

REVIEW COMMENT RECORD (RCR)		1. Date 04/05/05		2. Review No.	
		3. Project No.		4. Page 1 of 1	
		200-LW-1/LW-2			
5. Document Number(s)/Title(s) Validation Package for SDG H704 <i>2707 RLW 4-15-05</i>		6. Program/Project/Building Number Borehole Soil Sampling		7. Reviewer RL Weiss	
		8. Organization/Group ERC - S&DM		9. Location/Phone Sigma 1 372-9631	
17. Comment Submittal Approval: _____ Organization Manager (Optional)		10. Agreement with indicated comment disposition(s) 04/05/2005 Date R. L. Weiss Reviewer/Point of Contract R. L. Weiss Author/Originator		11. Closed <i>Richard L Weiss</i> Reviewer/Point of Contact <i>4-15-05</i> Date <i>Richard L Weiss</i> Author/Originator	
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)		16. Status
1	Wet Chemistry, Page 11; Analytes not validated should be "Xed" out.		<i>Concurrence</i>		<i>OK RLW 4-15-05</i>
2	Inorganic, Page 1; Metals analysis method is ICP not ICP/MS		<i>Concurrence</i>		<i>OK RLW 4-15-05</i>
3	Semivolatile, Volatile, PCB, & Rad – No Comments				

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Date: 24 March 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Radiochemistry - Data Package No. H2704



INTRODUCTION

This memo presents the results of data validation on Data Package No. H2704 prepared by Eberline Services (EB). 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
B191J2	8/18/04	Soil	C	See note 1
B191J4	8/18/04	Soil	C	See note 1
B19HY8	8/18/04	Soil	C	See note 2

- 1 - Gamma spectroscopy, isotopic thorium (aspec), tritium, technetium-99, nickel-63, carbon-14, tritium, strontium-90.
2 - Gamma spectroscopy, total uranium, alpha spectroscopy.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66, Draft A, Redline, May 2002). 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**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

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- **Laboratory (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable. It should be noted that several analytes exceeded the RTQL in the laboratory blank.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is either 65-135% or 70-130%, depending on the analyte. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS analysis, all thorium-228(aspec) and thorium-232(aspec) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection

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limit (CRDL) and the RPD is less than +/- 35 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (68%), all thorium-228(aspec) results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (46%), the potassium-40 result in samples B191J2 and B191J4 were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. Seven analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific RTQL.

- **Completeness**

Data package SDG No. H2704 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 an RPD outside QC limits (68%), all thorium-228(aspec) results were qualified as estimates and flagged "J". Due to an RPD outside QC limits (46%), the potassium-40 result in samples B191J2 and B191J4 were qualified as estimates and flagged "J". Due to the lack of an LCS analysis, all thorium-228(aspec) and thorium-232(aspec) 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.

Seven analytes exceeded the RTQL. 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-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

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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 the FHI statement of work are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- 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.
- 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.

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Appendix 2

Summary of Data Qualification

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RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H2704	REVIEWER: TLI	DATE: 3/24/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228(aspec) Thorium-232(aspec)	J	All	No LCS analysis
Thorium-228(aspec)	J	All	RPD
Potassium-40	J	B191J2, B191J4	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: FLUOR-HANFORD							
Laboratory: EB							
Case		SDG: H2704					
Sample Number		B191J2		B191J4		B19HY8	
Remarks							
Sample Date		8/18/04		8/18/04		8/18/04	
Radiochemistry	RTQL	Result	Q	Result	Q	Result	Q
Tritium	400	63.1		0.561	U	NA	
Carbon-14	50	35.6		0.234	U	NA	
Nickel-63	30	4580		19.1		NA	
Total Strontium	1	96300		5920		NA	
Technetium-99	15	9.18		0.168	U	NA	
Thorium-228		15.9	J	2.00	J	NA	
Thorium-230		7.89	U	0.680		NA	
Thorium-232	1	1.58	UJ*	1.41	J	NA	
Potassium-40			U UJ	9.39	J	8.87	
Cobalt-60	0.05	104		1.02		0.981	
Antimony-125			U U		U U		U U
Cesium-134			U U		U U		U U
Cesium 137	0.1	95600		277		352	
Radium-226			U U	0.292	U	0.432	
Radium-228			U U	0.562		0.603	
Europium-152	0.1		U U*		U U*		U U*
Europium-154	0.1	70.8		0.258		0.288	
Europium-155	0.1		U U*		U U*		U U*
Thorium-228			U U	1.22		0.903	
Thorium-232			U U	0.562		0.603	
Uranium-235(gea)			U U	7.39		5.69	
Uranium-238(gea)			U U	230		210	
Americium-241(gea)		5800		14.4		12.9	
Total Uranium (ug/g)		NA		NA		818	
Uranium-233/234(aspec)	1	NA		NA		236	
Uranium-235(aspec)	1	NA		NA		26.4	
Uranium-238(aspec)	1	NA		NA		236	
Neptunium-237	1	NA		NA		0.080	U
Plutonium-238	1	NA		NA		1.40	
Plutonium-239/240	1	NA		NA		40.1	
Americium-241	1	NA		NA		12.3	

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* - RTQL exceeded

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

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2694

7080-001

B191J2

DATA SHEET

SDG <u>7080</u>	Client/Case no <u>Hanford</u>	SDG <u>H2704</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408244-01</u>	Client sample id <u>B191J2</u>	
Dept sample id <u>7080-001</u>	Location/Matrix <u>216-S-20; 29.5'-32'</u>	<u>SOLID</u>
Received <u>08/27/04</u>	Collected/Weight <u>08/18/04 08:58 332.9 g</u>	
% solids <u>91.5</u>	Custody/SAF No <u>F03-025-114</u>	<u>F03-025</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	63.1	7.0	6.9	400		H
Carbon 14	14762-75-5	35.6	3.8	4.5	50		C
Nickel 63	13981-37-8	4580	220	180	30		NI_L
Total Strontium	SR-RAD	96300	940	71	1.0		SR
Technetium 99	14133-76-7	9.18	3.5	7.9	15		TC
Thorium 228	14274-82-9	15.9	9.6	12	1.0	J	TH
Thorium 230	14269-63-7	7.89	9.5	12	1.0	U	TH
Thorium 232	TH-232	1.58	3.2	12	1.0	U J	TH
Potassium 40	13966-00-2	U		8.4		U J	GAM
Cobalt 60	10198-40-0	104	2.8	2.3	0.050		GAM
Antimony 125	14234-35-6	U		50		U	GAM
Cesium 134	13967-70-9	U		5.6		U	GAM
Cesium 137	10045-97-3	95600	40	13	0.10		GAM
Radium 226	13982-63-3	U		18	0.10	U	GAM
Radium 228	15262-20-1	U		13	0.20	U	GAM
Europium 152	14683-23-9	U		42	0.10	U	GAM
Europium 154	15585-10-1	70.8	5.8	6.1	0.10		GAM
Europium 155	14391-16-3	U		19	0.10	U	GAM
Thorium 228	14274-82-9	U		17		U	GAM
Thorium 232	TH-232	U		13		U	GAM
Uranium 235	15117-96-1	U		34		U	GAM
Uranium 238	U-238	U		3100		U	GAM
Americium 241	14596-10-2	5800	15	15			GAM

200-LW-1/LW-2 Characterization-Soil

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Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/25/04</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2694

7080-002

B191J4

DATA SHEET

SDG <u>7080</u>	Client/Case no <u>Hanford</u>	SDG <u>H2704</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408244-02</u>	Client sample id <u>B191J4</u>	
Dept sample id <u>7080-002</u>	Location/Matrix <u>216-S-20; 32.5'-35'</u>	<u>SOLID</u>
Received <u>08/27/04</u>	Collected/Weight <u>08/18/04 11:25</u>	<u>252.0 g</u>
% solids <u>93.5</u>	Custody/SAF No <u>F03-025-115</u>	<u>F03-025</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.561	1.6	2.7	400	U	H
Carbon 14	14762-75-5	0.234	1.2	2.1	50	U	C
Nickel 63	13981-37-8	19.1	1.7	1.9	30		NI_L
Total Strontium	SR-RAD	5920	16	0.36	1.0		SR
Technetium 99	14133-76-7	0.168	0.15	0.40	15	U	TC
Thorium 228	14274-82-9	2.00	0.71	0.37	1.0		TH
Thorium 230	14269-63-7	0.680	0.39	0.37	1.0		TH
Thorium 232	TH-232	1.41	0.50	0.37	1.0		TH
Potassium 40	13966-00-2	9.39	0.68	0.50			GAM
Cobalt 60	10198-40-0	1.02	0.071	<u>0.057</u>	0.050		GAM
Antimony 125	14234-35-6	U		0.71		U	GAM
Cesium 134	13967-70-9	U		0.088		U	GAM
Cesium 137	10045-97-3	277	0.70	<u>0.24</u>	0.10		GAM
Radium 226	13982-63-3	0.292	0.22	<u>0.32</u>	0.10	U	GAM
Radium 228	15262-20-1	0.562	0.23	<u>0.29</u>	0.20		GAM
Europium 152	14683-23-9	U		<u>0.67</u>	0.10	U	GAM
Europium 154	15585-10-1	0.258	0.16	<u>0.18</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.68</u>	0.10	U	GAM
Thorium 228	14274-82-9	1.22	0.22	0.32			GAM
Thorium 232	TH-232	0.562	0.23	0.29			GAM
Uranium 235	15117-96-1	7.39	0.68	0.98			GAM
Uranium 238	U-238	230	11	9.9			GAM
Americium 241	14596-10-2	14.4	0.43	0.67			GAM

200-LW-1/LW-2 Characterization-Soil

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/25/04</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2694

7080-003

B19HY8

DATA SHEET

SDG <u>7080</u>	Client/Case no <u>Hanford</u>	SDG <u>H2704</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408244-03</u>	Client sample id <u>B19HY8</u>	
Dept sample id <u>7080-003</u>	Location/Matrix <u>216-S-20; 32.5'-35'</u>	<u>SOLID</u>
Received <u>08/27/04</u>	Collected/Weight <u>08/18/04 11:25</u>	<u>406.7 g</u>
% solids <u>93.4</u>	Custody/SAF No <u>F03-025-170</u>	<u>F03-025</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Uranium (ug/g)	7440-61-1	818	100	<u>3.6</u>	1.0		U_T
Uranium 233/234	U-233/234	236	17	<u>1.1</u>	1.0		U
Uranium 235	15117-96-1	26.4	2.4	0.19	1.0		U
Uranium 238	U-238	236	17	1.0	1.0		U
Neptunium 237	13994-20-2	0.080	0.16	0.24	1.0	U	NP
Plutonium 238	13981-16-3	1.40	0.60	0.45	1.0		PU
Plutonium 239/240	PU-239/240	40.1	5.3	0.45	1.0		PU
Americium 241	14596-10-2	12.3	1.3	0.17	1.0		AM
Potassium 40	13966-00-2	8.87	0.37	0.23			GAM
Cobalt 60	10198-40-0	0.981	0.042	0.029	0.050		GAM
Antimony 125	14234-35-6	U		0.44		U	GAM
Cesium 134	13967-70-9	U		0.053		U	GAM
Cesium 137	10045-97-3	352	0.40	<u>0.13</u>	0.10		GAM
Radium 226	13982-63-3	0.432	0.15	<u>0.20</u>	0.10		GAM
Radium 228	15262-20-1	0.603	0.12	0.14	0.20		GAM
Europium 152	14683-23-9	U		<u>0.44</u>	0.10	U	GAM
Europium 154	15585-10-1	0.288	0.099	0.10	0.10		GAM
Europium 155	14391-16-3	U		<u>0.40</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.903	0.15	0.22			GAM
Thorium 232	TH-232	0.603	0.12	0.14			GAM
Uranium 235	15117-96-1	5.69	0.45	0.66			GAM
Uranium 238	U-238	210	6.6	5.2			GAM
Americium 241	14596-10-2	12.9	0.29	0.43			GAM

200-LW-1/LW-2 Characterization-Soil

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Lab id <u>EBRLNE</u>
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Form <u>DVP-DS</u>
Version <u>3.06</u>
Report date <u>10/25/04</u>

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2704 was composed of three soil samples designated under SAF No. F03-025 with a Project Designation of: 200-LW-1/LW-2 Characterization - Soil.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklists.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The RPD between sample B191J2 and the sample duplicate was 113%, greater than the 3σ limit of 42%. The difference between sample B191J2 and the sample duplicate was less than the RDL (400 pCi/L) for H3.

