L			1.00	4.0		08/20/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

21  
 01  
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 Report WGPP/ver. 5.2  
 GPAP

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35

**SAF Number:** S08-007

**Sample #** W08P003447

**Client ID:** B1W229 PNNL-GPP  
WSCF

**Matrix:** WATER

**Group #:** WSCF20081417

**Department:** Inorganic

**Sampled:** 07/11/08

**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		120	mg/L			1.00	1.0		07/16/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

22  
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Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003448

Client ID: B1W247

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	DU	< 0.0420	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	D	11.2	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	BDN	0.0857	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	6.23	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	D	34.9	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H20 P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		5.84e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		2.95e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.40e+04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		21.8	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		52.5	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411		90.4	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411		22.4	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		5.77e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		340	ug/L			1.00	4.0		08/20/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

23  
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GPAP

Report WGPP/ver. 5.2

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003448

Client ID: B1W247 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**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)

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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

Report WGPP/ver. 5.2

GPAP

24 of 90

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003449

Client ID: B1W1P5

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H2O P Prep											08/19/08
ICP Metals Analysis, Grd H2O P											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		5.77e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		3.86e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		7.36e+03	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	58		08/20/08
Barium	7440-39-3	LA-505-411		22.4	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		3.08e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		207	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

25  
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GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** I08-047  
**Sample #** W08P003452  
**Client ID:** B1W1P6

**PNNL-GPP**  
**WSCF**

**Matrix:** WATER

**Group #:** WSCF20081417  
**Department:** Inorganic  
**Sampled:** 07/11/08  
**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	D	0.174	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	D	3.20	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	BDN	0.0467	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	0.963	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	D	18.3	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H20 P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		6.06e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		4.08e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		7.72e+03	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		23.6	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411		14.9	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		3.24e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		218	ug/L			1.00	4.0		08/20/08

**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)

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

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GPAP

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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003452

Client ID: B1W1P6

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		100	mg/L			1.00	1.0		07/16/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

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

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

27  
of  
90  
GPAP

Report WGPP/ver. 5.2

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** I08-047  
**Sample #** W08P003453  
**Client ID:** B1W1N8

**PNNL-GPP**  
**WSCF**

**Matrix:** WATER

**Group #:** WSCF20081417  
**Department:** Inorganic  
**Sampled:** 07/11/08  
**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>ICP Metals Analysis, Grd H20 P Prep</b>											
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		1.48e +04	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411		4.60	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		6.32e +03	ug/L			1.00	1.7e +02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.14e +04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		41.7	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		47.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		7.26e +04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		444	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**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)

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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

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GPAP

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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003454

Client ID: B1W1P9

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H2O P Prep											
ICP Metals Analysis, Grd H2O P											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411	U	< 50.0	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411	U	< 170	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411	U	< 51.0	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		154	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

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Report WGPP/ver. 5.2  
GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003455

Client ID: B1W1P2

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H20 P Prep											
ICP Metals Analysis, Grd H20 P											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		1.46e+04	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		6.52e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.15e+04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		40.6	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		47.3	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		7.33e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-8	LA-505-411		443	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** I08-047  
**Sample #** W08P003457  
**Client ID:** B1W1N9

**PNNL-GPP**  
**WSCF**

**Matrix:** WATER

**Group #:** WSCF20081417  
**Department:** Inorganic  
**Sampled:** 07/11/08  
**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	DU	< 0.0420	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	D	17.6	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DN	0.233	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	2.02	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	D	17.0	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H2O P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H2O P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		1.49e+04	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		6.74e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.19e+04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		41.6	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		45.1	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		7.38e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		450	ug/L			1.00	4.0		08/20/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

31  
 0190  
 Report WGPP/ver. 5.2  
 GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003457

Client ID: B1W1N9

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		220	mg/L			1.00	1.0		07/16/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003458

Client ID: B1W1R0

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	DU	< 0.0420	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	DU	< 0.220	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DNU	< 0.0198	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	DU	< 0.0720	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	DU	< 0.154	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H20 P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411	U	< 50.0	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411	U	< 170	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411	U	< 51.0	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		125	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**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)

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003458

Client ID: B1W1R0 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411	U	< 1.00	mg/L			1.00	1.0		07/16/08

**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)

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

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

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061014

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** I08-047  
**Sample #** W08P003459  
**Client ID:** B1W1P3

**Group #:** WSCF20081417  
**Department:** Inorganic  
**Sampled:** 07/11/08  
**Received:** 07/11/08

PNNL-GPP  
WSCF

**Matrix:** WATER

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	DU	< 0.0420	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	D	17.7	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DN	0.279	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	1.73	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	D	17.2	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H20 P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		7.79e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411		9.40	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		4.84e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.83e+04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		38.2	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411		5.40	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-68-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		4.35e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		259	ug/L			1.00	4.0		08/20/08

**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)

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample #: W08P003466

Client ID: B1W243

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H20 P Prep											08/19/08
ICP Metals Analysis, Grd H20 P											
Iron	7439-89-6	LA-505-411		34.8	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		9.29e+03	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		5.81e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	C	16.6	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.71e+04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		37.5	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		4.78e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		264	ug/L			1.00	4.0		08/20/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** S08-007  
**Sample #** W08P003467  
**Client ID:** BIW244

**Group #:** WSCF20081417  
**Department:** Inorganic  
**Sampled:** 07/11/08  
**Received:** 07/11/08

PNNL-GPP  
WSCF

**Matrix:** WATER

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	D	0.163	mg/L			2.00	0.042		07/11/08
Chloride	16887-00-6	LA-533-410	D	7.49	mg/L			2.00	0.22		07/11/08
Nitrogen in Nitrite	NO2-N	LA-533-410	BDN	0.113	mg/L			2.00	0.020		07/11/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	8.76	mg/L			2.00	0.072		07/11/08
Sulfate	14808-79-8	LA-533-410	D	36.4	mg/L			2.00	0.15		07/11/08
<b>ICP Metals Analysis, Grd H20 P Prep</b>											<b>08/19/08</b>
<b>ICP Metals Analysis, Grd H20 P</b>											
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		08/20/08
Magnesium	7439-95-4	LA-505-411		1.33e+04	ug/L			1.00	50		08/20/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Potassium	7440-09-7	LA-505-411		5.94e+03	ug/L			1.00	1.7e+02		08/20/08
Silver	7440-22-4	LA-505-411	C	11.2	ug/L			1.00	5.0		08/20/08
Sodium	7440-23-5	LA-505-411		1.06e+04	ug/L			1.00	51		08/20/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		08/20/08
Barium	7440-39-3	LA-505-411		37.5	ug/L			1.00	4.0		08/20/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Chromium	7440-47-3	LA-505-411		38.7	ug/L			1.00	13		08/20/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		08/20/08
Vanadium	7440-62-2	LA-505-411	U	< 12.0	ug/L			1.00	12		08/20/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		08/20/08
Calcium	7440-70-2	LA-505-411		6.68e+04	ug/L			1.00	73		08/20/08
Strontium	7440-24-6	LA-505-411		414	ug/L			1.00	4.0		08/20/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

