REVIEW COMMENT RECORD (RCR)

1. Date 06/01/05	2. Review No.
3. Project No. 200-LW-1/LW-2	4. Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Validation Package for SDG W04523	Borehole Soil Sampling	RL Weiss	ERC - S&DM	Sigma 1 372-9631

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. Closed
Organization Manager (Optional)	06/01/2005 R. L. Weiss Date Reviewer/Point of Contract	Richard L O'Weiss Reviewer/Point of Contact
	R. L. Weiss Author/Originator	6-14-05 Richard L O'Weiss Date 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, Volatile, Semivolatile, & PCB: No comments.			ok RLW
2	Inorganics, Pages 12 &13; Boron results should be flagged "UJ".		Cera	

A-6400-090.1 (11/99)

ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
06/14/2005	N/A
3. Project No. 200-MW-1	4. Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Package W04523	GRP & Waste Sites/200-MW-1	Doris Ayres	S&DM (FH)	A0-21/373-5582

17. Comment Submittal Approval

Organization Manager (optional)

10. Agreement with indicated comment disposition(s)

7/26/05 Date — Doris E. Ayres Reviewer/Point of Contact — DORIS E. AYRES Requester

11. **CLOSED**

7/26/05 Date — Doris E. Ayres Reviewer/Point of Contact — DORIS E. AYRES Requester

12. Item	13a. 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). Provide separate attachments if necessary.	16. Status
1	Wet Chemistry - Page 2, paragraph 3 says Due to the holding time being exceeded by less than twice the limit, the cyanide result in sample B19505 was qualified as an estimate andglagged "J". It should be sample B19405.			OK
2	Wet Chemistry - Page 4, bullet 2 under Minor Deficiencies again refers to the cyanied results for B19505. This should also be B19405.			OK
3	Volatiles - Page 11 the chart shows a sample B19427 and it should be B19406. Please verify that the data in the table on page 11 matches the data sheets.			OK
4	Semivolatiles - Page 5, bullet 1, line 2 says "..volatile organice result in sample.." should agree with the table on page 9 and read "..volatile petroleum hydrocarbons.."			OK

ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR) (continued)

1. Date	2. Review No.
06/14/2005	N/A
3. Project No.	4. Page 2 of 2
200-MW-1	

12. Item	13a. 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). Provide separate attachments if necessary.	16. Status

Ayres, Doris E

From: Thackaberry, W R (Bill)
Sent: Wednesday, May 25, 2005 1:21 PM
To: Ayres, Doris E
Subject: SDG W04523

I have no comments on SDG W04523 Inorganics, Semi VOA, VOA, PCB and Wet Chemistry

Bill Thackaberry

FINAL COPY 7/26/05 Daynes

~~PRELIMINARY COPY~~

JUN 2005 RECEIVED

Date: 4 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: PCB - Data Package No. W04523

INTRODUCTION

This memo presents the results of data validation on Data Package No. W04523 prepared by Severn Trent (STL). 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
B19406	2/14/05	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 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 the Client

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".

Due to the preparation holding time being exceeded by greater than twice the limit, all PCB results were rejected and flagged "UR".

- **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 practical quantitation limit (PQL). 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 PQL, the result is qualified as undetected and elevated to the PQL.

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 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". 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.

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

All other accuracy 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 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 30%. 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.

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

All other 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 to ensure that laboratory detection levels meet the required criteria. All undetected results exceeded the analyte specific RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data Package No. W04523 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 0%.

MAJOR DEFICIENCIES

Due to the preparation holding time being exceeded by greater than twice the limit, all PCB results were rejected and flagged "UR". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to the lack of a matrix spike and matrix spike duplicate analysis, all PCB 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 undetected 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.

Appendix 1

Glossary of Data Reporting Qualifiers

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).

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: W04523	REVIEWER: TLI	DATE: 5/4/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	UR	All	Holding time being exceeded by greater than twice the limit.
All	J	All	No MS/MSD 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.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD			
Laboratory: Severn Trent			
Case:	SDG: W04523		
Sample Number		B19406	
Remarks			
Sample Date		2/14/05	
Analysis Date		3/20/05	
PCB	RTQL	Result	Q
Aroclor-1016	16.5	ND	UR
Aroclor-1221	16.5	ND	UR
Aroclor-1232	16.5	ND	UR
Aroclor-1242	16.5	ND	UR
Aroclor-1248	16.5	ND	UR
Aroclor-1254	16.5	ND	UR
Aroclor-1260	16.5	ND	UR

000010

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. NA - Not analyzed

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

GC Semivolatiles

Lot-Sample #...:	F5B230353-003	Work Order #...:	G414M1A7	Matrix.....:	SOLID
Date Sampled...:	02/14/05	Date Received..:	02/23/05		
Prep Date.....:	03/18/05	Analysis Date..:	03/20/05		
Prep Batch #...:	5077250				
Dilution Factor:	1				
% Moisture.....:	3.7	Method.....:	SW846 8082		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Aroclor 1016	ND UR	78	ug/kg	4.9
Aroclor 1221	ND	78	ug/kg	4.9
Aroclor 1232	ND	78	ug/kg	4.9
Aroclor 1242	ND	78	ug/kg	4.9
Aroclor 1248	ND	78	ug/kg	4.9
Aroclor 1254	ND	78	ug/kg	5.0
Aroclor 1260	ND	78	ug/kg	5.0

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	98	(10 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

This report contains the analytical results for the three samples received under chain of custody by STL St. Louis on February 23, 2005. These samples are associated with your F03-025 SAF.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt. The samples were received with only one day remaining in the extraction hold time for several tests. Due to RAD levels, a minimum volume was accepted by the laboratory. Due to the volume limitation,matrix QC was not performed for the following tests on a sample from this SDG: PCBs, BNA, pH and oil and grease.

The laboratory does not perform analysis for ethylene glycol.

Volatiles

The MSE initial calibration, E050215C, % RSD is greater than 15 % for dichlorodifluotomethane, freon 114, chloromethane, bromomethane, acetone,iodomethane, acetonitrile, methyl acetate, 2-butoxy ethanol, 2-butanone, methacrylonitrile, 2-chloroethyl vinyl ether, tetrachloroethene, trans-1,4-dichloro-2-butene and penatchloroethane. In those instances where the % RSD exceeds 15%, the initial calibration is acceptable provided the mean % RSD for all analytes in the calibration is less than 15%. The mean % RSD for this initial calibration is 10.6. The average RSD approach will lead to greater uncertainty for those analyte for which the %RSD is greater than 15%. The data user should review the associated quality control results carefully, with particular attention to the matrix spike and laboratory control sample results to determine if the calibration linearity poses a significant concern. 2-Butoxy ethanol does not meet the minimum five point calibration criteria (only four points). This analyte will not be analyzed behind this calibration. The continuing calibration fails for two of the CCCs (>20%) - Vinyl Chloride (41.87% low) and 1,1,-Dichloroethene (25.7% high). Freon 114 is 95% high (>60%, samples ND). The affected samples were rerun outside hold time but behind an acceptable calibration.

Methylene chloride was observed in the method blank above the reporting limit in batch 5056052. Methylene chloride is recognized as a laboratory contaminant. Concentrations up to five times the level observed in the method blank, in associated laboratory samples, may be attributed to its presence in the laboratory.

The LCS recoveries in batch 5060035 are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample purge efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

Due to QC failure, 1-butanol could not be reported from the 8260 analysis.

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

Semi-Volatiles

There was insufficient sample provided to perform the analysis at the method specified amount. A reduced sample amount was prepared. The reporting limit has been elevated accordingly. There was insufficient volume to perform an MS/MSD.

Metals

The MS (MSD) recovery for Antimony is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

Oil and Grease

A dilution was performed for method 413.1 due to limited sample volume. Reporting limits were adjusted accordingly.

Nitrate/Nitrite-N

The MS recovery for Nitrate is outside the established QC limits. A matrix interference is evident in the sample. Method performance is demonstrated by acceptable LCS and LCS-Duplicate recoveries. No further action is required.