No other problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

The RPD between sample B191J2 and the sample duplicate was 133%, greater than the 3σ limit of 44%. The difference between sample B191J2 and the sample duplicate was less than the RDL (50 pCi/L) for C-14.

No other problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.9 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.10 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.11 Americium-241 Analyses

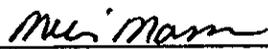
No problems were encountered during the course of the analyses.

2.12 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."



Melissa C. Mannion
Senior Program Manager

10/25/4

Date

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-025-114	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Wiberg/Tyra		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689		PROJECT COORDINATOR TRENT, SJ	
SAMPLING LOCATION <i>BL 5-20-04</i> 216-S-20; 82-0R-34.5R 29.5' - 32'		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		<i>H2699 (7080)</i> <i>H2694</i>		PRICE CODE 8N DATA TURNAROUND 45 Days / 45 Days	
ICE CHEST NO. <i>GRP-04-012</i>		FIELD LOGBOOK NO. HNF-N-356 1		119143E510 <i>10/25/14</i>		METHOD OF SHIPMENT Federal Express	
SHIPPED TO Eberline Services		OFFSITE PROPERTY NO. <i>See RSR-0006653</i>		BILL OF LADING/AIR BILL NO. <i>See RSR-0006653</i>			
MATRIX* A=Air DL=Drum L=Liquids DS=Drum S=Solids L=Liquid O=Oil S=Soil SE=Settlement T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION		Cool 4C	None		
		TYPE OF CONTAINER		gG	gG		
		NO. OF CONTAINER(S)		1	1		
		VOLUME		250ml	250ml		
SPECIAL HANDLING AND/OR STORAGE N/A		SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS		
SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME			
B191J2		SOIL	<i>8-18-14</i>	<i>1858</i>			
CHAIN OF POSSESSION		SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM <i>JSRP/ADP</i>		DATE/TIME <i>8-18-14 1200</i>	RECEIVED BY/STORED IN <i>Site Office - ADP</i>		DATE/TIME <i>8-18-14 1200</i>	(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413-1; (2) Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228} Technetium-99; Isotopic Thorium {Thorium-232} Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr; <i>IMP 8-4-14</i>	
RELINQUISHED BY/REMOVED FROM <i>Site Fridge</i>		DATE/TIME <i>8/24/14 840</i>	RECEIVED BY/STORED IN <i>Greg Thomas / Greg Thomas</i>		DATE/TIME <i>8/26/14 840</i>		
RELINQUISHED BY/REMOVED FROM <i>Greg Thomas / Greg Thomas</i>		DATE/TIME <i>8/26/14 1040</i>	RECEIVED BY/STORED IN <i>Fed Ex</i>		DATE/TIME		
RELINQUISHED BY/REMOVED FROM <i>Fed Ex</i>		DATE/TIME <i>8/27/14</i>	RECEIVED BY/STORED IN <i>Jim Dean</i>		DATE/TIME <i>8/27/14 11:30</i>		
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN		DATE/TIME		
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN		DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE				DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY				DATE/TIME	

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FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-025-115	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Wilberg/Tyra		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689		PROJECT COORDINATOR TRENT, SJ	
SAMPLING LOCATION 216-S-20; 35-0A-27.5E 32.5' - 35		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		H2699 (7080) HATROX mcm 10/25/14		PRICE CODE 8N DATA TURNAROUND 45 Days / 45 Days	
ICE CHEST NO. GRP-04-014		FIELD LOGBOOK NO. HNF-N-356 1		119143ES10		METHOD OF SHIPMENT Federal Express	
SHIPPED TO Eberline Services		OFFSITE PROPERTY NO. See PTR-14015		BILL OF LADING/AIR BILL NO. See PTR 14015			
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A		PRESERVATION Cool 4C None				
			TYPE OF CONTAINER aG aG				
			NO. OF CONTAINER(S) 1 1				
			VOLUME 250ml 250ml				
	SPECIAL HANDLING AND/OR STORAGE N/A		SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	
SAMPLE NO.		MATRIX*		SAMPLE DATE		SAMPLE TIME	
B191J4		SOIL		8/18/04		1125	
CHAIN OF POSSESSION				SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
SITE FRIG		8/18/04 1200		SITE FRIG		8/18/04 1200	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
SITE FRIG		8/24/04 0920		R. PFISTER/Rad/M		8/24/04 0920	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
R. PFISTER/Rad/M		8/24/04 1500		MO-026 FRIG		8/24/04 1500	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
MO-026 FRIG #1		8/24/04 1230		GREG THOMAS/Reg/Thoms		8/26/04 1230	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
GREG THOMAS/Reg/Thoms		8/26/04 1230		Fed Ex			
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
Fed Ex		8/27/04		J. Trent		8/27/04 11:45	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
LABORATORY SECTION		RECEIVED BY		TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD		DISPOSED BY		DATE/TIME	

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SMIS-4-04
 (1) Chromium Hex - 7196; NO2/NOS - 959.2; Sulfoxides - 9030; Oil & Grease - 413-1;
 (2) Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228} Technetium-99;
 Isotopic Thorium {Thorium-232} Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr;

Tie to Radiological Screen B191H3

COLLECTOR Pope/Pfister/Hughes/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE BN	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-S-20; 250ft-37-5ft 32.5' - 35' 18" E-10-04	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. GRP-04-014	FIELD LOGBOOK NO. HNF-N-356-1	FIELD LOGBOOK NO. H2694 (7080) H-8704 COA MUM 119143ES10 12/25/4	METHOD OF SHIPMENT Federal Express		

SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. See PTR-14015	BILL OF LADING/AIR BILL NO. See PTR-14015
--	--	---

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
			TYPE OF CONTAINER	gG*	gG	gG	gG*	gG	gG	gG	gG
			NO. OF CONTAINER(S)	3	1	1	3	1	1	1	1
			VOLUME	40mL	120mL	120mL	40mL	120mL	250mL	500mL	500mL
		SAMPLE ANALYSIS	VOA - 8260A (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	PCB - 8002	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS	
	SPECIAL HANDLING AND/OR STORAGE N/A Tie to Radiological Screen 319142										

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
B19HY8	SOIL	8/18/04	1125							X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM SSA/K/ASW	DATE/TIME 8-18-04 1200	RECEIVED BY/STORED IN SPE FRIE - RMA
RELINQUISHED BY/REMOVED FROM SITE FRK S-20	DATE/TIME 8/24/04 0920	RECEIVED BY/STORED IN R.PFISTER/Pulley
RELINQUISHED BY/REMOVED FROM R.PFISTER/ASW	DATE/TIME 8/24/04 1500	RECEIVED BY/STORED IN mo.026 FRK #1
RELINQUISHED BY/REMOVED FROM MO-026 Frig #1	DATE/TIME 8/26/04 1230	RECEIVED BY/STORED IN Greg Thomas Aug Thomas
RELINQUISHED BY/REMOVED FROM Greg Thomas Aug Thomas	DATE/TIME 8/26/04 1730	RECEIVED BY/STORED IN Fed Ex
RELINQUISHED BY/REMOVED FROM Fed Ex	DATE/TIME 8/27/04 1145	RECEIVED BY/STORED IN Fed Ex
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

(1)Semi-VOA - 8270A (TCL) (Phenol) Semi-VOA -- 8270A (Add-On) (Tributyl phosphate)
 (2)TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range) TPH-Gasoline Range - WTPH-G;
 (3)Alcohols, Glycols, & Ketones - 8015 (1-Butanol, Ethylene glycol)
 (4)ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) ICP Metals - 6010A (Supertrace Add-On) (Antimony, Beryllium, Bismuth, Copper, Nickel) Mercury - 7471 - (CV);
 (5)IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045;
 (6)Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Gamma Spec - Add-on (Antimony-125, Cesium-134) Isotopic Plutonium; Isotopic Uranium; Americium-241; Neptunium-237; Total Uranium;

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

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Appendix 5

Data Validation Supporting Documentation

**APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-LW-1/LW-2		DATA PACKAGE: #2704		
VALIDATOR:	TLI	LAB:	EB	DATE:	
			SDG:	#2704	
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tridium	C-14	H-6	
SAMPLES/MATRIX					
	B191J2	B191J4	B19HY8		
					soil

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) N/A

Instruments/detectors calibrated? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E)

N/A

Calibration checked within required frequency? Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E)

N/A

Background Counts checked within required frequency? Yes No N/A

Background Counts acceptable? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

5. Blanks (Levels B, C, D, E) N/A

Method blank analyzed within required frequency? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? Yes No N/A *skipped*

Field blank results acceptable? Yes No N/A

Analytes detected in field blank(s)? Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: NO FB

nt-63, Strontium, Thorium-232, eU's MDA's high

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) N/A

LCS /BSS analyzed within required frequency? Yes No N/A

LCS/BSS recoveries acceptable? Yes No N/A

LCS/BSS traceable? (Levels D,E) Yes No N/A

LCS/BSS expired? (Levels D,E) Yes No N/A

LCS/BSS levels correct? (Levels D,E) Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: NO th228 or th232 LCS - I ell

(spec)

7. Chemical Carrier Recovery (Levels C, D, E) N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? (Levels D, E) Yes No N/A

Chemical carrier expired? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) N/A

Tracer added? Yes No N/A

Tracer recovery acceptable? Yes No N/A

Tracer traceable? (Levels D, E) Yes No N/A

Tracer expired? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike source traceable? (Levels D, E) Yes No N/A

Spike source expired? Levels D, E) Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: Use tracer yield per VSR

10. Duplicates (Levels C, D, E)..... N/A

Duplicates Analyzed at required frequency?..... Yes No N/A

RPD Values Acceptable?..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes No N/A

Comments: th 228-6870 - J all (espec)
k-40-4670 - J ~~all~~ J2+J4
3/1/14

11. Field QC Samples (Levels C, D E)..... N/A

Field duplicate sample(s) analyzed?..... Yes No N/A

Field duplicate RPD values acceptable?..... Yes No N/A

Field split sample(s) analyzed?..... Yes No N/A

Field split RPD values acceptable?..... Yes No N/A

Performance audit sample(s) analyzed?..... Yes No N/A

Performance audit sample results acceptable?..... Yes No N/A

Comments: PO FD

12. Holding Times (All levels)

Are sample holding times acceptable?..... Yes No N/A

Comments: _____

13. Results and Detection Limits (All Levels)..... N/A

Results reported for all required sample analyses?..... Yes No N/A

Results supported in raw data?(Levels D, E)..... Yes No N/A

Results Acceptable? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E)..... Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: 7 over