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C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

061083  
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# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35

**SAF Number:** S08-007

**Sample #** W08P003467

**Client ID:** B1W244

PNNL-GPP  
WSCF

**Matrix:** WATER

**Group #:** WSCF20081417

**Department:** Inorganic

**Sampled:** 07/11/08

**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		08/20/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

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# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: Anions by Ion Chromatography

Sample Date: 07/11/08  
 Receive Date: 07/11/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P003439</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Chloride	16887-00-6	8.5875		RPD			0.841	20.000		07/11/08
DUP	Fluoride	16984-48-8	0.1349		RPD			0.000	20.000		07/11/08
DUP	Nitrogen in Nitrite	NO2-N	0.1181		RPD			5.996	20.000		07/11/08
DUP	Nitrogen in Nitrate	NO3-N	1.71		RPD			0.675	20.000		07/11/08
DUP	Sulfate	14808-79-8	32.6672		RPD			0.469	20.000		07/11/08
MS	Chloride	16887-00-6	0.84305	84.729	% Recov	80.000	120.000				07/11/08
MS	Fluoride	16984-48-8	0.5634	114.280	% Recov	80.000	120.000				07/11/08
MS	Nitrogen in Nitrite	NO2-N	0.3893	79.126	% Recov	80.000	120.000				07/11/08
MS	Nitrogen in Nitrate	NO3-N	0.44795	100.437	% Recov	80.000	120.000				07/11/08
MS	Sulfate	14808-79-8	1.82615	93.171	% Recov	80.000	120.000				07/11/08
MSD	Chloride	16887-00-6	0.80275	80.678	% Recov	80.000	120.000				07/11/08
MSD	Fluoride	16984-48-8	0.5517	111.907	% Recov	80.000	120.000				07/11/08
MSD	Nitrogen in Nitrite	NO2-N	0.38665	78.587	% Recov	80.000	120.000				07/11/08
MSD	Nitrogen in Nitrate	NO3-N	0.4382	98.251	% Recov	80.000	120.000				07/11/08
MSD	Sulfate	14808-79-8	1.65605	84.492	% Recov	80.000	120.000				07/11/08
SPK-RPD	Chloride	16887-00-6	80.678		RPD			4.898	20.000		07/11/08
SPK-RPD	Fluoride	16984-48-8	111.907		RPD			2.098	20.000		07/11/08
SPK-RPD	Nitrogen in Nitrite	NO2-N	78.587		RPD			0.684	20.000		07/11/08
SPK-RPD	Nitrogen in Nitrate	NO3-N	98.251		RPD			2.200	20.000		07/11/08
SPK-RPD	Sulfate	14808-79-8	84.492		RPD			9.770	20.000		07/11/08
<b>BATCH QC</b>											
BLANK	Chloride	16887-00-6	<0.11	n/a	mg/L	0.000	0.030			U	07/11/08
BLANK	Chloride	16887-00-6	<0.11	n/a	mg/L	0.000	0.030			U	07/11/08
BLANK	Fluoride	16984-48-8	<2.1e-2	n/a	mg/L	0.000	0.030			U	07/11/08
BLANK	Fluoride	16984-48-8	<2.1e-2	n/a	mg/L	0.000	0.030			U	07/11/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 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	<9.9e-3	n/a	mg/L	0.000	0.020			U	07/11/08
BLANK	Nitrogen in Nitrite	NO2-N	<9.9e-3	n/a	mg/L	0.000	0.020			U	07/11/08
BLANK	Nitrogen in Nitrate	NO3-N	<3.6e-2	n/a	mg/L	0.000	0.040			U	07/11/08
BLANK	Nitrogen in Nitrate	NO3-N	<3.6e-2	n/a	mg/L	0.000	0.040			U	07/11/08
BLANK	Sulfate	14808-79-8	<7.7e-2	n/a	mg/L	0.000	0.200			U	07/11/08
BLANK	Sulfate	14808-79-8	<7.7e-2	n/a	mg/L	0.000	0.200			U	07/11/08
LCS	Chloride	16887-00-6	196.54	97.781	% Recov	80.000	120.000				07/11/08
LCS	Fluoride	16984-48-8	103.8381	104.255	% Recov	80.000	120.000				07/11/08
LCS	Nitrogen in Nitrite	NO2-N	98.4283	99.022	% Recov	80.000	120.000				07/11/08
LCS	Nitrogen in Nitrate	NO3-N	91.7396	101.820	% Recov	80.000	120.000				07/11/08
LCS	Sulfate	14808-79-8	395.0079	99.749	% Recov	80.000	120.000				07/11/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 07/09/08  
 Receive Date: 07/09/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P003391											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Silver	7440-22-4	940.4	94.040	% Recov	75.000	125.000				08/20/08
MS	Barium	7440-39-3	444.3	88.860	% Recov	75.000	125.000				08/20/08
MS	Beryllium	7440-41-7	487.4	97.480	% Recov	75.000	125.000				08/20/08
MS	Calcium	7440-70-2	-6710	-671.000	% Recov	75.000	125.000				08/20/08
MS	Cadmium	7440-43-9	968.8	96.880	% Recov	75.000	125.000				08/20/08
MS	Cobalt	7440-48-4	950.3	95.030	% Recov	75.000	125.000				08/20/08
MS	Chromium	7440-47-3	930.5	93.050	% Recov	75.000	125.000				08/20/08
MS	Copper	7440-50-8	910.1	91.010	% Recov	75.000	125.000				08/20/08
MS	Iron	7439-89-6	937.6	93.760	% Recov	75.000	125.000				08/20/08
MS	Potassium	7440-09-7	8846	88.460	% Recov	75.000	125.000				08/20/08
MS	Magnesium	7439-95-4	-1020	-102.000	% Recov	75.000	125.000				08/20/08
MS	Manganese	7439-96-5	956.4	95.640	% Recov	75.000	125.000				08/20/08
MS	Sodium	7440-23-5	-780	-78.000	% Recov	75.000	125.000				08/20/08
MS	Nickel	7440-02-0	937.2	93.720	% Recov	75.000	125.000				08/20/08
MS	Antimony	7440-36-0	941.1	94.110	% Recov	75.000	125.000				08/20/08
MS	Strontium	7440-24-6	427.9	85.580	% Recov	75.000	125.000				08/20/08
MS	Vanadium	7440-62-2	933	93.300	% Recov	75.000	125.000				08/20/08
MS	Zinc	7440-66-6	941.3	94.130	% Recov	75.000	125.000				08/20/08
MSD	Silver	7440-22-4	992.8	99.280	% Recov	75.000	125.000				08/20/08
MSD	Barium	7440-39-3	484.3	96.860	% Recov	75.000	125.000				08/20/08
MSD	Beryllium	7440-41-7	526.6	105.320	% Recov	75.000	125.000				08/20/08
MSD	Calcium	7440-70-2	-1130	-113.000	% Recov	75.000	125.000				08/20/08
MSD	Cadmium	7440-43-9	1037	103.700	% Recov	75.000	125.000				08/20/08
MSD	Cobalt	7440-48-4	1033	103.300	% Recov	75.000	125.000				08/20/08
MSD	Chromium	7440-47-3	1009.5	100.950	% Recov	75.000	125.000				08/20/08
MSD	Copper	7440-50-8	980.7	98.070	% Recov	75.000	125.000				08/20/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 07/09/08  
 Receive Date: 07/09/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Iron	7439-89-6	1021	102.100	% Recov	75.000	125.000				08/20/08
MSD	Potassium	7440-09-7	9856	98.560	% Recov	75.000	125.000				08/20/08
MSD	Magnesium	7439-95-4	310	31.000	% Recov	75.000	125.000				08/20/08
MSD	Manganese	7439-96-5	1039	103.900	% Recov	75.000	125.000				08/20/08
MSD	Sodium	7440-23-5	430	43.000	% Recov	75.000	125.000				08/20/08
MSD	Nickel	7440-02-0	1018.1	101.810	% Recov	75.000	125.000				08/20/08
MSD	Antimony	7440-36-0	1016	101.600	% Recov	75.000	125.000				08/20/08
MSD	Strontium	7440-24-6	490.7	98.140	% Recov	75.000	125.000				08/20/08
MSD	Vanadium	7440-62-2	1008.8	100.880	% Recov	75.000	125.000				08/20/08
MSD	Zinc	7440-66-6	1013	101.300	% Recov	75.000	125.000				08/20/08
SPK-RPD	Silver	7440-22-4	99.280		RPD			5.421	20.000		08/20/08
SPK-RPD	Barium	7440-39-3	96.860		RPD			8.615	20.000		08/20/08
SPK-RPD	Beryllium	7440-41-7	105.320		RPD			7.732	20.000		08/20/08
SPK-RPD	Calcium	7440-70-2	-113.000		RPD			-142.347	20.000		08/20/08
SPK-RPD	Cadmium	7440-43-9	103.700		RPD			6.800	20.000		08/20/08
SPK-RPD	Cobalt	7440-48-4	103.300		RPD			8.340	20.000		08/20/08
SPK-RPD	Chromium	7440-47-3	100.950		RPD			8.144	20.000		08/20/08
SPK-RPD	Copper	7440-50-8	98.070		RPD			7.468	20.000		08/20/08
SPK-RPD	Iron	7439-89-6	102.100		RPD			8.516	20.000		08/20/08
SPK-RPD	Potassium	7440-09-7	98.560		RPD			10.801	20.000		08/20/08
SPK-RPD	Magnesium	7439-95-4	31.000		RPD			-374.648	20.000		08/20/08
SPK-RPD	Manganese	7439-96-5	103.900		RPD			8.279	20.000		08/20/08
SPK-RPD	Sodium	7440-23-5	43.000		RPD			-691.429	20.000		08/20/08
SPK-RPD	Nickel	7440-02-0	101.810		RPD			8.275	20.000		08/20/08
SPK-RPD	Antimony	7440-36-0	101.600		RPD			7.654	20.000		08/20/08
SPK-RPD	Strontium	7440-24-6	98.140		RPD			13.673	20.000		08/20/08
SPK-RPD	Vanadium	7440-62-2	100.880		RPD			7.807	20.000		08/20/08
SPK-RPD	Zinc	7440-66-6	101.300		RPD			7.338	20.000		08/20/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: ICP Metals Analysis, Grd H2O P

