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

**FLUOR**

## Memorandum

M4W41-SLF-08-720

| | | | | |
|---|---|---|---|---|
| To: | H. Hampt | E6-35 | Date: | July 18, 2008 |
| From: | S. L. Fitzgerald, Manager<br>WSCF Analytical Lab | for SLF | | |

cc: w/Attachments

| | | | |
|---|---|---|---|
| T. F. Dale | S3-30 | 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 WSCF20081136

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 WSCF20081136:

- Cover Sheet (Attachment 1)
- Narrative (Attachment 2)
- Issue Resolution Form (Attachment 3)
- Analytical Results (Attachment 4)
- Sample Receipt Information (Attachment 5)

SLF/grf

Attachments 5

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ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages
Including cover page

# WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20081136
Data Deliverable Date: 17-jul-2008
Data Deliverable: Cover Sheet

| SAF# | Sample ID | WSCF# | Matrix |
|---|---|---|---|
| I08-037 | B1V9V1 | W08P002703 | WATER |
| | B1V9V2 | W08P002704 | WATER |
| S08-001 | B1RTN7 | W08P002701 | WATER |
| | B1RTN8 | W08P002702 | WATER |

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ATTACHMENT 2

**NARRATIVE**

Consisting of 5 pages
Including cover page

## Introduction

Four groundwater samples were received at the WSCF Laboratory on June 4, 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. Included as Attachment 3 are copies of the following Issue Resolution Forms (IRF)

- IRF #08-084 – documenting missed regulatory hold time for the Ethyl Acetate (8015), and
- Draft IRF – documenting preservation and hold time issues with TOC

A Data Summary Report (Attachment 4) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 5.

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 18 through 20, for a complete listing of approved analytical methods.

## Inorganic Comments

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

- Duplicate, Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1V654 (SDG# 20081134)..

All QC controls are within the established limits.

**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 29 through 30 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.

- Sample B1RTN8 (Chloride) – Sample result was also EX flagged due to unknown peak possibly interfering with the chloride result.

All QC controls are within the established limits.

**Cyanide** – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per GRP Letter of Instruction. See page 31 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1VHX8 (SDG# 20081117, SAF# F08-094).

All QC controls are within the established limits.

**ICP-AES Metals** – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per the GRP Letter of Instruction. See pages 32 through 35 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1V9R9 (SDG# 20081134).

- Calcium, Magnesium and Sodium – Sample results exceeded spiking levels by a factor of 4. Spike recoveries are not valid. Check standard was analyzed to ensure linearity, because sample results were greater than the calibration standard.

All other QC controls are within the established limits.

**ICP-MS Metals** – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per the GRP Letter of Instruction. See pages 36 through 37 for QC details. Analytical Note(s):

- Matrix Spikes and Matrix Spike Duplicates were analyzed on samples B1V654 and B1V662 (SDG# 20081134).

All QC controls are within the established limits.

**Total Organic Carbon** – The hold time requirement for this analysis was not met. See comment below. A Matrix Spike, Matrix Spike Duplicate, Blank and Method Spike were analyzed with this delivery group per the GRP Letter of Instruction. See page 38 for QC details. Analytical Note(s):

- Improper Sample Preservation and Missed Hold Time – Sample was not preserved with acid as required by the COC. Copy of draft IRF documenting improper sample preservation and missed hold time is included as Attachment 3.

- Matrix Spikes and Matrix Spike Duplicates were analyzed on samples B1V654 (SDG# 20081134) and B1VN95 (SDG# 20081195)

All QC controls are within the established limits.

**Organic Comments**

**Alcohol/Glycols** - The hold time requirement for this analysis was not met. See comment below. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per GRP Letter of Instruction. See page 45 for QC details. Analytical Note(s):

- Missed Hold Time – Copy of IRF# 08-084 documenting the missed regulatory hold time is included as Attachment 3.

- Duplicate QC was analyzed on sample# B1V654 (SDG# 20081134)

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1VKT6 (SDG# 20081159).

All QC controls are within the established limits.

**Semi-VOA** – 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 GPP Letter of Instruction. See pages 46 through 49 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1V662 (SDG# 20081134).

All QC controls are within the established limits.

**TPHD-WA** – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 50 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1V654 (SDG# 20081134).

All QC controls are within the established limits.

**TPHG-WA** – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 51 for QC details. Analytical Note(s):

- Duplicate, Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1V7H2 (SDG# 20081134).

All QC controls are within the established limits.

**VOA** – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample, were analyzed with this delivery group per the GRP Letter of Instruction. See pages 52 through 54 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1V385 (SDG# 20081134).
- Sample results that were less than the lowest calibration standard, however greater than the method detection limit were J flagged.
- Carbon Tetrachloride (B1V9V2) – Sample result is an estimate and E flagged.

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 57 through 59 for QC details. Analytical Note(s):

- Strontium-89/90 – Duplicate QC was analyzed on sample# B1V654 (SDG# 20081134).
- Technetium-99 – Duplicate and Matrix Spike were analyzed on sample# B1V7J6 (SDG# 20081110).

All QC controls are within the established limits.

I certify that this data package is in compliance with the LOI, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager and Client Services as verified by the following signatures.

Mark Stauffer for SLF
Scot L. Fitzgerald
WSCF Analytical Laboratory Manager

Pauline D. Mix
Pauline D. Mix
WSCF Client Services

M4W41-SLF-08-720

ATTACHMENT 3

**ISSUE RESOLUTION FORM**

Consisting of 3 pages
Including cover page

## ISSUE RESOLUTION FORM

**PNNL TRACKING NUMBER:** 08-084
Date : **6-19-2008** SAF No.

SDG: **WSCF20081136** LOGIN No.: TEST: Ethyl Acetate by 8015

Sample No.(s) **B1V9V2** **W08P002704**

Submitted By: J. Trechter Submitted To: H Hampt
Phone No. 373-7046 Phone No. 376-4319
Fax No. 372-0456 Fax No

| ISSUE | PROPOSED RESOLUTION |
|---|---|
| Samples were taken and submitted to WSCF on 6/4/08, with a holding time limit date of 6/18/08. Due to an unplanned ventilation shut down on 6/18/08, the holding time was missed. The analysis was started on 6/19/08, making the holding time off by one day. | Accept the analysis one day past the holding time with appropriate comments in the report narrative. |

**GRP COMMENTS**
Accept proposed resolution.

Heidi Hampt 7/1/08
Signature and Date

## ISSUE RESOLUTION FORM

**PNNL TRACKING NUMBER:** 08-XXX **DRAFT**

Date : **7-18-2008** SAF No. **I08-037**

SDG: **WSCF20081136** LOGIN No.: TEST: TOC - 30

Sample No.(s) **B1V9V2**
**(W08GR02704)**

| | | | |
|---|---|---|---|
| Submitted By: | PD Mix | Submitted To: | H Hampt |
| Phone No. | 372-1488 | Phone No. | 376-4319 |
| Fax No. | 372-0456 | Fax No | |

| ISSUE | PROPOSED RESOLUTION |
|---|---|
| On June 4, 2008, GPAP sample (identified above) was delivered to the WSCF Laboratory with improper preservation. Sample was not acidified as per COC requirements.<br><br>Sample was acidified by WSCF Laboratory personnel and successfully analyzed on July 9, 2008 after the regulatory hold time had expired.<br><br>All QC Controls were within established laboratory limits. | Accept TOC sample result (as- is) and document in the case narrative that the sample was not correctly preserved in the field and analyzed after the regulatory hold time had expired. |

**GRP COMMENTS**

Signature and Date

M4W41-SLF-08-720

ATTACHMENT 4

**ANALYTICAL RESULTS**

Consisting of 48 pages
Including cover page

# WSCF
# ANALYTICAL RESULTS REPORT

**for**

**GPAP**
**Richland, WA 99352**

**Attention: Steve Trent E6-35**

Analytical: Markus Stauffer 7/18/08

Client Services: F.D. Miz 7/18/2008

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

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Report#: WSCF20081136
Report Date: 17-jul-2008
*Report WGPP/ver. 5.2*
*GPAP*

w13qlog v4.2 17-jul-2008 15:13:40

Department: Inorganic

W13q Worklist/Batch/QC Report for Group# WSCF20081136

| WL# | S# | Batch | QC# | Tray Type | Sample# | Test |
|---|---|---|---|---|---|---|
| 36583 | 2 | 37004 | 41348 | BLANK | | Anions by Ion Chromatography |
| 36583 | 13 | 37004 | 41348 | BLANK | | Anions by Ion Chromatography |
| 36583 | 3 | 37004 | 41348 | LCS | | Anions by Ion Chromatography |
| 36583 | 5 | 37004 | 41348 | DUP | W08P002702 | Anions by Ion Chromatography |
| 36583 | 6 | 37004 | 41348 | MS | W08P002702 | Anions by Ion Chromatography |
| 36583 | 7 | 37004 | 41348 | MSD | W08P002702 | Anions by Ion Chromatography |
| 36583 | 4 | 37004 | 41348 | SAMPLE | W08P002702 | Anions by Ion Chromatography |
| 36583 | 7 | 37004 | 41348 | SPK-RPD | W08P002702 | Anions by Ion Chromatography |
| 36583 | 11 | 37004 | 41348 | SAMPLE | W08P002704 | Anions by Ion Chromatography |
| 36610 | 3 | 37027 | 41368 | BLANK | | Ammonia (N) by IC |
| 36610 | 14 | 37027 | 41368 | BLANK | | Ammonia (N) by IC |
| 36610 | 1 | 37027 | 41368 | LCS | | Ammonia (N) by IC |
| 36610 | 5 | 37027 | 41368 | DUP | W08P002695 | Ammonia (N) by IC |
| 36610 | 6 | 37027 | 41368 | MS | W08P002695 | Ammonia (N) by IC |
| 36610 | 7 | 37027 | 41368 | MSD | W08P002695 | Ammonia (N) by IC |
| 36610 | 7 | 37027 | 41368 | SPK-RPD | W08P002695 | Ammonia (N) by IC |
| 36610 | 10 | 37027 | 41368 | SAMPLE | W08P002704 | Ammonia (N) by IC |
| 36669 | 1 | 37082 | 41410 | BLANK | | Cyanide by Midi/Spectrophotom |
| 36669 | 2 | 37082 | 41410 | LCS | | Cyanide by Midi/Spectrophotom |
| 36669 | 4 | 37082 | 41410 | MS | W08GR01437 | Cyanide by Midi/Spectrophotom |
| 36669 | 5 | 37082 | 41410 | MSD | W08GR01437 | Cyanide by Midi/Spectrophotom |
| 36669 | 5 | 37082 | 41410 | SPK-RPD | W08GR01437 | Cyanide by Midi/Spectrophotom |
| 36669 | 12 | 37082 | 41410 | SAMPLE | W08P002704 | Cyanide by Midi/Spectrophotom |
| 36820 | 1 | 37242 | 41582 | BLANK | | ICP-200.8 MS All possible meta |
| 36820 | 2 | 37242 | 41582 | LCS | | ICP-200.8 MS All possible meta |
| 36820 | 4 | 37242 | 41582 | MS | W08P002695 | ICP-200.8 MS All possible meta |
| 36820 | 5 | 37242 | 41582 | MSD | W08P002695 | ICP-200.8 MS All possible meta |
| 36820 | 5 | 37242 | 41582 | SPK-RPD | W08P002695 | ICP-200.8 MS All possible meta |
| 36820 | 7 | 37242 | 41582 | MS | W08P002697 | ICP-200.8 MS All possible meta |
| 36820 | 8 | 37242 | 41582 | MSD | W08P002697 | ICP-200.8 MS All possible meta |
| 36820 | 8 | 37242 | 41582 | SPK-RPD | W08P002697 | ICP-200.8 MS All possible meta |
| 36820 | 21 | 37242 | 41582 | SAMPLE | W08P002703 | ICP-200.8 MS All possible meta |
| 36820 | 22 | 37242 | 41582 | SAMPLE | W08P002704 | ICP-200.8 MS All possible meta |
| 37010 | 1 | 37433 | 41784 | BLANK | | Total Organic Carbon |
| 37010 | 2 | 37433 | 41784 | METHSPIKE | | Total Organic Carbon |
| 37010 | 3 | 37433 | 41784 | SPK-RSD | | Total Organic Carbon |
| 37010 | 4 | 37433 | 41784 | MS | W08P002695 | Total Organic Carbon |
| 37010 | 5 | 37433 | 41784 | MSD | W08P002695 | Total Organic Carbon |
| 37010 | 5 | 37433 | 41784 | SPK-RPD | W08P002695 | Total Organic Carbon |
| 37010 | 10 | 37433 | 41784 | SAMPLE | W08P002704 | Total Organic Carbon |
| 37010 | 18 | 37433 | 41784 | MS | W08P002879 | Total Organic Carbon |
| 37010 | 19 | 37433 | 41784 | MSD | W08P002879 | Total Organic Carbon |
| 37010 | 19 | 37433 | 41784 | SPK-RPD | W08P002879 | Total Organic Carbon |
| 37125 | 1 | 37551 | 41895 | BLANK | | ICP Metals Analysis, Grd H20 P |
| 37125 | 2 | 37551 | 41895 | LCS | | ICP Metals Analysis, Grd H20 P |
| 37125 | 4 | 37551 | 41895 | MS | W08P002699 | ICP Metals Analysis, Grd H20 P |
| 37125 | 5 | 37551 | 41895 | MSD | W08P002699 | ICP Metals Analysis, Grd H20 P |

| | | | | | | |
|---|---|---|---|---|---|---|
| 37125 | 5 | 37551 | 41895 | SPK-RPD | W08P002699 | ICP Metals Analysis, Grd H20 P |
| 37125 | 6 | 37551 | 41895 | SAMPLE | W08P002701 | ICP Metals Analysis, Grd H20 P |
| 37125 | 7 | 37551 | 41895 | SAMPLE | W08P002702 | ICP Metals Analysis, Grd H20 P |
| 37125 | 8 | 37551 | 41895 | SAMPLE | W08P002703 | ICP Metals Analysis, Grd H20 P |
| 37125 | 9 | 37551 | 41895 | SAMPLE | W08P002704 | ICP Metals Analysis, Grd H20 P |

