

FAX

TECHLAW, INC.

3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #1

WSCF20030459-All

WSCF20030461-All

WSCF20030613-All

WSCF20030757-All

W03975

Detection limits - Do I need to use the Soil High or Soil Low detection limits

Use the Soil Low detection limits.

FAX

TECHLAW, INC.

**3115 Loma Court
Tenino, WA 98589
509-521-6693**

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #2

WSCF20030459-All

WSCF20030461-All

WSCF20030613-All

WSCF20030757-All

W03975-All

I need a complete reference for DOE/RL 2000-60 Rev. 1

Put on CD and shipped via Federal Express on 09/29/03

FAX

TECHLAW, INC.

3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #14

W03975-Alcohols

The chain-of-custody requests diethyl ether as one of the analytes but no data is reported. Was it a lab oversight or was the analysis cancelled?

Sample Disposition Record number F04-005 cancelled the diethyl ether analyses. Copy forwarded to the validator.

Date: 4 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Wet Chemistry - Data Package No. W03975

INTRODUCTION

This memo presents the results of data validation on Data Package No. W03975 prepared by Severn Trent Laboratories Inc.. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9-A	5/30/03	Soil	C	See note 1

1 - Nitrate/nitrite by 353.1, oil & grease by 8015B and hexavalent chromium by 7196A.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times/Sample Preservation**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for hexavalent chromium, 28 days for oil & grease and nitrate/nitrite.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

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All holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike and LCS recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to the lack of a matrix spike analysis, all oil & grease results were qualified as estimates and flagged "J".

All other matrix spike and LCS recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in

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the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. All results met the TQL.

- **Completeness**

Data package No. W03975 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, all oil & grease results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

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REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

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Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

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Appendix 2

Summary of Data Qualification

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WET CHEMISTRY DATA QUALIFICATION SUMMARY

SDG: W03975	REVIEWER: TLI	DATE: 11/4/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Oil & grease	J	All	No matrix spike analysis

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: FLUOR-HANFORD							
Laboratory: Severn Trent							
Case		SDG: W03975					
Sample Number	B171B9-A						
Remarks							
Location							
Sample Date	5/30/03						
Wet Chemistry	TQL	Result	Q	Result	Q	Result	Q
Hexavalent chromium		ND	U				
Nitrate/Nitrite		115					
Oil & Grease	200	ND	UJ				

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Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

FLUOR HANFORD IC

Client Sample ID: B171B9-A

General Chemistry

Lot-Sample #....: F3F060265-001 Work Order #....: FP4X6 Matrix.....: SOLID
Date Sampled....: 05/30/03 Date Received...: 06/06/03
‡ Moisture.....:

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Hexavalent Chromium	ND	0.40	mg/kg	SW846 7196A	06/17/03	3168482
			Dilution Factor: 1	MDL.....: 0.054		
Nitrate/Nitrite as N 115		40.0	mg/kg	MCAWW 353.1	06/10/03	3161268
			Dilution Factor: 80	MDL.....: 2.9		
Oil and Grease (Gravimetric)	ND	200	mg/kg	SW846 9071B	06/10-06/11/03	3161456
			Dilution Factor: 1	MDL.....:		

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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LOT NUMBER F3F060265

8015B Alcohols

Case Narrative:

The LCS surrogate recovery was outside acceptance limits. LCS spike recoveries are within QC limits demonstrating acceptable sample extraction and instrument performance. The surrogate was double spiked due to analyst oversight that the surrogate is already contained in the LCS spiking solution.

For the MS/MSD on sample B17216-A the surrogate was doubled-spiked. When this double spike is taken into account all spike recoveries in the samples were in-control.

The hold time for these samples was exceeded due to scheduling issues and the fact that half the holding time had expired before the samples were received at the lab.

Wet Chemistry

The Nitrate/nitrite MS recovery was outside the established criteria. The spike data was flagged with an "N" qualifier.