Appendix 6

Additional Documentation Requested by Client

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2694

7080-005

Method Blank

METHOD BLANK

SDG <u>7080</u>	Client/Case no <u>Hanford</u>	SDG <u>H2704</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408244-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7080-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-025</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	3.80	6.1	7.1	400	U	H
Carbon 14	14762-75-5	-0.462	3.3	5.6	50	U	C
Nickel 63	13981-37-8	78.0	100	<u>170</u>	30	U	NI_L
Total Strontium	SR-RAD	-7.59	26	<u>44</u>	1.0	U	SR
Technetium 99	14133-76-7	-0.819	2.6	6.2	15	U	TC
Thorium 228	14274-82-9	0	3.1	<u>12</u>	1.0	U	TH
Thorium 230	14269-63-7	0	9.3	<u>12</u>	1.0	U	TH
Thorium 232	TH-232	-1.55	3.1	<u>12</u>	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.015	0.036	1.0	U	U_T
Uranium 233/234	U-233/234	0.019	0.038	0.14	1.0	U	U
Uranium 235	15117-96-1	0	0.046	0.17	1.0	U	U
Uranium 238	U-238	0.019	0.038	0.14	1.0	U	U
Neptunium 237	13994-20-2	0	0.12	0.18	1.0	U	NP
Plutonium 238	13981-16-3	0	0.090	0.34	1.0	U	PU
Plutonium 239/240	PU-239/240	0.090	0.090	0.34	1.0	U	PU
Americium 241	14596-10-2	0.095	0.13	0.24	1.0	U	AM
Potassium 40	13966-00-2	U		4.2		U	GAM
Cobalt 60	10198-40-0	U		<u>0.43</u>	0.050	U	GAM
Antimony 125	14234-35-6	U		0.83		U	GAM
Cesium 134	13967-70-9	U		0.46		U	GAM
Cesium 137	10045-97-3	U		<u>0.38</u>	0.10	U	GAM
Radium 226	13982-63-3	U		<u>0.70</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>1.5</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.93</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>1.2</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.58</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.47		U	GAM
Thorium 232	TH-232	U		1.5		U	GAM
Uranium 235	15117-96-1	U		1.1		U	GAM

200-LW-1/LW-2 Characterization-Soil

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

Page 9

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/25/04</u>

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EBERLINE SERVICES / RICHMOND
 SAMPLE DELIVERY GROUP H2694

7080-005

Method Blank

BLANK, cont.

SDG <u>7080</u>	Client/Case no <u>Hanford</u>	SDG <u>H2704</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408244-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7080-005</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>F03-025</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 238	U-238	U		46		U	GAM
Americium 241	14596-10-2	U		0.33		U	GAM

200-LW-1/LW-2 Characterization-Soil

QC-BLANK 48945

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/25/04</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2694

7080-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7080</u>	Client/Case no <u>Hanford</u>	<u>SDG H2704</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408244-04</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7080-004</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-025</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	3110	37	12	400	H	3020	120	103	83-117	80-120
Carbon 14	6290	130	25	50	C	6380	260	99	84-116	80-120
Nickel 63	27400	480	<u>180</u>	30	NI_L	27200	1100	101	84-116	80-120
Total Strontium	2410	99	<u>43</u>	1.0	SR	2240	90	108	82-118	80-120
Technetium 99	1710	43	5.8	15	TC	1710	68	100	83-117	80-120
Thorium 230	2320	210	<u>12</u>	1.0	TH	2320	93	100	83-117	80-120
Total Uranium (ug/g)	400	46	0.36	1.0	U_T	362	14	110	75-125	80-120
Uranium 233/234	18.8	1.7	0.75	1.0	U	19.3	0.77	97	84-116	80-120
Uranium 235	15.0	1.4	0.16	1.0	U	15.7	0.63	96	84-116	80-120
Uranium 238	20.3	1.8	0.72	1.0	U	21.0	0.84	97	84-116	80-120
Neptunium 237	20.0	1.9	0.13	1.0	NP	21.8	0.87	92	84-116	80-120
Plutonium 238	29.0	3.7	0.37	1.0	PU	26.6	1.1	109	77-123	80-120
Plutonium 239/240	29.7	3.8	0.37	1.0	PU	29.0	1.2	102	78-122	80-120
Americium 241	20.9	2.1	0.22	1.0	AM	20.8	0.83	100	82-118	80-120
Cobalt 60	47.4	1.4	<u>0.59</u>	0.050	GAM	55.9	2.2	85	80-120	80-120
Cesium 137	46.5	1.2	<u>0.85</u>	0.10	GAM	54.0	2.2	86	79-121	80-120

200-LW-1/LW-2 Characterization-Soil

QC-LCS 48944

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>10/25/04</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2694

7080-006

B191J2

DUPLICATE

SDG <u>7080</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R408244-06</u> Dept sample id <u>7080-006</u> % solids <u>91.5</u>	ORIGINAL Lab sample id <u>R408244-01</u> Dept sample id <u>7080-001</u> Received <u>08/27/04</u> % solids <u>91.5</u>	Client/Case no <u>Hanford</u> SDG <u>H2704</u> Contract No. <u>630</u> Client sample id <u>B191J2</u> Location/Matrix <u>216-S-20; 29.5'-32'</u> <u>SOLID</u> Collected/Weight <u>08/18/04 08:58</u> <u>332.9 g</u> Custody/SAF No <u>F03-025-114</u> <u>F03-025</u>
--	---	---

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Tritium	17.5	5.9	9.0	400		H	63.1	7.0	6.9		113	42	
Carbon 14	7.17	3.3	5.2	50		C	35.6	3.8	4.5		133	44	
Nickel 63	4480	210	170	30		NI_L	4580	220	180		2	23	
Total Strontium	93400	650	48	1.0		SR	96300	940	71		3	21	
Technetium 99	6.53	3.0	7.2	15	U	TC	9.18	3.5	7.9		34	91	
Thorium 228	7.86	7.9	10	1.0	U	TH	15.9	9.6	12		68	157	
Thorium 230	5.21	10	17	1.0	U	TH	7.89	9.5	12	U	-	-	
Thorium 232	1.30	2.6	10	1.0	U	TH	1.58	3.2	12	U	-	-	
Potassium 40	13.4	5.7	6.3			GAM	U		8.4	U	46	143	
Cobalt 60	96.4	1.5	1.2	0.050		GAM	104	2.8	2.3		8	32	
Antimony 125	U		24		U	GAM	U		50	U	-	-	
Cesium 134	U		5.0		U	GAM	U		5.6	U	-	-	
Cesium 137	104000	0	8.2	0.10		GAM	95600	40	13		8	32	
Radium 226	U		9.4	0.10	U	GAM	U		18	U	-	-	
Radium 228	U		11	0.20	U	GAM	U		13	U	-	-	
Europium 152	U		21	0.10	U	GAM	U		42	U	-	-	
Europium 154	89.3	7.1	7.4	0.10		GAM	70.8	5.8	6.1		23	36	
Europium 155	U		25	0.10	U	GAM	U		19	U	-	-	
Thorium 228	U		8.0		U	GAM	U		17	U	-	-	
Thorium 232	U		11		U	GAM	U		13	U	-	-	
Uranium 235	U		17		U	GAM	U		34	U	-	-	
Uranium 238	U		310		U	GAM	U		3100	U	-	-	
Americium 241	5580	18	22			GAM	5800	15	15		4	32	

200-LW-1/LW-2 Characterization-Soil

QC-DUP#1 48946

DUPLICATES
Page 1
SUMMARY DATA SECTION
Page 12

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DUP
 Version 3.06
 Report date 10/25/04

000031

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2694

7080-007

B19HY8

DUPLICATE

SDG <u>7080</u>	Client/Case no <u>Hanford</u>	SDG <u>H2704</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R408244-07</u>	Lab sample id <u>R408244-03</u>	Client sample id <u>B19HY8</u>
Dept sample id <u>7080-007</u>	Dept sample id <u>7080-003</u>	Location/Matrix <u>216-S-20; 32.5'-35'</u> SOLID
	Received <u>08/27/04</u>	Collected/Weight <u>08/18/04 11:25</u> <u>406.7 g</u>
% solids <u>93.4</u>	% solids <u>93.4</u>	Custody/SAF No <u>F03-025-170</u> <u>F03-025</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Total Uranium (ug/g)	843	110	<u>3.6</u>	1.0		U_T	818	100	<u>3.6</u>		3	33	
Uranium 233/234	227	15	1.0	1.0		U	236	17	<u>1.1</u>		4	18	
Uranium 235	27.4	2.3	0.17	1.0		U	26.4	2.4	0.19		4	21	
Uranium 238	225	15	1.0	1.0		U	236	17	1.0		5	18	
Neptunium 237	0.126	0.13	0.19	1.0	U	NP	0.080	0.16	0.24	U	-		
Plutonium 238	1.22	0.52	0.39	1.0		PU	1.40	0.60	0.45		14	92	
Plutonium 239/240	42.3	5.3	0.39	1.0		PU	40.1	5.3	0.45		5	29	
Americium 241	12.2	1.2	0.16	1.0		AM	12.3	1.3	0.17		1	24	

200-LW-1/LW-2 Characterization-Soil

QC-DUP#3 48947

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>10/25/04</u>

000032

00000119

Date: 24 March 2005
 To: Fluor Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 200-LW-1/LW-2 Characterization - Soil
 Subject: Wet Chemistry - Data Package No. H2704



INTRODUCTION

This memo presents the results of data validation on Data Package No. H2704 prepared by Lionville Laboratory, Inc. (LLI). 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
B191J4	8/18/04	Soil	C	See note 2 & 3
B19HY8	8/18/04	Soil	C	See note 1 & 3

- 1 - Chromium VI by 7196A, nitrate/nitrite by 353.1, oil & grease by 9071A and total sulfide by (9030).
- 2 - Anions by 300.0, pH by 9045C, ammonia by 350.1 and cyanide by 9010A.
- 3 - Nitrate, nitrite and phosphate not validated or reported per FHI..

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66, Draft A, Redline, May 2002). 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 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 chromium VI; 28 days for ammonia, nitrate/nitrite, oil & grease, chloride, fluoride and sulfate; 14 days for cyanide; 7 days for sulfide; and immediate (24 hours) for pH.

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

000001

"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".

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".

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

All other 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

Matrix spike (MS) 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, all oil & grease results were qualified as estimates and flagged "J".

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All other matrix spike recovery results were acceptable.

Laboratory Control Sample

The LCS is used to monitor the overall performance of all steps in the analysis. Recoveries must fall within the range of 80% to 120% for LCS analysis. Samples with a recovery of less than 50% are rejected and flagged "UR". Samples with a recovery of 50% to 79% and a sample recovery below the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All LCS 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 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.

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

All other 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 required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. The oil & grease, sulfide and ammonia results in all samples were reported above the RTQL. Under the FHI statement of work, no qualification is required. All other results met the RTQL.

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- **Completeness**

Data package No. H2704 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 88%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J". Due to the holding time being exceeded by less than twice the limit, all sulfide results were qualified as estimates and flagged "J". Due to the lack of a matrix spike, all oil & grease results were qualified as estimates and flagged "J". Due to the lack of a duplicate 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.