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Department: Organic

W13q Worklist/Batch/QC Report for Group# WSCF20081136

| WL# | S# | Batch | QC# | Tray Type | Sample# | Test |
|---|---|---|---|---|---|---|
| | | | 41400 | BLANK | | NWTPH-D TPH Diesel Range (Wa) |
| | | | 41400 | LCS | | NWTPH-D TPH Diesel Range (Wa) |
| | | | 41400 | MS | W08P002695 | NWTPH-D TPH Diesel Range (Wa) |
| | | | 41400 | MSD | W08P002695 | NWTPH-D TPH Diesel Range (Wa) |
| | | | 41400 | SPK-RPD | W08P002695 | NWTPH-D TPH Diesel Range (Wa) |
| | | | 41400 | SAMPLE | W08P002704 | NWTPH-D TPH Diesel Range (Wa) |
| | | | 41400 | SURR | W08P002704 | NWTPH-D TPH Diesel Range (Wa) |
| | | | 41445 | BLANK | | SW-846 8270C Semi-Vols |
| | | | 41445 | LCS | | SW-846 8270C Semi-Vols |
| | | | 41445 | MS | W08P002697 | SW-846 8270C Semi-Vols |
| | | | 41445 | MSD | W08P002697 | SW-846 8270C Semi-Vols |
| | | | 41445 | SPK-RPD | W08P002697 | SW-846 8270C Semi-Vols |
| | | | 41445 | SAMPLE | W08P002704 | SW-846 8270C Semi-Vols |
| | | | 41445 | SURR | W08P002704 | SW-846 8270C Semi-Vols |
| 36990 | 1 | 37412 | 41747 | BLANK | | NWTPH-GX TPH Gasoline Range |
| 36990 | 2 | 37412 | 41747 | LCS | | NWTPH-GX TPH Gasoline Range |
| 36990 | 4 | 37412 | 41747 | DUP | W08P002592 | NWTPH-GX TPH Gasoline Range |
| 36990 | 5 | 37412 | 41747 | MS | W08P002592 | NWTPH-GX TPH Gasoline Range |
| 36990 | 6 | 37412 | 41747 | MSD | W08P002592 | NWTPH-GX TPH Gasoline Range |
| 36990 | 6 | 37412 | 41747 | SPK-RPD | W08P002592 | NWTPH-GX TPH Gasoline Range |
| 36990 | 11 | 37412 | 41747 | SAMPLE | W08P002704 | NWTPH-GX TPH Gasoline Range |
| | | | 41824 | BLANK | | VOA Ground Water Protection |
| | | | 41824 | LCS | | VOA Ground Water Protection |
| | | | 41824 | MS | W08P002686 | VOA Ground Water Protection |
| | | | 41824 | MSD | W08P002686 | VOA Ground Water Protection |
| | | | 41824 | SPK-RPD | W08P002686 | VOA Ground Water Protection |
| | | | 41824 | SAMPLE | W08P002702 | VOA Ground Water Protection |
| | | | 41824 | SURR | W08P002702 | VOA Ground Water Protection |
| | | | 41824 | SAMPLE | W08P002704 | VOA Ground Water Protection |
| | | | 41824 | SURR | W08P002704 | VOA Ground Water Protection |
| 37099 | 1 | 37525 | 41877 | BLANK | | Alcohols, Glycols - 8015 |
| 37099 | 2 | 37525 | 41877 | LCS | | Alcohols, Glycols - 8015 |
| 37099 | 4 | 37525 | 41877 | DUP | W08P002695 | Alcohols, Glycols - 8015 |
| 37099 | 7 | 37525 | 41877 | SAMPLE | W08P002704 | Alcohols, Glycols - 8015 |
| 37099 | 9 | 37525 | 41877 | MS | W08P002743 | Alcohols, Glycols - 8015 |
| 37099 | 10 | 37525 | 41877 | MSD | W08P002743 | Alcohols, Glycols - 8015 |
| 37099 | 10 | 37525 | 41877 | SPK-RPD | W08P002743 | Alcohols, Glycols - 8015 |

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Department: Radiochemistry

W13q Worklist/Batch/QC Report for Group# WSCF20081136

| WL# | S# | Batch | QC# | Tray Type | Sample# | Test |
|---|---|---|---|---|---|---|
| 36693 | 1 | 37110 | 41472 | BLANK | | Tritium by Liq Sct column prep |
| 36693 | 2 | 37110 | 41472 | LCS | | Tritium by Liq Sct column prep |
| 36693 | 4 | 37110 | 41472 | DUP | W08P002702 | Tritium by Liq Sct column prep |
| 36693 | 3 | 37110 | 41472 | MS | W08P002702 | Tritium by Liq Sct column prep |
| 36693 | 5 | 37110 | 41472 | SAMPLE | W08P002702 | Tritium by Liq Sct column prep |
| 36693 | 6 | 37110 | 41472 | SAMPLE | W08P002704 | Tritium by Liq Sct column prep |
| 36701 | 1 | 37118 | 41566 | BLANK | | Strontium 89/90 |
| 36701 | 2 | 37118 | 41566 | LCS | | Strontium 89/90 |
| 36701 | 3 | 37118 | 41566 | DUP | W08P002695 | Strontium 89/90 |
| 36701 | 10 | 37118 | 41566 | SAMPLE | W08P002704 | Strontium 89/90 |
| 36701 | 11 | 37118 | 41566 | SURR | W08P002704 | Strontium 89/90 |
| 36601 | 1 | 37018 | 41598 | BLANK | | TC99 by Liquid Scin. |
| 36601 | 4 | 37018 | 41598 | LCS | | TC99 by Liquid Scin. |
| 36601 | 3 | 37018 | 41598 | DUP | W08P002653 | TC99 by Liquid Scin. |
| 36601 | 2 | 37018 | 41598 | MS | W08P002653 | TC99 by Liquid Scin. |
| 36601 | 17 | 37018 | 41598 | SAMPLE | W08P002704 | TC99 by Liquid Scin. |

# WSCF
# METHOD REFERENCES REPORT

**Department:** Inorganic

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

| | | |
|---|---|---|
| **LA-344-406** | LA-344-406: TOTAL ORGANIC CARBON (TOC) BASED ON SW-846 | |
| | **EPA SW-846 9060** | TOTAL ORGANIC CARBON |
| | **HEIS 9060_TOC** | Total Organic Carbon |
| **LA-503-401** | LA-503-401: ANALYSIS OF CATIONS BY ION CHROMATOGRAPHY | |
| | **EPA-600/4-86-024 300.7** | Dissolved Sodium, Ammonium, Potassium, and Calcium in Wet Deposition by Chemical |
| | **HEIS 300.7_CATIONS_IC** | Determination of Ammonium by Ion Chromatography |
| **LA-505-411** | LA-505-411: ELEMENTAL ANALYSIS BY INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPE | |
| | **HEIS 6010_METALS_ICP** | Inductively Coupled Plasma-Atomic Emmision Spectrometry |
| **LA-505-412** | LA-505-412: DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY | |
| | **EPA-600/R-94-111 200.8** | DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY COUPLED PLAS |
| | **HEIS 200.8_METALS_ICPMS** | Inductively Coupled Plasma - Mass Spectrometry |
| | **HEIS RADISOTOPES_ICPMS** | Radioisotopes by ICP/MS |
| **LA-533-410** | LA-533-410: ANION ANALYSIS BY ION CHROMATOGRAPHY | |
| | **EPA-600/R-94-111 300.0** | DETERMINATION OF INORGANIC ANIONS BY ION CHROMATOGRAPHY |
| | **HEIS 300.0_ANIONS_IC** | Determination of Inorganic Anions by Ion Chromatography |
| **LA-695-402** | LA-695-402: DETERMINATION OF CYANIDE BY MIDIDISTILLATION AND SPECTROPHOTOMETRIC | |
| | **EPA-600/4-79-020 335.2** | Cyanide, Total |
| | **HEIS 335.2_CYANIDE** | Cyanide, Total |

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

# WSCF
# METHOD REFERENCES REPORT

**Department:** Organic

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

| | | |
|---|---|---|
| **LA-523-443** | LA-523-443: GAS CHROMATOGRAPH ANALYSIS OF GASOLINE RANGE TOTAL PETROLEUM HYDROCA | |
| | **HEIS WTPH_GASOLINE** | Total Petroleum Hydrocarbons, Gasoline |
| | **WDOE TPH NWTPH-G** | Volatile Petroleum Products Method for Soil and Water |
| **LA-523-455** | LA-523-455: VOLATILE SAMPLE ANALYSIS BY SW-846 | |
| | **EPA SW-846 8000B** | DETERMINATIVE CHROMATOGRAPHIC SEPARATIONS |
| | **EPA SW-846 8260B** | VOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS) |
| | **HEIS 8260_VOA_GCMS** | Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) |
| **LA-523-456** | LA-523-456: SEMIVOLATILE SAMPLE ANALYSIS BY SW-846, METHOD 8270C | |
| | **EPA SW-846 8000B** | DETERMINATIVE CHROMATOGRAPHIC SEPARATIONS |
| | **EPA SW-846 8270C** | SEMIVOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS) |
| | **HEIS 8270_SVOA_GCMS** | Semivolatile Orgamoc Compounds By Gas Chromatography/Mass Spectrometry (GC/MS) |
| **LA-523-493** | NWTPH-Diesel and/or Gasoline | |
| | **HEIS WTPH_DIESEL (HEIS)** | Total Petroleum Hydrocarbons in Diesel |
| | **WDOE TPHD** | Total Petroleum Hydrocarbons in Diesel |
| **Organics** | Organics - Alcohols, Glycols | |
| | **EPA SW-846 8015B** | Nonhalogenated Organics Using GC/FID |

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

# WSCF
# METHOD REFERENCES REPORT

**Department:** Radiochemistry

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

**LA-508-415** LA-508-415: OPERATION OF THE PROTEAN 2-INCH ALPHA/BETA COUNTING SYSTEM FOR GROSS

| | | |
|---|---|---|
| **HEIS** | **ALPHA_GPC** | GROSS ALPHA GPC |
| **HEIS** | **BETA_GPC** | GROSS BETA GPC |
| **HEIS** | **SRTOT_SEP_PRECIP_GPC** | Strontium 89/90 |

**LA-508-421** LA-508-421: OPERATION OF THE TRI-CARB MODEL 2500TR LIQUID SCINTILLATION ANALYZER

| | | |
|---|---|---|
| **HEIS** | **ALPHA_LSC** | A/B Liquid Scintilillation |
| **HEIS** | **BETA_LSC** | A/B Liquid Scintilallation |
| **HEIS** | **TC99_3MDSK_LSC** | TC99 by Liquid Scintillation |
| **HEIS** | **TRITIUM_EIE_LSC** | Tritium Liquid Scintillation |