Sample Date:  
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>BATCH QC</b>											
BLANK	Silver	7440-22-4	23.4	23.400	ug/L						08/20/08
BLANK	Barium	7440-39-3	<4	n/a	ug/L					U	08/20/08
BLANK	Beryllium	7440-41-7	<4	n/a	ug/L					U	08/20/08
BLANK	Calcium	7440-70-2	<73	n/a	ug/L					U	08/20/08
BLANK	Cadmium	7440-43-9	<4	n/a	ug/L					U	08/20/08
BLANK	Cobalt	7440-48-4	<4	n/a	ug/L					U	08/20/08
BLANK	Chromium	7440-47-3	<13	n/a	ug/L					U	08/20/08
BLANK	Copper	7440-50-8	<6	n/a	ug/L					U	08/20/08
BLANK	Iron	7439-89-6	<25	n/a	ug/L					U	08/20/08
BLANK	Potassium	7440-09-7	<170	n/a	ug/L					U	08/20/08
BLANK	Magnesium	7439-95-4	<50	n/a	ug/L					U	08/20/08
BLANK	Manganese	7439-96-5	<4	n/a	ug/L					U	08/20/08
BLANK	Sodium	7440-23-5	<51	n/a	ug/L					U	08/20/08
BLANK	Nickel	7440-02-0	<4	n/a	ug/L					U	08/20/08
BLANK	Antimony	7440-36-0	<56	n/a	ug/L					U	08/20/08
BLANK	Strontium	7440-24-6	<4	n/a	ug/L					U	08/20/08
BLANK	Vanadium	7440-62-2	<12	n/a	ug/L					U	08/20/08
BLANK	Zinc	7440-66-6	<9	n/a	ug/L					U	08/20/08
LCS	Silver	7440-22-4	912.3	91.230	% Recov	80.000	120.000				08/20/08
LCS	Barium	7440-39-3	449.7	89.940	% Recov	80.000	120.000				08/20/08
LCS	Beryllium	7440-41-7	508.3	101.660	% Recov	80.000	120.000				08/20/08
LCS	Calcium	7440-70-2	962.5	96.250	% Recov	80.000	120.000				08/20/08
LCS	Cadmium	7440-43-9	946.5	94.650	% Recov	80.000	120.000				08/20/08
LCS	Cobalt	7440-48-4	984.9	98.490	% Recov	80.000	120.000				08/20/08
LCS	Chromium	7440-47-3	960.9	96.090	% Recov	80.000	120.000				08/20/08
LCS	Copper	7440-50-8	916.1	91.610	% Recov	80.000	120.000				08/20/08
LCS	Iron	7439-89-6	942.1	94.210	% Recov	80.000	120.000				08/20/08
LCS	Potassium	7440-09-7	8822	88.220	% Recov	80.000	120.000				08/20/08