The oil & grease, sulfide and ammonia results in all samples were reported above the RTQL. 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-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

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).

000006

Appendix 2

Summary of Data Qualification

000007

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H2704	REVIEWER: TLI	DATE: 3/24/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH Sulfide	J	All	Holding time
Oil & grease	J	All	No matrix spike or duplicate analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: FLUOR-HANFORD							
Laboratory: LLI							
Case		SDG: H2704					
Sample Number		B191J4		B19HY8			
Remarks							
Location							
Sample Date		8/18/04		8/18/04			
Wet Chemistry	RTQL	Result	Q	Result	Q	Result	Q
Chloride	2	NA		16.7			
Fluoride	5	NA		1.1	U		
Cyanide	0.5	NA		0.33	U		
Sulfate	5	NA		4.8			
Ammonia	0.5	NA		5.1	U		
pH**		NA		9.3	J		
Chromium VI	0.5	1.3	NA				
Nitrate/nitrite		2.0	NA				
Oil & Grease	200	717	UJ	NA			
Sulfide	5	41.9	UJ	NA			
** - Units are pH units							
NA - Not analyzed							

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/28/04

CLIENT: TNUHANFORD F03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B191J4	% Solids	93.0	%	0.01	1.0
		Chromium VI	1.3	MG/KG	0.22	1.0
		Nitrate Nitrite	2.0	MG/KG	0.08	1.0
		Oil & Grease Gravimetri	717	uJ MG/KG	717	1.0
		Sulfide	41.9	uJ MG/KG	41.9	1.0
-002	B19HY8	% Solids	94.2	%	0.01	1.0
		Chloride by IC	16.7	MG/KG	1.1	1.0
		Fluoride by IC	1.1	u MG/KG	1.1	1.0
		Nitrate by IC	1.05	u MG/KG	1.05	1.0
		Nitrate by IC	0.50	MG/KG	1.05	1.0
		Cyanide, Total	0.33	u MG/KG	0.33	1.0
		Phosphate by IC	1.1	u MG/KG	1.1	1.0
		Sulfate by IC	4.8	MG/KG	1.1	1.0
		Ammonia, as N	5.1	u MG/KG	5.1	1.0
		pH	9.3	J SOIL PH	0.01	1.0

KJH
KJH

12
3/18/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



Analytical Report

Client: TNU-HANFORD F03-025 H2704
LVL#: 0408L475

W.O.#: 11343-606-001-9999-00
Date Received: 08-27-04

INORGANIC NARRATIVE

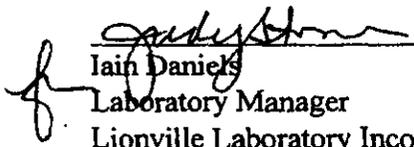
1. This narrative covers the analyses of 2 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met with the exception of Sulfide that was received past hold.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy with the exception of Sulfide as noted on the Sample Receipt Checklist.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Sulfide and Ammonia were within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries for Chromium VI, Nitrate Nitrite, Sulfide, Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Phosphate, Sulfate and Ammonia were within the 75-125% control limits.
8. The replicate analyses for Chromium VI, Nitrate Nitrite, Sulfide, Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Phosphate, Ammonia and pH were within the 20% RPD control limit, however replicate analysis for Sulfate was outside the control limit at 26.4% that may be attributed to sample inhomogeneity.

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

000013

03

9. The matrix quality control analyses associated with this LvLI batch for Oil and Grease are found in LvLI batch 0409L691.
10. Results for solid samples are reported on a dry weight basis.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/4/09
Date

njpl08-475



000014

00000090

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-115	PAGE 1 OF 1	
COLLECTOR Pope/Pfister/Wiberg/Tyra		COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days	
SAMPLING LOCATION 216-S-20; 26-09-27.5R 22.5' - 35'		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY <input type="checkbox"/>		
ICE CHEST NO. GRP-04-015		FIELD LOGBOOK NO. HNF-N-356 1	COA 119143E510	METHOD OF SHIPMENT Federal Express			
SHIPPED TO Eberline School		OFFSITE PROPERTY NO. See PTR - 14017		BILL OF LADING/AIR BILL NO. See PTR - 14017			
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION Cool AC None	TYPE OF CONTAINER gG gG	NO. OF CONTAINER(S) 1 1	VOLUME 250ml 250ml	SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS SEE ITEM (2) IN SPECIAL INSTRUCTIONS	
	SPECIAL HANDLING AND/OR STORAGE N/A - TC to Radiological Screen B191H3						

000015

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM R. PFISTER/Relief 5-20	DATE/TIME 8/18/04 1200	RECEIVED BY/STORED IN SITE FRIG 5-20
RELINQUISHED BY/REMOVED FROM SITE FRIG	DATE/TIME 8/24/04 0920	RECEIVED BY/STORED IN R. PFISTER/Relief
RELINQUISHED BY/REMOVED FROM R. PFISTER/Relief	DATE/TIME 8/24/04 1500	RECEIVED BY/STORED IN MO-026 FRIG #1
RELINQUISHED BY/REMOVED FROM MO-026 Frig #1	DATE/TIME 8/26/04 1320	RECEIVED BY/STORED IN Greg Thomas / Greg Thomas
RELINQUISHED BY/REMOVED FROM Greg Thomas / Greg Thomas	DATE/TIME 8/28/04/1320	RECEIVED BY/STORED IN Fed Ex
RELINQUISHED BY/REMOVED FROM Fed Ex	DATE/TIME 8-27-04/0930	RECEIVED BY/STORED IN J. Nichols
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1;
 (2) Nickel-63; Gamma Spec - Radium (Radium-226, Radium-228); Technetium-99;
 Isotopic Thorium (Thorium-232); Tritium-3; Carbon-14; Strontium-89,90 - Total
 Sc.

JM
8-24-04

00000100

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							F03-025-170		PAGE 1 OF 1	
COLLECTOR Pope/Pfister/Hughes/Wiberg		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689			PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N		DATA TURNAROUND 45 Days / 45 Days	
SAMPLING LOCATION 216-S-20; 89-01-97.5ft 32.5' - 35' 48-8-10-04		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil				SAF NO. F03-025		AIR QUALITY <input type="checkbox"/>				
ICE CHEST NO. ARP-04-015		FIELD LOGBOOK NO. HNF-N-356 1		COA 119143ES10		METHOD OF SHIPMENT Federal Express						
SHIPPED TO Papa		OFFSITE PROPERTY NO. See PTR-14017			BILL OF LADING/AIR BILL NO. See PTR-14017							
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
		TYPE OF CONTAINER		gG*	gG	gG	gG*	gG	gG	gG	gG	gG
		NO. OF CONTAINER(S)		3	1	1	3	1	1	1	1	1
		VOLUME		40mL	120mL	120mL	40mL	120mL	250mL	500mL	500mL	500mL
SPECIAL HANDLING AND/OR STORAGE N/A Tie to Radiologist Screen B191H3		SAMPLE ANALYSIS		VOA - 8280A (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	PCOB - 8082;	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19HY8	SOIL	8/18/04	1125	X	X	X	X	X	X	X		
CHAIN OF POSSESSION		SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS						
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met. The lab is to analyze pH within 24 hours of sample receipt, and, report kerosene range organics from the WTPH-D analysis. (1)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA - 8270A (Add-On) {Tributyl phosphate} (2)TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; (3)Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol} (4)ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver} ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Copper, Nickel} Mercury - 7471 - (CV); (5)IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate} Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; (6)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154,				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME						
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME						
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME						
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME						
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME						
LABORATORY SECTION	RECEIVED BY					TITLE		DATE/TIME				
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD					DISPOSED BY		DATE/TIME				

000016

0000101

PTR 8-1-04

Appendix 5

Data Validation Supporting Documentation

000017

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-LW-1/LW-2		DATA PACKAGE: H2704		
VALIDATOR:	TLI	LAB:	LLI	DATE: 3/18/05	
			SDG:	H2704	
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO₂/NO₃
Sulfate	TDS	TKN	Phosphate	Sulfide	Expend
Cyanide					5/10/05
SAMPLES/MATRIX					
B191J4 B19HVV					
- not validity nitrate, nitrate or phosphate per #H/					
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 ANALYSIS DATA VALIDATION CHECKLIST

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 F \oplus

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: MS - oil + grease - no MS J all

NO PAR

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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: No oil + Green dup - J all

6. HOLDING TIMES (all levels)

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

Comments: pH - over 2x - J all
sulfide - less than 2x - J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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: ammens on
oil + grease - on
Subside - on

Appendix 6

Additional Documentation Requested by Client

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/28/04

CLIENT: TNUHANFORD F03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408LA75

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	04LVI028-MB1	Chromium VI	0.20	u MG/KG	0.20	1.0
BLANK10	04LN3054-MB1	Nitrate Nitrite	0.08	u MG/KG	0.08	1.0
BLANK10	04LOG024-MB1	Oil & Grease Gravimetri	667	u MG/KG	667	1.0
BLANK10	04LSD047-MB1	Sulfide	40.0	u MG/KG	40.0	1.0
BLANK10	04LICB53-MB1	Chloride by IC	1.2	u MG/KG	1.2	1.0
		Fluoride by IC	1.2	u MG/KG	1.2	1.0
		Nitrite by IC	1.25	u MG/KG	1.25	1.0
		Nitrate by IC	1.25	u MG/KG	1.25	1.0
		Phosphate by IC	1.2	u MG/KG	1.2	1.0
		Sulfate by IC	1.2	u MG/KG	1.2	1.0
BLANK1	04LC064-MB1	Cyanide, Total	0.50	u MG/KG	0.50	1.0
BLANK10	04LAM026-MB1	Ammonia, as N	5.0	u MG/KG	5.0	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/28/04

CLIENT: TNUHANFORD F03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B191J4	Soluble Chromium VI	5.6	1.3	4.3	100.5	1.0
		Insoluble Chromium VI	1360	1.3	1320	103.0	100
		Nitrate Nitrite	4.0	2.0	2.1	95.6	1.0
		Sulfide	354	8.4	418	82.7	1.0
-002	B19HY8	Chloride by IC	62.8	16.7	41.6	110.8	2.0
		Fluoride by IC	43.5	0.06	41.6	104.4	2.0
		Nitrite by IC	44.5	1.05u	41.6	107.0	2.0
		Nitrate by IC	54.5	8.50	41.6	110.5	2.0
		Cyanide, Total	4.88	0.33u	4.90	99.7	1.0
		Phosphate by IC	44.9	1.1 u	41.6	107.9	2.0
		Sulfate by IC	53.3	4.8	41.6	116.3	2.0
		Ammonia, as N	212	5.1 u	216	98.0	1.0
BLANK10	04LVI028-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100	1.0
		Insoluble Chromium VI	1170	0.20u	1180	99.0	100
BLANK10	04LN3054-MB1	Nitrate Nitrite	2.0	0.08u	2.0	97.8	1.0
BLANK10	04LOG024-MB1	Oil & Grease Gravimetr	6000	667 u	6840	87.7	1.0
BLANK10	04LSD047-MB1	Sulfide	334	40.0 u	376	89.0	1.0
		Sulfide, MSD	326	40.0 u	376	86.8	1.0
BLANK10	04LICB53-MB1	Chloride by IC	23.7	1.2 u	25.0	94.8	1.0
		Fluoride by IC	24.0	1.2 u	25.0	95.8	1.0
		Nitrite by IC	25.1	1.25u	25.0	100.3	1.0
		Nitrate by IC	24.6	1.25u	25.0	98.6	1.0
		Phosphate by IC	24.4	1.2 u	25.0	97.6	1.0
		Sulfate by IC	24.5	1.2 u	25.0	98.2	1.0
BLANK10	04LAM026-MB1	Ammonia, as N	190	5.0 u	200	95.2	1.0
		Ammonia, as N MSD	182	5.0 u	200	91.2	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 09/28/04

