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**FLUOR**<sup>®</sup>

M4W41-SLF-07-342

May 30, 2007

Ms. Dorothy L. Stewart, K6-96  
Field Hydrology & Chemistry  
Pacific Northwest National Laboratory  
902 Battelle Boulevard  
Richland, WA 99352

Dear Ms. Stewart:

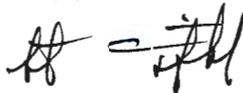
FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20070818

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

This letter contains the following information for sample delivery group WSCF20070818:

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

Very truly yours,



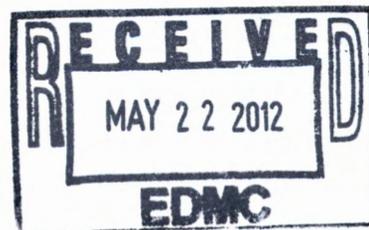
S. L. Fitzgerald  
Manager, Analytical Chemistry

SLF/grf

Attachments 4

cc: T. F Dale, S3-30  
D. Felmy, K6-75  
H. Hampt, K6-96  
H. K. Mezmarich, S3-30  
P. D. Mix, S3-30

J. E. Trechter, S3-30  
S. J. Trent, E6-35  
D. D. Wright, S3-30  
File/LB



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ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

# WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20070818  
Data Deliverable Date: 28-jun-2007  
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
W07-005	B1N594	W07P000941	WATER
	B1N599	W07P000942	WATER
	B1N5B4	W07P000943	WATER
	B1N5D6	W07P000944	WATER
	B1N5F4	W07P000945	WATER
	B1N5K0	W07P000946	WATER
	B1N5L0	W07P000947	WATER
	B1N5L5	W07P000948	WATER
	B1N5M5	W07P000949	WATER

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ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

<b>Sample Delivery Group</b>	<b>WSCF20070818</b>
<b>Sample Matrix</b>	<b>Water</b>
<b>Data Deliverable</b>	<b>Summary Report</b>

**Introduction**

Nine (9) groundwater samples were received at the WSCF Laboratory on May 15, 2007. Samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Letter of Instruction for Analytical Services for the Groundwater Remediation Project in support of the Performance Assessment Project*, referenced in the cover letter.

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was stamped “iced” and initialed by the WSCF Laboratory Sample Custodian during sample receiving, indicating the presence of ice in the sample container.

**Analytical Methodology for Requested Analyses**

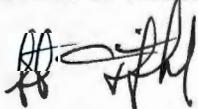
Refer to *WSCF Method References Report*, page 10, for a complete listing of approved analytical methods.

**Inorganic Comments**

**Alkalinity** – The hold time requirement for this analysis was met. A Duplicate and Laboratory Control Sample were analyzed with this delivery group per GRP Letter of Instruction. See page 20 for QC details.

All QC controls are within the established limits.

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



Scot L. Fitzgerald  
WSCF Analytical Laboratory Manager



Pauline D. Mix  
WSCF Client Services

Abbreviations

Hg – mercury

IC – ion chromatography

ICP – inductively coupled plasma

ICP/AES – ICP/atomic emission spectroscopy

ICP/MS – ICP/mass spectrometry

Total U – total uranium

AT/TB – total alpha/total beta

AEA – Alpha Energy Analysis

WTPH-G – Total Hydrocarbons-Gasoline

Am – americium

Cm - curium

Pu – plutonium

Np – neptunium

GEA – gamma energy analysis

H3 – Tritium

Sr – Strontium 89, 90

WTPH-D – Total Hydrocarbons-Diesel

TSS – Total Suspended Solids

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ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 14 pages  
Including cover page

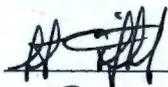
**WSCF**  
**ANALYTICAL RESULTS REPORT**

for

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

**Attention: DL Stewart K6-96**

Analytical:

 S. Fitzgerald 5/30/07

Client Services:

 P.D. Misp 5/29/2007

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

This information is intended for the use of the addressee only. If the reader of this report is not the intended recipient or is not authorized by the recipient to receive the report, you are hereby notified that any dissemination, distribution or copying of this report is strictly prohibited. If you have received this report in error, please notify WSCF Laboratory immediately by telephone at (509) 373-7020 or (509) 531-8004. Information designation of this report is the responsibility of the customer.