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# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: ICP Metals Analysis, Grd H2O 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	881.8	88.180	% Recov	80.000	120.000				08/20/08
LCS	Manganese	7439-96-5	954.8	95.480	% Recov	80.000	120.000				08/20/08
LCS	Sodium	7440-23-5	854.9	85.490	% Recov	80.000	120.000				08/20/08
LCS	Nickel	7440-02-0	965.1	96.510	% Recov	80.000	120.000				08/20/08
LCS	Antimony	7440-36-0	870	87.000	% Recov	80.000	120.000				08/20/08
LCS	Strontium	7440-24-6	456.4	91.280	% Recov	80.000	120.000				08/20/08
LCS	Vanadium	7440-62-2	945.1	94.510	% Recov	80.000	120.000				08/20/08
LCS	Zinc	7440-66-6	933.9	93.390	% Recov	80.000	120.000				08/20/08

Lab ID: W08P003447  
**BATCH QC ASSOCIATED WITH SAMPLE**

MS	Silver	7440-22-4	976.9	97.690	% Recov	75.000	125.000				08/20/08
MS	Barium	7440-39-3	485	97.000	% Recov	75.000	125.000				08/20/08
MS	Beryllium	7440-41-7	524.3	104.860	% Recov	75.000	125.000				08/20/08
MS	Calcium	7440-70-2	2170	217.000	% Recov	75.000	125.000				08/20/08
MS	Cadmium	7440-43-9	1031	103.100	% Recov	75.000	125.000				08/20/08
MS	Cobalt	7440-48-4	1031	103.100	% Recov	75.000	125.000				08/20/08
MS	Chromium	7440-47-3	1017.5	101.750	% Recov	75.000	125.000				08/20/08
MS	Copper	7440-50-8	979.9	97.990	% Recov	75.000	125.000				08/20/08
MS	Iron	7439-89-6	988.1	98.810	% Recov	75.000	125.000				08/20/08
MS	Potassium	7440-09-7	10023	100.230	% Recov	75.000	125.000				08/20/08
MS	Magnesium	7439-95-4	1285	128.500	% Recov	75.000	125.000				08/20/08
MS	Manganese	7439-96-5	1028	102.800	% Recov	75.000	125.000				08/20/08
MS	Sodium	7440-23-5	1250	125.000	% Recov	75.000	125.000				08/20/08
MS	Nickel	7440-02-0	1017.3	101.730	% Recov	75.000	125.000				08/20/08
MS	Antimony	7440-36-0	1038	103.800	% Recov	75.000	125.000				08/20/08
MS	Strontium	7440-24-6	499.5	99.900	% Recov	75.000	125.000				08/20/08
MS	Vanadium	7440-62-2	1006	100.600	% Recov	75.000	125.000				08/20/08
MS	Zinc	7440-66-6	1020	102.000	% Recov	75.000	125.000				08/20/08
MSD	Silver	7440-22-4	889.5	88.950	% Recov	75.000	125.000				08/20/08