CLIENT: TNUHANFORD F03-025 H2704
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	SPIKE#1	SPIKE#2	%DIFF
			%RECOV	%RECOV	
BLANK10	04LSD047-MB1	Sulfide	89.0	86.8	2.4
BLANK10	04LAM026-MB1	Ammonia, as N	95.2	91.2	4.3

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/28/04

CLIENT: TNUHANFORD F03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE RPD		
-001REP	B191J4	Chromium VI	1.3	1.2	4.9	1.0
		Nitrate Nitrite	2.0	1.9	4.6	1.0
		Sulfide	41.9 u	43.2 u	NC	1.0
-002REP	B19HY8	Chloride by IC	16.7	17.5	4.2	1.0
		Fluoride by IC	1.1 u	1.1 u	NC	1.0
		Nitrite, by IC	1.05u	1.07u	NC	1.0
		Nitrate by IC	8.50	8.70	2.3	1.0
		Cyanide, Total	0.33u	0.35u	NC	1.0
		Phosphate by IC	1.1 u	1.1 u	NC	1.0
		Sulfate by IC	4.8	6.3	26.4	1.0
		Ammonia, as N	5.1 u	5.6 u	NC	1.0
		pH	9.3	9.3	0.1	1.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/28/04

CLIENT: TNUHANFORD P03-025 H2704
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 04081A75

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	04LC064-LCS1	Cyanide, Total LCS	2.16	2.0	MG/KG	108.2
LCSS2	04LC064-LCS2	Cyanide, Total LCS	10.3	10.0	MG/KG	102.8

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Date: 24 March 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Inorganics - Data Package No. H2704



INTRODUCTION

This memo presents the results of data validation on Data Package No. H2704 prepared by Lionville Laboratory Inc. (LLI). 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
B19HY8	8/18/04	Soil	C	See note 1

1 - ICP by 6010B and mercury by 7471A.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66, Draft A, Redline, May 2002). 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**

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 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

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- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Matrix Spike Duplicate

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

Due to a matrix spike recovery outside QC limits (0%), all bismuth results were rejected and flagged "R".

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Due to a matrix spike recovery outside QC limits (57.1%), all chromium results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (40.7%), all antimony results were qualified as undetected and flagged "J".

All other MS/MSD results were acceptable.

Laboratory Control Sample

The LCS is used to monitor the overall performance of all steps in the analysis. Recoveries must fall within the range of 80% to 120% for LCS analysis. Samples with a recovery of less than 50% are rejected and flagged "UR". Samples with a recovery of 50% to 79% and a sample recovery below the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

Due to an LCS recovery outside QC limits (-0.30%), all bismuth results were rejected and flagged "R".

All other LCS results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

Due to a RPD outside QC limits (36.6%), all chromium results were qualified as estimates and flagged "J".

Due to a RPD outside QC limits (66.1%), all lead results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

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Field Duplicate

No field duplicate results were submitted for analysis.

- **Analytical Detection Limits**

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

- **Completeness**

Data package No. H2704 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 92%.

MAJOR DEFICIENCIES

Due to a matrix spike recovery outside QC limits (0%), all bismuth results were rejected and flagged "R". Due to an LCS recovery outside QC limits (-0.30%), all bismuth results were rejected and flagged "R". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to a matrix spike recovery outside QC limits (57.1%), all chromium results were qualified as estimates and flagged "J". Due to a matrix spike recovery outside QC limits (40.7%), all antimony results were qualified as undetected and flagged "J". Due to a RPD outside QC limits (36.6%), all chromium results were qualified as estimates and flagged "J". Due to a RPD outside QC limits (66.1%), all lead 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.

REFERENCES

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

DOE/RL-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

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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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METALS DATA QUALIFICATION SUMMARY*

SDG: H2704	REVIEWER: TLI	DATE: 3/24/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium Antimony	J	All	MS recovery
Chromium Lead	J	All	RPD
Bismuth	R	All	LCS & MS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: FLUOR HANFORD														
Laboratory: LLI														
Case	SDG: H2704													
Sample Number	B19HY8													
Remarks														
Sample Date	8/18/04													
Inorganics	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.5	0.28	U											
Arsenic	1	2.4												
Barium	20	133												
Beryllium	0.5	2.7												
Bismuth		1.5	UR											
Cadmium	0.5	0.09	U											
Chromium	1	22.6	J											
Copper	2.5	31.3												
Mercury	0.2	0.93												
Nickel	4	12.0												
Lead	1	15.3	J											
Antimony	1	1.2	J											
Selenium	10	1.2	U											

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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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/06/04

CLIENT: TNUHANFORD P03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B19HY8	Silver, Total	0.28 u	MG/KG	0.28	3.0
		Arsenic, Total	2.4	MG/KG	1.1	3.0
		Barium, Total	133	MG/KG	0.06	3.0
		Beryllium, Total	2.7	MG/KG	0.03	3.0
		Bismuth, Total	1.5	uR MG/KG	1.5	3.0
		Cadmium, Total	0.09 u	MG/KG	0.09	3.0
		Chromium, Total	22.6	J MG/KG	0.19	3.0
		Copper, Total	31.3	MG/KG	0.16	3.0
		Mercury, Total	0.93	MG/KG	0.02	1.0
		Nickel, Total	12.0	MG/KG	0.38	3.0
		Lead, Total	15.3	J MG/KG	0.60	3.0
		Antimony, Total	1.2	J MG/KG	0.95	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0

Handwritten:
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 3/18/05

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Analytical Report

Client: TNU-HANFORD F03-025
LVL#: 0408L475
SDG/SAF#: H2704/F03-025

W.O.#: 11343-606-001-9999-00
Date Received: 08-27-04

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 soil sample.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The sample was analyzed with a 3-fold dilution due to sample matrix.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LVL's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report. The LCS was not spiked with Bismuth.
10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits (including Bismuth which was not spiked). Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

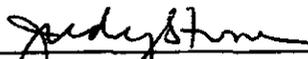
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

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<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
B19HY8	Bismuth	600	97.5
	Chromium	600	99.9
	Antimony	300	102.0

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



 Iain Daniels
 Laboratory Manager
 Lionville Laboratory Incorporated

10/8/04
 Date

jjw/m08-475



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FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F03-025-170		PAGE 1 OF 1		
COLLECTOR Pope/Pfister/Hughes/Wiberg		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689		PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N		DATA TURNAROUND 45 Days / 45 Days		
SAMPLING LOCATION 216-S-20; 89-0N-97-5R 32.5' - 35' 48" 8-18-04		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		AIR QUALITY <input type="checkbox"/>						
ICE CHEST NO. ARP-04-015		FIELD LOGBOOK NO. HNF-N-356 1		COA 119143ES10		METHOD OF SHIPMENT Federal Express						
SHIPPED TO Pope		OFFSITE PROPERTY NO. See PTR-14017				BILL OF LADING/AIR BILL NO. See PTR-14017						
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WT=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
		TYPE OF CONTAINER		aGs*	aG	aG	Gs*	aG	aG	aG	aG	
		NO. OF CONTAINER(S)		3	1	1	3	1	1	1	1	
		VOLUME		40mL	120mL	120mL	40mL	120mL	250mL	500mL	500mL	
SPECIAL HANDLING AND/OR STORAGE N/A Tr to Radiological Section B191H3		SAMPLE ANALYSIS		VOA - 820A (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	PCN - 8082	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19HY8	SOIL	8/18/04	1125	X	X	X	X	X	X	X		
CHAIN OF POSSESSION				SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS				
RELINQUISHED BY/REMOVED FROM J Spoke / AGP		DATE/TIME 8-18-04 1200		RECEIVED BY/STORED IN Mike Gidge		DATE/TIME 8-18-04 1200		FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met. The lab is to analyze pH within 24 hours of sample receipt, and. report kerosene range organics from the WTPH-D analysis. (1)Semi-VOA - 8270A (TCL) (Phenol) Semi-VOA -- 8270A (Add-On) (Tributyl phosphate) (2)TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range) TPH-Gasoline Range - WTPH-G; (3)Alcohols, Glycols, & Ketones - 8015 (1-Butanol, Ethylene glycol) (4)ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) ICP Metals - 6010A (Supertrace Add-On) (Antimony, Beryllium, Bismuth, Copper, Nickel) Mercury - 7471 - (CV); (5)IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; <i>mjs 8-18-04</i> (6)Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154,				
RELINQUISHED BY/REMOVED FROM SITE PRIG S-20		DATE/TIME 8/24/04 0926		RECEIVED BY/STORED IN R. PFISTER/Ralph		DATE/TIME 8/24/04 0920						
RELINQUISHED BY/REMOVED FROM R. PFISTER/Ralph		DATE/TIME 8/24/04 1500		RECEIVED BY/STORED IN MO-026 PRIG #1		DATE/TIME 8/24/04 1500						
RELINQUISHED BY/REMOVED FROM MO-026 FRIG #1		DATE/TIME 8/26/04 1320		RECEIVED BY/STORED IN Greg Thomas / Greg Thomas		DATE/TIME 8/26/04 1320						
RELINQUISHED BY/REMOVED FROM Greg Thomas / Greg Thomas		DATE/TIME 8/27/04 1030		RECEIVED BY/STORED IN Fed Ex		DATE/TIME 8/27/04 1030						
RELINQUISHED BY/REMOVED FROM Greg Thomas		DATE/TIME 8-27-04 1030		RECEIVED BY/STORED IN Wiberg		DATE/TIME 8-27-04 1030						
LABORATORY SECTION	RECEIVED BY	TITLE				DATE/TIME						
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY				DATE/TIME						

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TPH 8-V-24

Appendix 5

Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	260-LW-1/LW-2		DATA PACKAGE: H2704		
VALIDATOR:	TLI	LAB:	LIP	DATE: 3/18/05	
			SDG:	H2704	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
B19HY8					
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

ICP interference checks 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: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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)

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 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: Bismuth - 070 - R MS
Chromium - 5790 - J MS
Antimony - 40.770 - J MS
Bismuth - - 0.3070 - R LCS

NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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: Chromium - 36.4% J all
lead 66.1% J all

6. ICP QUALITY CONTROL (Levels D and E)

- ICP serial dilution samples analyzed? Yes No N/A
- ICP serial dilution %D values acceptable? Yes No N/A
- ICP post digestion spike required? Yes No N/A
- ICP post digestion spike values 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: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

- Duplicate injections performed as required? Yes No **N/A**
- Duplicate injection %RSD values acceptable? Yes No **N/A**
- Analytical spikes performed as required? Yes No **N/A**
- Analytical spike recoveries acceptable? Yes No **N/A**
- Standards traceable? Yes No **N/A**
- Standards expired? Yes No **N/A**
- MSA performed as required? Yes No **N/A**
- MSA results acceptable? Yes No **N/A**
- Transcription/calculation errors? Yes No **N/A**