Ammonia

The MS recovery for Ammonia is outside the established QC limits. A matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH-diesel/Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples, associated with this method blank, demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Samples were extracted out of hold. Samples were received with only one day remaining in the extraction holding time.
Affected Samples:
F5B230353 (1): B19404
F5B230353 (2): B19405

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SAMPLE SUMMARY

F5B230353

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
G412N	001	B19404	02/10/05	12:45
G414G	002	B19405	02/08/05	14:00
G414M	003	B19406	02/14/05	14:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F5B230353

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Chloride	MCAWW 300.0A	MCAWW 300.0A
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3550
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Hexavalent Chromium	SW846 7196A	SW846 3060A
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A	SW846 7471A
Nitrate as N	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.1	
Nitrite as N	MCAWW 300.0A	MCAWW 300.0A
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Oil & Grease (Gravimetric)	SW846 9071A	
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Phosphate as P, Ortho	MCAWW 300.0A	MCAWW 300.0A
PCBs by SW-846 8082	SW846 8082	SW846 3550B/366
Semivolatile Organic Compounds by GC/MS	SW846 8270C	SW846 3550B
Soil and Waste pH	SW846 9045C	SW846 DI-LEACHA
Sulfate	MCAWW 300.0A	MCAWW 300.0A
Sulfide	SW846 9030	
Total Cyanide	SW846 9010A	SW846 9010A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B
Volatile Organics by GC/MS	SW846 8260B	SW846 5030B/826
Volatile Petroleum Hydrocarbons	SW846 8015 MOD	SW846 5030

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-180	PAGE 1 OF 2
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-Z-7; 27.5'-30.0'	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil	SAF NO.: F03-025	AIR QUALITY: ☐
ICE CHEST NO.: GRF-03-006	FIELD LOGBOOK NO.: — COA: 119143ES10	METHOD OF SHIPMENT: Federal Express	
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: 2u RSR E0004	BILL OF LADING/AIR BILL NO.: 2u RSR E0004	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: NA MAO 2/20/05 Rad fu to B19416

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C	Cool 4C
TYPE OF CONTAINER	aGa*	aG
NO. OF CONTAINER(S)	3	1
VOLUME	40mL	120mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B19406	SOIL	2/14/05	1400	X	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MD-Bailey/MG Bailey	2/22/05 0855	M.G. Bailey/M.G. Bailey	2/22/05
M.G. Bailey/M.G. Bailey	2/22/05	RU EX	

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Original COC attached to document chain of possession.

LABORATORY SECTION	RECEIVED BY: M Ward	TITLE	DATE/TIME: 2-23-05 09:00
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

F-A-6003-618(03/03)

000017

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-180	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐	DATA TURNAROUND 45 Days
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. See RSR E0004		BILL OF LADING/AIR BILL NO. See RSR E0004		

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.

(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA – 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol}

(2)PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

A-6003-618(03/03)

LOT F5523 0253 W04523 15 of 104

000018

Appendix 5

Data Validation Supporting Documentation

HNF-20433 REV 0

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: W04523		
VALIDATOR: TLI		LAB: ST		DATE: 4/29/05	
			SDG: W04523		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
B19406					
					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 FB

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 MS - J all MSD 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: NO MS/MSD – J all

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:

14 + 18 = 32 prep hold – UR all

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: all ovr

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:

Appendix 6

Additional Documentation Requested by Client

STL ST. LOUIS

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: F5B230353 Work Order #...: G6H061AA Matrix.....: SOLID
MB Lot-Sample #: F5C180000-250

Prep Date.....: 03/18/05
Analysis Date..: 03/20/05 Prep Batch #...: 5077250
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Aroclor 1016	ND	75	ug/kg	SW846 8082
Aroclor 1221	ND	75	ug/kg	SW846 8082
Aroclor 1232	ND	75	ug/kg	SW846 8082
Aroclor 1242	ND	75	ug/kg	SW846 8082
Aroclor 1248	ND	75	ug/kg	SW846 8082
Aroclor 1254	ND	75	ug/kg	SW846 8082
Aroclor 1260	ND	75	ug/kg	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	111	(30 - 150)

NOTE(S):
Calculations are performed before rounding to avoid round-off errors in calculated results.

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: F5B230353 Work Order #...: G6H061AC Matrix.....: SOLID
LCS Lot-Sample#: F5C180000-250
Prep Date.....: 03/18/05 Analysis Date..: 03/20/05
Prep Batch #...: 5077250
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Aroclor 1016	167	173	ug/kg	104	SW846 8082
Aroclor 1260	167	186	ug/kg	111	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	94	(73 - 150)

NOTE(S):

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

Bold print denotes control parameters

Date: 4 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Wet Chemistry - Data Package No. W04523

JUN 2005 RECEIVED

FINAL COPY ~~PRELIMINARY COPY~~ Daynes 7/26/05

INTRODUCTION

This memo presents the results of data validation on Data Package No. W04523 prepared by Severn Trent. 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
B19404	2/10/05	Soil	C	See note 1*
B19405	2/8/05	Soil	C	See note 1*
B19406	2/14/05	Soil	C	See note 1*

1 - Anions by 300.0, pH by 045C, ammonia by 350.1, cyanide by 9010A, chromium VI by 7196A, nitrate/nitrite by 353.1, oil & grease by 9071A and total sulfide by (9030).
* - Nitrate, nitrite and phosphate not validated 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

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".

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, the cyanide result in sample B19405 was qualified as an estimate 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%

than the IDL, no qualification is required.

All 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.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All cyanide, sulfide, oil & grease and sulfide results were reported above the RTQL. The sulfate and chloride results in sample B19406 were reported above the RTQL. Under the FHI statement of work, no qualification is required. All other results met the RTQL.

above the RTQL. The sulfate and chloride results in sample B19406 were reported above the RTQL. Under the FHI statement of work, no qualification is required. All other results met the RTQL.

- **Completeness**

Data package No. W04523 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 reported.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- 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, the cyanide result in sample B19405 was qualified as an estimate 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".

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 cyanide, sulfide, oil & grease and sulfide results were reported above the RTQL. The sulfate and chloride results in sample B19406 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

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).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: W04523	REVIEWER: TLI	DATE: 5/4/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH Sulfide	J	All	Holding time
Cyanide	J	B19405	Holding time

* - 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

GENERAL CHEMISTRY ANALYSIS, SOILMATRIX, (MG/KG)

Project: FLUOR-HANFORD							
Laboratory: Severn Trent							
Case:	SDG: W04523						
Sample Number		B19404		B19405		B19406	
Remarks							
Sample Date		2/10/05		2/8/05		2/14/05	
General Chemistry	RTQL	Result	Q	Result	Q	Result	Q
pH**		9.0	J	8.8	J	9.0	J
Chloride	2	1.0		1.1		ND	U
Fluoride	5	0.26		ND	U	ND	U
Chromium VI	0.5	0.73		0.73		ND	U
Nitrate/Nitrite		ND	U	ND	U	ND	U
Ammonia	0.5	ND	U	ND	U	ND	U
Oil & Grease	200	ND	U	ND	U	ND	U
Sulfate	5	3.2		3.1		ND	U
Total cyanide	0.5	ND	U	ND	UJ	ND	U
Total sulfide	5	ND	UJ	ND	UJ	ND	UJ

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.

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

General Chemistry

Lot-Sample #...: F5B230353-001 Work Order #...: G412N Matrix.....: SOLID
Date Sampled...: 02/10/05 Date Received..: 02/23/05
% Moisture.....: 3.4

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	13.0	5.2	mg/kg	MCAWW 300.0A	02/24/05	5056211
		Dilution Factor: 1		MDL.....: 0.52		
pH (solid)	9.0 J	0.10	No Units	SW846 9045C	03/08/05	5067377
		Dilution Factor: 1		MDL.....:		
Chloride	1.0 B	2.1	mg/kg	MCAWW 300.0A	02/24/05	5056207
		Dilution Factor: 1		MDL.....: 0.45		
Fluoride	0.26 B	1.0	mg/kg	MCAWW 300.0A	02/24/05	5056208
		Dilution Factor: 1		MDL.....: 0.10		
Hexavalent Chromium	0.73	0.40	mg/kg	SW846 7196A	03/10-03/11/05	5070038
		Dilution Factor: 1		MDL.....: 0.25		
Nitrate	1.0	0.21	mg/kg	MCAWW 300.0A	02/24/05	5056209
		Dilution Factor: 1		MDL.....: 0.041		
Nitrate/Nitrite as N	ND	0.50	mg/kg	MCAWW 353.1	03/03/05	5062427
		Dilution Factor: 1		MDL.....: 0.027		
Nitrite	ND	0.21	mg/kg	MCAWW 300.0A	02/24/05	5056210
		Dilution Factor: 1		MDL.....: 0.041		
Nitrogen, as Ammonia	ND	0.52	mg/kg	MCAWW 350.1	03/08/05	5068247
		Dilution Factor: 1		MDL.....: 0.060		
Oil and Grease (Gravimetric)	ND	621	mg/kg	SW846 9071A	03/07/05	5067192
		Dilution Factor: 3		MDL.....: 257		
Percent Moisture	3.4	0.10	%	MCAWW 160.3 MOD	02/27-03/03/05	5060219
		Dilution Factor: 1		MDL.....:		
Sulfate	3.2 B	5.2	mg/kg	MCAWW 300.0A	02/24/05	5056212
		Dilution Factor: 1		MDL.....: 1.2		
Total Cyanide	ND	0.52	mg/kg	SW846 9010A	02/24-02/25/05	5058072
		Dilution Factor: 1		MDL.....: 0.13		

(Continued on next page)

MW 3.29.05

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

General Chemistry

Lot-Sample #...: F5B230353-001 **Work Order #...:** G412N **Matrix.....:** SOLID

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Sulfide	ND UJ	10.4	mg/kg	SW846 9030	02/28/05	5059429