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** S08-001
**Sample #** W08P002701
**Client ID:** B1RTN7 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Inorganic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ICP Metals Analysis, Grd H20 P Prep** | | | | | | | | | | | **07/08/08** |
| **ICP Metals Analysis, Grd H20 P** | | | | | | | | | | | |
| Iron | 7439-89-6 | LA-505-411 | | 50.2 | ug/L | | | 1.00 | 25 | | 07/17/08 |
| Magnesium | 7439-95-4 | LA-505-411 | | 1.70e+03 | ug/L | | | 1.00 | 50 | | 07/17/08 |
| Manganese | 7439-96-5 | LA-505-411 | | 16.4 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Nickel | 7440-02-0 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Potassium | 7440-09-7 | LA-505-411 | | 5.26e+03 | ug/L | | | 1.00 | 1.7e+02 | | 07/17/08 |
| Silver | 7440-22-4 | LA-505-411 | U | < 5.00 | ug/L | | | 1.00 | 5.0 | | 07/17/08 |
| Sodium | 7440-23-5 | LA-505-411 | | 5.10e+04 | ug/L | | | 1.00 | 51 | | 07/17/08 |
| Antimony | 7440-36-0 | LA-505-411 | U | < 56.0 | ug/L | | | 1.00 | 56 | | 07/17/08 |
| Barium | 7440-39-3 | LA-505-411 | | 33.4 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Cadmium | 7440-43-9 | LA-505-411 | | 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Chromium | 7440-47-3 | LA-505-411 | U | < 13.0 | ug/L | | | 1.00 | 13 | | 07/17/08 |
| Cobalt | 7440-48-4 | LA-505-411 | | 4.10 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Copper | 7440-50-8 | LA-505-411 | U | < 6.00 | ug/L | | | 1.00 | 6.0 | | 07/17/08 |
| Vanadium | 7440-62-2 | LA-505-411 | U | < 12.0 | ug/L | | | 1.00 | 12 | | 07/17/08 |
| Zinc | 7440-66-6 | LA-505-411 | U | < 9.00 | ug/L | | | 1.00 | 9.0 | | 07/17/08 |
| Calcium | 7440-70-2 | LA-505-411 | | 1.22e+04 | ug/L | | | 1.00 | 73 | | 07/17/08 |
| Strontium | 7440-24-6 | LA-505-411 | | 93.0 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Beryllium | 7440-41-7 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** S08-001
**Sample #** W08P002702
**Client ID:** B1RTN8 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Inorganic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anions by Ion Chromatography** | | | | | | | | | | | |
| Fluoride | 16984-48-8 | LA-533-410 | D | 0.893 | mg/L | | | 2.00 | 0.042 | | 06/05/08 |
| Chloride | 16887-00-6 | LA-533-410 | DEX | 3.14 | mg/L | | | 2.00 | 0.22 | | 06/05/08 |
| Nitrogen in Nitrite | NO2-N | LA-533-410 | DU | < 0.0198 | mg/L | | | 2.00 | 0.020 | | 06/05/08 |
| Nitrogen in Nitrate | NO3-N | LA-533-410 | BD | 0.142 | mg/L | | | 2.00 | 0.072 | | 06/05/08 |
| Sulfate | 14808-79-8 | LA-533-410 | D | 1.22 | mg/L | | | 2.00 | 0.15 | | 06/05/08 |
| **ICP Metals Analysis, Grd H20 P Prep** | | | | | | | | | | | **07/08/08** |
| **ICP Metals Analysis, Grd H20 P** | | | | | | | | | | | |
| Iron | 7439-89-6 | LA-505-411 | | 99.9 | ug/L | | | 1.00 | 25 | | 07/17/08 |
| Magnesium | 7439-95-4 | LA-505-411 | | 1.61e+03 | ug/L | | | 1.00 | 50 | | 07/17/08 |
| Manganese | 7439-96-5 | LA-505-411 | | 15.2 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Nickel | 7440-02-0 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Potassium | 7440-09-7 | LA-505-411 | | 5.23e+03 | ug/L | | | 1.00 | 1.7e+02 | | 07/17/08 |
| Silver | 7440-22-4 | LA-505-411 | U | < 5.00 | ug/L | | | 1.00 | 5.0 | | 07/17/08 |
| Sodium | 7440-23-5 | LA-505-411 | | 5.04e+04 | ug/L | | | 1.00 | 51 | | 07/17/08 |
| Antimony | 7440-36-0 | LA-505-411 | U | < 56.0 | ug/L | | | 1.00 | 56 | | 07/17/08 |
| Barium | 7440-39-3 | LA-505-411 | | 32.1 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Cadmium | 7440-43-9 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Chromium | 7440-47-3 | LA-505-411 | U | < 13.0 | ug/L | | | 1.00 | 13 | | 07/17/08 |
| Cobalt | 7440-48-4 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Copper | 7440-50-8 | LA-505-411 | U | < 6.00 | ug/L | | | 1.00 | 6.0 | | 07/17/08 |
| Vanadium | 7440-62-2 | LA-505-411 | U | < 12.0 | ug/L | | | 1.00 | 12 | | 07/17/08 |
| Zinc | 7440-66-6 | LA-505-411 | U | < 9.00 | ug/L | | | 1.00 | 9.0 | | 07/17/08 |
| Calcium | 7440-70-2 | LA-505-411 | | 1.16e+04 | ug/L | | | 1.00 | 73 | | 07/17/08 |
| Strontium | 7440-24-6 | LA-505-411 | | 90.1 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** S08-001
**Sample #** W08P002702
**Client ID:** B1RTN8 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Inorganic
**Sampled:** 06/04/08
**Received:** 06/04/08

| 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 | | 07/17/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002703
**Client ID:** B1V9V1 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Inorganic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ICP Metals Analysis, Grd H20 P Prep** | | | | | | | | | | | **07/08/08** |
| **ICP Metals Analysis, Grd H20 P** | | | | | | | | | | | |
| Iron | 7439-89-6 | LA-505-411 | U | < 25.0 | ug/L | | | 1.00 | 25 | | 07/17/08 |
| Magnesium | 7439-95-4 | LA-505-411 | | 1.69e+04 | ug/L | | | 1.00 | 50 | | 07/17/08 |
| Manganese | 7439-96-5 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Nickel | 7440-02-0 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Potassium | 7440-09-7 | LA-505-411 | | 3.90e+03 | ug/L | | | 1.00 | 1.7e+02 | | 07/17/08 |
| Silver | 7440-22-4 | LA-505-411 | U | < 5.00 | ug/L | | | 1.00 | 5.0 | | 07/17/08 |
| Sodium | 7440-23-5 | LA-505-411 | | 1.68e+04 | ug/L | | | 1.00 | 51 | | 07/17/08 |
| Antimony | 7440-36-0 | LA-505-411 | U | < 56.0 | ug/L | | | 1.00 | 56 | | 07/17/08 |
| Barium | 7440-39-3 | LA-505-411 | | 53.4 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Cadmium | 7440-43-9 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Chromium | 7440-47-3 | LA-505-411 | U | < 13.0 | ug/L | | | 1.00 | 13 | | 07/17/08 |
| Cobalt | 7440-48-4 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Copper | 7440-50-8 | LA-505-411 | U | < 6.00 | ug/L | | | 1.00 | 6.0 | | 07/17/08 |
| Vanadium | 7440-62-2 | LA-505-411 | | 23.0 | ug/L | | | 1.00 | 12 | | 07/17/08 |
| Zinc | 7440-66-6 | LA-505-411 | U | < 9.00 | ug/L | | | 1.00 | 9.0 | | 07/17/08 |
| Calcium | 7440-70-2 | LA-505-411 | | 5.73e+04 | ug/L | | | 1.00 | 73 | | 07/17/08 |
| Lithium | 7439-93-2 | LA-505-411 | | 5.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Strontium | 7440-24-6 | LA-505-411 | | 262 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Beryllium | 7440-41-7 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| **ICP-200.8 MS All possible meta Prep** | | | | | | | | | | | **06/24/08** |
| **ICP-200.8 MS All possible meta** | | | | | | | | | | | |
| Lead | 7439-92-1 | LA-505-412 | U | < 0.100 | ug/L | | | 1.00 | 0.100 | | 06/24/08 |
| Mercury | 7439-97-6 | LA-505-412 | U | < 0.0500 | ug/L | | | 1.00 | 0.0500 | | 06/24/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002703
**Client ID:** B1V9V1 GPP-PNNL TRENT WSCF **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Inorganic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7440-38-2 | LA-505-412 | | 1.69 | ug/L | | | 1.00 | 0.400 | | 06/24/08 |

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

B - The analyte < the RDL but >= the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but >= MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002704
**Client ID:** B1V9V2 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Inorganic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anions by Ion Chromatography** | | | | | | | | | | | |
| Fluoride | 16984-48-8 | LA-533-410 | D | 0.223 | mg/L | | | 2.00 | 0.042 | | 06/05/08 |
| Chloride | 16887-00-6 | LA-533-410 | D | 27.3 | mg/L | | | 2.00 | 0.22 | | 06/05/08 |
| Nitrogen in Nitrite | NO2-N | LA-533-410 | DU | < 0.0198 | mg/L | | | 2.00 | 0.020 | | 06/05/08 |
| Nitrogen in Nitrate | NO3-N | LA-533-410 | D | 13.7 | mg/L | | | 5.00 | 0.18 | | 06/05/08 |
| Sulfate | 14808-79-8 | LA-533-410 | D | 37.5 | mg/L | | | 2.00 | 0.15 | | 06/05/08 |
| **Cyanide** | | | | | | | | | | | |
| Cyanide | 57-12-5 | LA-695-402 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 06/09/08 |
| **ICP Metals Analysis, Grd H20 P Prep** | | | | | | | | | | | **07/08/08** |
| **ICP Metals Analysis, Grd H20 P** | | | | | | | | | | | |
| Iron | 7439-89-6 | LA-505-411 | U | < 25.0 | ug/L | | | 1.00 | 25 | | 07/17/08 |
| Magnesium | 7439-95-4 | LA-505-411 | | 1.67e+04 | ug/L | | | 1.00 | 50 | | 07/17/08 |
| Manganese | 7439-96-5 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Nickel | 7440-02-0 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Potassium | 7440-09-7 | LA-505-411 | | 3.82e+03 | ug/L | | | 1.00 | 1.7e+02 | | 07/17/08 |
| Silver | 7440-22-4 | LA-505-411 | U | < 5.00 | ug/L | | | 1.00 | 5.0 | | 07/17/08 |
| Sodium | 7440-23-5 | LA-505-411 | | 1.66e+04 | ug/L | | | 1.00 | 51 | | 07/17/08 |
| Antimony | 7440-36-0 | LA-505-411 | U | < 56.0 | ug/L | | | 1.00 | 56 | | 07/17/08 |
| Barium | 7440-39-3 | LA-505-411 | | 52.7 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Cadmium | 7440-43-9 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Chromium | 7440-47-3 | LA-505-411 | U | < 13.0 | ug/L | | | 1.00 | 13 | | 07/17/08 |
| Cobalt | 7440-48-4 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Copper | 7440-50-8 | LA-505-411 | U | < 6.00 | ug/L | | | 1.00 | 6.0 | | 07/17/08 |
| Vanadium | 7440-62-2 | LA-505-411 | | 22.9 | ug/L | | | 1.00 | 12 | | 07/17/08 |
| Zinc | 7440-66-6 | LA-505-411 | U | < 9.00 | ug/L | | | 1.00 | 9.0 | | 07/17/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002704
**Client ID:** B1V9V2 GPP-PNNL TRENT WSCF **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Inorganic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 7440-70-2 | LA-505-411 | | 5.66e+04 | ug/L | | | 1.00 | 73 | | 07/17/08 |
| Lithium | 7439-93-2 | LA-505-411 | | 4.70 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Strontium | 7440-24-6 | LA-505-411 | | 259 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| Beryllium | 7440-41-7 | LA-505-411 | U | < 4.00 | ug/L | | | 1.00 | 4.0 | | 07/17/08 |
| **ICP-200.8 MS All possible meta Prep** | | | | | | | | | | | **06/24/08** |
| **ICP-200.8 MS All possible meta** | | | | | | | | | | | |
| Lead | 7439-92-1 | LA-505-412 | U | < 0.100 | ug/L | | | 1.00 | 0.100 | | 06/24/08 |
| Mercury | 7439-97-6 | LA-505-412 | U | < 0.0500 | ug/L | | | 1.00 | 0.0500 | | 06/24/08 |
| Uranium | 7440-61-1 | LA-505-412 | | 0.960 | ug/L | | | 1.00 | 0.0500 | | 06/24/08 |
| Arsenic | 7440-38-2 | LA-505-412 | | 1.67 | ug/L | | | 1.00 | 0.400 | | 06/24/08 |
| **Nitrogen in ammonium** | | | | | | | | | | | |
| Nitrogen in ammonium | NH4-N | LA-503-401 | U | < 9.32e-03 | mg/L | | | 1.00 | 9.3e-03 | | 06/06/08 |
| **Total organic carbon** | | | | | | | | | | | |
| Total organic carbon | TOC | LA-344-406 | U | < 0.300 | mg/L | | | 1.00 | 0.30 | | 07/09/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: Ammonia (N) by IC

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab ID: W08P002695 | | | | | | | | | | | |
| BATCH QC ASSOCIATED WITH SAMPLE | | | | | | | | | | | |
| DUP | Ammonia (N) by IC | 7664-41-7 | <9.32e-3 | | RPD | | | n/a | 20.000 | U | 06/06/08 |
| MS | Ammonia (N) by IC | 7664-41-7 | 0.4942 | 99.237 | % Recov | 80.000 | 120.000 | | | | 06/06/08 |
| MSD | Ammonia (N) by IC | 7664-41-7 | 0.5263 | 105.683 | % Recov | 80.000 | 120.000 | | | | 06/06/08 |
| SPK-RPD | Ammonia (N) by IC | 7664-41-7 | 105.683 | | RPD | | | 6.291 | 20.000 | | 06/06/08 |
| BATCH QC | | | | | | | | | | | |
| BLANK | Ammonia (N) by IC | 7664-41-7 | <9.32e-3 | n/a | mg/L | 0.000 | 0.002 | | | U | 06/06/08 |
| BLANK | Ammonia (N) by IC | 7664-41-7 | <9.32e-3 | n/a | mg/L | 0.000 | 0.002 | | | U | 06/06/08 |
| LCS | Ammonia (N) by IC | 7664-41-7 | 92.6644 | 92.664 | % Recov | 80.000 | 120.000 | | | | 06/06/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: Anions by Ion Chromatography