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# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 07/11/08  
 Receive Date: 07/11/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Barium	7440-39-3	439.9	87.980	% Recov	75.000	125.000				08/20/08
MSD	Beryllium	7440-41-7	480.5	96.100	% Recov	75.000	125.000				08/20/08
MSD	Calcium	7440-70-2	1800	180.000	% Recov	75.000	125.000				08/20/08
MSD	Cadmium	7440-43-9	947.7	94.770	% Recov	75.000	125.000				08/20/08
MSD	Cobalt	7440-48-4	953.2	95.320	% Recov	75.000	125.000				08/20/08
MSD	Chromium	7440-47-3	939.4	93.940	% Recov	75.000	125.000				08/20/08
MSD	Copper	7440-50-8	881.8	88.180	% Recov	75.000	125.000				08/20/08
MSD	Iron	7439-89-6	920.7	92.070	% Recov	75.000	125.000				08/20/08
MSD	Potassium	7440-09-7	8613	86.130	% Recov	75.000	125.000				08/20/08
MSD	Magnesium	7439-95-4	805	80.500	% Recov	75.000	125.000				08/20/08
MSD	Manganese	7439-96-5	943.5	94.350	% Recov	75.000	125.000				08/20/08
MSD	Sodium	7440-23-5	510	51.000	% Recov	75.000	125.000				08/20/08
MSD	Nickel	7440-02-0	945.4	94.540	% Recov	75.000	125.000				08/20/08
MSD	Antimony	7440-36-0	1133	113.300	% Recov	75.000	125.000				08/20/08
MSD	Strontium	7440-24-6	451.8	90.360	% Recov	75.000	125.000				08/20/08
MSD	Vanadium	7440-62-2	927.4	92.740	% Recov	75.000	125.000				08/20/08
MSD	Zinc	7440-66-6	939.2	93.920	% Recov	75.000	125.000				08/20/08
SPK-RPD	Silver	7440-22-4	88.950		RPD			9.366	20.000		08/21/08
SPK-RPD	Barium	7440-39-3	87.980		RPD			9.752	20.000		08/21/08
SPK-RPD	Beryllium	7440-41-7	96.100		RPD			8.718	20.000		08/21/08
SPK-RPD	Calcium	7440-70-2	180.000		RPD			18.640	20.000		08/21/08
SPK-RPD	Cadmium	7440-43-9	94.770		RPD			8.420	20.000		08/21/08
SPK-RPD	Cobalt	7440-48-4	95.320		RPD			7.842	20.000		08/21/08
SPK-RPD	Chromium	7440-47-3	93.940		RPD			7.982	20.000		08/21/08
SPK-RPD	Copper	7440-50-8	88.180		RPD			10.539	20.000		08/21/08
SPK-RPD	Iron	7439-89-6	92.070		RPD			7.062	20.000		08/21/08
SPK-RPD	Potassium	7440-09-7	86.130		RPD			15.132	20.000		08/21/08
SPK-RPD	Magnesium	7439-95-4	80.500		RPD			45.933	20.000		08/21/08
SPK-RPD	Manganese	7439-96-5	94.350		RPD			8.572	20.000		08/21/08
SPK-RPD	Sodium	7440-23-5	51.000		RPD			84.091	20.000		08/21/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 07/11/08  
 Receive Date: 07/11/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
SPK-RPD	Nickel	7440-02-0	94.540		RPD			7.327	20.000		08/21/08
SPK-RPD	Antimony	7440-36-0	113.300		RPD			8.752	20.000		08/21/08
SPK-RPD	Strontium	7440-24-6	90.360		RPD			10.028	20.000		08/21/08
SPK-RPD	Vanadium	7440-62-2	92.740		RPD			8.131	20.000		08/21/08
SPK-RPD	Zinc	7440-66-6	93.920		RPD			8.248	20.000		08/21/08
<b>BATCH QC</b>											
BLANK	Silver	7440-22-4	15.5	15.500	ug/L						08/20/08
BLANK	Barium	7440-39-3	<4	n/a	ug/L					U	08/20/08
BLANK	Beryllium	7440-41-7	<4	n/a	ug/L					U	08/20/08
BLANK	Calcium	7440-70-2	<73	n/a	ug/L					U	08/20/08
BLANK	Cadmium	7440-43-9	<4	n/a	ug/L					U	08/20/08
BLANK	Cobalt	7440-48-4	<4	n/a	ug/L					U	08/20/08
BLANK	Chromium	7440-47-3	<13	n/a	ug/L					U	08/20/08
BLANK	Copper	7440-50-8	<6	n/a	ug/L					U	08/20/08
BLANK	Iron	7439-89-6	<25	n/a	ug/L					U	08/20/08
BLANK	Potassium	7440-09-7	<170	n/a	ug/L					U	08/20/08
BLANK	Magnesium	7439-95-4	<50	n/a	ug/L					U	08/20/08
BLANK	Manganese	7439-96-5	<4	n/a	ug/L					U	08/20/08
BLANK	Sodium	7440-23-5	<51	n/a	ug/L					U	08/20/08
BLANK	Nickel	7440-02-0	<4	n/a	ug/L					U	08/20/08
BLANK	Antimony	7440-36-0	<56	n/a	ug/L					U	08/20/08
BLANK	Strontium	7440-24-6	<4	n/a	ug/L					U	08/20/08
BLANK	Vanadium	7440-62-2	<12	n/a	ug/L					U	08/20/08
BLANK	Zinc	7440-66-6	<9	n/a	ug/L					U	08/20/08
LCS	Silver	7440-22-4	999.1	99.910	% Recov	80.000	120.000				08/20/08
LCS	Barium	7440-39-3	477.7	95.540	% Recov	80.000	120.000				08/20/08
LCS	Beryllium	7440-41-7	539.8	107.960	% Recov	80.000	120.000				08/20/08
LCS	Calcium	7440-70-2	1024	102.400	% Recov	80.000	120.000				08/20/08
LCS	Cadmium	7440-43-9	1049	104.900	% Recov	80.000	120.000				08/20/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: ICP Metals Analysis, Grd H2O 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	Cobalt	7440-48-4	1074	107.400	% Recov	80.000	120.000				08/20/08
LCS	Chromium	7440-47-3	1034	103.400	% Recov	80.000	120.000				08/20/08
LCS	Copper	7440-50-8	983.9	98.390	% Recov	80.000	120.000				08/20/08
LCS	Iron	7439-89-6	1030	103.000	% Recov	80.000	120.000				08/20/08
LCS	Potassium	7440-09-7	10040	100.400	% Recov	80.000	120.000				08/20/08
LCS	Magnesium	7439-95-4	949	94.900	% Recov	80.000	120.000				08/20/08
LCS	Manganese	7439-96-5	1039	103.900	% Recov	80.000	120.000				08/20/08
LCS	Sodium	7440-23-5	946.8	94.680	% Recov	80.000	120.000				08/20/08
LCS	Nickel	7440-02-0	1063	106.300	% Recov	80.000	120.000				08/20/08
LCS	Antimony	7440-36-0	1050	105.000	% Recov	80.000	120.000				08/20/08
LCS	Strontium	7440-24-6	492.5	98.500	% Recov	80.000	120.000				08/20/08
LCS	Vanadium	7440-62-2	1017	101.700	% Recov	80.000	120.000				08/20/08
LCS	Zinc	7440-66-8	1028	102.800	% Recov	80.000	120.000				08/20/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: Total Alkalinity as mg/L CaCO3

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

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P003351</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Total Alkalinity as mg/L CaCO3	ALKALINITY	125.3		RPD			0.000	20.000		07/16/08
<b>Lab ID: W08P003485</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Total Alkalinity as mg/L CaCO3	ALKALINITY	141.8		RPD			0.071	20.000		07/16/08
<b>BATCH QC</b>											
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	115.9	100.783	%Recover	80.000	120.000				07/16/08
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	32.66	109.597	%Recover	80.000	120.000				07/16/08
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	115.3	100.261	%Recover	80.000	120.000				07/16/08
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	32.39	108.691	%Recover	80.000	120.000				07/16/08
LCS	Total Alkalinity as mg/L CaCO3	ALKALINITY	30.32	101.745	%Recover	80.000	120.000				07/16/08

# WSCF ANALYTICAL COMMENT REPORT

**Attention:** Steve Trent E6-35

**Group #:** WSCF20081417  
**Department:** Inorganic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		<p>H-3 LCS is low. Since all the other QC checks came out fine, this batch has been approved. Imh</p> <p>IC Anion - MS/MSD recoveries slightly low for nitrite in sample W08P003439; Data N-flagged. DTS</p> <p>ICP-AES: [Samples W08P3438-3439; 3445-3446] High silver preparation blank result; "C" flag if applicable. No zirconium present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure sodium and calcium linearity because sample results are greater than the calibration standard.</p> <p>ICP-AES: [Samples W08P3447-3449; 3452-3459; 3466-3467] High silver preparation blank result; "C" flag if applicable. No zirconium present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure magnesium, sodium, and calcium linearity because sample results are greater than the</p>

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

VALTEST - Test Validation  
LOGTEST - Login for Tests

TESTDATA - Test Data Entry

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# WSCF ANALYTICAL COMMENT REPORT

**Attention:** Steve Trent E6-35

**Group #:** WSCF20081417  
**Department:** Inorganic

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Sample #	Client ID	Lab Area	Test	Comment
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calibration standard.