Comments: _____

8. HOLDING TIMES (all levels)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. 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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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/06/04

CLIENT: TNUHANFORD F03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	04L0506-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	0.36 u	MG/KG	0.36	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Bismuth, Total	0.47 u	MG/KG	0.47	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.06 u	MG/KG	0.06	1.0
		Copper, Total	0.05 u	MG/KG	0.05	1.0
		Nickel, Total	0.12 u	MG/KG	0.12	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
		Antimony, Total	0.30 u	MG/KG	0.30	1.0
		Selenium, Total	0.40	MG/KG	0.39	1.0
BLANK1	04C0207-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/06/04

CLIENT: TNUHANFORD F03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	B19HY8	Silver, Total	3.5	0.28u	3.7	94.6	3.0
		Arsenic, Total	145	2.4	147	96.7	3.0
		Barium, Total	289	133	147	106.1	3.0
		Beryllium, Total	6.5	2.7	3.7	102.7	3.0
		Bismuth, Total	1.0 u	1.5 u	368	NC	3.0
		Cadmium, Total	3.7	0.09u	3.7	100	3.0
		Chromium, Total	31.0	22.6	14.7	57.1	3.0
		Copper, Total	48.5	31.3	18.4	93.5	3.0
		Mercury, Total	2.6	0.93	0.16	1053 *	3.0
		Nickel, Total	46.5	12.0	36.9	93.5	3.0
		Lead, Total	43.9	15.3	36.9	77.5	3.0
		Antimony, Total	16.2	1.2	36.9	40.7	3.0
		Selenium, Total	142	1.2 u	147	96.7	3.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/06/04

CLIENT: TNUHANFORD F03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-002REP	B19HY8	Silver, Total	0.28u	0.28u	NC	3.0
		Arsenic, Total	2.4	2.7	11.8	3.0
		Barium, Total	133	134	0.68	3.0
		Beryllium, Total	2.7	2.8	3.6	3.0
		Bismuth, Total	1.5 u	1.5 u	NC	3.0
		Cadmium, Total	0.09u	0.09u	NC	3.0
		Chromium, Total	22.6	15.6	36.6	3.0
		Copper, Total	31.3	30.3	3.2	3.0
		Mercury, Total	0.93	1.2	25.6	1.0
		Nickel, Total	12.0	10.1	17.2	3.0
		Lead, Total	15.3	7.7	66.1	3.0
		Antimony, Total	1.2	1.3	8.0	3.0
		Selenium, Total	1.2 u	1.2 u	NC	3.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/06/04

CLIENT: TNUHANFORD P03-025 H2704
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0408L475

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	04L0586-LC1	Silver, LCS	47.9	50.0	MG/KG	95.8
		Arsenic, LCS	968	1000	MG/KG	96.8
		Barium, LCS	493	500	MG/KG	98.7
		Beryllium, LCS	25.2	25.0	MG/KG	100.8
		Bismuth, LCS	-1.	500	MG/KG	-0.30
		Cadmium, LCS	24.3	25.0	MG/KG	97.2
		Chromium, LCS	50.5	50.0	MG/KG	101.0
		Copper, LCS	129	125	MG/KG	103.4
		Nickel, LCS	198	200	MG/KG	98.8
		Lead, LCS	246	250	MG/KG	98.3
		Antimony, LCS	283	300	MG/KG	94.3
		Selenium, LCS	931	1000	MG/KG	93.1
LCS1	04C0207-LC1	Mercury, LCS	6.1	6.2	MG/KG	98.2

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Date: 24 March 2005
 To: Fluor Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 200-LW-1/LW-2 Characterization - Soil
 Subject: Semivolatile - Data Package No. H2704



INTRODUCTION

This memo presents the results of data validation on Data Package No. H2704 prepared by Lionville Laboratory Inc.(LLI). 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
B19HY8	8/18/04	Soil	C	See note 1

1 -Semivolatiles by 8270 (phenol & tributylphosphate) and TPH-D (diesel and kerosene) and ethylene glycol by 8015B.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66, Draft A, Redline, May 2002). Appendices 1 through 5 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

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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".

All holding times were met.

- **Method 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. 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 CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike sample analyses are used to assess the analytical accuracy of the reported data. Matrix spike/matrix duplicate results 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 five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. 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 matrix spike/matrix spike duplicate and blank spike results were acceptable.

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Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to the lack of a surrogate analysis, all ethylene glycol results were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) 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. Samples 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 detected sample results are qualified as estimates and flagged "J". 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.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQL's) to ensure that laboratory detection levels meet the

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required criteria. All results exceeded the analyte specific RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2704 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 surrogate analysis, all ethylene 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.

All results exceeded the analyte specific RTQL. 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-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

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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 the 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 same 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 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 usable for decision-making purposes).

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Appendix 2

Summary of Data Qualification

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SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: H2704	REVIEWER: TLI	DATE: 3/24/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Ethylene glycol	J	All	No surrogate analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: FLUOR-HANFORD					
Laboratory: LLI					
Case:		SDG: H2704			
Sample Number		B19HY8			
Sample Date		8/18/04			
Semivolatile/8015B	RTQL	Result	Q	Result	Q
Phenol	330	350	U		
Tributyl phosphate	330	350	U		
Diesel Range Organics*	5	12.7	U		
Kerosene*	5	12.7	U		
Ethylene glycol*	5	5.50	UJ		
* - Units are mg/kg					

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Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

Report Date: 09/17/04 14:20

RFW Batch Number: 0408L475

Client: TNOHANFORD F03-025 H2704

Work Order: 11343606001

Page: 1a

	Cust ID:	B19HY8	B19HY8	B19HY8	SBLKWA	SBLKWA BS
Sample Information	RFW#:	002	002 MS	002 MSD	04LE1100-MB1	04LE1100-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
<hr/>						
Surrogate	Nitrobenzene-d5	84 %	75 %	57 %	87 %	85 %
Recovery	2-Fluorobiphenyl	75 %	74 %	56 %	79 %	81 %
	Terphenyl-d14	104 %	104 %	67 %	124 %	116 %
	Phenol-d5	81 %	76 %	62 %	86 %	81 %
	2-Fluorophenol	73 %	69 %	59 %	81 %	78 %
	2,4,6-Tribromophenol	69 %	76 %	65 %	11 * %	39 %
<hr/>						
	-----fl-----fl-----fl-----fl-----fl-----fl-----fl-----					
	Phenol	350 U	76 %	62 %	330 U	77 %
	Tributylphosphate	350 U	350 U	350 U	330 U	330 U

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3/18/05

*= Outside of EPA CLP QC limits.

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Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 10/08/04 13:17

RFW Batch Number: 0408L475

Client: TNUHANFORD F03-025 H2704 Work Order: 11343606001 Page: 1

	Cust ID:	B19HY8	B19HY8	B19HY8	BLK	BLK BS
Sample Information	RFW#:	002	002 MS	002 MSD	04LE1099-MB1	04LE1099-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
	p-Terphenyl	89 %	113 %	117 %	114 %	124 %
		fl	fl	fl	fl	fl
Diesel Range Organics		12.7 U	80 %	79 %	12.0 U	91 %
Kerosene		12.7 U	12.7 U	12.7 U	12.0 U	12.0 U

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 3/18/05
 [Signature]

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

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Lionville Laboratory, Inc.

Nonhalogenated Volatiles by GC, Method 8015

Report Date: 10/08/04 12:09

RFW Batch Number: 04081475

Client:

RFW Batch Number: 04081475

Client: TNUHANFORD F03-025 H2704 Work Order: 11343606001 Page: 1

Sample Information	Cust ID:	B19HY8	B19HY8	B19HY8	BLK	BLK BS	BLK BSD
	RFW#:	002	002 MS	002 MSD	04GCK033-MB1	04GCK033-MB1	04GCK033-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ethylene Glycol		5.50 U	101 %	82 %	5.00 U	105 %	115 %

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3/18/05

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U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Client: TNU HANFORD F03-025
LVL#: 0408L475
SDG/SAF#: H2704/F03-025

W.O.#: 11343-606-001-9999-00
Date Received: 08-27-2004

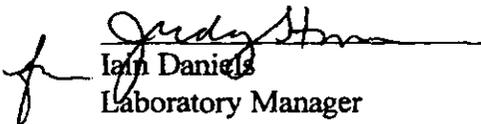
SEMIVOLATILE

One (1) soil sample was collected on 08-18-2004.

The sample and its associated QC samples were extracted according to Lionville Laboratory SOPs based on method 3540C on 08-30-2004 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 09-10,16-2004.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The sample was extracted and analyzed within required holding time.
3. One (1) of thirty (30) surrogate recoveries was outside acceptance criteria. However, CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).
4. The matrix spike recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. Internal standard area criteria were not met for sample B19HY8 MSD. The analysis of associated sample fulfills the reanalysis requirement.
7. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
8. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/14/04
Date

som\group\data\bna\tnu-hanford\0408-475.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 11 pages.

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Analytical Report

Client: TNU-HANFORD F03-025
LVL #: 0408L475
SDG/SAF # H2704/F03-025

W.O. #: 11343-606-001-9999-00
Date Received: 08-27-2004

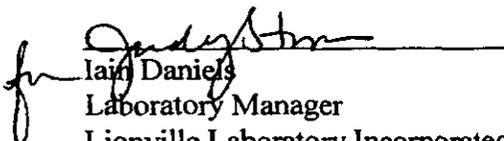
GC SCAN BY FID

One (1) soil sample was collected on 08-18-2004.

The sample and its associated QC samples were prepared on 08-28-2004 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures based on method 8015B (Microextraction-5g into 5mL of water) for Ethylene Glycol on 09-29-2004.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The sample was analyzed within required holding time.
3. The method blank was below the reporting limits for the target compound.
4. Surrogates are not currently employed in the methodology.
5. The blank spike recoveries were within acceptance criteria.
6. The matrix spike recoveries were within acceptance criteria.
7. All initial calibrations were within acceptance criteria.
8. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/14/04
Date

son:\group\data\gsc\0408-475.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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Analytical Report

Client: TNU-HANFORD F03-025
LVL #: 0408L475
SDG/SAF # H2704/F03-025

W.O. #: 11343-606-001-9999-00
Date Received: 08-27-2004

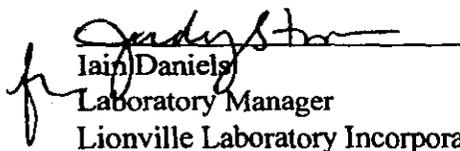
DIESEL RANGE ORGANICS

One (1) soil sample was collected on 08-18-2004.