LOT# F3F060265

SDG# W03975

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FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-185	Page 1 of 1	
Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ		Price Code 8N	Data Turnaround 45 Days	
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		Sampling Location 216-B-12 (C3246)		SAF No. F03-006		Air Quality		
Ice Chest No. ERC 96-060		Field Logbook No. HNF-N-3361		COA		Method of Shipment Federal Express		
Shipped To Severn Trent Incorporated, Richmond St. Louis		Offsite Property No. BSR 107195		Bill of Lading/Air Bill No. NA				
POSSIBLE SAMPLE HAZARDS/REMARKS Radio active TIC to B171P0 Special Handling and/or Storage Cool 4C W03975				Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C
				Type of Container	aG	aG	aG	aG
				No. of Container(s)	1	1	0	0
				Volume	40mL	40mL	40mL	40mL
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	NO2/NO3 - 353.1	Oil & Grease - 413.1	
Sample No.	Matrix *	Sample Date	Sample Time					
B171B9-A	SOIL	5-30-03	1140	X	X	X	X	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
Bebe		6/4/03		Bebe		6/4/03		
Bebe		6/4/03		R-filly		6-7-03		
Bebe		6/4/03		LA		3228 6-4-03		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
LA 3228		6-5-03 1000		R-filly		6-5-03		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
R-filly		6-5-03		Fed Ex				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
FSD Ex								
LABORATORY SECTION		Received By		Title		Date/Time		
		Hulstrom		6-6-03 0900				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time		

(1) Alcohols, Glycols, & Ketones - 8015 (1-Butanol, Diethyl ether, Ethylene glycol, Methanol)

Take All Analysis out of the two 40ml bottles provided.

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

Appendix 5

Data Validation Supporting Documentation

000015

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 200-PW-2/200-PW-4			DATA PACKAGE: W03975		
VALIDATOR: TLI		LAB: ST		DATE: 10/18/05	
CASE:			SDG: W03975		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	<u>Oil and Grease</u>	Alkalinity
Ammonia	BOD/COD	Chloride	<u>Chromium-VI</u>	pH	<u>NO₃/NO₂</u>
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
B171B9-A					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes No N/A

Initial calibrations acceptable? Yes No N/A

ICV and CCV checks performed on all instruments? Yes No N/A

ICV and CCV checks acceptable? Yes No N/A

Standards traceable? Yes No N/A

Standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) Yes No N/A
 ICB and CCB results acceptable? (Levels D, E) Yes No N/A
 Laboratory blanks analyzed? Yes No N/A
 Laboratory blank results acceptable? Yes No N/A
 Field blanks analyzed? (Levels C, D, E) Yes No N/A
 Field blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: NO FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? Yes No N/A
 Spike recoveries acceptable? Yes No N/A
 Spike standards NIST traceable? (Levels D, E) Yes No N/A
 Spike standards expired? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A
 Comments: NO oil + grease MS - J all
NO FB

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

5. PRECISION (Levels C, D, and E)

- Duplicate RPD values acceptable? Yes No N/A
- Duplicate results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

- Samples properly preserved? Yes No N/A
- Sample holding times acceptable? Yes No N/A

Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. **RESULT QUANTITATION AND DETECTION LIMITS (all levels)**

Results reported for all requested analyses? Yes No N/A
Results supported in the raw data? (Levels D, E) Yes No N/A
Samples properly prepared? (Levels D, E) Yes No N/A
Detection limits meet RDL? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: _____

Appendix 6

Additional Documentation Requested by Client

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MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F3F060265

Matrix.....: SOLID

Date Sampled...: 05/31/03

Date Received...: 06/06/03

Percent Moisture: 100

PARAMETER	SAMPLE SPIKE		MEASURED		PERCENT	METHOD	PREPARATION-	PREP
	AMOUNT	AMT	AMOUNT	UNITS	RECOVERY		ANALYSIS DATE	BATCH #
Hexavalent Chromium	ND	40.0	43.8	mg/kg	109	SW846 7196A	06/17/03	3168482
			Dilution Factor: 1					
Nitrate/Nitrite as N	126	500	750 N	mg/kg	125	MCAWW 353.1	06/10/03	3161268
			Dilution Factor: 100					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

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METHOD BLANK REPORT

General Chemistry

Client Lot #...: F3F060265

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING		METHOD	PREPARATION-	PREP	
		LIMIT	UNITS		ANALYSIS DATE	BATCH #	
Hexavalent Chromium	ND	0.40	mg/kg	SW846 7196A	06/17/03	3168482	
		Dilution Factor: 1					
Nitrate/Nitrite as N	ND	0.50	mg/kg	MCAWW 353.1	06/10/03	3161268	
		Dilution Factor: 1					
Oil and Grease (Gravimetric)	ND	200	mg/kg	SW846 9071B	06/10-06/11/03	3161456	
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #....: F3F060265