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

VALTEST - Test Validation  
LOGTEST - Login for Tests

TESTDATA - Test Data Entry

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Report Date: 25-aug-2008

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OF  
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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003439

Client ID: B1W226 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Radiochemistry

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415	U	0.980	pCi/L	+0.843	pCi/L	1.00	1.2		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415		8.10	pCi/L	+1.62	pCi/L	1.00	1.6		07/29/08
<b>TC99 by Liquid Scin.</b>											
Tc-99 by Liquid Scin.	14133-76-7	LA-508-421	U	1.20	pCi/L	+3.44	pCi/L	1.00	5.8		07/17/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		1.60e +04	pCi/L	+3.20e +03	pCi/L	1.00	2.3e +02		07/15/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003447

Client ID: B1W229 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Radiochemistry

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415	U	0.960	pCi/L	+0.826	pCi/L	1.00	1.2		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415		11.0	pCi/L	+1.87	pCi/L	1.00	1.6		07/29/08
<b>TC99 by Liquid Scin.</b>											
Tc-99 by Liquid Scin.	14133-76-7	LA-508-421		6.10	pCi/L	+3.78	pCi/L	1.00	5.8		07/17/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		4.00e+04	pCi/L	+8.00e+03	pCi/L	1.00	2.3e+02		07/15/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

**3\*** - Indicates results that have NOT been validated;

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

+ - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003448

Client ID: B1W247 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Radiochemistry

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415		1.80	pCi/L	+ -0.990	pCi/L	1.00	1.3		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415		24.0	pCi/L	+ -3.12	pCi/L	1.00	1.6		07/29/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		5.70e +03	pCi/L	+ -1.14e +03	pCi/L	1.00	2.3e +02		07/15/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35

**SAF Number:** I08-047

**Sample #** W08P003452

**Client ID:** B1W1P6 PNNL-GPP  
WSCF

**Matrix:** WATER

**Group #:** WSCF20081417

**Department:** Radiochemistry

**Sampled:** 07/11/08

**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>TC99 by Liquid Scin.</b>											
Tc-99 by Liquid Scin.	14133-76-7	LA-508-421	U	0.200	pCi/L	+ -2.00	pCi/L	1.00	5.8		07/17/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		280	pCi/L	+ -158	pCi/L	1.00	2.3e +02		07/15/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

061055

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GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35

**SAF Number:** I08-047

**Sample #** W08P003457

**Client ID:** B1W1N9 PNNL-GPP  
WSCF

**Matrix:** WATER

**Group #:** WSCF20081417

**Department:** Radiochemistry

**Sampled:** 07/11/08

**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>TC99 by Liquid Scin.</b>											
Tc-99 by Liquid Scin.	14133-76-7	LA-508-421	U	3.90	pCi/L	+ -3.63	pCi/L	1.00	5.8		07/17/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		810	pCi/L	+ -219	pCi/L	1.00	2.3e +02		07/15/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

+ - Indicates more than six qualifier symbols

5610190

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GPAP

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003458

Client ID: B1W1R0

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Radiochemistry

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>TC99 by Liquid Scin.</b>											
Tc-99 by Liquid Scin.	14133-76-7	LA-508-421	U	-1.20	pCi/L	+ -3.36	pCi/L	1.00	5.8		07/17/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421	U	-20.0	pCi/L	+ -12.0	pCi/L	1.00	2.3e+02		07/15/08

**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)

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

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Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35

**SAF Number:** I08-047

**Sample #** W08P003459

**Client ID:** B1W1P3 PNNL-GPP  
WSCF

**Matrix:** WATER

**Group #:** WSCF20081417

**Department:** Radiochemistry

**Sampled:** 07/11/08

**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>TC99 by Liquid Scin.</b>											
Tc-99 by Liquid Scin.	14133-76-7	LA-508-421	U	-0.400	pCi/L	+ -3.41	pCi/L	1.00	5.8		07/17/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		830	pCi/L	+ -249	pCi/L	1.00	2.3e +02		07/15/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

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0 of 90  
Report WGPP/ver. 5.2  
GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** S08-007  
**Sample #** W08P003460  
**Client ID:** B1W255

PNNL-GPP  
 WSCF

**Matrix:** WATER

**Group #:** WSCF20081417  
**Department:** Radiochemistry  
**Sampled:** 07/11/08  
**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415	U	0.0880	pCi/L	+0.352	pCi/L	1.00	0.67		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415	U	0.590	pCi/L	+0.826	pCi/L	1.00	1.4		07/29/08
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-0.600	pCi/L	+1.63	pCi/L	1.00	1.1		07/21/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		82.4	Percent			1.00	0.0		07/21/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

061065

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003461

Client ID: B1W254

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Radiochemistry

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415	U	0.600	pCi/L	+ -0.660	pCi/L	1.00	1.0		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415		4.80	pCi/L	+ -1.25	pCi/L	1.00	1.5		07/29/08
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-2.80	pCi/L	+ -2.80	pCi/L	1.00	0.99		07/21/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		89.3	Percent			1.00	0.0		07/21/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

+ - Indicates more than six qualifier symbols

061009

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35

**SAF Number:** S08-007

**Sample #** W08P003462

**Client ID:** B1W250

PNNL-GPP  
WSCF

**Matrix:** WATER

**Group #:** WSCF20081417

**Department:** Radiochemistry

**Sampled:** 07/11/08

**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415	U	1.70	pCi/L	+ -1.67	pCi/L	1.00	2.6		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415		7.70	pCi/L	+ -2.93	pCi/L	1.00	4.1		07/29/08
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-2.70	pCi/L	+ -2.70	pCi/L	1.00	1.0		07/21/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		85.8	Percent			1.00	0.0		07/21/08

**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)

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

- Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

GPAP

0610190

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003463

Client ID: B1W249

PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Radiochemistry

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415	U	2.00	pCi/L	+ -1.72	pCi/L	1.00	2.5		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415		7.40	pCi/L	+ -2.89	pCi/L	1.00	4.0		07/29/08
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-0.690	pCi/L	+ -1.64	pCi/L	1.00	1.1		07/21/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		81.2	Percent			1.00	0.0		07/21/08

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank. (inorg)

N - Spike sample recovery is outside control limits. (inorg)

Report WGPP/ver. 5.2

GPAP

0620190

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** I08-047  
**Sample #** W08P003464  
**Client ID:** B1W1V2

PNNL-GPP  
 WSCF

**Matrix:** WATER

**Group #:** WSCF20081417  
**Department:** Radiochemistry  
**Sampled:** 07/11/08  
**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-2.40	pCi/L	+ -2.40	pCi/L	1.00	1.0		07/21/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		84.6	Percent			1.00	0.0		07/21/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		940	pCi/L	+ -282	pCi/L	1.00	2.3e+02		07/15/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