Sample Date: 06/04/08
Receive Date:06/04/08

Lab ID: W08P002702

BATCH QC ASSOCIATED WITH SAMPLE

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DUP | Chloride | 16887-00-6 | 3.103 | | RPD | | | 1.144 | 20.000 | | 06/05/08 |
| DUP | Fluoride | 16984-48-8 | 0.8587 | | RPD | | | 3.927 | 20.000 | | 06/05/08 |
| DUP | Nitrogen in Nitrite | NO2-N | <1.98e-2 | | RPD | | | n/a | 20.000 | U | 06/05/08 |
| DUP | Nitrogen in Nitrate | NO3-N | 0.1427 | | RPD | | | 0.351 | 20.000 | | 06/05/08 |
| DUP | Sulfate | 14808-79-8 | 1.1743 | | RPD | | | 3.432 | 20.000 | | 06/05/08 |
| MS | Chloride | 16887-00-6 | 0.93645 | 94.116 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MS | Fluoride | 16984-48-8 | 0.50235 | 101.897 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MS | Nitrogen in Nitrite | NO2-N | 0.51365 | 104.400 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MS | Nitrogen in Nitrate | NO3-N | 0.4553 | 102.085 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MS | Sulfate | 14808-79-8 | 1.95285 | 99.635 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MSD | Chloride | 16887-00-6 | 0.88155 | 88.598 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MSD | Fluoride | 16984-48-8 | 0.4964 | 100.690 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MSD | Nitrogen in Nitrite | NO2-N | 0.47315 | 96.169 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MSD | Nitrogen in Nitrate | NO3-N | 0.44895 | 100.661 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| MSD | Sulfate | 14808-79-8 | 1.9254 | 98.235 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| SPK-RPD | Chloride | 16887-00-6 | 88.598 | | RPD | | | 6.040 | 20.000 | | 06/05/08 |
| SPK-RPD | Fluoride | 16984-48-8 | 100.690 | | RPD | | | 1.192 | 20.000 | | 06/05/08 |
| SPK-RPD | Nitrogen in Nitrite | NO2-N | 96.169 | | RPD | | | 8.208 | 20.000 | | 06/05/08 |
| SPK-RPD | Nitrogen in Nitrate | NO3-N | 100.661 | | RPD | | | 1.405 | 20.000 | | 06/05/08 |
| SPK-RPD | Sulfate | 14808-79-8 | 98.235 | | RPD | | | 1.415 | 20.000 | | 06/05/08 |

BATCH QC

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BLANK | Chloride | 16887-00-6 | <0.11 | n/a | mg/L | 0.000 | 0.030 | | | U | 06/05/08 |
| BLANK | Chloride | 16887-00-6 | <0.11 | n/a | mg/L | 0.000 | 0.030 | | | U | 06/05/08 |
| BLANK | Fluoride | 16984-48-8 | <2.1e-2 | n/a | mg/L | 0.000 | 0.030 | | | U | 06/05/08 |
| BLANK | Fluoride | 16984-48-8 | <2.1e-2 | n/a | mg/L | 0.000 | 0.030 | | | U | 06/05/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
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 | 06/05/08 |
| BLANK | Nitrogen in Nitrite | NO2-N | <9.9e-3 | n/a | mg/L | 0.000 | 0.020 | | | U | 06/05/08 |
| BLANK | Nitrogen in Nitrate | NO3-N | <3.6e-2 | n/a | mg/L | 0.000 | 0.040 | | | U | 06/05/08 |
| BLANK | Nitrogen in Nitrate | NO3-N | <3.6e-2 | n/a | mg/L | 0.000 | 0.040 | | | U | 06/05/08 |
| BLANK | Sulfate | 14808-79-8 | <7.7e-2 | n/a | mg/L | 0.000 | 0.200 | | | U | 06/05/08 |
| BLANK | Sulfate | 14808-79-8 | <7.7e-2 | n/a | mg/L | 0.000 | 0.200 | | | U | 06/05/08 |
| LCS | Chloride | 16887-00-6 | 200.1605 | 99.582 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| LCS | Fluoride | 16984-48-8 | 102.5081 | 102.920 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| LCS | Nitrogen in Nitrite | NO2-N | 101.8117 | 102.426 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| LCS | Nitrogen in Nitrate | NO3-N | 94.1074 | 104.448 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |
| LCS | Sulfate | 14808-79-8 | 402.1822 | 101.561 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: Cyanide by Midi/Spectrophotom

Sample Date: 06/03/08
Receive Date:06/03/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab ID: W08GR01437 | | | | | | | | | | | |
| BATCH QC ASSOCIATED WITH SAMPLE | | | | | | | | | | | |
| MS | Cyanide by Midi/Spectrophotom | 57-12-5 | 37.5 | 93.750 | % Recov | 75.000 | 125.000 | | | | 06/09/08 |
| MSD | Cyanide by Midi/Spectrophotom | 57-12-5 | 35.2 | 88.000 | % Recov | 75.000 | 125.000 | | | | 06/09/08 |
| SPK-RPD | Cyanide by Midi/Spectrophotom | 57-12-5 | 88.000 | | RPD | | | 6.327 | 20.000 | | 06/09/08 |
| BATCH QC | | | | | | | | | | | |
| BLANK | Cyanide by Midi/Spectrophotom | 57-12-5 | < 4 | n/a | ug/L | -4.000 | 4.000 | | | U | 06/09/08 |
| LCS | Cyanide by Midi/Spectrophotom | 57-12-5 | 44.4 | 88.800 | % Recov | 85.000 | 115.000 | | | | 06/09/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 06/04/08
Receive Date:06/04/08

Lab ID: W08P002699
BATCH QC ASSOCIATED WITH SAMPLE

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MS | Silver | 7440-22-4 | 1044 | 104.400 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Barium | 7440-39-3 | 525.2 | 105.040 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Beryllium | 7440-41-7 | 546.6 | 109.320 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Calcium | 7440-70-2 | 1430 | 143.000 | % Recov | 75.000 | 125.000 | | | • | 07/17/08 |
| MS | Cadmium | 7440-43-9 | 1080 | 108.000 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Cobalt | 7440-48-4 | 1049 | 104.900 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Chromium | 7440-47-3 | 1077 | 107.700 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Copper | 7440-50-8 | 1018 | 101.800 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Iron | 7439-89-6 | 1059 | 105.900 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Potassium | 7440-09-7 | 8938 | 89.380 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Lithium | 7439-93-2 | 516 | 103.200 | % Recov | 70.000 | 130.000 | | | | 07/17/08 |
| MS | Magnesium | 7439-95-4 | 1180 | 118.000 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Manganese | 7439-96-5 | 1089.3 | 108.930 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Sodium | 7440-23-5 | 1120 | 112.000 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Nickel | 7440-02-0 | 1071 | 107.100 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Antimony | 7440-36-0 | 1051 | 105.100 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Strontium | 7440-24-6 | 546.6 | 109.320 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Vanadium | 7440-62-2 | 1054.9 | 105.490 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MS | Zinc | 7440-66-6 | 1142 | 114.200 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Silver | 7440-22-4 | 1044 | 104.400 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Barium | 7440-39-3 | 523 | 104.600 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Beryllium | 7440-41-7 | 547.5 | 109.500 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Calcium | 7440-70-2 | 1930 | 193.000 | % Recov | 75.000 | 125.000 | | | • | 07/17/08 |
| MSD | Cadmium | 7440-43-9 | 1086 | 108.600 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Cobalt | 7440-48-4 | 1056 | 105.600 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Chromium | 7440-47-3 | 1085 | 108.500 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MSD | Copper | 7440-50-8 | 1009 | 100.900 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Iron | 7439-89-6 | 1061 | 106.100 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Potassium | 7440-09-7 | 8708 | 87.080 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Lithium | 7439-93-2 | 504.3 | 100.860 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Magnesium | 7439-95-4 | 1170 | 117.000 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Manganese | 7439-96-5 | 1095.3 | 109.530 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Sodium | 7440-23-5 | 970 | 97.000 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Nickel | 7440-02-0 | 1077 | 107.700 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Antimony | 7440-36-0 | 1061 | 106.100 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Strontium | 7440-24-6 | 544.5 | 108.900 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Vanadium | 7440-62-2 | 1055.9 | 105.590 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| MSD | Zinc | 7440-66-6 | 1149 | 114.900 | % Recov | 75.000 | 125.000 | | | | 07/17/08 |
| SPK-RPD | Silver | 7440-22-4 | 104.400 | | RPD | | | 0.000 | 20.000 | | 07/17/08 |
| SPK-RPD | Barium | 7440-39-3 | 104.600 | | RPD | | | 0.420 | 20.000 | | 07/17/08 |
| SPK-RPD | Beryllium | 7440-41-7 | 109.500 | | RPD | | | 0.165 | 20.000 | | 07/17/08 |
| SPK-RPD | Calcium | 7440-70-2 | 193.000 | | RPD | | | 29.762 | 20.000 • | | 07/17/08 |
| SPK-RPD | Cadmium | 7440-43-9 | 108.600 | | RPD | | | 0.554 | 20.000 | | 07/17/08 |
| SPK-RPD | Cobalt | 7440-48-4 | 105.600 | | RPD | | | 0.665 | 20.000 | | 07/17/08 |
| SPK-RPD | Chromium | 7440-47-3 | 108.500 | | RPD | | | 0.740 | 20.000 | | 07/17/08 |
| SPK-RPD | Copper | 7440-50-8 | 100.900 | | RPD | | | 0.888 | 20.000 | | 07/17/08 |
| SPK-RPD | Iron | 7439-89-6 | 106.100 | | RPD | | | 0.189 | 20.000 | | 07/17/08 |
| SPK-RPD | Potassium | 7440-09-7 | 87.080 | | RPD | | | 2.607 | 20.000 | | 07/17/08 |
| SPK-RPD | Lithium | 7439-93-2 | 100.860 | | RPD | | | 2.293 | 20.000 | | 07/17/08 |
| SPK-RPD | Magnesium | 7439-95-4 | 117.000 | | RPD | | | 0.851 | 20.000 | | 07/17/08 |
| SPK-RPD | Manganese | 7439-96-5 | 109.530 | | RPD | | | 0.549 | 20.000 | | 07/17/08 |
| SPK-RPD | Sodium | 7440-23-5 | 97.000 | | RPD | | | 14.354 | 20.000 | | 07/17/08 |
| SPK-RPD | Nickel | 7440-02-0 | 107.700 | | RPD | | | 0.559 | 20.000 | | 07/17/08 |
| SPK-RPD | Antimony | 7440-36-0 | 106.100 | | RPD | | | 0.947 | 20.000 | | 07/17/08 |
| SPK-RPD | Strontium | 7440-24-6 | 108.900 | | RPD | | | 0.385 | 20.000 | | 07/17/08 |
| SPK-RPD | Vanadium | 7440-62-2 | 105.590 | | RPD | | | 0.095 | 20.000 | | 07/17/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPK-RPD | Zinc | 7440-66-6 | 114.900 | | RPD | | | 0.611 | 20.000 | | 07/17/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | Silver | 7440-22-4 | <5 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Barium | 7440-39-3 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Beryllium | 7440-41-7 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Calcium | 7440-70-2 | <73 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Cadmium | 7440-43-9 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Cobalt | 7440-48-4 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Chromium | 7440-47-3 | <13 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Copper | 7440-50-8 | <6 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Iron | 7439-89-6 | <25 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Potassium | 7440-09-7 | <170 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Lithium | 7439-93-2 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Magnesium | 7439-95-4 | <50 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Manganese | 7439-96-5 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Sodium | 7440-23-5 | <51 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Nickel | 7440-02-0 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Antimony | 7440-36-0 | <56 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Strontium | 7440-24-6 | <4 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Vanadium | 7440-62-2 | <12 | n/a | ug/L | | | | | U | 07/17/08 |
| BLANK | Zinc | 7440-66-6 | <9 | n/a | ug/L | | | | | U | 07/17/08 |
| LCS | Silver | 7440-22-4 | 1034 | 103.400 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Barium | 7440-39-3 | 523.3 | 104.660 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Beryllium | 7440-41-7 | 554.4 | 110.880 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Calcium | 7440-70-2 | 1095 | 109.500 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Cadmium | 7440-43-9 | 1075 | 107.500 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Cobalt | 7440-48-4 | 1055 | 105.500 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Chromium | 7440-47-3 | 1070 | 107.000 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Copper | 7440-50-8 | 1018 | 101.800 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: ICP Metals Analysis, Grd H20 P

Sample Date:
Receive Date:

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LCS | Iron | 7439-89-6 | 1052 | 105.200 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Potassium | 7440-09-7 | 9398 | 93.980 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Lithium | 7439-93-2 | 534.4 | 106.880 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Magnesium | 7439-95-4 | 1049 | 104.900 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Manganese | 7439-96-5 | 1079 | 107.900 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Sodium | 7440-23-5 | 1072 | 107.200 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Nickel | 7440-02-0 | 1083 | 108.300 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Antimony | 7440-36-0 | 1061 | 106.100 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Strontium | 7440-24-6 | 544.4 | 108.880 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Vanadium | 7440-62-2 | 1052 | 105.200 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |
| LCS | Zinc | 7440-66-6 | 1143 | 114.300 | % Recov | 80.000 | 120.000 | | | | 07/17/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: ICP-200.8 MS All possible meta