Dilution Factor: 1 MDL.....: 7.5

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

C1 Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19405

General Chemistry

Lot-Sample #...: F5B230353-002 Work Order #...: G414G Matrix.....: SOLID
Date Sampled...: 02/08/05 Date Received..: 02/23/05
% Moisture.....: 4.6

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	7.1 ~~J~~ C	5.2	mg/kg	MCAWW 300.0A	02/24/05	5056211
		Dilution Factor: 1		MDL.....: 0.52		
pH (solid)	8.8 J	0.10	No Units	SW846 9045C	03/08/05	5067377
		Dilution Factor: 1		MDL.....:		
Chloride	1.1 B	2.1	mg/kg	MCAWW 300.0A	02/24/05	5056207
		Dilution Factor: 1		MDL.....: 0.46		
Fluoride	ND	1.0	mg/kg	MCAWW 300.0A	02/24/05	5056208
		Dilution Factor: 1		MDL.....: 0.10		
Hexavalent Chromium	0.73	0.40	mg/kg	SW846 7196A	03/10-03/11/05	5070038
		Dilution Factor: 1		MDL.....: 0.25		
Nitrate	1.2	0.21	mg/kg	MCAWW 300.0A	02/24/05	5056209
		Dilution Factor: 1		MDL.....: 0.042		
Nitrate/Nitrite as N	ND	0.50	mg/kg	MCAWW 353.1	03/03/05	5062427
		Dilution Factor: 1		MDL.....: 0.027		
Nitrite	ND	0.21	mg/kg	MCAWW 300.0A	02/24/05	5056210
		Dilution Factor: 1		MDL.....: 0.042		
Nitrogen, as Ammonia	ND	0.52	mg/kg	MCAWW 350.1	03/08/05	5068247
		Dilution Factor: 1		MDL.....: 0.061		
Oil and Grease (Gravimetric)	ND	336	mg/kg	SW846 9071A	03/07/05	5067192
		Dilution Factor: 1.6		MDL.....: 139		
Percent Moisture	4.6	0.10	%	MCAWW 160.3 MOD	02/27-03/03/05	5060219
		Dilution Factor: 1		MDL.....:		
Sulfate	3.1 B	5.2	mg/kg	MCAWW 300.0A	02/24/05	5056212
		Dilution Factor: 1		MDL.....: 1.3		

(Continued on next page)

mw 3-29-05

5/18/05

FLUOR HANFORD IC

Client Sample ID: B19405

General Chemistry

Lot-Sample #...: F5B230353-002 **Work Order #...:** G414G **Matrix.....:** SOLID

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Cyanide	ND U5	0.52	mg/kg	SW846 9010A	02/24-02/25/05	5058072
		Dilution Factor: 1		MDL.....: 0.13		
Total Sulfide	ND U5	10.5	mg/kg	SW846 9030	02/28/05	5059429
		Dilution Factor: 1		MDL.....: 7.6		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

C Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

General Chemistry

Lot-Sample #...: F5B230353-003 Work Order #...: G414M Matrix.....: SOLID
Date Sampled...: 02/14/05 Date Received..: 02/23/05
% Moisture.....: 3.7

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	ND	5.2	mg/kg	MCAWW 300.0A	02/24/05	5056211
		Dilution Factor: 1		MDL.....: 0.52		
pH (solid)	9.0 J	0.20	No Units	SW846 9045C	02/24/05	5056410
		Dilution Factor: 2		MDL.....:		
Chloride	ND	2.1	mg/kg	MCAWW 300.0A	02/24/05	5056207
		Dilution Factor: 1		MDL.....: 0.45		
Fluoride	ND	1.0	mg/kg	MCAWW 300.0A	02/24/05	5056208
		Dilution Factor: 1		MDL.....: 0.10		
Hexavalent Chromium	ND	0.40	mg/kg	SW846 7196A	03/10-03/11/05	5070038
		Dilution Factor: 1		MDL.....: 0.25		
Nitrate	0.55	0.21	mg/kg	MCAWW 300.0A	02/24/05	5056209
		Dilution Factor: 1		MDL.....: 0.041		
Nitrate/Nitrite as N	ND	0.50	mg/kg	MCAWW 353.1	03/03/05	5062427
		Dilution Factor: 1		MDL.....: 0.027		
Nitrite	ND	0.21	mg/kg	MCAWW 300.0A	02/24/05	5056210
		Dilution Factor: 1		MDL.....: 0.042		
Nitrogen, as Ammonia	ND	0.52	mg/kg	MCAWW 350.1	03/08/05	5068247
		Dilution Factor: 1		MDL.....: 0.060		
Oil and Grease (Gravimetric)	ND	395	mg/kg	SW846 9071A	03/02/05	5061497
		Dilution Factor: 1.9		MDL.....: 163		
Percent Moisture	3.7	0.10	%	MCAWW 160.3 MOD	02/27-03/03/05	5060219
		Dilution Factor: 1		MDL.....:		
Sulfate	ND	5.2	mg/kg	MCAWW 300.0A	02/24/05	5056212
		Dilution Factor: 1		MDL.....: 1.2		

(Continued on next page)

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

General Chemistry

Lot-Sample #...: F5B230353-003 Work Order #...: G414M Matrix.....: SOLID

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Cyanide	ND	0.52	mg/kg	SW846 9010A	02/24-02/25/05	5058072
		Dilution Factor: 1		MDL.....: 0.13		
Total Sulfide	ND UJ	10.4	mg/kg	SW846 9030	02/28/05	5059429
		Dilution Factor: 1		MDL.....: 7.5		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

5/1/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

This report contains the analytical results for the three samples received under chain of custody by STL St. Louis on February 23, 2005. These samples are associated with your F03-025 SAF.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt. The samples were received with only one day remaining in the extraction hold time for several tests. Due to RAD levels, a minimum volume was accepted by the laboratory. Due to the volume limitation,matrix QC was not performed for the following tests on a sample from this SDG: PCBs, BNA, pH and oil and grease.

The laboratory does not perform analysis for ethylene glycol.

Volatiles

The MSE initial calibration, E050215C, % RSD is greater than 15 % for dichlorodifluotomethane, freon 114, chloromethane, bromomethane, acetone,iodomethane, acetonitrile, methyl acetate, 2-butoxy ethanol, 2-butanone, methacrylonitrile, 2-chloroethyl vinyl ether, tetrachloroethene, trans-1,4-dichloro-2-butene and penatchloroethane. In those instances where the % RSD exceeds 15%, the initial calibration is acceptable provided the mean % RSD for all analytes in the calibration is less than 15%. The mean % RSD for this initial calibration is 10.6. The average RSD approach will lead to greater uncertainty for those analyte for which the %RSD is greater than 15%. The data user should review the associated quality control results carefully, with particular attention to the matrix spike and laboratory control sample results to determine if the calibration linearity poses a significant concern. 2-Butoxy ethanol does not meet the minimum five point calibration criteria (only four points). This analyte will not be analyzed behind this calibration. The continuing calibration fails for two of the CCCs (>20%) - Vinyl Chloride (41.87% low) and 1,1,-Dichloroethene (25.7% high). Freon 114 is 95% high (>60%, samples ND). The affected samples were rerun outside hold time but behind an acceptable calibration.

Methylene chloride was observed in the method blank above the reporting limit in batch 5056052. Methylene chloride is recognized as a laboratory contaminant. Concentrations up to five times the level observed in the method blank, in associated laboratory samples, may be attributed to its presence in the laboratory.

The LCS recoveries in batch 5060035 are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample purge efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

Due to QC failure, 1-butanol could not be reported from the 8260 analysis.

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

Semi-Volatiles

There was insufficient sample provided to perform the analysis at the method specified amount. A reduced sample amount was prepared. The reporting limit has been elevated accordingly. There was insufficient volume to perform an MS/MSD.

Metals

The MS (MSD) recovery for Antimony is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

Oil and Grease

A dilution was performed for method 413.1 due to limited sample volume. Reporting limits were adjusted accordingly.

Nitrate/Nitrite-N

The MS recovery for Nitrate is outside the established QC limits. A matrix interference is evident in the sample. Method performance is demonstrated by acceptable LCS and LCS-Duplicate recoveries. No further action is required.