63  
 0190  
 GPAP

Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003465

Client ID: B1W1V1 PNNL-GPP  
WSCF

Matrix: WATER

Group #: WSCF20081417

Department: Radiochemistry

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-0.960	pCi/L	+ -1.43	pCi/L	1.00	1.1		07/21/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		77.6	Percent			1.00	0.0		07/21/08
<b>Tritium by Liq Sct column prep</b>											
Tritium	10028-17-8	LA-508-421		980	pCi/L	+ -245	pCi/L	1.00	2.3e+02		07/15/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

- Indicates results that have NOT been validated;

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

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

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

+ - Indicates more than six qualifier symbols

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

64  
07  
90

Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** S08-007  
**Sample #** W08P003467  
**Client ID:** B1W244

**PNNL-GPP  
WSCF**

**Matrix:** WATER

**Group #:** WSCF20081417  
**Department:** Radiochemistry  
**Sampled:** 07/11/08  
**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gross Alpha on Alpha Plateau</b>											
Gross alpha on alpha plateau	12587-46-1	LA-508-415		2.90	pCi/L	+ -1.57	pCi/L	1.00	1.9		08/01/08
<b>Gross Alpha/Gross Beta (AB32)</b>											
Gross beta	12587-47-2	LA-508-415		6.10	pCi/L	+ -2.20	pCi/L	1.00	3.0		07/29/08

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

\* - Indicates results that have NOT been validated;

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

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

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

C - The Analyte was found in the Associated Blank.(inorg)

N - Spike sample recovery is outside control limits.(inorg)

+ - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

GPAP

650190

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: Gross Alpha on Alpha Plateau

Sample Date: 07/10/08  
 Receive Date: 07/10/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P003421</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Gross alpha on alpha plateau	12587-46-1	U8.0E-01		RPD			n/a	20.000		08/01/08
<b>BATCH QC</b>											
BLANK	Gross alpha on alpha plateau	12587-46-1-ap	U4.5E-02	n/a	pCi/L	-100.000	100.000				08/01/08
LCS	Gross alpha on alpha plateau	12587-46-1-ap	33.1	85.441	% Recov	80.000	120.000				08/01/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: Gross Alpha/Gross Beta (AB32)

Sample Date: 07/10/08  
 Receive Date: 07/10/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P003421</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Gross beta	12587-47-2	4.2E+03		RPD			4.651	20.000		07/29/08
<b>BATCH QC</b>											
BLANK	Gross beta	12587-47-2	U8.5E-01	n/a	pCi/L	-10.000	10.000				07/29/08
LCS	Gross beta	12587-47-2	106.1	106.100	% Recov	80.000	120.000				07/29/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: Strontium 89/90

Sample Date: 07/10/08  
 Receive Date: 07/10/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P003411 BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Sr-85 Tracer by Beta Counting	SR85	82.4	82.400	% Recov	30.000	105.000				07/21/08
DUP	Strontium-89/90	SR-RAD	U-2.2		RPD			n/a	20.000		07/21/08
Lab ID: W08P003460 BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	82.4	82.400	% Recov	30.000	105.000				07/21/08
Lab ID: W08P003461 BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	89.3	89.300	% Recov	30.000	105.000				07/21/08
Lab ID: W08P003462 BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	85.8	85.800	% Recov	30.000	105.000				07/21/08
Lab ID: W08P003463 BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	81.2	81.200	% Recov	30.000	105.000				07/21/08
Lab ID: W08P003464 BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	84.6	84.600	% Recov	30.000	105.000				07/21/08
Lab ID: W08P003465 BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	77.8	77.600	% Recov	30.000	105.000				07/21/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: Strontium 89/90

Sample Date: 07/11/08  
 Receive Date: 07/11/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>BATCH QC</b>											
BLANK	Sr-85 Tracer by Beta Counting	SR85	79.2	79.200	% Recov	30.000	105.000				07/21/08
BLANK	Strontium-89/90	10098-97-2	U-2.7	n/a	pCi/L	-10.000	100.000				07/21/08
LCS	Sr-85 Tracer by Beta Counting	SR85	75.6	75.600	% Recov	30.000	105.000				07/21/08
LCS	Strontium-89/90	10098-97-2	139	100.122	% Recov	80.000	120.000				07/21/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: TC99 by Liquid Scin.

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

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P003355</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Tc-99 by Liquid Scin.	14133-76-7	6.8E+01		RPD			7.874	20.000		07/17/08
MS	Tc-99 by Liquid Scin.	14133-76-7	204.7	108.825	% Recov	75.000	125.000				07/17/08
<b>BATCH QC</b>											
BLANK	Tc-99 by Liquid Scin.	14133-76-7	U-0.7	n/a	pCi/L	-10.000	10.000				07/17/08
LCS	Tc-99 by Liquid Scin.	14133-76-7	204.7	108.825	% Recov	80.000	120.000				07/17/08

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081417  
 Matrix: WATER  
 Test: Tritium by Liq Sct column prep

Sample Date: 07/10/08  
 Receive Date: 07/10/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P003411</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Tritium	10028-17-8	U2.2E+01		RPD			n/a	20.000		07/15/08
MS	Tritium	10028-17-8	20422.5	79.240	% Recov	75.000	125.000				07/15/08
<b>BATCH QC</b>											
BLANK	Tritium	10028-17-8	U-9.5E+01	n/a	pCi/L	-10.000	1000.000				07/15/08
LCS	Tritium	10028-17-8	2180.0	63.814	% Recov	80.000	120.000				07/15/08

# WSCF ANALYTICAL COMMENT REPORT

Attention: Steve Trent E6-35

Group #: WSCF20081417  
Department: Radiochemistry

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		<p>H-3 LCS is low. Since all the other QC checks came out fine, this batch has been approved. lmh</p> <p>IC Anion - MS/MSD recoveries slightly low for nitrite in sample W08P003439; Data N-flagged. DTS</p> <p>ICP-AES: [Samples W08P3438-3439; 3445-3446] High silver preparation blank result; "C" flag if applicable. No zirconium present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure sodium and calcium linearity because sample results are greater than the calibration standard.</p> <p>ICP-AES: [Samples W08P3447-3449; 3452-3459; 3466-3467] High silver preparation blank result; "C" flag if applicable. No zirconium present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure magnesium, sodium, and calcium linearity because sample results are greater than the</p>

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

VALTEST - Test Validation  
LOGTEST - Login for Tests

TESTDATA - Test Data Entry

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# WSCF ANALYTICAL COMMENT REPORT

**Attention:** Steve Trent E6-35

**Group #:** WSCF20081417  
**Department:** Radiochemistry

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Sample #	Client ID	Lab Area	Test	Comment
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calibration standard.