Matrix.....: SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Nitrate/Nitrite as N								
	20.0	18.4	mg/kg	92		MCAWW 353.1	06/10/03	3161268
	20.0	18.1	mg/kg	90	1.6	MCAWW 353.1	06/10/03	3161268
Dilution Factor: 1								

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Oil and Grease (Gravimetric)								
	3330	4000	mg/kg	120		SW846 9071B	06/10-06/11/03	3161456
	3330	3400	mg/kg	102	16	SW846 9071B	06/10-06/11/03	3161456
Dilution Factor: 1								

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

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LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F3F060265

Matrix.....: SOLID

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCNT</u> <u>RECVRY</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>PREP</u> <u>BATCH #</u>
Hexavalent Chromium	2.00	2.00	mg/kg	100	SW846 7196A	06/17/03	3168482

Work Order #: FQQQL1AC LCS Lot-Sample#: F3F170000-482

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Date: 4 November 2003
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Alcohols - Data Package No. W03975

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. W03975 prepared by Severn Trent Laboratories Inc. A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9-A	5/30/03	Soil	C	See note 1 & 2

1 - Alcohols/glycols by 8015B.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Samples must be analyzed within: 14 days of the date of sample collection for alcohols. If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results



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are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all alcohol/glycol results were qualified as estimates and flagged "J".

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (MDL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the MDL, qualified as undetected and flagged "U".

All method blank results were acceptable.

Field Blanks

No field duplicate samples were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within 70-130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All MS/MSD and blank spike results were acceptable.

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Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Sample results must be within RPD limits of +/- 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. 1-Butanol and ethylene glycol exceeded the TQL. Under the FHI statement of work, no qualification is required.

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- **Completeness**

Data package No. W03975 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the holding time being exceeded by less than twice the limit, all alcohol/glycol results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

1-Butanol and ethylene glycol exceeded the TQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

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Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validator in compliance with the BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

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Appendix 2

Summary of Data Qualification

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VOA DATA QUALIFICATION SUMMARY

SDG: W03975	REVIEWER: TLI	DATE: 11/4/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	Holding time

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: FLUOR-HANFORD							
Laboratory: Severn Trent							
Case:		SDG: W03975					
Sample Number		B171B9-A					
Remarks							
Sample Date		05/30/03					
Analysis Date		06/19/03					
Alcohols	TQL	Result	Q	Result	Q	Result	Q
Methanol		ND	UJ				
1-Butanol	5	ND	UJ				
Ethylene glycol	5	ND	UJ				
ND=Not detected							

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize mis-interpretation of results. All other qualifiers shown were applied during validation.

STL ST. LOUIS

FLOOR HANFORD IC

Client Sample ID: B171B9-A

GC Volatiles

Lot-Sample #....: F3F060265-001 Work Order #....: FP4X61AE Matrix.....: SOLID
Date Sampled....: 05/30/03 Date Received...: 06/06/03
Prep Date.....: 06/17/03 Analysis Date...: 06/19/03
Prep Batch #....: 3169566
Dilution Factor: 1
% Moisture.....: Method.....: SW846 8015B

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>		
		<u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Methanol	ND J	50	mg/kg	8.8
1-Butanol	ND J	50	mg/kg	50
Ethylene glycol	ND J	50	mg/kg	50
<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>		
	<u>RECOVERY</u>	<u>LIMITS</u>		
Isobutanol	64	(51 - 130)		

Handwritten signature
10/18/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012

LOT NUMBER F3F060265

8015B Alcohols

Case Narrative:

The LCS surrogate recovery was outside acceptance limits. LCS spike recoveries are within QC limits demonstrating acceptable sample extraction and instrument performance. The surrogate was double spiked due to analyst oversight that the surrogate is already contained in the LCS spiking solution.

For the MS/MSD on sample B17216-A the surrogate was doubled-spiked. When this double spike is taken into account all spike recoveries in the samples were in-control.

The hold time for these samples was exceeded due to scheduling issues and the fact that half the holding time had expired before the samples were received at the lab.