Ammonia

The MS recovery for Ammonia is outside the established QC limits. A matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH-diesel/Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples, associated with this method blank, demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Samples were extracted out of hold. Samples were received with only one day remaining in the extraction holding time.
Affected Samples:
F5B230353 (1): B19404
F5B230353 (2): B19405

LOT # F5B230253

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-127	PAGE 1 OF 2
COLLECTOR: Pope/Pfister/Tyra/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-Z-7; 12.5ft-20ft 225-25' BT 12/01/04	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil	SAF NO.: F03-025	AIR QUALITY: ☐
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-356 1 — COA: 119143E510	METHOD OF SHIPMENT: Governament Vehicle	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: NA	BILL OF LADING/AIR BILL NO.: NA	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive File To: B19414

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
TYPE OF CONTAINER	Gs*	aG	aG	Gs*	P	aG	aG			
NO. OF CONTAINER(S)	3	1	1	3	1	1	1			
VOLUME	40mL	120mL	120mL	40mL	500mL	250mL	120mL			
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs-8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	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											
~~B19403~~	~~SOIL~~	~~2/10/05~~	~~1245~~									X	MAB 2/22/05	
B19404 ①	SOIL	2/10/05	1245	X	BT 2-18-05	BT 2-18-05	BT 2-18-05	BT 2-18-05	BT 2-18-05					

CHAIN OF POSSESSION	SIGN/ PRINT NAMES
RELINQUISHED BY/REMOVED FROM: Site Frig — DATE/TIME: 2/10/05 1429	RECEIVED BY/STORED IN: SITE FRIG — DATE/TIME: 2/10/05 1429
RELINQUISHED BY/REMOVED FROM: Site Fridge — DATE/TIME: 2/18/05 11:20 AM	RECEIVED BY/STORED IN: David Tyra — DATE/TIME: 2/18/05 11:30 AM
RELINQUISHED BY/REMOVED FROM: Z-75 to fridge — DATE/TIME: 2-22-05/0780	RECEIVED BY/STORED IN: Kevin Hughes — DATE/TIME: 2-22-05 0780
RELINQUISHED BY/REMOVED FROM: Kevin Hughes — DATE/TIME: 2-22-05	RECEIVED BY/STORED IN: David Tyra — DATE/TIME: 2/22/05 0800
RELINQUISHED BY/REMOVED FROM: David Tyra — DATE/TIME: 2/22/05 0830	RECEIVED BY/STORED IN: MO-026 Fridge #3 — DATE/TIME: 2/22/05 0830
RELINQUISHED BY/REMOVED FROM: — DATE/TIME:	RECEIVED BY/STORED IN: — DATE/TIME:
RELINQUISHED BY/REMOVED FROM: — DATE/TIME:	RECEIVED BY/STORED IN: — DATE/TIME:

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

① Sample number changed to B19403 MAB 2/22/05

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

W04523

000020

8 of 104

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-127	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND 45 Days
SAMPLING LOCATION 216-Z-7; ~~19-5ft-20ft~~ 22.5'-25' SJT 12/01/04	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-356 1	COA 119143ES10	METHOD OF SHIPMENT Governement Vehicle		
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA		

SPECIAL INSTRUCTIONS

The lab is to analyze pH within 24 hours of sample receipt. The lab is to report kerosene range organics from the WTPH-D analysis. FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met.

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Butanol}
(2)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA – 8270A (Add-On) {Tributyl phosphate} 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 {Ethylene glycol}
(4)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on ~~{Antimony-125, Cesium-134}~~ TRO'S 1 HOY Isotopic Plutonium; Isotopic Uranium; Neptunium-237; Americium-241;
(5)ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Copper, Nickel, Silver} ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Lead, Mercury, Selenium, Uranium} ICP Metals - 6010A (Add-on) {Bismuth}
(6)IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Cations (IC) - 300.7 {Nitrogen in ammonium} Cyanide (Total) - 335.2; pH (Soil) - 9045;

A-6003-618(03/03)

LOT # F5B230253 W04523 9 OF 104

000021

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-179	PAGE 1 OF 2
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-Z-7; 17.5'-201	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil	SAF NO.: F03-025	AIR QUALITY ☐
ICE CHEST NO.: GRP-03-006	FIELD LOGBOOK NO.: — COA: 119143E510	METHOD OF SHIPMENT: Federal Express	
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: See RSR E0004	BILL OF LADING/AIR BILL NO.: See RSR E0004	

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 [illegible] 2/22/05; Rad Info B19415

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C											
TYPE OF CONTAINER	wGa*											
NO. OF CONTAINER(S)	3											
VOLUME	40mL											
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS											

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B19405	SOIL	2/8/05	1400	X									

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
M.G. Bucher	2/22/05 0830	M.H. Bauchu/M.G. Bucher	2/22/05 0830
M.H. Bauchu/M.G. Bucher	2/22/05 0830	Lab Ex	

SPECIAL INSTRUCTIONS: SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS. Original COC attached to document chain of possession

LABORATORY SECTION	RECEIVED BY: M Ward	TITLE:	DATE/TIME: 2.23.05 9:00
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD:	DISPOSED BY:	DATE/TIME:

LOT # E5R025

WO 5523

000022

A-6003-618(03/03)

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-179	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N DATA TURNAROUND
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐ 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express	
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. SEI RSR E0004		BILL OF LADING/AIR BILL NO. SEI RSR E0004	

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.
(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol} PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

LOT # 5123251

W04523

000023

11 of 104

A-6003-618(03/03)

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-180	PAGE 1 OF 2
COLLECTOR: Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8N
SAMPLING LOCATION: 216-Z-7; 27.5'-30.0'	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025	AIR QUALITY ☐
ICE CHEST NO.: GRP-03-006	FIELD LOGBOOK NO.:	COA: 119143ES10	METHOD OF SHIPMENT: Federal Express	DATA TURNAROUND: 45 Days / 45 Days
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: 2u RSR E0004		BILL OF LADING/AIR BILL NO.: 2u RSR E0004	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A MAO 2/22/05 Pad tu to B19416

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C	Cool 4C								
TYPE OF CONTAINER	aGs*	aG								
NO. OF CONTAINER(S)	3	1								
VOLUME	40mL	120mL								
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS								

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B19406	SOIL	2/14/05	1400	X	X								

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MD-026 2/22/05	0855	M.A. Bulkin M.A. Bulkin	2/22/05
M.A. Bulkin M.A. Bulkin	2/22/05	PU 8X	

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Original COC attached to document chain of possession.

LABORATORY SECTION	RECEIVED BY: M. Ward	TITLE	DATE/TIME: 2-23-05 09:00
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

F-A-6003-618(03/03)

LOT # E3B1025

MO-0503

000024

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-180	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐	DATA TURNAROUND 45 Days
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. See RSR E0004		BILL OF LADING/AIR BILL NO. See RSR E0004		

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.

(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA – 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol}

(2)PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

A-6003-618(03/03)

LOT # F5B230253 W04523 15 of 104

000025

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: W04523		
VALIDATOR: TLI		LAB: ST		DATE: 4/27/05	
			SDG: W04523		

ANALYSES PERFORMED

Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate/14	TDS	TKN	Phosphate	cyanide	sulfide

SAMPLES/MATRIX

B19404 B19405 B19406

nitrate, nitrate + phosphate not validated per BHI

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 FB

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

Spike samples analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A

Spike standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

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

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

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

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

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

Comments: NO PAS

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:

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

404-13			sulfide	pH	
405-15	[redacted]	Cyanide	sulfide	pH	
406-9	[redacted]		sulfide	pH	
		<2x	<2x	over 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:

04	05	04
ammonia	ammonia	ammonia
O+G	O+G	O+G
cyanide	cyanide	cyanide
sulfide	sulfide	sulfide
		chloride
		sulfate

Appendix 6

Additional Documentation Requested by Client

STL ST. LOUIS

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F5B230353 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		Work Order #: G45HN1AA		MB Lot-Sample #:	F5B250000-207	
	ND	2.0	mg/kg	MCAWW 300.0A	02/24/05	5056207
		Dilution Factor: 1				
Fluoride		Work Order #: G45HR1AA		MB Lot-Sample #:	F5B250000-208	
	ND	1.0	mg/kg	MCAWW 300.0A	02/24/05	5056208
		Dilution Factor: 1				
Hexavalent Chromium		Work Order #: G51NP1AA		MB Lot-Sample #:	F5C110000-038	
	ND	0.40	mg/kg	SW846 7196A	03/10-03/11/05	5070038
		Dilution Factor: 1				
Nitrate		Work Order #: G45HV1AA		MB Lot-Sample #:	F5B250000-209	
	ND	0.20	mg/kg	MCAWW 300.0A	02/24/05	5056209
		Dilution Factor: 1				
Nitrate/Nitrite as N		Work Order #: G5HA21AA		MB Lot-Sample #:	F5C030000-427	
	ND	0.50	mg/kg	MCAWW 353.1	03/03/05	5062427
		Dilution Factor: 1				
Nitrite		Work Order #: G45HW1AA		MB Lot-Sample #:	F5B250000-210	
	ND	0.20	mg/kg	MCAWW 300.0A	02/24/05	5056210
		Dilution Factor: 1				
Nitrogen, as Ammonia		Work Order #: G5TP01AA		MB Lot-Sample #:	F5C090000-247	
	ND	0.50	mg/kg	MCAWW 350.1	03/08/05	5068247
		Dilution Factor: 1				
Oil and Grease (Gravimetric)		Work Order #: G5E041AA		MB Lot-Sample #:	F5C020000-497	
	ND	200	mg/kg	SW846 9071A	03/02/05	5061497
		Dilution Factor: 1				
Oil and Grease (Gravimetric)		Work Order #: G5P6D1AA		MB Lot-Sample #:	F5C080000-192	
	ND	200	mg/kg	SW846 9071A	03/07/05	5067192
		Dilution Factor: 1				
Phosphate as P, Ortho		Work Order #: G45H21AA		MB Lot-Sample #:	F5B250000-211	
	2.3 B	5.0	mg/kg	MCAWW 300.0A	02/24/05	5056211
		Dilution Factor: 1				

(Continued on next page)

STL ST. LOUIS

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F5B230353 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate		Work Order #: G45H41AA		MB Lot-Sample #:	F5B250000-212	
	ND	5.0	mg/kg	MCAWW 300.0A	02/24/05	5056212
		Dilution Factor: 1				
Total Cyanide		Work Order #: G470C1AA		MB Lot-Sample #:	F5B270000-072	
	ND	0.50	mg/kg	SW846 9010A	02/24-02/25/05	5058072
		Dilution Factor: 1				
Total Sulfide		Work Order #: G48151AA		MB Lot-Sample #:	F5B280000-429	
	ND	10.0	mg/kg	SW846 9030	02/28/05	5059429
		Dilution Factor: 1				

NOTE(S):

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

B Estimated result. Result is less than RL.

STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F5B230353 **Matrix.....:** SOLID
Date Sampled...: 02/14/05 **Date Received..:** 02/23/05

Percnt Moisture: 14

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride			Work Order #...:		G414M1EA		MS Lot-Sample #: F5B230353-003	
	ND	20.8	20.2	mg/kg	97	MCAWW 300.0A	02/24-02/25/05	5056207
			Dilution Factor: 1					
Fluoride			Work Order #...:		G414M1EC		MS Lot-Sample #: F5B230353-003	
	ND	20.8	19.5	mg/kg	94	MCAWW 300.0A	02/24-02/25/05	5056208
			Dilution Factor: 1					
Nitrate			Work Order #...:		G414M1ED		MS Lot-Sample #: F5B230353-003	
	0.55	4.15	4.28	mg/kg	90	MCAWW 300.0A	02/24-02/25/05	5056209
			Dilution Factor: 1					
Nitrate/Nitrite as N			Work Order #...:		G414M1D9		MS Lot-Sample #: F5B230353-003	
	ND	5.00	6.16 N	mg/kg	123	MCAWW 353.1	03/03/05	5062427
			Dilution Factor: 1					
Nitrite			Work Order #...:		G414M1EE		MS Lot-Sample #: F5B230353-003	
	ND	1.04	0.839	mg/kg	81	MCAWW 300.0A	02/24-02/25/05	5056210
			Dilution Factor: 1					
Nitrogen, as Ammonia			Work Order #...:		G414M1D6		MS Lot-Sample #: F5B230353-003	
	ND	5.19	7.16 N	mg/kg	138	MCAWW 350.1	03/08/05	5068247
			Dilution Factor: 1					
Oil and Grease (Gravimetric)			Work Order #...:		G4PH11AF		MS Lot-Sample #: F5B180204-001	
	101	3470	2910	mg/kg	81	SW846 9071A	03/02/05	5061497
			Dilution Factor: 1					
Oil and Grease (Gravimetric)			Work Order #...:		G4PH11AK		MS Lot-Sample #: F5B180204-001	
	101	3470	2910	mg/kg	81	SW846 9071A	03/02/05	5061497
			Dilution Factor: 1					
Phosphate as P, Ortho			Work Order #...:		G414M1D4		MS Lot-Sample #: F5B230353-003	
	ND	41.5	40.6	mg/kg	98	MCAWW 300.0A	02/24-02/25/05	5056211
			Dilution Factor: 1					
Sulfate			Work Order #...:		G414M1D5		MS Lot-Sample #: F5B230353-003	
	ND	41.5	47.2	mg/kg	114	MCAWW 300.0A	02/24-02/25/05	5056212
			Dilution Factor: 1					

(Continued on next page)

STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F5B230353 **Matrix.....:** SOLID
Date Sampled...: 02/14/05 **Date Received..:** 02/23/05

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Cyanide			Work Order #...:		G414M1D7		MS Lot-Sample #:	F5B230353-003
	ND	5.19	4.51	mg/kg	87	SW846 9010A	02/24-02/25/05	5058072
			Dilution Factor: 1					
Total Sulfide			Work Order #...:		G414M1D8		MS Lot-Sample #:	F5B230353-003
	ND	104	99.7	mg/kg	96	SW846 9030	02/28/05	5059429
			Dilution Factor: 1					

NOTE(S):

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

N Spiked analyte recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F5B230353 Matrix.....: SOLID
Date Sampled...: 02/03/05 Date Received..: 02/18/05

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
								% Moisture.....: 3.7	
Hexavalent Chromium			WO#: G414M1CH-MS/G414M1CJ-MSD					MS Lot-Sample #: F5B230353-003	
	ND	40.0	38.0	mg/kg	95		SW846 7196A	03/10-03/11/05	5070038
	ND	40.0	38.0	mg/kg	95	0.0	SW846 7196A	03/10-03/11/05	5070038

Dilution Factor: 1

NOTE(S):

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

N Spiked analyte recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

STL ST. LOUIS

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F5B230353 Work Order #...: G414M-SMP G414M-DUP Matrix.....: SOLID

Date Sampled...: 02/14/05 Date Received..: 02/23/05

% Moisture.....: 3.7

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate/Nitrite as N						SD Lot-Sample #:	F5B230353-003	
	ND	ND	mg/kg	0	(0-30)	MCAWW 353.1	03/03/05	5062427
			Dilution Factor: 1					
Chloride						SD Lot-Sample #:	F5B230353-003	
	ND	1.1 B	mg/kg	200	(0-30)	MCAWW 300.0A	02/24-02/25/05	5056207
			Dilution Factor: 1					
Fluoride						SD Lot-Sample #:	F5B230353-003	
	ND	ND	mg/kg	0	(0-30)	MCAWW 300.0A	02/24-02/25/05	5056208
			Dilution Factor: 1					
Nitrate						SD Lot-Sample #:	F5B230353-003	
	0.55	0.19 B	mg/kg	99	(0-30)	MCAWW 300.0A	02/24-02/25/05	5056209
			Dilution Factor: 1					
Nitrite						SD Lot-Sample #:	F5B230353-003	
	ND	ND	mg/kg	0	(0-30)	MCAWW 300.0A	02/24-02/25/05	5056210
			Dilution Factor: 1					
Phosphate as P, Ortho						SD Lot-Sample #:	F5B230353-003	
	ND	2.5 B	mg/kg	200	(0-30)	MCAWW 300.0A	02/24-02/25/05	5056211
			Dilution Factor: 1					
Sulfate						SD Lot-Sample #:	F5B230353-003	
	ND	1.5 B	mg/kg	200	(0-30)	MCAWW 300.0A	02/24-02/25/05	5056212
			Dilution Factor: 1					
Nitrogen, as Ammonia						SD Lot-Sample #:	F5B230353-003	
	ND	ND	mg/kg	0	(0-30)	MCAWW 350.1	03/08/05	5068247
			Dilution Factor: 1					
Total Cyanide						SD Lot-Sample #:	F5B230353-003	
	ND	ND	mg/kg	0	(0-30)	SW846 9010A	02/24-02/25/05	5058072
			Dilution Factor: 1					
Total Sulfide						SD Lot-Sample #:	F5B230353-003	
	ND	ND	mg/kg	0	(0-30)	SW846 9030	02/28/05	5059429
			Dilution Factor: 1					

NOTE(S):