The sample and its associated QC samples were extracted on 08-30-2004 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 09-30-2004. The extraction and analysis were based on method 8015B. The analysis met the intent of method WTPH-D.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LVL's sample acceptance policy.
2. The sample was analyzed within required holding time.
3. The method blank was below the reporting limits for the target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. The matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/14/04
Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						P03-025-170		PAGE 1 OF 1		
COLLECTOR Pope/Pfister/Hughes/Wiberg		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689		PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N		DATA TURNAROUND 45 Days / 45 Days		
SAMPLING LOCATION 216-S-20; 89.0N-97.5E 32.5' - 35' 48" 8-10-04		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. P03-025		METHOD OF SHIPMENT Federal Express		AIR QUALITY <input type="checkbox"/>		45 Days / 45 Days		
ICE CHEST NO. ARP-04-015		FIELD LOGBOOK NO. HNF-N-356 1		COA 119143E10		METHOD OF SHIPMENT Federal Express		BILL OF LADING/AIR BILL NO. see PTR-14017				
SHIPPED TO Pera		OFFSITE PROPERTY NO. see PTR-14017										
MATRIX* A=Air DL=Drum L=Liquid DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
		TYPE OF CONTAINER		aG*	aG	aG	G*	aG	aG	aG	aG	aG
		NO. OF CONTAINER(S)		3	1	1	3	1	1	1	1	1
		VOLUME		40mL	120mL	120mL	40mL	120mL	250mL	500mL	500mL	500mL
SPECIAL HANDLING AND/OR STORAGE NA Tr to Radiological Serena B191113		SAMPLE ANALYSIS		VOA - 8270A (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	PCBs - 8082	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19HY8	SOIL	8/18/04	1125	X	X	X	X	X	X	X		
CHAIN OF POSSESSION				SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS				
RELINQUISHED BY/REMOVED FROM JSP/12/12/04		DATE/TIME 8-18-04 1200		RECEIVED BY/STORED IN Mike Gilte		DATE/TIME 8-18-04 1200		FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met. The lab is to analyze pH within 24 hours of sample receipt, and, report kerosene range organics from the WTPH-D analysis. (1)Semi-VOA - 8270A (TCL) (Phenol) Semi-VOA - 8270A (Add-On) (Tributyl phosphate) (2)TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range) TPH-Gasoline Range - WTPH-G; (3)Alcohols, Glycols, & Ketones - 8015 (1-Butanol, Ethylene glycol) (4)ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) ICP Metals - 6010A (Supertrace Add-On) (Antimony, Beryllium, Bismuth, Copper, Nickel) Mercury - 7471 - (CV); (5)IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; (6)Gamma Spectroscopy (Caesium-137, Cobalt-60, Europium-152, Europium-154,				
RELINQUISHED BY/REMOVED FROM SITE PRIC 3-20		DATE/TIME 8/24/04 0920		RECEIVED BY/STORED IN R. PFISTER/RadLab		DATE/TIME 8/24/04 0920						
RELINQUISHED BY/REMOVED FROM R. PFISTER/RadLab		DATE/TIME 8/24/04 1500		RECEIVED BY/STORED IN MO-026 RPR/1		DATE/TIME 8/24/04 1500						
RELINQUISHED BY/REMOVED FROM MD-026 Fm #1		DATE/TIME 8/26/04 1320		RECEIVED BY/STORED IN Greg Thomas / Greg Thomas		DATE/TIME 8/26/04 1320						
RELINQUISHED BY/REMOVED FROM Greg Thomas / Greg Thomas		DATE/TIME 8/26/04 1320		RECEIVED BY/STORED IN Fed Ex		DATE/TIME						
RELINQUISHED BY/REMOVED FROM JSP/12/12/04		DATE/TIME 8-27-04 1030		RECEIVED BY/STORED IN WJ/med		DATE/TIME 8-27-04 1030						
LABORATORY SECTION	RECEIVED BY	TITLE				DATE/TIME						
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY				DATE/TIME						

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TPH 8-V-04

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-LW-1/LW-2		DATA PACKAGE: H2704		
VALIDATOR:	TLP	LAB:	LLI	DATE: 3/18/05	
			SDG: H2704		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270	8015 B TPH-D ethylac glycol	SW-846 8270 (TCLP)
SAMPLES/MATRIX					
BIGHY8					
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 FRS

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

Surrogates/system monitoring compounds analyzed? ~~3/10/12~~ 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: ethylene glycol - no surrogate - J all

NO PDS

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: _____

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: <u>all over</u>			

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:			

Date: 24 March 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: PCB - Data Package No. H2704

F03-J-5



INTRODUCTION

This memo presents the results of data validation on Data Package No. H2704 prepared by Lionville Laboratory Inc. (LLI). 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
B19HY8	8/18/04	Soil	C	PCBs by 8082

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66, Draft A, Redline, May 2002). Appendices 1 through 5 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

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less 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 detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than minimum detectable activity (MDA). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than MDA, the result is qualified as undetected and elevated to the MDA.

All method blank target compound results were acceptable.

Field Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Blank Spike

Matrix spike and blank spike 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 and is done in duplicate. Matrix spike and blank spike analyses must be within control limits of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected 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/BS results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected

000002

compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate 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 as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

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

- **Completeness**

Data Package No. H2704 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.

000003

MINOR DEFICIENCIES

None found.

REFERENCES

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

DOE/RL-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with the procedures herein 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 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).

000006

Appendix 2

Summary of Data Qualification

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PCB DATA QUALIFICATION SUMMARY*

SDG: H2704	REVIEWER: TLI	DATE: 3/24/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: FLUOR-HANFORD					
Laboratory: LLI					
Case:		SDG: H2704			
Sample Number		B19HY8			
Remarks					
Sample Date		8/18/04			
Analysis Date		9/2/04			
PCB	RDL	Result	Q	Result	Q
Aroclor-1016	16.5	14	U		
Aroclor-1221	16.5	14	U		
Aroclor-1232	16.5	14	U		
Aroclor-1242	16.5	14	U		
Aroclor-1248	16.5	14	U		
Aroclor-1254	16.5	14	U		
Aroclor-1260	16.5	14	U		

000010

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 09/06/04 09:49

RFW Batch Number: 0408L475

Client: TNU-HANFORD F03-025

Work Order: 11343606001 Page: 1

Sample Information	Cust ID:	B19HY8	B19HY8	B19HY8	PBLKVD	PBLKVD BS
	RFW#:	002	002 MS	002 MSD	04LE1098-MB1	04LE1098-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	81 %	88 %	85 %	43 %	81 %
	Decachlorobiphenyl	72 %	78 %	78 %	43 %	70 %
-----fl-----fl-----fl-----fl-----fl-----fl-----fl-----						
Aroclor-1016		14 U	105 %	111 %	13 U	94 %
Aroclor-1221		14 U	14 U	14 U	13 U	13 U
Aroclor-1232		14 U	14 U	14 U	13 U	13 U
Aroclor-1242		14 U	14 U	14 U	13 U	13 U
Aroclor-1248		14 U	14 U	14 U	13 U	13 U
Aroclor-1254		14 U	14 U	14 U	13 U	13 U
Aroclor-1260		14 U	78 %	78 %	13 U	68 %

0000000004

000011

K
3/18/05

gph/04

00000029

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
% = Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



Analytical Report

Client: TNU HANFORD F03-025
LVL#: 0408L475
SDG/SAF#: H2704/F03-025

W.O.#: 11343-606-001-9999-00
Date Received: 08-27-2004

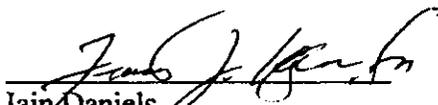
PCB

One (1) soil sample was collected on 08-18-2004.

The sample and its associated QC samples were extracted on 08-30-2004 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 09-02-2004. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LVL's sample acceptance policy.
2. The sample was extracted and analyzed within required holding time.
3. The sample and its associated QC samples received Copper-Sulfur and Sulfuric Acid clean-ups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/14/04
Date

som:\r\group\data\pest\tnu hanford\0408-475.pcb
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COLLECTOR: Pope/Pfister/Hughes/Wiberg
 COMPANY CONTACT: TRENT, STEVE TELEPHONE NO.: 373-5689 PROJECT COORDINATOR: TRENT, SJ
 PRICE CODE: 8N DATA TURNAROUND: 45 Days / 45 Days

SAMPLING LOCATION: 216-S-20; 87.0N-97.5E 32.5' - 35' 98-8-10-04
 PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil SAF NO.: F03-025
 AIR QUALITY:

ICE CHEST NO.: ARP-04-015
 FIELD LOGBOOK NO.: HNF-N-356 1 COA: 119143E510
 METHOD OF SHIPMENT: Federal Express

SHIPPED TO: *Perse*
 OFFSITE PROPERTY NO.: *See PTR-14017*
 BILL OF LADING/AIR BILL NO.: *See PTR-14017*

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION									
		Cool 4C			Cool 4C			Cool 4C			
		None	None	None	None	None	None	None	None	None	
		None	None	None	None	None	None	None	None	None	
		NO. OF CONTAINER(S)	3	1	1	3	1	1	1	1	
		VOLUME	40mL	120mL	120mL	40mL	120mL	250mL	500mL	500mL	
		SPECIAL HANDLING AND/OR STORAGE	N/A Tie to Radiological Screen B191H3								
		SAMPLE ANALYSIS	VOA - 820A (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	PCBs - 8082	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	Cool 4C	None	None	None				
B19HYB	SOIL	8/18/04	1125	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met. The lab is to analyze pH within 24 hours of sample receipt, and, report kerosene range organics from the WTPH-D analysis. (1)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} (2)TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; (3)Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol} (4)ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver} ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Copper, Nickel} Mercury - 7471 - (CV); (5)IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate} Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; (6)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154}	
<i>ISPOL/AGM</i>	8-18-04 1200	<i>Mike Kille</i>	8-18-04 1200		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
517Z FRIG 3-20	8/24/04 0926	<i>R. Pfister/Ralph</i>	8/24/04 0920		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>R. Pfister/realpac</i>	8/24/04 1500	<i>MO-026</i>	8/24/04 1500		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>MD-026 Frig #1</i>	8/26/04 1320	<i>Greg Thomas</i>	8/26/04 1320		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>Greg Thomas</i>	8/26/04 1320	<i>Fed Ex</i>			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>Realpac</i>	8-27-04 10930	<i>W. Muench</i>	8-27-04 10930		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

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1838383838

PTR 8-1-04

Appendix 5

Data Validation Supporting Documentation

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PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: H2704		
VALIDATOR: TLI		LAB: LLI		DATE: 3/18/15	
			SDG: H2704		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
B19HY8					
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 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

DDT and endrin breakdowns acceptable? Yes No N/A

Comments: _____

PCB 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 FR

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

Surrogates analyzed? Yes No N/A
Surrogate 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 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 PAS

PCB DATA VALIDATION CHECKLIST

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. SYSTEM PERFORMANCE (Levels D and E)

- Chromatographic performance acceptable? Yes No N/A
- Positive results resolved acceptably? 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: _____

PCB 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
Detection limits meet RDL? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable? Yes No N/A
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: _____

Date: 24 March 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Volatiles - Data Package No. H2704



INTRODUCTION

This memo presents the results of data validation on Data Package No. H2704 prepared by Lionville Laboratory Inc. (LLI). 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
B19HY8	8/18/04	Soil	C	See note 1

1 - Volatile by 8260A, n-butanol and TPH-G by 8015B.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66, Draft A, Redline, May 2002). Appendices 1 through 5 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

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Analytical holding times were 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 14 days of the date of sample collection.

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.

- **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".

Due to method blank contamination, all methylene chloride results were qualified as undetected, raised to the RTQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks 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 50-150%. 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 accuracy 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.

Due to the lack of a surrogate analysis, all n-butanol results were qualified as estimates and flagged "J".

All other 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 required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the

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required criteria. All analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2704 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 method blank contamination, all methylene chloride results were qualified as undetected, raised to the RTQL and flagged "U". Due to the lack of a surrogate analysis, all n-butanol 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.