Report#: WSCF20070818  
Report Date: 29-may-2007  
Report WGPP/ver. 5.2  
GPAP

## W13q Worklist/Batch/QC Report for Group# WSCF20070818

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
31959	1	32343	36430	LCS		Total Alkalinity as mg/L CaCO3
31959	13	32343	36430	LCS		Total Alkalinity as mg/L CaCO3
31959	25	32343	36430	LCS		Total Alkalinity as mg/L CaCO3
31959	27	32343	36430	LCS		Total Alkalinity as mg/L CaCO3
31959	15	32343	36430	DUP	W07GR00990	Total Alkalinity as mg/L CaCO3
31959	3	32343	36430	DUP	W07P000941	Total Alkalinity as mg/L CaCO3
31959	2	32343	36430	SAMPLE	W07P000941	Total Alkalinity as mg/L CaCO3
31959	4	32343	36430	SAMPLE	W07P000942	Total Alkalinity as mg/L CaCO3
31959	5	32343	36430	SAMPLE	W07P000943	Total Alkalinity as mg/L CaCO3
31959	6	32343	36430	SAMPLE	W07P000944	Total Alkalinity as mg/L CaCO3
31959	7	32343	36430	SAMPLE	W07P000945	Total Alkalinity as mg/L CaCO3
31959	8	32343	36430	SAMPLE	W07P000946	Total Alkalinity as mg/L CaCO3
31959	9	32343	36430	SAMPLE	W07P000947	Total Alkalinity as mg/L CaCO3
31959	10	32343	36430	SAMPLE	W07P000948	Total Alkalinity as mg/L CaCO3
31959	11	32343	36430	SAMPLE	W07P000949	Total Alkalinity as mg/L CaCO3

**METHOD REFERENCES REPORT**

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

<b>LA-531-411</b>	<b>LA-531-411: ALKALINITY (TITRIMETRIC)</b>
	<b>EPA-600/4-79-020 310.1</b> <b>ALKALINITY</b>
	<b>HEIS 310.1_ALKALINITY</b> <b>Alkalinity</b>

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

Report Date: 29-may-2007

Report #: WSCF20070818

Report WGPPM/5.2

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07  
29

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** DL Stewart K6-96

**SAF Number:** W07-005

**Sample #** W07P000941

**Client ID:** B1N594 STEWART  
WSCF

**Matrix:** WATER

**Group #:** WSCF20070818

**Department:** Inorganic

**Sampled:** 05/15/07

**Received:** 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO<sub>3</sub></b>											
Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	LA-531-411		96.0	mg/L			1.00	1.0		05/24/07

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

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# WSCF ANALYTICAL RESULTS REPORT

**Attention:** DL Stewart K6-96

**SAF Number:** W07-005

**Sample #** W07P000942

**Client ID:** B1N599 STEWART  
WSCF

**Matrix:** WATER

**Group #:** WSCF20070818

**Department:** Inorganic

**Sampled:** 05/15/07

**Received:** 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO<sub>3</sub></b>											
Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	LA-531-411		120	mg/L			1.00	1.0		05/24/07

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL RESULTS REPORT

Attention: DL Stewart K6-96

SAF Number: W07-005

Sample # W07P000943

Client ID: B1N5B4 STEWART  
WSCF

Matrix: WATER

Group #: WSCF20070818

Department: Inorganic

Sampled: 05/15/07

Received: 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		110	mg/L			1.00	1.0		05/24/07

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** DL Stewart K6-96

**SAF Number:** W07-005

**Sample #** W07P000944

**Client ID:** BIN5D6 STEWART  
WSCF

**Matrix:** WATER

**Group #:** WSCF20070818

**Department:** Inorganic

**Sampled:** 05/15/07

**Received:** 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO<sub>3</sub></b>											
Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	LA-531-411		93.0	mg/L			1.00	1.0		05/24/07

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: DL Stewart K6-96

SAF Number: W07-005

Sample # W07P000945

Client ID: B1N5F4 STEWART  
WSCF

Matrix: WATER

Group #: WSCF20070818

Department: Inorganic

Sampled: 05/15/07

Received: 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		110	mg/L			1.00	1.0		05/24/07