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID: W08P002695** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| MS | Arsenic | 7440-38-2 | 34.98 | 87.450 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MS | Mercury | 7439-97-6 | 2.06 | 103.000 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MS | Lead | 7439-92-1 | 37.71 | 94.275 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MS | Uranium | 7440-61-1 | 38.48 | 96.200 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Arsenic | 7440-38-2 | 35.04 | 87.600 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Mercury | 7439-97-6 | 2.11 | 105.500 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Lead | 7439-92-1 | 37.42 | 93.550 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Uranium | 7440-61-1 | 38.56 | 96.400 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| SPK-RPD | Arsenic | 7440-38-2 | 87.600 | | RPD | | | 0.171 | 20.000 | | 06/25/08 |
| SPK-RPD | Mercury | 7439-97-6 | 105.500 | | RPD | | | 2.398 | 20.000 | | 06/25/08 |
| SPK-RPD | Lead | 7439-92-1 | 93.550 | | RPD | | | 0.772 | 20.000 | | 06/25/08 |
| SPK-RPD | Uranium | 7440-61-1 | 96.400 | | RPD | | | 0.208 | 20.000 | | 06/25/08 |
| **Lab ID: W08P002697** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| MS | Arsenic | 7440-38-2 | 35.66 | 89.150 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MS | Mercury | 7439-97-6 | 2.26 | 113.000 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MS | Lead | 7439-92-1 | 39.59 | 98.975 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MS | Uranium | 7440-61-1 | 44.87 | 112.175 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Arsenic | 7440-38-2 | 34.53 | 86.325 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Mercury | 7439-97-6 | 2.17 | 108.500 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Lead | 7439-92-1 | 37.22 | 93.050 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| MSD | Uranium | 7440-61-1 | 40.54 | 101.350 | % Recov | 70.000 | 130.000 | | | | 06/24/08 |
| SPK-RPD | Arsenic | 7440-38-2 | 86.325 | | RPD | | | 3.220 | 20.000 | | 06/25/08 |
| SPK-RPD | Mercury | 7439-97-6 | 108.500 | | RPD | | | 4.063 | 20.000 | | 06/25/08 |
| SPK-RPD | Lead | 7439-92-1 | 93.050 | | RPD | | | 6.171 | 20.000 | | 06/25/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** **Inorganic**

SDG Number: WSCF20081136
Matrix: WATER
Test: ICP-200.8 MS All possible meta

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPK-RPD | Uranium | 7440-61-1 | 101.350 | | RPD | | | 10.139 | 20.000 | | 06/25/08 |

## BATCH QC

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BLANK | Arsenic | 7440-38-2 | <0.4 | n/a | ug/L | | | | | U | 06/24/08 |
| BLANK | Mercury | 7439-97-6 | <5e-2 | n/a | ug/L | | | | | U | 06/24/08 |
| BLANK | Lead | 7439-92-1 | <0.1 | n/a | ug/L | | | | | U | 06/24/08 |
| BLANK | Uranium | 7440-61-1 | <5e-2 | n/a | ug/L | | | | | U | 06/24/08 |
| LCS | Arsenic | 7440-38-2 | 34.39 | 85.975 | % Recov | 85.000 | 115.000 | | | | 06/24/08 |
| LCS | Mercury | 7439-97-6 | 2.05 | 102.500 | % Recov | 85.000 | 115.000 | | | | 06/24/08 |
| LCS | Lead | 7439-92-1 | 38.26 | 95.650 | % Recov | 85.000 | 115.000 | | | | 06/24/08 |
| LCS | Uranium | 7440-61-1 | 39.18 | 97.950 | % Recov | 85.000 | 115.000 | | | | 06/24/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Inorganic

SDG Number: WSCF20081136
Matrix: WATER
Test: Total Organic Carbon

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID: W08P002695** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| MS | Total Organic Carbon | TOC | 3.992 | 99.800 | % Recov | 75.000 | 125.000 | | | | 07/09/08 |
| MSD | Total Organic Carbon | TOC | 3.875 | 96.875 | % Recov | 75.000 | 125.000 | | | | 07/09/08 |
| SPK-RPD | Total Organic Carbon | TOC | 96.875 | | RPD | | | 2.974 | 20.000 | | 07/09/08 |
| **Lab ID: W08P002879** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| MS | Total Organic Carbon | TOC | 4.089 | 102.225 | % Recov | 75.000 | 125.000 | | | | 07/09/08 |
| MSD | Total Organic Carbon | TOC | 3.981 | 99.525 | % Recov | 75.000 | 125.000 | | | | 07/09/08 |
| SPK-RPD | Total Organic Carbon | TOC | 99.525 | | RPD | | | 2.677 | 20.000 | | 07/09/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | Total Organic Carbon | TOC | < 0.045 | n/a | mg/L | 0.000 | 300.000 | | | U | 07/09/08 |
| METHSPIKE | Total Organic Carbon | TOC | 1.973 | 98.650 | % Recov | 80.000 | 120.000 | | | | 07/09/08 |
| SPK-RSD | Total Organic Carbon | TOC | 1.335 | 1.335 | % RSD | 0.000 | 20.000 | | | | 07/09/08 |

# WSCF
# ANALYTICAL COMMENT REPORT

**Attention:** Steve Trent E6-35

**Group #:** WSCF20081136
**Department:** Inorganic

| Sample # | Client ID | Lab Area | Test | Comment |
|---|---|---|---|---|
| | | VALGROUP | | IC Anion - Sample W08P002702: Unknown peak possibly interfering with chloride result. DTS<br><br>ICP-AES: No zirconium present in the LCS.<br>Sodium, magnesium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid.<br>Check standard is used to ensure calcium, sodium, and magnesium linearity because sample results are greater than the calibration standard. |

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 RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** S08-001
**Sample #** W08P002702
**Client ID:** B1RTN8 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Organic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOA Ground Water Protection** | | | | | | | | | | | |
| 1,1-Dichloroethene | 75-35-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Trichloroethene | 79-01-6 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Benzene | 71-43-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Toluene | 108-88-3 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Chlorobenzene | 108-90-7 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,1-Dichloroethane | 75-34-3 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Ethylbenzene | 100-41-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,2-Dichloroethane | 107-06-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 4-Methyl-2-Pentanone | 108-10-1 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Tetrachloroethene | 127-18-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Xylenes (total) | 1330-20-7 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Carbon tetrachloride | 56-23-5 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Acetone | 67-64-1 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Chloroform | 67-66-3 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,1,1-Trichloroethane | 71-55-6 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Vinyl chloride | 75-01-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Methylenechloride | 75-09-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Carbon disulfide | 75-15-0 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 2-Butanone | 78-93-3 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,1,2-Trichloroethane | 79-00-5 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1-Butanol | 71-36-3 | LA-523-455 | U | < 100 | ug/L | | | 1.00 | 1.0e+02 | | 06/13/08 |
| Tetrahydrofuren | 109-99-9 | LA-523-455 | U | < 2.00 | ug/L | | | 1.00 | 2.0 | | 06/13/08 |
| trans-1,2-Dichloroethylene | 156-60-5 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| cis-1,2-Dichloroethylene | 156-59-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** S08-001
**Sample #** W08P002702
**Client ID:** B1RTN8 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Organic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethyl cyanide | 107-12-0 | LA-523-455 | U | < 2.00 | ug/L | | | 1.00 | 2.0 | | 06/13/08 |
| 1,4-Dichlorobenzene | 106-46-7 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |

**MDL=Minimum Detection Limit**
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*Report WGPP/ver. 5.2*
*GPAP*

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002704
**Client ID:** B1V9V2 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Organic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alcohols, Glycols - 8015 Prep** | | | | | | | | | | | **06/18/08** |
| **Alcohols, Glycols - 8015** | | | | | | | | | | | |
| Ethyl acetate | 141-78-6 | Organics | U | < 5.00e+03 | ug/L | | | 1.00 | 5.0e+03 | | 06/19/08 |
| **NWTPH-D TPH Diesel Range (Wa) Prep** | | | | | | | | | | | **06/06/08** |
| **NWTPH-D TPH Diesel Range (Wa)** | | | | | | | | | | | |
| Total Pet. Hydrocarbons Diesel | TPHDIESEL | LA-523-493 | U | < 71.0 | ug/L | | | 1.00 | 71 | | 06/09/08 |
| Kerosene | TPHKEROSENE | LA-523-493 | U | < 71.0 | ug/L | | | 1.00 | 71 | | 06/09/08 |
| **NWTPH-GX TPH Gasoline Range Prep** | | | | | | | | | | | **06/05/08** |
| **NWTPH-GX TPH Gasoline Range** | | | | | | | | | | | |
| Total Pet. Hydrocarbons Gas | TPHGASOLINE | LA-523-443 | U | < 50.0 | ug/L | | | 1.00 | 50 | | 06/05/08 |
| **SW-846 8270C Semi-Vols Prep** | | | | | | | | | | | **06/10/08** |
| **SW-846 8270C Semi-Vols** | | | | | | | | | | | |
| 4-Nitrophenol | 100-02-7 | LA-523-456 | U | < 0.950 | ug/L | | | 1.00 | 0.95 | | 06/12/08 |
| 1,4-Dichlorobenzene | 106-46-7 | LA-523-456 | U | < 1.30 | ug/L | | | 1.00 | 1.3 | | 06/12/08 |
| Phenol | 108-95-2 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| 1,2,4-Trichlorobenzene | 120-82-1 | LA-523-456 | U | < 2.10 | ug/L | | | 1.00 | 2.1 | | 06/12/08 |
| 2,4-Dinitrotoluene | 121-14-2 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| Pyrene | 129-00-0 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| 4-Chloro-3-methylphenol | 59-50-7 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| N-Nitrosodi-n-dipropylamine | 621-64-7 | LA-523-456 | U | < 0.570 | ug/L | | | 1.00 | 0.57 | | 06/12/08 |
| Acenaphthene | 83-32-9 | LA-523-456 | U | < 2.50 | ug/L | | | 1.00 | 2.5 | | 06/12/08 |
| Pentachlorophenol | 87-86-5 | LA-523-456 | U | < 1.40 | ug/L | | | 1.00 | 1.4 | | 06/12/08 |
| 2-Chlorophenol | 95-57-8 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| Bis(2-ethylhexyl) phthalate | 117-81-7 | LA-523-456 | U | < 0.760 | ug/L | | | 1.00 | 0.76 | | 06/12/08 |
| 2,4-Dichlorophenol | 120-83-2 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |

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# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002704
**Client ID:** B1V9V2 GPP-PNNL TRENT WSCF
**Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Organic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Nitrophenol | 88-75-5 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| Naphthalene | 91-20-3 | LA-523-456 | U | < 2.00 | ug/L | | | 1.00 | 2.0 | | 06/12/08 |
| 2-Methylphenol (cresol, o-) | 95-48-7 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| 3 & 4 Methylphenol Total | 65794-96-9 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| Tributyl phosphate | 126-73-8 | LA-523-456 | U | < 0.480 | ug/L | | | 1.00 | 0.48 | | 06/12/08 |
| Benzothiazole | 95-16-9 | LA-523-456 | U | < 0.570 | ug/L | | | 1.00 | 0.57 | | 06/12/08 |
| 2-Picoline | 109-06-8 | LA-523-456 | U | < 4.80 | ug/L | | | 1.00 | 4.8 | | 06/12/08 |
| Total cresols | 1319-77-3 | LA-523-456 | U | < 0.950 | ug/L | | | 1.00 | 0.95 | | 06/12/08 |
| Tris-2-chloroethyl phosphate | 115-96-8 | LA-523-456 | U | < 0.620 | ug/L | | | 1.00 | 0.62 | | 06/12/08 |
| **VOA Ground Water Protection** | | | | | | | | | | | |
| 1,1-Dichloroethene | 75-35-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Trichloroethene | 79-01-6 | LA-523-455 | J | 1.90 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Benzene | 71-43-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Toluene | 108-88-3 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Chlorobenzene | 108-90-7 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,1-Dichloroethane | 75-34-3 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Ethylbenzene | 100-41-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,2-Dichloroethane | 107-06-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 4-Methyl-2-Pentanone | 108-10-1 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Tetrachloroethene | 127-18-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Xylenes (total) | 1330-20-7 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Carbon tetrachloride | 56-23-5 | LA-523-455 | E | 260 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Acetone | 67-64-1 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Chloroform | 67-66-3 | LA-523-455 | J | 3.20 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,1,1-Trichloroethane | 71-55-6 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |

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

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# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002704
**Client ID:** B1V9V2 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Organic
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vinyl chloride | 75-01-4 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Methylenechloride | 75-09-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Carbon disulfide | 75-15-0 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 2-Butanone | 78-93-3 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1,1,2-Trichloroethane | 79-00-5 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| 1-Butanol | 71-36-3 | LA-523-455 | U | < 100 | ug/L | | | 1.00 | 1.0e+02 | | 06/13/08 |
| Tetrahydrofuran | 109-99-9 | LA-523-455 | U | < 2.00 | ug/L | | | 1.00 | 2.0 | | 06/13/08 |
| trans-1,2-Dichloroethylene | 156-60-5 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| cis-1,2-Dichloroethylene | 156-59-2 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |
| Ethyl cyanide | 107-12-0 | LA-523-455 | U | < 2.00 | ug/L | | | 1.00 | 2.0 | | 06/13/08 |
| 1,4-Dichlorobenzene | 106-46-7 | LA-523-455 | U | < 1.00 | ug/L | | | 1.00 | 1.0 | | 06/13/08 |

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

B - The analyte < the RDL but >= the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but >= MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: Alcohols, Glycols - 8015