Wet Chemistry

The Nitrate/nitrite MS recovery was outside the established criteria. The spike data was flagged with an "N" qualifier.

Severn Trent Laboratories, Inc.

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000013

LOT# F3F060265

SDG# W03975 000014

6

STL ST. LOUIS

cur 1883

FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-185		Page 1 of 1								
Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ		Price Code 8N		Data Turnaround 45 Days								
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		Sampling Location 216-B-12 (C3246)		SAF No. F03-006		Air Quality										
Ice Chest No. ERC 96-060		Field Logbook No. HNF-N-3361		COA		Method of Shipment Federal Express										
Shipped To Severn Trent Incorporated, ^{MSW-4-03} Richland St. LOUIS		Offsite Property No. RSR 107195		Bill of Lading/Air Bill No. NA												
POSSIBLE SAMPLE HAZARDS/REMARKS Radio active TIC to B171PO Special Handling and/or Storage Cool 4C W03975				Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C								
				Type of Container	aG	aG	aG	aG								
				No. of Container(s)	1	1	0	0								
				Volume	40mL	40mL	40mL	40mL								
W03975 SAMPLE ANALYSIS				See item (1) in Special Instructions	Chromium Hex - 7196	NO2/NO3 - 353.1	Oil & Grease - 413.1									
Sample No.	Matrix *	Sample Date	Sample Time													
B171B9-A	SOIL	5-30-03	1140	X	X	X	X									
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) Alcohols, Glycols, & Ketones - 8015 (1-Butanol, Diethyl ether, Ethylene glycol, Methanol) Take All Analysis out of the two 40ml bottles provided.				S=Soil SE=Solids SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other				
...		6/4/03		...		6/4/03										
...		6/3/03		ERC		6/4/03										
...		6/4/03		LA		6/4/03										
LA		6-5-03 1000		R-falky		6-5-03										
...		6-5-03		Fed Ex												
LABORATORY SECTION		Received By		Date/Time		Title										
FINAL SAMPLE DISPOSITION		Disposal Method		Date/Time		Disposed By										

Appendix 5

Data Validation Supporting Documentation

000015

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-PW-2/200-PW-4		DATA PACKAGE: W03975		
VALIDATOR:	TLI	LAB: ST	DATE: 10/18/03		
CASE:			SDG: W03975		
ANALYSES PERFORMED					
SW-846 8260	8015B	SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
B17189-A					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No **N/A**

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? Yes No **N/A**
 Initial calibrations acceptable? Yes No **N/A**
 Continuing calibrations acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A
Calibration blank results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable? Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: No FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
Surrogates traceable? (Levels D, E) Yes No N/A
Surrogates expired? (Levels D, E) Yes No N/A
MS/MSD samples analyzed? Yes No N/A
MS/MSD results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards? (Levels D, E) Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable? Yes No N/A
Standards traceable? (Levels D, E) Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A
Comments: NO PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? Yes No N/A
MS/MSD RPD values acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
Field duplicate RPD values acceptable? Yes No N/A
Field split RPD values acceptable? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No N/A
Internal standard areas acceptable? Yes No N/A
Internal standard retention times acceptable? Yes No N/A
Standards traceable? Yes No N/A
Standards expired? Yes No N/A
Transcription/calculation errors? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? Yes No N/A
Sample holding times acceptable? Yes No N/A

Comments: < 2X the limit I all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

- Compound identification acceptable? (Levels D, E) Yes No N/A
- Compound quantitation acceptable? (Levels D, E) Yes No N/A
- Results reported for all requested analyses? Yes No N/A
- Results supported in the raw data? (Levels D, E) Yes No N/A
- Samples properly prepared? (Levels D, E) Yes No N/A
- Laboratory properly identified and coded all TIC? (Levels D, E) Yes No N/A
- Detection limits meet RDL? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: No diethyl ester analyses as requested in
the Chan - of custody file 11/22/01

9. SAMPLE CLEANUP (Levels D and E)

- GPC cleanup performed? Yes No N/A
- GPC check performed? Yes No N/A
- GPC check recoveries acceptable? Yes No N/A
- GPC calibration performed? Yes No N/A
- GPC calibration check performed? Yes No N/A
- GPC calibration check retention times acceptable? Yes No N/A
- Check/calibration materials traceable? Yes No N/A
- Check/calibration materials Expired? Yes No N/A
- Analytical batch QC given similar cleanup? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000020