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

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: F5B230353 Matrix.....: SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride			WO#:G45HN1AC-LCS/G45HN1AD-LCSD				LCS Lot-Sample#: F5B250000-207	
	10.0	9.84	mg/kg	98		MCAWW 300.0A	02/24/05	5056207
	10.0	9.71	mg/kg	97	1.3	MCAWW 300.0A	02/24/05	5056207
			Dilution Factor: 1					
Fluoride			WO#:G45HR1AC-LCS/G45HR1AD-LCSD				LCS Lot-Sample#: F5B250000-208	
	5.00	4.95	mg/kg	99		MCAWW 300.0A	02/24/05	5056208
	5.00	5.03	mg/kg	101	1.5	MCAWW 300.0A	02/24/05	5056208
			Dilution Factor: 1					
Hexavalent Chromium			WO#:G51NP1AC-LCS/G51NP1AD-LCSD				LCS Lot-Sample#: F5C110000-038	
	2.00	1.86	mg/kg	93		SW846 7196A	03/10-03/11/05	5070038
	2.00	1.91	mg/kg	96	2.6	SW846 7196A	03/10-03/11/05	5070038
			Dilution Factor: 1					
Nitrate			WO#:G45HV1AC-LCS/G45HV1AD-LCSD				LCS Lot-Sample#: F5B250000-209	
	2.00	1.97	mg/kg	98		MCAWW 300.0A	02/24/05	5056209
	2.00	1.97	mg/kg	98	0.02	MCAWW 300.0A	02/24/05	5056209
			Dilution Factor: 1					
Nitrate/Nitrite as N			WO#:G5HA21AC-LCS/G5HA21AD-LCSD				LCS Lot-Sample#: F5C030000-427	
	4.00	4.13	mg/kg	103		MCAWW 353.1	03/03/05	5062427
	4.00	4.06	mg/kg	102	1.7	MCAWW 353.1	03/03/05	5062427
			Dilution Factor: 1					
Nitrite			WO#:G45HW1AC-LCS/G45HW1AD-LCSD				LCS Lot-Sample#: F5B250000-210	
	0.800	0.757	mg/kg	95		MCAWW 300.0A	02/24/05	5056210
	0.800	0.808	mg/kg	101	6.6	MCAWW 300.0A	02/24/05	5056210
			Dilution Factor: 1					
Nitrogen, as Ammonia			WO#:G5TP01AC-LCS/G5TP01AD-LCSD				LCS Lot-Sample#: F5C090000-247	
	4.00	4.14	mg/kg	104		MCAWW 350.1	03/08/05	5068247
	4.00	4.14	mg/kg	104	0.0	MCAWW 350.1	03/08/05	5068247
			Dilution Factor: 1					
Oil and Grease (Gravimetric)			WO#:G5E041AC-LCS/G5E041AD-LCSD				LCS Lot-Sample#: F5C020000-497	
	3330	2700	mg/kg	81		SW846 9071A	03/02/05	5061497
	3330	2700	mg/kg	81	0.0	SW846 9071A	03/02/05	5061497
			Dilution Factor: 1					

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STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: F5B230353 Matrix.....: SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Oil and Grease (Gravimetric)			WO#:G5P6D1AC-LCS/G5P6D1AD-LCSD			LCS Lot-Sample#: F5C080000-192		
	3330	2700	mg/kg	81		SW846 9071A	03/07/05	5067192
	3330	2600 N	mg/kg	78	3.8	SW846 9071A	03/07/05	5067192
			Dilution Factor: 1					
Phosphate as P, Ortho			WO#:G45H21AC-LCS/G45H21AD-LCSD			LCS Lot-Sample#: F5B250000-211		
	40.0	43.8	mg/kg	110		MCAWW 300.0A	02/24/05	5056211
	40.0	43.0	mg/kg	108	1.8	MCAWW 300.0A	02/24/05	5056211
			Dilution Factor: 1					
Sulfate			WO#:G45H41AC-LCS/G45H41AD-LCSD			LCS Lot-Sample#: F5B250000-212		
	40.0	36.1	mg/kg	90		MCAWW 300.0A	02/24/05	5056212
	40.0	38.8	mg/kg	97	7.1	MCAWW 300.0A	02/24/05	5056212
			Dilution Factor: 1					

NOTE(S):

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

N Spiked analyte recovery is outside stated control limits.

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F5B230353 Matrix.....: SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)			Work Order #: G46J91AA		LCS Lot-Sample#:	F5B250000-410	
	7.00	7.02	No Units	100	SW846 9045C	02/24/05	5056410
			Dilution Factor: 1				
pH (solid)			Work Order #: G5Q851AA		LCS Lot-Sample#:	F5C080000-377	
	7.00	7.02	No Units	100	SW846 9045C	03/08/05	5067377
			Dilution Factor: 1				
Total Cyanide			Work Order #: G470C1AC		LCS Lot-Sample#:	F5B270000-072	
	5.00	4.94	mg/kg	99	SW846 9010A	02/24-02/25/05	5058072
			Dilution Factor: 1				
Total Sulfide			Work Order #: G48151AC		LCS Lot-Sample#:	F5B280000-429	
	100	96.0	mg/kg	96	SW846 9030	02/28/05	5059429
			Dilution Factor: 1				

NOTE(S):

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

JUN 2005 RECEIVED

Date: 4 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Inorganics - Data Package No. W04523

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INTRODUCTION

This memo presents the results of data validation on Data Package No. W04523 prepared by Severn Trent (STL). 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
B19404	2/10/05	Soil	C	See note 1*
B19405	2/8/05	Soil	C	See note 1
B19406	2/14/05	Soil	C	See note 1

1 - ICP by 6010B and mercury by 7471A.
* - ICP/MS 200.8 requested but ICP 6010B was the analysis method.

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.

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

All other holding times were acceptable.

- **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.

Due to method blank contamination, all boron results were qualified as estimates and flagged "UJ".

All other 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 MS recovery outside QC limits 62%) and a MSD recovery outside QC limits (59%), all antimony results were qualified as estimates 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 of 67%, all antimony results were qualified as estimates and flagged "J".

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.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicate results were submitted for analysis.

- **Analytical Detection Limits**

Reported analytical detection levels are compared against the required target quanitiation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. Six results were reported above the RTQL. Under the FHI

statement of work, no qualification is required. All other undetected results met the analyte specific RTQL.

- **Completeness**

Data package No. W04523 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

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less than twice the limit, all mercury results were qualified as estimates and flagged "J".
- Due to method blank contamination, all boron results were qualified as estimates and flagged "UJ".
- Due to a MS recovery outside QC limits 62%) and a MSD recovery outside QC limits (59%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery of 67%, all antimony 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.

Six results 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

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).

Appendix 2

Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: W04523	REVIEWER: TLI	DATE: 5/4/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	J	All	Holding time
Boron	UJ	All	Method blank contamination
Antimony	J	All	MS/MSD and LCS 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.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, MG/KG

Project: FLUOR-HANFORD									
Laboratory: Severn Trent									
Case:	SDG: W04523								
Sample Number		B19404		B19405		B19406			
Remarks									
Sample Date		2/10/05		2/8/05		2/14/05			
Inorganics	RTQL	Result	Q	Result	Q	Result	Q	Result	Q
Antimony	6	1.3	J	2.8	J	0.54	J		
Arsenic	1	1.5		3.1		1.3			
Barium	20	69.1		71.9		55.0			
Beryllium	0.5	0.16		0.071		0.21			
Cadmium	0.5	ND*	U	ND*	U	ND*	U		
Chromium	1	47.2		193		6.2			
Copper	2.5	18.2		16.0		13.4			
Lead	1	2.2		14.3		1.8			
Nickel	4	6.9		6.8		5.8			
Selenium	10	ND	U	ND	U	ND	U		
Silver	0.5	ND*	U	ND*	U	ND*	U		
Bismuth	10	108		116		123			
Boron		3.0	UJ	2.6	UJ	3.1	UJ		
Mercury	0.2	0.81	J	5.6	J	0.037	J		
* - RTQL exceeded									

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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.

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

TOTAL Metals

Lot-Sample #...: F5B230353-001 **Matrix.....:** SOLID
Date Sampled...: 02/10/05 **Date Received..:** 02/23/05
% Moisture.....: 3.4

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5061047						
Antimony	1.3 J	1.0	mg/kg	SW846 6010B	03/02/05	G412N1AV
		Dilution Factor: 1		MDL.....: 0.21		
Arsenic	1.5	1.0	mg/kg	SW846 6010B	03/02/05	G412N1AW
		Dilution Factor: 1		MDL.....: 0.19		
Barium	69.1 #	20.7	mg/kg	SW846 6010B	03/02/05	G412N1AX
		Dilution Factor: 1		MDL.....: 0.046		
Beryllium	0.16 B	0.52	mg/kg	SW846 6010B	03/02/05	G412N1A0
		Dilution Factor: 1		MDL.....: 0.039		
Cadmium	ND	0.52	mg/kg	SW846 6010B	03/02/05	G412N1A1
		Dilution Factor: 1		MDL.....: 0.023		
Chromium	47.2	1.0	mg/kg	SW846 6010B	03/02/05	G412N1A2
		Dilution Factor: 1		MDL.....: 0.58		
Copper	18.2	2.6	mg/kg	SW846 6010B	03/02/05	G412N1A3
		Dilution Factor: 1		MDL.....: 0.39		
Lead	2.2	0.52	mg/kg	SW846 6010B	03/02/05	G412N1A4
		Dilution Factor: 1		MDL.....: 0.21		
Nickel	6.9 #	4.1	mg/kg	SW846 6010B	03/02/05	G412N1A5
		Dilution Factor: 1		MDL.....: 0.14		
Selenium	ND	0.52	mg/kg	SW846 6010B	03/02/05	G412N1A6
		Dilution Factor: 1		MDL.....: 0.31		
Silver	ND	1.0	mg/kg	SW846 6010B	03/02/05	G412N1A7
		Dilution Factor: 1		MDL.....: 0.60		
Bismuth	108	20.7	mg/kg	SW846 6010B	03/02/05	G412N1A8
		Dilution Factor: 1		MDL.....: 2.1		
Boron	3.0 B, UJ	20.7	mg/kg	SW846 6010B	03/02/05	G412N1A9
		Dilution Factor: 1		MDL.....: 0.59		
Prep Batch #...: 5075584						
Mercury	0.81 J	0.034	mg/kg	SW846 7471A	03/16-03/23/05	G412N1AU
		Dilution Factor: 1		MDL.....: 0.0075		