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

VALTEST - Test Validation  
LOGTEST - Login for Tests

TESTDATA - Test Data Entry

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M4W41-SLF-08-891

ATTACHMENT 4

**SAMPLE RECEIPT INFORMATION**

Consisting of 17 pages  
Including cover page

**Waste Sampling and Characterization Facility**  
P.O. BOX 1970 S3-30, Richland, WA 99352  
PHONE: (509) 373-7004/FAX: (509) 373-7134

*File*

ACKNOWLEDGMENT OF SAMPLES RECEIVED

*08/11/08*  
*[Signature]*

GPAP

Richland, WA 99352  
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP  
PO#: 122543  
Group#: 20081417

The following samples were received from you on 07/11/08. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
W08P003438	B1W225	PNNL-GPP @GPP6010	Water	07/11/08
W08P003439	B1W226	PNNL-GPP @AB-32 @ALPHA @TC99-30 ALKALI	Water @GPP6010 @H3-33 @IC-30	07/11/08
W08P003445	B1W228	PNNL-GPP @GPP6010	Water	07/11/08
W08P003446	B1W246	PNNL-GPP @GPP6010	Water	07/11/08
W08P003447	B1W229	PNNL-GPP @AB-32 @ALPHA @TC99-30 ALKALI	Water @GPP6010 @H3-33 @IC-30	07/11/08
W08P003448	B1W247	PNNL-GPP @AB-32 @ALPHA	Water @GPP6010 @H3-33 @IC-30	07/11/08
W08P003449	B1W1P5	PNNL-GPP @GPP6010	Water	07/11/08
W08P003452	B1W1P6	PNNL-GPP @GPP6010 @H3-33	Water @IC-30 @TC99-30 ALKALI	07/11/08
W08P003453	B1W1N8	PNNL-GPP @GPP6010	Water	07/11/08
W08P003454	B1W1P9	PNNL-GPP @GPP6010	Water	07/11/08
W08P003455	B1W1P2	PNNL-GPP @GPP6010	Water	07/11/08
W08P003457	B1W1N9	PNNL-GPP @GPP6010 @H3-33	Water @IC-30 @TC99-30 ALKALI	07/11/08
W08P003458	B1W1R0	PNNL-GPP @GPP6010 @H3-33	Water @IC-30 @TC99-30 ALKALI	07/11/08
W08P003459	B1W1P3	PNNL-GPP @GPP6010 @H3-33	Water @IC-30 @TC99-30 ALKALI	07/11/08

GPAP

Richland, WA 99352  
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP  
PO#: 122543  
Group#: 20081417

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
W08P003460	B1W255	PNNL-GPP @AB-32 @ALPHA @SR89_90	Water	07/11/08
W08P003461	B1W254	PNNL-GPP @AB-32 @ALPHA @SR89_90	Water	07/11/08
W08P003462	B1W250	PNNL-GPP @AB-32 @ALPHA @SR89_90	Water	07/11/08
W08P003463	B1W249	PNNL-GPP @AB-32 @ALPHA @SR89_90	Water	07/11/08
W08P003464	B1W1V2	PNNL-GPP @H3-33 @SR89_90	Water	07/11/08
W08P003465	B1W1V1	PNNL-GPP @H3-33 @SR89_90	Water	07/11/08
W08P003466	B1W243	PNNL-GPP @GPP6010	Water	07/11/08
W08P003467	B1W244	PNNL-GPP @AB-32 @ALPHA @GPP6010 @IC-30	Water	07/11/08

Test Acronym Description

Test Acronym	Description
@AB-32	Gross Alpha/Gross Beta (AB32)
@ALPHA	Gross Alpha on Alpha Plateau
@GPP6010	ICP Metals Analysis, Grd H20 P
@H3-33	Tritium by Liq Sct column prep
@IC-30	Anions by Ion Chromatography
@SR89_90	Strontium 89/90
@TC99-30	TC99 by Liquid Scin.
ALKALI	Total Alkalinity as mg/L CaCO3

Collector <b>Scott E. Hamaker</b>	Contact/Requester <b>Steve Trent</b>	Telephone No. 509-373-5869	MSIN FAX
SAF No. S08-007	Sampling Origin Hanford Site	Purchase Order/Charge Code	
Project Title SURV JULY 2008	<b>HNF-N-506 17</b>	Ice Chest No. 002	Temp.
Shipped To (Lab) Waste Sampling & Characterization	Method of Shipment Govt. Vehicle	Bill of Lading/Air Bill No.	
Protocol SURV	Priority: 30 Days <b>PRIORITY</b>	Offsite Property No.	

POSSIBLE SAMPLE HAZARDS/REMARKS ** **	SPECIAL INSTRUCTIONS Hold Time Site-Wide Generator Knowledge Information Form applies.
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1W225 (F)	W08R03438	W	7-11-08	0917	1x500-mL G/P	6010_METALS_ICP: List-3 (18)	HNO3 to pH <2
B1W226	3439	W			1x500-mL G/P	6010_METALS_ICP: List-3 (18)	HNO3 to pH <2
B1W226		W			1x500-mL P	300.0_ANIONS_IC: List-1 (5)	Cool-4C
B1W226		W			1x500-mL G/P	ALPHABETA_GPC: Alpha discrete + Beta (2); ALPHABETA_GPC: Alpha discrete + Beta (2)	HNO3 to pH <2
B1W226		W			1x1000-mL G/P	TC99_3MDSK_LSC: Tc-99 (1)	HCl to pH <2
B1W226		W			1x250-mL G	TRITIUM_EIE_LSC: Tritium (1)	None
B1W226		W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	Cool-4C
<b>ICED</b>							

Relinquished By <b>Scott E. Hamaker</b>	Print	Sign <i>Scott Hamaker</i>	Date/Time <b>JUL 11 2008</b>	Received By <i>Victor Sims</i>	Print	Sign <i>[Signature]</i>	Date/Time <b>JUL 11 2008</b>	Matrix *
Relinquished By	Date/Time	Received By	Date/Time	S = Soil                      DS = Drum Solid SF = Sediment              DI = Drum Liquid SO = Solid                    T = Tissue SL = Sludge                  WI = Wine W = Water                    L = Liquid O = Oil                        V = Vegetation A = Air                         X = Other				
Relinquished By	Date/Time	Received By	Date/Time					
Relinquished By	Date/Time	Received By	Date/Time					
<b>7</b> FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time			

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