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID: W08P002695** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| DUP | 2-Bromoethanol | 540-51-2 | 17100 | | RPD | | | 2.882 | 25.000 | | 06/19/08 |
| DUP | Ethyl acetate | 141-78-6 | <5000 | | RPD | | | n/a | 25.000 | U | 06/19/08 |
| **Lab ID: W08P002743** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| MS | 2-Bromoethanol | 540-51-2 | 14900 | 84.659 | % Recov | 70.000 | 125.000 | | | | 06/19/08 |
| MS | Ethyl acetate | 141-78-6 | 7700 | 85.556 | % Recov | 75.000 | 125.000 | | | | 06/19/08 |
| MSD | 2-Bromoethanol | 540-51-2 | 13700 | 77.841 | % Recov | 70.000 | 125.000 | | | | 06/19/08 |
| MSD | Ethyl acetate | 141-78-6 | 7500 | 83.333 | % Recov | 75.000 | 125.000 | | | | 06/19/08 |
| SPK-RPD | 2-Bromoethanol | 540-51-2 | 77.841 | | RPD | | | 8.391 | 20.000 | | 06/19/08 |
| SPK-RPD | Ethyl acetate | 141-78-6 | 83.333 | | RPD | | | 2.632 | 20.000 | | 06/19/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | 2-Bromoethanol | 540-51-2 | 17200 | 97.727 | % Recov | 75.000 | 125.000 | | | | 06/19/08 |
| BLANK | Ethyl acetate | 141-78-6 | <5000 | n/a | ug/L | 0.000 | 5.000 | | | U | 06/19/08 |
| LCS | 2-Bromoethanol | 540-51-2 | 16300 | 92.614 | % Recov | 70.000 | 130.000 | | | | 06/19/08 |
| LCS | Ethyl acetate | 141-78-6 | 7700 | 85.556 | % Recov | 70.000 | 130.000 | | | | 06/19/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: SW-846 8270C Semi-Vols

Sample Date: 06/04/08
Receive Date:06/04/08

Lab ID: W08P002697
BATCH QC ASSOCIATED WITH SAMPLE

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MS | 1,2,4-Trichlorobenzene | 120-82-1 | 16.462 | 86.400 | % Recov | 50.000 | 120.000 | | | | 06/11/08 |
| MS | 1,4-Dichlorobenzene | 106-46-7 | 15.983 | 83.900 | % Recov | 41.000 | 113.000 | | | | 06/11/08 |
| MS | 2,4-Dinitrotoluene | 121-14-2 | 17.574 | 92.300 | % Recov | 65.000 | 109.000 | | | | 06/11/08 |
| MS | 2-Fluorophenol(Surr) | 367-12-4 | 13.114 | 68.800 | % Recov | 50.000 | 110.000 | | | | 06/11/08 |
| MS | Acenaphthene | 83-32-9 | 17.422 | 91.500 | % Recov | 62.000 | 112.000 | | | | 06/11/08 |
| MS | 4-Chloro-3-methylphenol | 59-50-7 | 26.236 | 91.800 | % Recov | 59.000 | 115.000 | | | | 06/11/08 |
| MS | 2-Chlorophenol | 95-57-8 | 24.312 | 85.100 | % Recov | 69.000 | 111.000 | | | | 06/11/08 |
| MS | N-Nitrosodi-n-dipropylamine | 621-64-7 | 16.999 | 89.200 | % Recov | 69.000 | 115.000 | | | | 06/11/08 |
| MS | 2-Fluorobiphenyl(Surr) | 321-60-8 | 18.032 | 94.700 | % Recov | 58.000 | 109.000 | | | | 06/11/08 |
| MS | Phenol | 108-95-2 | 24.358 | 85.300 | % Recov | 59.000 | 115.000 | | | | 06/11/08 |
| MS | Nitrobenzene-d5(Surr) | 4165-60-0 | 18.408 | 96.600 | % Recov | 60.000 | 118.000 | | | | 06/11/08 |
| MS | 4-Nitrophenol | 100-02-7 | 25.576 | 89.500 | % Recov | 32.000 | 130.000 | | | | 06/11/08 |
| MS | Pentachlorophenol | 87-86-5 | 26.196 | 91.700 | % Recov | 51.000 | 121.000 | | | | 06/11/08 |
| MS | Phenol-d5(Surr) | 4165-62-2 | 16.768 | 88.000 | % Recov | 59.000 | 116.000 | | | | 06/11/08 |
| MS | Pyrene | 129-00-0 | 16.855 | 88.500 | % Recov | 58.000 | 116.000 | | | | 06/11/08 |
| MS | 2,4,6-Tribromophenol(Surr) | 118-79-6 | 18.002 | 94.500 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |
| MS | Terphenyl-d14(Surr) | 98904-43-9 | 19.314 | 101.000 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |
| MSD | 1,2,4-Trichlorobenzene | 120-82-1 | 17.486 | 91.800 | % Recov | 50.000 | 120.000 | | | | 06/11/08 |
| MSD | 1,4-Dichlorobenzene | 106-46-7 | 17.328 | 91.000 | % Recov | 41.000 | 113.000 | | | | 06/11/08 |
| MSD | 2,4-Dinitrotoluene | 121-14-2 | 17.585 | 92.300 | % Recov | 65.000 | 109.000 | | | | 06/11/08 |
| MSD | 2-Fluorophenol(Surr) | 367-12-4 | 13.313 | 69.900 | % Recov | 50.000 | 110.000 | | | | 06/11/08 |
| MSD | Acenaphthene | 83-32-9 | 18.181 | 95.500 | % Recov | 62.000 | 112.000 | | | | 06/11/08 |
| MSD | 4-Chloro-3-methylphenol | 59-50-7 | 26.667 | 93.300 | % Recov | 59.000 | 115.000 | | | | 06/11/08 |
| MSD | 2-Chlorophenol | 95-57-8 | 24.487 | 85.700 | % Recov | 69.000 | 111.000 | | | | 06/11/08 |
| MSD | N-Nitrosodi-n-dipropylamine | 621-64-7 | 17.654 | 92.700 | % Recov | 69.000 | 115.000 | | | | 06/11/08 |
| MSD | 2-Fluorobiphenyl(Surr) | 321-60-8 | 18.070 | 94.900 | % Recov | 58.000 | 109.000 | | | | 06/11/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: SW-846 8270C Semi-Vols

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MSD | Phenol | 108-95-2 | 25.250 | 88.400 | % Recov | 59.000 | 115.000 | | | | 06/11/08 |
| MSD | Nitrobenzene-d5(Surr) | 4165-60-0 | 18.050 | 94.800 | % Recov | 60.000 | 118.000 | | | | 06/11/08 |
| MSD | 4-Nitrophenol | 100-02-7 | 27.508 | 96.300 | % Recov | 32.000 | 130.000 | | | | 06/11/08 |
| MSD | Pentachlorophenol | 87-86-5 | 23.230 | 81.300 | % Recov | 51.000 | 121.000 | | | | 06/11/08 |
| MSD | Phenol-d5(Surr) | 4165-62-2 | 17.395 | 91.300 | % Recov | 59.000 | 116.000 | | | | 06/11/08 |
| MSD | Pyrene | 129-00-0 | 16.745 | 87.900 | % Recov | 58.000 | 116.000 | | | | 06/11/08 |
| MSD | 2,4,6-Tribromophenol(Surr) | 118-79-6 | 18.104 | 95.000 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |
| MSD | Terphenyl-d14(Surr) | 98904-43-9 | 18.950 | 99.500 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |
| SPK-RPD | 1,2,4-Trichlorobenzene | 120-82-1 | 91.800 | | RPD | | | 6.061 | 25.000 | | 06/11/08 |
| SPK-RPD | 1,4-Dichlorobenzene | 106-46-7 | 91.000 | | RPD | | | 8.119 | 25.000 | | 06/11/08 |
| SPK-RPD | 2,4-Dinitrotoluene | 121-14-2 | 92.300 | | RPD | | | 0.000 | 25.000 | | 06/11/08 |
| SPK-RPD | 2-Fluorophenol(Surr) | 367-12-4 | 69.900 | | RPD | | | 1.586 | 25.000 | | 06/11/08 |
| SPK-RPD | Acenaphthene | 83-32-9 | 95.500 | | RPD | | | 4.278 | 25.000 | | 06/11/08 |
| SPK-RPD | 4-Chloro-3-methylphenol | 59-50-7 | 93.300 | | RPD | | | 1.621 | 25.000 | | 06/11/08 |
| SPK-RPD | 2-Chlorophenol | 95-57-8 | 85.700 | | RPD | | | 0.703 | 25.000 | | 06/11/08 |
| SPK-RPD | N-Nitrosodi-n-dipropylamine | 621-64-7 | 92.700 | | RPD | | | 3.848 | 25.000 | | 06/11/08 |
| SPK-RPD | 2-Fluorobiphenyl(Surr) | 321-60-8 | 94.900 | | RPD | | | 0.211 | 25.000 | | 06/11/08 |
| SPK-RPD | Phenol | 108-95-2 | 88.400 | | RPD | | | 3.569 | 16.000 | | 06/11/08 |
| SPK-RPD | Nitrobenzene-d5(Surr) | 4165-60-0 | 94.800 | | RPD | | | 1.881 | 25.000 | | 06/11/08 |
| SPK-RPD | 4-Nitrophenol | 100-02-7 | 96.300 | | RPD | | | 7.320 | 25.000 | | 06/11/08 |
| SPK-RPD | Pentachlorophenol | 87-86-5 | 81.300 | | RPD | | | 12.023 | 25.000 | | 06/11/08 |
| SPK-RPD | Phenol-d5(Surr) | 4165-62-2 | 91.300 | | RPD | | | 3.681 | 25.000 | | 06/11/08 |
| SPK-RPD | Pyrene | 129-00-0 | 87.900 | | RPD | | | 0.680 | 25.000 | | 06/11/08 |
| SPK-RPD | 2,4,6-Tribromophenol(Surr) | 118-79-6 | 95.000 | | RPD | | | 0.528 | 25.000 | | 06/11/08 |
| SPK-RPD | Terphenyl-d14(Surr) | 98904-43-9 | 99.500 | | RPD | | | 1.496 | 25.000 | | 06/11/08 |

Lab ID: W08P002704
BATCH QC ASSOCIATED WITH SAMPLE

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SURR | 2-Fluorophenol(Surr) | 367-12-4 | 10.883 | 57.100 | % Recov | 50.000 | 110.000 | | | | 06/12/08 |
| SURR | 2-Fluorobiphenyl(Surr) | 321-60-8 | 16.479 | 86.500 | % Recov | 58.000 | 109.000 | | | | 06/12/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: SW-846 8270C Semi-Vols

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SURR | Nitrobenzene-d5(Surr) | 4165-60-0 | 16.637 | 87.300 | % Recov | 60.000 | 118.000 | | | | 06/12/08 |
| SURR | Phenol-d5(Surr) | 4165-62-2 | 14.494 | 76.100 | % Recov | 59.000 | 116.000 | | | | 06/12/08 |
| SURR | 2,4,6-Tribromophenol(Surr) | 118-79-6 | 14.987 | 78.700 | % Recov | 60.000 | 120.000 | | | | 06/12/08 |
| SURR | Terphenyl-d14(Surr) | 98904-43-9 | 19.243 | 101.000 | % Recov | 60.000 | 120.000 | | | | 06/12/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | 1,2,4-Trichlorobenzene | 120-82-1 | < 2.2 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 1,4-Dichlorobenzene | 106-46-7 | < 1.4 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2,4-Dichlorophenol | 120-83-2 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2,4-Dinitrotoluene | 121-14-2 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2-Fluorophenol(Surr) | 367-12-4 | 12.091 | 60.500 | % Recov | 50.000 | 110.000 | | | | 06/11/08 |
| BLANK | 2-Methylphenol (cresol, o-) | 95-48-7 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2-Nitrophenol | 88-75-5 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2-Picoline | 109-06-8 | < 5.0 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 3 & 4 Methylphenol Total | 65794-96-9 | < 0.50 | n/a | ug/L | 0.000 | 5.000 | | | U | 06/11/08 |
| BLANK | Acenaphthene | 83-32-9 | < 2.6 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | Bis(2-ethylhexyl) phthalate | 117-81-7 | < 0.80 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | Benzothiazole | 95-16-9 | < 0.60 | n/a | ug/L | 0.000 | 300.000 | | | U | 06/11/08 |
| BLANK | 4-Chloro-3-methylphenol | 59-50-7 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2-Chlorophenol | 95-57-8 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | N-Nitrosodi-n-dipropylamine | 621-64-7 | < 0.60 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2-Fluorobiphenyl(Surr) | 321-60-8 | 17.694 | 88.500 | % Recov | 58.000 | 109.000 | | | | 06/11/08 |
| BLANK | Phenol | 108-95-2 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | Naphthalene | 91-20-3 | < 2.1 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | Nitrobenzene-d5(Surr) | 4165-60-0 | 17.227 | 86.100 | % Recov | 60.000 | 118.000 | | | | 06/11/08 |
| BLANK | 4-Nitrophenol | 100-02-7 | < 1.0 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | Pentachlorophenol | 87-86-5 | < 1.5 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | Phenol-d5(Surr) | 4165-62-2 | 16.283 | 81.400 | % Recov | 59.000 | 116.000 | | | | 06/11/08 |
| BLANK | Pyrene | 129-00-0 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | Tris-2-chloroethyl phosphate | 115-96-8 | < 0.65 | n/a | ug/L | 0.000 | 300.000 | | | U | 06/11/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: SW-846 8270C Semi-Vols

Sample Date:
Receive Date:

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BLANK | Tributyl phosphate | 126-73-8 | < 0.50 | n/a | ug/L | | | | | U | 06/11/08 |
| BLANK | 2,4,6-Tribromophenol(Surr) | 118-79-6 | 16.311 | 81.600 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |
| BLANK | Terphenyl-d14(Surr) | 98904-43-9 | 19.844 | 99.200 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |
| LCS | 1,2,4-Trichlorobenzene | 120-82-1 | 16.582 | 82.900 | % Recov | 46.000 | 107.000 | | | | 06/11/08 |
| LCS | 1,4-Dichlorobenzene | 106-46-7 | 16.813 | 84.100 | % Recov | 42.000 | 111.000 | | | | 06/11/08 |
| LCS | 2,4-Dinitrotoluene | 121-14-2 | 17.310 | 86.600 | % Recov | 59.000 | 106.000 | | | | 06/11/08 |
| LCS | 2-Fluorophenol(Surr) | 367-12-4 | 13.169 | 65.800 | % Recov | 50.000 | 110.000 | | | | 06/11/08 |
| LCS | Acenaphthene | 83-32-9 | 17.401 | 87.000 | % Recov | 61.000 | 116.000 | | | | 06/11/08 |
| LCS | 4-Chloro-3-methylphenol | 59-50-7 | 24.808 | 82.700 | % Recov | 61.000 | 106.000 | | | | 06/11/08 |
| LCS | 2-Chlorophenol | 95-57-8 | 25.354 | 84.500 | % Recov | 66.000 | 106.000 | | | | 06/11/08 |
| LCS | N-Nitrosodi-n-dipropylamine | 621-64-7 | 18.164 | 90.800 | % Recov | 71.000 | 114.000 | | | | 06/11/08 |
| LCS | 2-Fluorobiphenyl(Surr) | 321-60-8 | 18.629 | 93.100 | % Recov | 58.000 | 109.000 | | | | 06/11/08 |
| LCS | Phenol | 108-95-2 | 24.996 | 83.300 | % Recov | 67.000 | 105.000 | | | | 06/11/08 |
| LCS | Nitrobenzene-d5(Surr) | 4165-60-0 | 18.564 | 92.800 | % Recov | 60.000 | 118.000 | | | | 06/11/08 |
| LCS | 4-Nitrophenol | 100-02-7 | 27.820 | 92.700 | % Recov | 32.000 | 118.000 | | | | 06/11/08 |
| LCS | Pentachlorophenol | 87-86-5 | 24.640 | 82.100 | % Recov | 62.000 | 114.000 | | | | 06/11/08 |
| LCS | Phenol-d5(Surr) | 4165-62-2 | 16.810 | 84.000 | % Recov | 59.000 | 116.000 | | | | 06/11/08 |
| LCS | Pyrene | 129-00-0 | 17.406 | 87.000 | % Recov | 66.000 | 118.000 | | | | 06/11/08 |
| LCS | 2,4,6-Tribromophenol(Surr) | 118-79-6 | 14.177 | 70.900 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |
| LCS | Terphenyl-d14(Surr) | 98904-43-9 | 20.263 | 101.000 | % Recov | 60.000 | 120.000 | | | | 06/11/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: NWTPH-D TPH Diesel Range (Wa)

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID: W08P002695** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| MS | ortho-Terphenyl Surr | 84-15-1 | 467.65 | 98.200 | % Recov | 70.000 | 130.000 | | | | 06/09/08 |
| MS | Total Pet. Hydrocarbons Diesel | TPHDIESEL | 2356.8 | 99.000 | % Recov | 75.000 | 125.000 | | | | 06/09/08 |
| MSD | ortho-Terphenyl Surr | 84-15-1 | 480.66 | 101.000 | % Recov | 70.000 | 130.000 | | | | 06/09/08 |
| MSD | Total Pet. Hydrocarbons Diesel | TPHDIESEL | 2443.5 | 103.000 | % Recov | 75.000 | 125.000 | | | | 06/09/08 |
| SPK-RPD | ortho-Terphenyl Surr | 84-15-1 | 101.000 | | RPD | | | 2.811 | 20.000 | | 06/09/08 |
| SPK-RPD | Total Pet. Hydrocarbons Diesel | TPHDIESEL | 103.000 | | RPD | | | 3.960 | 20.000 | | 06/09/08 |
| **Lab ID: W08P002704** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| SURR | ortho-Terphenyl Surr | 84-15-1 | 509.30 | 107.000 | % Recov | 70.000 | 130.000 | | | | 06/09/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | Kerosene | TPHKEROSENE | < 75 | n/a | ug/L | | | | | U | 06/09/08 |
| BLANK | ortho-Terphenyl Surr | 84-15-1 | 519.33 | 104.000 | % Recov | 70.000 | 130.000 | | | | 06/09/08 |
| BLANK | Total Pet. Hydrocarbons Diesel | TPHDIESEL | < 75 | n/a | ug/L | | | | | U | 06/09/08 |
| LCS | ortho-Terphenyl Surr | 84-15-1 | 492.40 | 98.500 | % Recov | 70.000 | 130.000 | | | | 06/09/08 |
| LCS | Total Pet. Hydrocarbons Diesel | TPHDIESEL | 2520.4 | 101.000 | % Recov | 80.000 | 120.000 | | | | 06/09/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: NWTPH-GX TPH Gasoline Range

Sample Date: 05/27/08
Receive Date:05/27/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID: W08P002592** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| DUP | Total Pet. Hydrocarbons Gas | TPHGASOLINE | <50 | | RPD | | | n/a | 20.000 | U | 06/05/08 |
| MS | Total Pet. Hydrocarbons Gas | TPHGASOLINE | 2600 | 104.000 | % Recov | 75.000 | 125.000 | | | | 06/05/08 |
| MSD | Total Pet. Hydrocarbons Gas | TPHGASOLINE | 2800 | 112.000 | % Recov | 75.000 | 125.000 | | | | 06/05/08 |
| SPK-RPD | Total Pet. Hydrocarbons Gas | TPHGASOLINE | 112.000 | | RPD | | | 7.407 | 20.000 | | 06/05/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | Total Pet. Hydrocarbons Gas | TPHGASOLINE | <50 | n/a | mg/L | 0.000 | 300.000 | | | U | 06/05/08 |
| LCS | Total Pet. Hydrocarbons Gas | TPHGASOLINE | 2500 | 100.000 | %rec | 80.000 | 120.000 | | | | 06/05/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: VOA Ground Water Protection

Sample Date: 06/04/08
Receive Date:06/04/08

Lab ID: W08P002686
BATCH QC ASSOCIATED WITH SAMPLE

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MS | 1,1-Dichloroethene | 75-35-4 | 20.840 | 83.400 | % Recov | 63.000 | 117.000 | | | | 06/12/08 |
| MS | Benzene | 71-43-2 | 21.720 | 86.900 | % Recov | 75.000 | 129.000 | | | | 06/12/08 |
| MS | 4-Bromofluorobenzene(Surr) | 460-00-4 | 56.130 | 112.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| MS | Chlorobenzene | 108-90-7 | 24.120 | 96.500 | % Recov | 79.000 | 119.000 | | | | 06/12/08 |
| MS | 1,2-Dichloroethane-d4(Surr) | 17060-07-0 | 58.950 | 118.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| MS | Toluene-d8(Surr) | 2037-26-5 | 52.180 | 104.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| MS | Toluene | 108-88-3 | 22.850 | 91.400 | % Recov | 76.000 | 120.000 | | | | 06/12/08 |
| MS | Trichloroethene | 79-01-6 | 19.680 | 78.700 | % Recov | 73.000 | 123.000 | | | | 06/12/08 |
| MSD | 1,1-Dichloroethene | 75-35-4 | 21.470 | 85.900 | % Recov | 63.000 | 117.000 | | | | 06/12/08 |
| MSD | Benzene | 71-43-2 | 23.090 | 92.400 | % Recov | 75.000 | 129.000 | | | | 06/12/08 |
| MSD | 4-Bromofluorobenzene(Surr) | 460-00-4 | 55.690 | 111.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| MSD | Chlorobenzene | 108-90-7 | 26.090 | 104.000 | % Recov | 79.000 | 119.000 | | | | 06/12/08 |
| MSD | 1,2-Dichloroethane-d4(Surr) | 17060-07-0 | 57.440 | 115.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| MSD | Toluene-d8(Surr) | 2037-26-5 | 52.140 | 104.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| MSD | Toluene | 108-88-3 | 24.720 | 98.900 | % Recov | 76.000 | 120.000 | | | | 06/12/08 |
| MSD | Trichloroethene | 79-01-6 | 20.340 | 81.400 | % Recov | 73.000 | 123.000 | | | | 06/12/08 |
| SPK-RPD | 1,1-Dichloroethene | 75-35-4 | 85.900 | | RPD | | | 2.953 | 20.000 | | 06/12/08 |
| SPK-RPD | Benzene | 71-43-2 | 92.400 | | RPD | | | 6.135 | 20.000 | | 06/12/08 |
| SPK-RPD | 4-Bromofluorobenzene(Surr) | 460-00-4 | 111.000 | | RPD | | | 0.897 | 20.000 | | 06/12/08 |
| SPK-RPD | Chlorobenzene | 108-90-7 | 104.000 | | RPD | | | 7.481 | 20.000 | | 06/12/08 |
| SPK-RPD | 1,2-Dichloroethane-d4(Surr) | 17060-07-0 | 115.000 | | RPD | | | 2.575 | 20.000 | | 06/12/08 |
| SPK-RPD | Toluene-d8(Surr) | 2037-26-5 | 104.000 | | RPD | | | 0.000 | 20.000 | | 06/12/08 |
| SPK-RPD | Toluene | 108-88-3 | 98.900 | | RPD | | | 7.882 | 20.000 | | 06/12/08 |
| SPK-RPD | Trichloroethene | 79-01-6 | 81.400 | | RPD | | | 3.373 | 20.000 | | 06/12/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: VOA Ground Water Protection

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID: W08P002702** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| SURR | 4-Bromofluorobenzene(Surr) | 460-00-4 | 55.420 | 111.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| SURR | 1,2-Dichloroethane-d4(Surr) | 17060-07-0 | 57.270 | 115.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| SURR | Toluene-d8(Surr) | 2037-26-5 | 52.410 | 105.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| **Lab ID: W08P002704** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| SURR | 4-Bromofluorobenzene(Surr) | 460-00-4 | 55.720 | 111.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| SURR | 1,2-Dichloroethane-d4(Surr) | 17060-07-0 | 56.710 | 113.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| SURR | Toluene-d8(Surr) | 2037-26-5 | 52.510 | 105.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | 1,1-Dichloroethane | 75-34-3 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 1,1,1-Trichloroethane | 71-55-6 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 1,1,2-Trichloroethane | 79-00-5 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 1,1-Dichloroethene | 75-35-4 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 1,2-Dichloroethane | 107-06-2 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 1,4-Dichlorobenzene | 106-46-7 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 1-Butanol | 71-36-3 | < 100 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 4-Methyl-2-Pentanone | 108-10-1 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Acetone | 67-64-1 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Benzene | 71-43-2 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 4-Bromofluorobenzene(Surr) | 460-00-4 | 56.570 | 113.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| BLANK | Carbon disulfide | 75-15-0 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Carbon tetrachloride | 56-23-5 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Chloroform | 67-66-3 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Chlorobenzene | 108-90-7 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | cis-1,2-Dichloroethylene | 156-59-2 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Organic

SDG Number: WSCF20081136
Matrix: WATER
Test: VOA Ground Water Protection

Sample Date:
Receive Date:

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BLANK | 1,2-Dichloroethane-d4(Surr) | 17060-07-0 | 57.960 | 116.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| BLANK | trans-1,2-Dichloroethylene | 156-60-5 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Ethylbenzene | 100-41-4 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Ethyl cyanide | 107-12-0 | < 2.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | 2-Butanone | 78-93-3 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Methylenechloride | 75-09-2 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Tetrachloroethene | 127-18-4 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Xylenes (total) | 1330-20-7 | < 1.0 | n/a | ug/L | 0.000 | 5.000 | | | U | 06/12/08 |
| BLANK | Tetrahydrofuran | 109-99-9 | < 2.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Toluene-d8(Surr) | 2037-26-5 | 51.870 | 104.000 | % Recov | 75.000 | 125.000 | | | | 06/12/08 |
| BLANK | Toluene | 108-88-3 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Trichloroethene | 79-01-6 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| BLANK | Vinyl chloride | 75-01-4 | < 1.0 | n/a | ug/L | | | | | U | 06/12/08 |
| LCS | 1,1-Dichloroethene | 75-35-4 | 23.220 | 92.900 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| LCS | Benzene | 71-43-2 | 23.980 | 95.900 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| LCS | 4-Bromofluorobenzene(Surr) | 460-00-4 | 55.350 | 111.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| LCS | Chlorobenzene | 108-90-7 | 26.140 | 105.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| LCS | 1,2-Dichloroethane-d4(Surr) | 17060-07-0 | 58.120 | 116.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| LCS | Toluene-d8(Surr) | 2037-26-5 | 52.220 | 104.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| LCS | Toluene | 108-88-3 | 25.080 | 100.000 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| LCS | Trichloroethene | 79-01-6 | 20.430 | 81.700 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** S08-001
**Sample #** W08P002702
**Client ID:** B1RTN8 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Radiochemistry
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tritium by Liq Sct column prep** | | | | | | | | | | | |
| Tritium | 10028-17-8 | LA-508-421 | | 1.20e+03 | pCi/L | +-288 | pCi/L | 1.00 | 2.2e+02 | | 06/13/08 |

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

B - The analyte < the RDL but >= the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but >= MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF
# ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35
**SAF Number:** I08-037
**Sample #** W08P002704
**Client ID:** B1V9V2 GPP-PNNL WSCF TRENT **Matrix:** WATER