(Continued on next page)

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19405

TOTAL Metals

Lot-Sample #...: F5B230353-002 **Matrix.....: SOLID**
Date Sampled...: 02/08/05 **Date Received..: 02/23/05**
% Moisture.....: 4.6

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5061047						
Antimony	**2.8** J	**1.0**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AR**
		Dilution Factor: 1		MDL.....: 0.21		
Arsenic	**3.1**	**1.0**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AF**
		Dilution Factor: 1		MDL.....: 0.19		
Barium	**71.9**	**21.0**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AG**
		Dilution Factor: 1		MDL.....: 0.046		
Beryllium	**0.071 B**	**0.52**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AH**
		Dilution Factor: 1		MDL.....: 0.040		
Cadmium	ND	0.52	mg/kg	SW846 6010B	03/02/05	G414G1AJ
		Dilution Factor: 1		MDL.....: 0.023		
Chromium	**193**	**1.0**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AK**
		Dilution Factor: 1		MDL.....: 0.59		
Copper	**16.0**	**2.6**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AL**
		Dilution Factor: 1		MDL.....: 0.39		
Lead	**14.3**	**0.52**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AM**
		Dilution Factor: 1		MDL.....: 0.21		
Nickel	**6.8**	**4.2**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AN**
		Dilution Factor: 1		MDL.....: 0.14		
Selenium	ND	0.52	mg/kg	SW846 6010B	03/02/05	G414G1AP
		Dilution Factor: 1		MDL.....: 0.32		
Silver	ND	1.0	mg/kg	SW846 6010B	03/02/05	G414G1AQ
		Dilution Factor: 1		MDL.....: 0.61		
Bismuth	**116**	**21.0**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AR**
		Dilution Factor: 1		MDL.....: 2.1		
Boron	**2.6 B**	**21.0**	**mg/kg**	**SW846 6010B**	**03/02/05**	**G414G1AT**
		Dilution Factor: 1		MDL.....: 0.59		
Prep Batch #...: 5075584						
Mercury	**5.6** J	**0.35**	**mg/kg**	**SW846 7471A**	**03/16-03/24/05**	**G414G1AD**
		Dilution Factor: 10		MDL.....: 0.075		

MW 3.29.05

(Continued on next page)

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

TOTAL Metals

Lot-Sample #...: F5B230353-003 **Matrix.....:** SOLID
Date Sampled...: 02/14/05 **Date Received..:** 02/23/05
% Moisture.....: 3.7

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5061047						
Antimony	0.54 B J	1.0	mg/kg	SW846 6010B	03/02/05	G414M1AE
		Dilution Factor: 1		MDL.....: 0.21		
Arsenic	1.3	1.0	mg/kg	SW846 6010B	03/02/05	G414M1AF
		Dilution Factor: 1		MDL.....: 0.19		
Barium	55.0	20.8	mg/kg	SW846 6010B	03/02/05	G414M1AG
		Dilution Factor: 1		MDL.....: 0.046		
Beryllium	0.21 B	0.52	mg/kg	SW846 6010B	03/02/05	G414M1AH
		Dilution Factor: 1		MDL.....: 0.039		
Cadmium	ND	0.52	mg/kg	SW846 6010B	03/02/05	G414M1AJ
		Dilution Factor: 1		MDL.....: 0.023		
Chromium	6.2	1.0	mg/kg	SW846 6010B	03/02/05	G414M1AK
		Dilution Factor: 1		MDL.....: 0.58		
Copper	13.4	2.6	mg/kg	SW846 6010B	03/02/05	G414M1AL
		Dilution Factor: 1		MDL.....: 0.39		
Lead	1.8	0.52	mg/kg	SW846 6010B	03/02/05	G414M1AM
		Dilution Factor: 1		MDL.....: 0.21		
Nickel	5.8	4.2	mg/kg	SW846 6010B	03/02/05	G414M1AN
		Dilution Factor: 1		MDL.....: 0.14		
Selenium	ND	0.52	mg/kg	SW846 6010B	03/02/05	G414M1AP
		Dilution Factor: 1		MDL.....: 0.31		
Silver	ND	1.0	mg/kg	SW846 6010B	03/02/05	G414M1AQ
		Dilution Factor: 1		MDL.....: 0.60		
Bismuth	123	20.8	mg/kg	SW846 6010B	03/02/05	G414M1AR
		Dilution Factor: 1		MDL.....: 2.1		
Boron	3.1 UJ	20.8	mg/kg	SW846 6010B	03/02/05	G414M1AT
		Dilution Factor: 1		MDL.....: 0.59		
Prep Batch #...: 5075584						
Mercury	0.037 J	0.035	mg/kg	SW846 7471A	03/16-03/23/05	G414M1AD
		Dilution Factor: 1		MDL.....: 0.0075		

(Continued on next page)

LOT #3 F5B230253 W04523 5/1/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

This report contains the analytical results for the three samples received under chain of custody by STL St. Louis on February 23, 2005. These samples are associated with your F03-025 SAF.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt. The samples were received with only one day remaining in the extraction hold time for several tests. Due to RAD levels, a minimum volume was accepted by the laboratory. Due to the volume limitation,matrix QC was not performed for the following tests on a sample from this SDG: PCBs, BNA, pH and oil and grease.

The laboratory does not perform analysis for ethylene glycol.

Volatiles

The MSE initial calibration, E050215C, % RSD is greater than 15 % for dichlorodifluotomethane, freon 114, chloromethane, bromomethane, acetone,iodomethane, acetonitrile, methyl acetate, 2-butoxy ethanol, 2-butanone, methacrylonitrile, 2-chloroethyl vinyl ether, tetrachloroethene, trans-1,4-dichloro-2-butene and penatchloroethane. In those instances where the % RSD exceeds 15%, the initial calibration is acceptable provided the mean % RSD for all analytes in the calibration is less than 15%. The mean % RSD for this initial calibration is 10.6. The average RSD approach will lead to greater uncertainty for those analyte for which the %RSD is greater than 15%. The data user should review the associated quality control results carefully, with particular attention to the matrix spike and laboratory control sample results to determine if the calibration linearity poses a significant concern. 2-Butoxy ethanol does not meet the minimum five point calibration criteria (only four points). This analyte will not be analyzed behind this calibration. The continuing calibration fails for two of the CCCs (>20%) - Vinyl Chloride (41.87% low) and 1,1,-Dichloroethene (25.7% high). Freon 114 is 95% high (>60%, samples ND). The affected samples were rerun outside hold time but behind an acceptable calibration.

Methylene chloride was observed in the method blank above the reporting limit in batch 5056052. Methylene chloride is recognized as a laboratory contaminant. Concentrations up to five times the level observed in the method blank, in associated laboratory samples, may be attributed to its presence in the laboratory.

The LCS recoveries in batch 5060035 are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample purge efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

Due to QC failure, 1-butanol could not be reported from the 8260 analysis.

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

Semi-Volatiles

There was insufficient sample provided to perform the analysis at the method specified amount. A reduced sample amount was prepared. The reporting limit has been elevated accordingly. There was insufficient volume to perform an MS/MSD.

Metals

The MS (MSD) recovery for Antimony is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

Oil and Grease

A dilution was performed for method 413.1 due to limited sample volume. Reporting limits were adjusted accordingly.

Nitrate/Nitrite-N

The MS recovery for Nitrate is outside the established QC limits. A matrix interference is evident in the sample. Method performance is demonstrated by acceptable LCS and LCS-Duplicate recoveries. No further action is required.