All analytes exceeded the RTQL. 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-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

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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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VOLATILE DATA QUALIFICATION SUMMARY*

SDG: H2704	REVIEWER: TLI	DATE: 3/24/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U at RTQL	All	Method blank contamination
n-Butanol	J	All	No surrogate analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: FLUOR-HANFORD					
Laboratory: LLI					
Case:		SDG: H2704			
Sample Number		B19HY8			
Sample Date		8/18/04			
VOA/Alcohols/TPH-g	RTQL	Result	Q	Result	Q
Chloromethane		11	U		
Bromomethane		11	U		
Vinyl Chloride		11	U		
Chloroethane		11	U		
Methylene Chloride	5	5	U		
Acetone		11	U		
Carbon Disulfide		6	U		
1,1-Dichloroethene	5	6	U		
1,1-Dichloroethane	10	6	U		
1,2-Dichloroethene (total)		6	U		
Chloroform	5	6	U		
1,2-Dichloroethane		6	U		
2-Butanone	10	11	U		
1,1,1-Trichloroethane	5	6	U		
Carbon Tetrachloride	5	6	U		
Vinyl Acetate		6	U		
Bromodichloromethane		6	U		
1,2-Dichloropropane		6	U		
cis-1,3-Dichloropropene		6	U		
Trichloroethene		6	U		
Dibromochloromethane		6	U		
1,1,2-Trichloroethane		6	U		
Benzene	5	6	U		
trans-1,3-Dichloropropene		6	U		
Bromoform		6	U		
4-Methyl-2-pentanone		11	U		
2-Hexanone		11	U		
Tetrachloroethene		6	U		
1,1,2,2-Tetrachloroethane		6	U		
Toluene	5	6	U		
Chlorobenzene	5	6	U		
Ethylbenzene	5	6	U		
Styrene		6	U		
Xylenes (total)	5	6	U		
Gasoline Range Organics	5	33	U		
n-Butanol	5	5.5	UJ		

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Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 09/22/04 09:55

RFW Batch Number: 0408L475

Client: TNUHANFORD F03-025 H2704 Work Order: 11343606001 Page: 1a

Sample Information	Cust ID:	B19HY8	B19HY8	B19HY8	VBLKVR	VBLKVR BS
	RFW#:	002	002 MS	002 MSD	04LVX244-MB1	04LVX244-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.04	0.962	1.04	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate	Toluene-d8	96 %	96 %	93 %	94 %	93 %
Recovery	Bromofluorobenzene	86 %	86 %	88 %	90 %	92 %
	1,2-Dichloroethane-d4	85 %	84 %	87 %	81 %	81 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Chloromethane		11 U	10 U	11 U	10 U	10 U
Bromomethane		11 U	10 U	11 U	10 U	10 U
Vinyl Chloride		11 U	10 U	11 U	10 U	10 U
Chloroethane		11 U	10 U	11 U	10 U	10 U
Methylene Chloride		5 U	5 B	5 JB	2 J	3 JB
Acetone		11 U	10 U	11 U	10 U	10 U
Carbon Disulfide		6 U	5 U	6 U	5 U	5 U
1,1-Dichloroethene		6 U	99 %	86 %	5 U	82 %
1,1-Dichloroethane		6 U	5 U	6 U	5 U	5 U
1,2-Dichloroethene (total)		6 U	5 U	6 U	5 U	5 U
Chloroform		6 U	5 U	6 U	5 U	5 U
1,2-Dichloroethane		6 U	5 U	6 U	5 U	5 U
2-Butanone		11 U	10 U	11 U	10 U	10 U
1,1,1-Trichloroethane		6 U	5 U	6 U	5 U	5 U
Carbon Tetrachloride		6 U	5 U	6 U	5 U	5 U
Bromodichloromethane		6 U	5 U	6 U	5 U	5 U
1,2-Dichloropropane		6 U	5 U	6 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	5 U	6 U	5 U	5 U
Trichloroethene		6 U	108 %	96 %	5 U	96 %
Dibromochloromethane		6 U	5 U	6 U	5 U	5 U
1,1,2-Trichloroethane		6 U	5 U	6 U	5 U	5 U
Benzene		6 U	97 %	90 %	5 U	89 %
Trans-1,3-Dichloropropene		6 U	5 U	6 U	5 U	5 U
Bromoform		6 U	5 U	6 U	5 U	5 U
4-Methyl-2-pentanone		11 U	10 U	11 U	10 U	10 U
2-Hexanone		11 U	10 U	11 U	10 U	10 U
Tetrachloroethene		6 U	5 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	5 U	6 U	5 U	5 U
Toluene		6 U	97 %	86 %	5 U	87 %

*= Outside of EPA CLP QC limits.

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Handwritten signature
3/18/05

Cust ID: B19HY8 B19HY8 B19HY8 VBLKVR VBLKVR BS

RFW#: 002 002 MS 002 MSD 04LVX244-MB1 04LVX244-MB1

Chlorobenzene	6 U	103 %	93 %	5 U	94 %
Ethylbenzene	6 U	5 U	6 U	5 U	5 U
Styrene	6 U	5 U	6 U	5 U	5 U
Xylene (total)	6 U	5 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Handwritten signature
3/18/05

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000015



Client: TNU-HANFORD F03-025
LVL #: 0408L475
SDG/SAF # H2704/F03-025

W.O. #: 11343-606-001-9999-00
Date Received: 08-27-2004

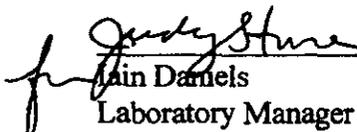
GC/MS VOLATILE

One (1) soil sample was collected on 08-18-2004.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 08-30-2004.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The sample was analyzed within required holding time.
3. A non-target compound was detected in sample B19HY8.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL
8. Internal standard area criteria were not met for sample B19HY8 MS. The analysis of associated matrix spike duplicate fulfills the reanalysis requirement.
9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."


Judy Stone
Laboratory Manager
Lionville Laboratory Incorporated

10/14/04
Date

son\group\data\voa\tnu-hanford\0408-475.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

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02



Analytical Report

Client: TNU-HANFORD F03-025
LVL #: 0408L475
SDG/SAF # H2704/F03-025

W.O. #: 11343-606-001-9999-00
Date Received: 08-27-2004

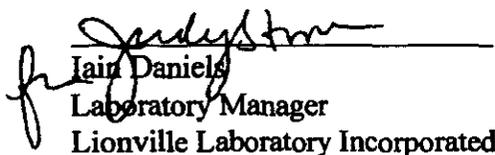
GC SCAN

One (1) soil sample was collected on 08-18-2004.

The sample and its associated QC samples were prepared and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 08-28-2004. The sample was analyzed based on method 8015B (Microextraction-5g into 5mL of water) for client specified target compound n-Butanol.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LVL's sample acceptance policy.
2. The sample was extracted and analyzed within required holding time.
3. The method blank was below the reporting limit for the target compound.
4. Surrogates are not currently employed in the methodology.
5. The blank spike recoveries were within acceptance criteria.
6. The matrix spike recoveries were within acceptance criteria.
7. Confirmation was not required because target compounds were not detected in the sample.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Jaim Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/14/04
Date

sontr:\group\data\gsc\tnu\0408-475.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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00000002



Analytical Report

Client: TNU-HANFORD F03-025
LVL #: 0408L475
SDG/SAF # H2704/F03-025

W.O. #: 11343-606-001-9999-00
Date Received: 08-27-2004

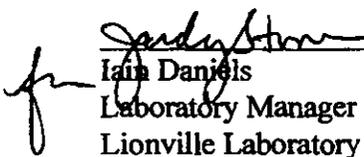
GRO

One (1) soil sample was collected on 08-18-2004.

The sample and its associated QC samples were analyzed according to Lionville Laboratory SOPs based on SW-846 method 8015 for Gasoline Range Organics (GRO) on 08-29-2004. The analysis met the intent of method WTPH-G.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LVL's sample acceptance policy.
2. The sample was analyzed within required holding time.
3. The method blank was below the reporting limits for the target compound.
4. All surrogate recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. The matrix spike recoveries were within acceptance criteria.
7. Confirmation was not required because the target compound was not detected in the sample.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/14/04
Date

son\l\group\data\gro\tnu-hanford\0408-475.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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02

COLLECTOR: Pope/Pfister/Hughes/Wiberg
 COMPANY CONTACT: TRENT, STEVE
 TELEPHONE NO.: 373-5689
 PROJECT COORDINATOR: TRENT, SJ
 PRICE CODE: 8N
 DATA TURNAROUND: 45 Days / 45 Days

SAMPLING LOCATION: 216-S-20; 89:0N-97:5E 32.5' - 35' 48" 8-10-04
 PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil
 SAF NO.: F03-025
 AIR QUALITY:

ICE CHEST NO.: ARP-04-015
 FIELD LOGBOOK NO.: HNF-N-356 1
 COA: 119143E510
 METHOD OF SHIPMENT: Federal Express

SHIPPED TO: *Perera*
 OFFSITE PROPERTY NO.: *See PTR-14017*
 BILL OF LADING/AIR BILL NO.: *See PTR-14017*

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None
		TYPE OF CONTAINER	gGs*	gG	gG	Gs*	gG	gG	gG	gG
		NO. OF CONTAINER(S)	3	1	1	3	1	1	1	1
		VOLUME	40mL	120mL	120mL	40mL	120mL	250mL	500mL	500mL
SPECIAL HANDLING AND/OR STORAGE N/A Tie to Radiologist Screen B191H3	SAMPLE ANALYSIS	VOA - 8270A (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	PCBs - 8082	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
B19HY8	SOIL	8/18/04	1125	X	X	X	X	X	X	X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: <i>ISole/AR</i> 8-18-04 1200	RECEIVED BY/STORED IN: <i>Mike Fidge</i> 8-18-04 1200	FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met. The lab is to analyze pH within 24 hours of sample receipt, and report kerosene range organics from the WTPH-D analysis. (1)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} (2)TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; (3)Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol} (4)ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver} ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Copper, Nickel} Mercury - 7471 - (CV); (5)IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate} Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; (6)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154,
RELINQUISHED BY/REMOVED FROM: <i>SITE PRIC 3-20</i> 8/24/04 0926	RECEIVED BY/STORED IN: <i>R. PFISTER/Rubyn</i> 8/24/04 0926	
RELINQUISHED BY/REMOVED FROM: <i>R. PASTOR/Rubyn</i> 8/24/04 1500	RECEIVED BY/STORED IN: <i>MO-026 PRIC#1</i> 8/24/04 1500	
RELINQUISHED BY/REMOVED FROM: <i>MO-026 PRIC #1</i> 8/26/04 1320	RECEIVED BY/STORED IN: <i>Greg Thomas / Greg Thomas</i> 8/26/04 1320	
RELINQUISHED BY/REMOVED FROM: <i>Greg Thomas / Greg Thomas</i> 8/26/04 1320	RECEIVED BY/STORED IN: <i>Fed Ex</i>	
RELINQUISHED BY/REMOVED FROM: <i>PRIC#1</i> 8-27-04 10930	RECEIVED BY/STORED IN: <i>W. M. M. M.</i> 8-27-04 10930	

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

000019

000012

PTR 8-1-04

Appendix 5

Data Validation Supporting Documentation

000020

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 2/08/1
 Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: methylene chloride in blank - to RTOL + 0 all

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 n-butanol surrogate - J all

NO P45

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: _____

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: all above

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: _____