MATRIX SPIKE SAMPLE DATA REPORT

GC Volatiles

Client Lot #....: F3F060265 Work Order #....: FP40X1AR-MS Matrix.....: SOLID
 MS Lot-Sample #: F3F060265-003 FP40X1AT-MSD
 Date Sampled...: 05/31/03 Date Received...: 06/06/03
 Prep Date.....: 06/17/03 Analysis Date...: 06/20/03
 Prep Batch #...: 3169566
 Dilution Factor: 1 † Moisture.....:

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Methanol	ND	98.0	89.0	ug/kg	91		SW846 8015B
	ND	99.0	89.0	ug/kg	90	0.0	SW846 8015B
1-Butanol	ND	98.0	76.0	ug/kg	78		SW846 8015B
	ND	99.0	72.0	ug/kg	73	5.4	SW846 8015B
Ethylene glycol	ND	98.0	76.0	ug/kg	78		SW846 8015B
	ND	99.0	72.0	ug/kg	73	5.4	SW846 8015B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Isobutanol	143 *	(51 - 130)
	141 *	(51 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters
 * Surrogate recovery is outside stated control limits.

METHOD BLANK REPORT

GC Volatiles

Client Lot #...: F3F060265
MB Lot-Sample #: F3F180000-566

Work Order #...: FQRVV1AA

Matrix.....: SOLID

Leach Batch #...: P317009
Dilution Factor: 1

Prep Date.....: 06/17/03
Prep Batch #...: 3169566

Analysis Date...: 06/19/03

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>		<u>METHOD</u>
		<u>LIMIT</u>	<u>UNITS</u>	
Methanol	ND	50	mg/kg	SW846 8015B
1-Butanol	ND	50	mg/kg	SW846 8015B
Ethylene glycol	ND	50	mg/kg	SW846 8015B

<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>
	<u>RECOVERY</u>	<u>LIMITS</u>
Isobutanol	72	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: F3F060265
 LCS Lot-Sample#: F3F180000-566

Work Order #...: FQRVV1AC
 Prep Date.....: 06/17/03
 Prep Batch #...: 3169566

Matrix.....: SOLID
 Analysis Date...: 06/19/03

Leach Batch #...: P317009
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
Methanol	100	92.0	mg/kg	92	SW846 8015B
1-Butanol	100	82.0	mg/kg	82	SW846 8015B
Ethylene glycol	100	82.0	mg/kg	82	SW846 8015B
<u>SURROGATE</u>				<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
Isobutanol				150 *	(70 - 130)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

* Surrogate recovery is outside stated control limits.

SAMPLE DISPOSITION RECORD

SDR No.: F04-005

Revision No.: 0

Date Initiated: 07/1/03

Sample Event Information

SAF: F03-006

OU: 200-PW-2/PW-4

Project: CPP 200 Area

Sampling Event: 200-PW-2/200-PW-4 OU - Soil Sampling

Laboratory: WSCF

Sampling Information

Number of Samples: 3

ID Numbers: B171B9-A, B17216-A, B17217-A

Matrix: SOIL

Collection Date: 05/30/03 - 05/31/03

Issue Background

Class Project Data Use General Laboratory Direction Validation Direction General Sample Management Direction

Type: OTHER

Description:

Diethyl Ether Analysis Not Reported By Laboratory

Disposition

Description:

The listed samples could not be analysed at the WSCF laboratory using method 8015 due to the elevated radioactivity exhibited by these samples. The samples were subsequently sent to the Severn Trent Laboratory (St. Louis) for analysis using method 8015. Diethyl Ether is a compound that is normally reported using method 8015 at the WSCF laboratory. However, the Severn Trent laboratory does not report this compound from the method 8015 analysis. As a result, no diethyl ether data were reported for the listed samples.

Justification:

The method 8015 analysis could only be run on the listed samples at the Severn Trent laboratory due to the elevated radioactivity. Diethyl Ether is not included in the 8015 VOA analyte list at the Severn Trent laboratory.

Approval Signatures

SJ Trent

Project Coordinator (Print/Sign Name)

10/16/03

Date

LC Hulstrom

Task Manager (Print/Sign Name)

Date