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** DL Stewart K6-96

**SAF Number:** W07-005

**Sample #** W07P000946

**Client ID:** B1N5K0 STEWART  
WSCF

**Matrix:** WATER

**Group #:** WSCF20070818

**Department:** Inorganic

**Sampled:** 05/15/07

**Received:** 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO<sub>3</sub></b>											
Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	LA-531-411		100	mg/L			1.00	1.0		05/24/07

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

# WSCF

## ANALYTICAL RESULTS REPORT

**Attention:** DL Stewart K6-96

**SAF Number:** W07-005

**Sample #** W07P000947

**Client ID:** B1N5L0 STEWART  
WSCF

**Matrix:** WATER

**Group #:** WSCF20070818

**Department:** Inorganic

**Sampled:** 05/15/07

**Received:** 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		86.0	mg/L			1.00	1.0		05/24/07

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** DL Stewart K6-96  
**SAF Number:** W07-005  
**Sample #** W07P000948  
**Client ID:** B1N5L5

**STEWART  
WSCF**

**Matrix:** WATER

**Group #:** WSCF20070818  
**Department:** Inorganic  
**Sampled:** 05/15/07  
**Received:** 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO<sub>3</sub></b>											
Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	LA-531-411		94.0	mg/L			1.00	1.0		05/24/07

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

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

*Report WGPP/ver. 5.2*  
*GPAP*

# WSCF

## ANALYTICAL RESULTS REPORT

Attention: DL Stewart K6-96

SAF Number: W07-005

Sample # W07P000949

Client ID: B1N5M5 STEWART  
WSCF

Matrix: WATER

Group #: WSCF20070818

Department: Inorganic

Sampled: 05/15/07

Received: 05/15/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Total Alkalinity as mg/L CaCO<sub>3</sub></b>											
Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	LA-531-411		95.0	mg/L			1.00	1.0		05/24/07

**MDL = Minimum Detection Limit**

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

GPAP

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20070818  
 Matrix: WATER  
 Test: Total Alkalinity as mg/L CaCO<sub>3</sub>

Sample Date: 05/16/07  
 Receive Date: 05/16/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W07GR00990</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	127		RPD			0.791	20.000		05/24/07
<b>Lab ID: W07P000941</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	97		RPD			1.036	20.000		05/24/07
<b>BATCH QC</b>											
LCS	Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	123	106.957	%Recover	80.000	120.000				05/24/07
LCS	Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	120	104.348	%Recover	80.000	120.000				05/24/07
LCS	Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	122	106.087	%Recover	80.000	120.000				05/24/07
LCS	Total Alkalinity as mg/L CaCO <sub>3</sub>	ALKALINITY	49.66	110.848	%Recover	80.000	120.000				05/24/07

M4W41-SLF-07-342

ATTACHMENT 4

**SAMPLE RECEIPT INFORMATION**

Consisting of 11 pages  
Including cover page

File

ACKNOWLEDGMENT OF SAMPLES RECEIVED

06/28/07

td

GPAP

Richland, WA 99352  
Attn: DL Stewart K6-96

Customer Code: PNNL-GPP  
PO#: 122543  
Group#: 20070818

The following samples were received from you on 05/15/07. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
W07P000941	B1N594	STEWART ALKALI	Water	05/15/0
W07P000942	B1N599	STEWART ALKALI	Water	05/15/0
W07P000943	B1N5B4	STEWART ALKALI	Water	05/15/0
W07P000944	B1N5D6	STEWART ALKALI	Water	05/15/0
W07P000945	B1N5F4	STEWART ALKALI	Water	05/15/0
W07P000946	B1N5K0	STEWART ALKALI	Water	05/15/0
W07P000947	B1N5L0	STEWART ALKALI	Water	05/15/0
W07P000948	B1N5L5	STEWART ALKALI	Water	05/15/0
W07P000949	B1N5M5	STEWART ALKALI	Water	05/15/0

Test Acronym Description

Test Acronym	Description
ALKALI	Total Alkalinity as mg/L CaCO3