**Group #:** WSCF20081136
**Department:** Radiochemistry
**Sampled:** 06/04/08
**Received:** 06/04/08

| Test Performed | CAS # | Method | RQ | Result | Unit | TP Err | Unit | DF | MDL | PQL | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Strontium 89/90** | | | | | | | | | | | |
| Strontium-89/90 | SR-RAD | LA-508-415 | U | -2.50 | pCi/L | +-2.50 | pCi/L | 1.00 | 1.0 | | 06/16/08 |
| Sr-85 Tracer by Beta Counting | SR85 | LA-508-415 | | 88.4 | Percent | | | 1.00 | 0.0 | | 06/16/08 |
| **TC99 by Liquid Scin.** | | | | | | | | | | | |
| Tc-99 by Liquid Scin. | 14133-76-7 | LA-508-421 | | 83.0 | pCi/L | +-17.4 | pCi/L | 1.00 | 6.1 | | 06/05/08 |
| **Tritium by Liq Sct column prep** | | | | | | | | | | | |
| Tritium | 10028-17-8 | LA-508-421 | U | 40.0 | pCi/L | +-62.4 | pCi/L | 1.00 | 2.2e+02 | | 06/13/08 |

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

B - The analyte < the RDL but > = the IDL/MDL (inorg)
E - Analyte is an estimate, has potentially larger errors(inorg)
J - Analyte < lowest calibration but > = MDL.(org)
U - Analyzed for but not detected above limiting criteria.(org)

D - Analyte was identified at a secondary dilution factor(inorg)
E - Analyte is an estimate, has potentially larger errors.(org)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Radiochemistry

SDG Number: WSCF20081136
Matrix: WATER
Test: Strontium 89/90

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID: W08P002695** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| DUP | Sr-85 Tracer by Beta Counting | SR85 | 84.2 | 84.200 | % Recov | 30.000 | 105.000 | | | | 06/16/08 |
| DUP | Strontium-89/90 | SR-RAD | U-2.6 | | RPD | | | n/a | 20.000 | | 06/16/08 |
| **Lab ID: W08P002704** | | | | | | | | | | | |
| **BATCH QC ASSOCIATED WITH SAMPLE** | | | | | | | | | | | |
| SURR | Sr-85 Tracer by Beta Counting | SR85 | 88.4 | 88.400 | % Recov | 30.000 | 105.000 | | | | 06/16/08 |
| **BATCH QC** | | | | | | | | | | | |
| BLANK | Sr-85 Tracer by Beta Counting | SR85 | 90.9 | 90.900 | % Recov | 30.000 | 105.000 | | | | 06/16/08 |
| BLANK | Strontium-89/90 | 10098-97-2 | U-1.3 | n/a | pCi/L | -10.000 | 100.000 | | | | 06/16/08 |
| LCS | Sr-85 Tracer by Beta Counting | SR85 | 91.6 | 91.600 | % Recov | 30.000 | 105.000 | | | | 06/16/08 |
| LCS | Strontium-89/90 | 10098-97-2 | 128 | 92.199 | % Recov | 80.000 | 120.000 | | | | 06/16/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** Radiochemistry

SDG Number: WSCF20081136
Matrix: WATER
Test: TC99 by Liquid Scin.

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

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab ID: W08P002653 | | | | | | | | | | | |
| BATCH QC ASSOCIATED WITH SAMPLE | | | | | | | | | | | |
| DUP | Tc-99 by Liquid Scin. | 14133-76-7 | U-6.9 | | RPD | | | n/a | 20.000 | | 06/05/08 |
| MS | Tc-99 by Liquid Scin. | 14133-76-7 | 794.0 | 105.452 | % Recov | 75.000 | 125.000 | | | | 06/05/08 |
| BATCH QC | | | | | | | | | | | |
| BLANK | Tc-99 by Liquid Scin. | 14133-76-7 | U-5.1 | n/a | pCi/L | -10.000 | 10.000 | | | | 06/05/08 |
| LCS | Tc-99 by Liquid Scin. | 14133-76-7 | 202.3 | 107.549 | % Recov | 80.000 | 120.000 | | | | 06/05/08 |

# WSCF ANALYTICAL LABORATORY QC REPORT

**Department:** **Radiochemistry**

SDG Number: WSCF20081136
Matrix: WATER
Test: Tritium by Liq Sct column prep

Sample Date: 06/04/08
Receive Date:06/04/08

| QC Type | Analyte | CAS # | QC Found | QC Yield | Units | Lower Limit | Upper Limit | RPD(%) | RPD Limit | RQ | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab ID: W08P002702 | | | | | | | | | | | |
| BATCH QC ASSOCIATED WITH SAMPLE | | | | | | | | | | | |
| DUP | Tritium | 10028-17-8 | 9.9E+02 | | RPD | | | 19.178 | 20.000 | | 06/13/08 |
| MS | Tritium | 10028-17-8 | 24190 | 93.372 | % Recov | 75.000 | 125.000 | | | | 06/13/08 |
| BATCH QC | | | | | | | | | | | |
| BLANK | Tritium | 10028-17-8 | U-1.4E+02 | n/a | pCi/L | -10.000 | 1000.000 | | | | 06/13/08 |
| LCS | Tritium | 10028-17-8 | 3130.0 | 91.147 | % Recov | 80.000 | 120.000 | | | | 06/13/08 |

M4W41-SLF-08-720

ATTACHMENT 5

**SAMPLE RECEIPT INFORMATION**

Consisting of 5 pages
Including cover page

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

File
7/17/08

ACKNOWLEDGMENT OF SAMPLES RECEIVED

GPAP

Richland, WA 99352
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP
PO#: 122543
Group#: 20081136

The following samples were received from you on 06/04/08. 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 |
|---|---|---|---|---|
| W08P002701 | B1RTN7 | GPP-PNNL<br>@GPP6010 | TRENT Water | 06/04/0 |
| W08P002702 | B1RTN8 | GPP-PNNL<br>@GPP6010 @H3-33 @IC-30 @VOA-GPP | TRENT Water | 06/04/0 |
| W08P002703 | B1V9V1 | GPP-PNNL<br>@2008 @GPP6010 | TRENT Water | 06/04/0 |
| W08P002704 | B1V9V2 | GPP-PNNL<br>@2008 @8015GPP @GPP6010 @H3-33 @IC-30<br>@SR89_90 @SVOCGPP @TC99-30 @TPHD-WA @TPHG-WA @VOA-<br>CN-02 NH4-IC TOC-30 | TRENT Water | 06/04/0 |

Test Acronym Description

| Test Acronym | Description |
|---|---|
| @2008 | ICP-200.8 MS All possible meta |
| @8015GPP | Alcohols, Glycols - 8015 |
| @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 |
| @SVOCGPP | SW-846 8270C Semi-Vols |
| @TC99-30 | TC99 by Liquid Scin. |
| @TPHD-WA | NWTPH-D TPH Diesel Range (Wa) |
| @TPHG-WA | NWTPH-GX TPH Gasoline Range |
| @VOA-GPP | VOA Ground Water Protection |
| CN-02 | Cyanide by Midi/Spectrophotom |
| NH4-IC | Ammonia (N) by IC |
| TOC-30 | Total Organic Carbon |

FLUOR HANFORD

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

S08-001-164



| | | |
|---|---|---|
| Collector: D. Woehle | Contact/Requester: Steve Trent | Telephone No.: 509-373-5869 MSIN FAX |
| SAF No.: S08-001 | Sampling Origin: Hanford Site | Purchase Order/Charge Code |
| Project Title: SURV JANUARY 2008 | HNF-N-506.12 | Ice Chest No.: 026 Temp. |
| Shipped To (Lab): Waste Sampling & Characterization | Method of Shipment: Govt. Vehicle | Bill of Lading/Air Bill No. |
| Protocol: SURV 20081136 | Priority: 45 Days | Offsite Property No. |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐
Site-Wide Generator Knowledge Information Form applies.

| Sample No. | Lab ID | * | Date | Time | No/Type Container | Sample Analysis | Preservative |
|---|---|---|---|---|---|---|---|
| B1RTN7 (F) | W0P102701 | W | 6-4-08 | 1117 | 1x500-mL G/P | 6010_METALS_ICP: List-3 (18) | HNO3 to pH <2 |
| B1RTN8 | 2702 | W | | | 1x250-mL G | TRITIUM_EIE_LSC: Tritium (1) | None |
| B1RTN8 | | W | | | 4x40-mL aGs* | 8260_VOA_GCMS: List-2 (25) | HCl or H2SO4 to pH <2 Cool~4C |
| B1RTN8 | | W | | | 1x500-mL G/P | 6010_METALS_ICP: List-3 (18) | HNO3 to pH <2 |
| B1RTN8 | | W | | | 1x500-mL P | 300.0_ANIONS_IC: List-1 (5) | Cool~4C |

ICED

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |
|---|---|---|---|---|---|---|---|
| D. Woehle | | | JUN 04 2008 15:00 | | | | JUN 04 2008 15:00 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |

Matrix *

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

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

FLUOR HANFORD

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

I08-037-82



| | | |
|---|---|---|
| Collector: D. Woehle | Contact/Requester: Steve Trent | Telephone No.: 509-373-5869 MSIN FAX |
| SAF No.: I08-037 | Sampling Origin: Hanford Site | Purchase Order/Charge Code |
| Project Title: 2UP1, MAY 2008 | HNF-N-026-12 | Ice Chest No.: 026 Temp. |
| Shipped To (Lab): Waste Sampling & Characterization | Method of Shipment: Govt. Vehicle | Bill of Lading/Air Bill No. |
| Protocol: SURV | Priority: 45 Days | Offsite Property No. |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

**SPECIAL INSTRUCTIONS** Hold Time
200 Area Generator Knowledge Information Form applies.

Total Activity Exemption: Yes ☑ No ☐

| Sample No. | Lab ID | * | Date | Time | No/Type Container | Sample Analysis | Preservative |
|---|---|---|---|---|---|---|---|
| B1V9V1 (F) | W0408703 | W | 6-4-08 | 0930 | 1x500-mL G/P | 200.8_METALS_ICPMS: Arsenic (1); 200.8_METALS_ICPMS: Lead (1) | HNO3 to pH <2 |
| B1V9V1 (F) | | W | | | 1x500-mL G/P | 200.8_METALS_ICPMS: Mercury (1) | HNO3 to pH <2 |
| B1V9V1 (F) | | W | | | 1x500-mL G/P | 6010_METALS_ICP: List-3 + Lithium (19) | HNO3 to pH <2 |
| B1V9V2 | 2704 | W | | | 4x40-mL aGs* | 8260_VOA_GCMS: List-2 (25) | HCl or H2SO4 to pH <2 Cool~4C |
| B1V9V2 | | W | | | 3x40-mL aGs* | Alcohols, Glycols, & Ketones - 8015 | Cool~4C |
| B1V9V2 | | W | | | 4x1000-mL aG | 8270_SVOA_GCMS: List-1 + Cresol (14) | Cool~4C |
| B1V9V2 | | W | | | 1x500-mL G/P | 200.8_METALS_ICPMS: Arsenic (1); 200.8_METALS_ICPMS: Lead (1) | HNO3 to pH <2 |
| B1V9V2 | | W | | | 1x500-mL G/P | 200.8_METALS_ICPMS: Mercury (1) | HNO3 to pH <2 |
| B1V9V2 | | W | | | 1x500-mL G/P | 200.8_METALS_ICPMS: Uranium (1) | HNO3 to pH <2 |
| B1V9V2 | | W | | | 1x500-mL G/P | 6010_METALS_ICP: List-3 + Lithium (19) | HNO3 to pH <2 |
| B1V9V2 | | W | | | 1x500-mL P | 300.0_ANIONS_IC: List-1 (5) | Cool~4C |
| B1V9V2 | | W | | | 1x250-mL G/P | 300.7_CATIONS_IC: Ammonia (1) | H2SO4 to pH <2 |
| B1V9V2 | | W | | | 1x250-mL G/P | 335.2_CYANIDE: Cyanide (1) | NaOH to pH >= 12 Cool~4C |
| B1V9V2 | | W | | | 1x1-L G/P | Strontium-90 | HNO3 to pH <2 |
| B1V9V2 | | W | | | 1x1000-mL G/P | TC99_3MDSK_LSC: Tc-99 (1) | HCl to pH <2 |
| B1V9V2 | | W | | | 1x250-mL G | TRITIUM_EIE_LSC: Tritium (1) | None |

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |
|---|---|---|---|---|---|---|---|
| D. Woehle | | | JUN 04 2008 15:00 | Victor Bruns | | | JUN 04 2008 15:00 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |

ICED

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

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

FLUOR HANFORD

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

I08-037-82



| SAF No. | Contact/Requestor | Telephone No. | MSIN | FAX |
|---|---|---|---|---|
| I08-037 | Steve Trent | 509-373-5869 | | |

| Sample No. | Lab ID | * | Date | Time | No/Type Container | Sample Analysis | Preservative |
|---|---|---|---|---|---|---|---|
| B1V9V2 | | W | 6-4-08 | 0930 | 1x250-mL aGs* | 9060_TOC: TOC (1) | HCl or H2SO4 to pH <2 Cool~4C |
| B1V9V2 | | W | | | 3x1000-mL aG | TPH-DieselKerosene Range - WTPH-D | HCl to pH <2 Cool~4C |
| B1V9V2 | | W | | | 4x40-mL aGs* | TPH-Gasoline Range - WTPH-G | HCl to pH <2 Cool~4C |

ICED

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |
|---|---|---|---|---|---|---|---|
| D. Woehle | D. Woehle | | JUN 04 2008 1530 | Victor Bms | | | JUN 04 2008 1530 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |

Matrix *

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

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