Ammonia

The MS recovery for Ammonia is outside the established QC limits. A matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH-diesel/Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples, associated with this method blank, demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Samples were extracted out of hold. Samples were received with only one day remaining in the extraction holding time.
Affected Samples:
F5B230353 (1): B19404
F5B230353 (2): B19405

STL ST. LOUIS

SAMPLE SUMMARY

F5B230353

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
G412N	001	B19404	02/10/05	12:45
G414G	002	B19405	02/08/05	14:00
G414M	003	B19406	02/14/05	14:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

STL ST. LOUIS

METHODS SUMMARY

F5B230353

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Chloride	MCAWW 300.0A	MCAWW 300.0A
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3550
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Hexavalent Chromium	SW846 7196A	SW846 3060A
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A	SW846 7471A
Nitrate as N	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.1	
Nitrite as N	MCAWW 300.0A	MCAWW 300.0A
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Oil & Grease (Gravimetric)	SW846 9071A	
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Phosphate as P, Ortho	MCAWW 300.0A	MCAWW 300.0A
PCBs by SW-846 8082	SW846 8082	SW846 3550B/366
Semivolatile Organic Compounds by GC/MS	SW846 8270C	SW846 3550B
Soil and Waste pH	SW846 9045C	SW846 DI-LEACHA
Sulfate	MCAWW 300.0A	MCAWW 300.0A
Sulfide	SW846 9030	
Total Cyanide	SW846 9010A	SW846 9010A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B
Volatile Organics by GC/MS	SW846 8260B	SW846 5030B/826
Volatile Petroleum Hydrocarbons	SW846 8015 MOD	SW846 5030

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

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LOT # F5B230253

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-127	PAGE 1 OF 2
COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8N; AIR QUALITY: ☐; DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: 216-Z-7; 12.5ft-20ft 226-25 BT 12/01/04	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-356 1	COA: 119143ES10	METHOD OF SHIPMENT: Governement Vehicle	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA	

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

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: B19414

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
TYPE OF CONTAINER	Gs*	aG	aG	Gs*	P	aG	aG			
NO. OF CONTAINER(S)	3	1	1	3	1	1	1			
VOLUME	40mL	120mL	120mL	40mL	500mL	250mL	120mL			
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	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										
~~B19403~~	~~SOIL~~	~~2/10/05~~	~~1245~~							X	MAB 2/22/05		
B19404 ①	SOIL	2/10/05	1245	X	DT 2-18-05	DT 2-18-05	DT 2-18-05	DT 2-18-05	DT 2-18-05				

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	2/10/05 1429	SITE FRIG	2/10/05 1429
Site Fridge	2/18/05 1130 AM	David Tyra [signature] DT	2/18/05 1130 AM
2-7 Site fridge	2-22-05 0730	Kevin Augies [signature]	2-22-05 0730
Kevin Augies [signature]	0800 2-22-05	David Tyra [signature] DT	2/22/05 0800
David Tyra [signature] DT	2/22/05 0830	MO-0216 Fridge #3	2/22/05 0830

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

① Sample number changed to B19403 MAB 2/22/05

0780

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

W04523

000019

8 of 104

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-127	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐	DATA TURNAROUND 45 Days
SAMPLING LOCATION 216-Z-7; ~~17.5ft-20ft~~ 22.5'-25' JT 12/01/04	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-356 1	COA 119143ES10	METHOD OF SHIPMENT Governement Vehicle		
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA		

SPECIAL INSTRUCTIONS

The lab is to analyze pH within 24 hours of sample receipt. The lab is to report kerosene range organics from the WTPH-D analysis. FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met.

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Butanol}
(2)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} 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 {Ethylene glycol}
(4)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - ~~Add-on {Antimony-125, Cesium-134}~~ TMS 1104 Isotopic Plutonium; Isotopic Uranium; Neptunium-237; Americium-241;
(5)ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Copper, Nickel, Silver} ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Lead, Mercury, Selenium, Uranium} ICP Metals - 6010A (Add-on) {Bismuth}
(6)IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Cations (IC) - 300.7 {Nitrogen in ammonium} Cyanide (Total) - 335.2; pH (Soil) - 9045;

A-6003-618(03/03)

LOT # F5B230253 W04523 9 of 104

000020

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-179	PAGE 1 OF 2
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-Z-7; 17.5'-201	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil	SAF NO.: F03-025	AIR QUALITY ☐
ICE CHEST NO.: GRP-03-006	FIELD LOGBOOK NO.: — COA: 119143E510	METHOD OF SHIPMENT: Federal Express	
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: 2u RSR E0004	BILL OF LADING/AIR BILL NO.: 2u RSR E0004	

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 [illegible] 2/22/05 Rad-free B19415

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C
TYPE OF CONTAINER	aGa*
NO. OF CONTAINER(S)	3
VOLUME	40mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B19405	SOIL	2/8/05	1400	X

CHAIN OF POSSESSION — SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
M.G. Bracken	2/22/05 0830	M.H. Bauer/M.G. Bracken	2/22/05 0830
M.H. Bauer/M.G. Bracken	2/22/05 0830	Lab Ex	

SPECIAL INSTRUCTIONS: SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS. Original COC attached to document chain of possession

LABORATORY SECTION	RECEIVED BY: M Ward	TITLE	DATE/TIME: 2.23.05 9:00
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

LOT # EBR0251

000021

A-6003-618(03/03)

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-179	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. Sci RSR E0004		BILL OF LADING/AIR BILL NO. Sci RSR E0004		

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.

(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol} PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

A-6003-618(03/03)

LOT # F5B230253 W04523 11 of 104

000022

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-180	PAGE 1 OF 2
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-Z-7; 27.5'-30.0'	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025	AIR QUALITY ☐	
ICE CHEST NO.: GRP-03-006	FIELD LOGBOOK NO.	COA: 119143ES10	METHOD OF SHIPMENT: Federal Express		
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: Su RSR E0004		BILL OF LADING/AIR BILL NO.: Su RSR E0004		

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 MAB 2/22/05 Bad tu to B19416

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C	Cool 4C											
TYPE OF CONTAINER	aGs*	aG											
NO. OF CONTAINER(S)	3	1											
VOLUME	40mL	120mL											
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS											

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B19406	SOIL	2/14/05	1400	X	X								

CHAIN OF POSSESSION — SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MO-226 GRP 3	2/22/05 0855	M.H. Bauchler M.G. Bauchler	2/22/05 0855
M.G. Bauchler M.G. Bauchler	2/22/05	Fed Ex	

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Original COC attached to document chain of possession.

LABORATORY SECTION	RECEIVED BY: McWard	TITLE	DATE/TIME: 2-23-05 09:00
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

LOT # E5B230258

W04523

14 of 104

000023

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-180	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. See RSR E0004		BILL OF LADING/AIR BILL NO. See RSR E0004		

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.

(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol}

(2)PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

A-6003-618(03/03)

LOT # F5B230253 W04523 15 of 104

000024

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: W04523		
VALIDATOR: TCI		LAB: ST		DATE: 4/29/05	
			SDG: W04523		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
B19404	B19405	B19406			
					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 FR

Boron - UJ all

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: MS - antimony 62% - J all

MSD 59% - " " NO PAS

LCS - antimony 67% - J all

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: _____

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

4/24/04

Comments:

04 - 18+23 = 41
06 - 14+23 = 37
05 - 20+23 = 43

J all mercury

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Rresults 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: 04 05 06

cadmium cadmium cadmium – over

silver silver silver

Appendix 6

Additional Documentation Requested by Client

STL ST. LOUIS

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F5B230353 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F5C020000-047 Prep Batch #...: 5061047						
Antimony	ND	1.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AA
		Dilution Factor: 1				
Arsenic	ND	1.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AC
		Dilution Factor: 1				
Barium	0.062 B	20.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AD
		Dilution Factor: 1				
Beryllium	ND	0.50	mg/kg	SW846 6010B	03/02/05	G5CRH1AE
		Dilution Factor: 1				
Cadmium	ND	0.50	mg/kg	SW846 6010B	03/02/05	G5CRH1AF
		Dilution Factor: 1				
Chromium	ND	1.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AG
		Dilution Factor: 1				
Copper	ND	2.5	mg/kg	SW846 6010B	03/02/05	G5CRH1AH
		Dilution Factor: 1				
Lead	ND	0.50	mg/kg	SW846 6010B	03/02/05	G5CRH1AJ
		Dilution Factor: 1				
Nickel	0.24 B	4.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AK
		Dilution Factor: 1				
Selenium	ND	0.50	mg/kg	SW846 6010B	03/02/05	G5CRH1AL
		Dilution Factor: 1				
Silver	ND	1.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AM
		Dilution Factor: 1				
Bismuth	ND	20.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AN
		Dilution Factor: 1				
Boron	4.7 B	20.0	mg/kg	SW846 6010B	03/02/05	G5CRH1AP
		Dilution Factor: 1				

(Continued on next page)

STL ST. LOUIS

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F5B230353 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F5C160000-584 Prep Batch #...: 5075584						
Mercury	ND	0.033	mg/kg	SW846 7471A	03/16-03/23/05	G6DW81AA
		Dilution Factor: 1				

NOTE(S):

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

B Estimated result. Result is less than RL.

STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F5B230353 Matrix.....: SOLID
Date Sampled...: 02/14/05 Date Received..: 02/23/05

MS Lot-Sample #: F5B230353-003 Prep Batch #...: 5061047
% Moisture.....: 3.7

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Antimony									
	0.54	51.9	32.8 N	mg/kg	62		SW846 6010B	03/02/05	G414M1C1
	0.54	51.9	31.0 N	mg/kg	59	5.4	SW846 6010B	03/02/05	G414M1C2
			Dilution Factor: 1						
Arsenic									
	1.3	208	201	mg/kg	96		SW846 6010B	03/02/05	G414M1C3
	1.3	208	201	mg/kg	96	0.05	SW846 6010B	03/02/05	G414M1C4
			Dilution Factor: 1						
Barium									
	55.0	208	249	mg/kg	94		SW846 6010B	03/02/05	G414M1C5
	55.0	208	271	mg/kg	104	8.3	SW846 6010B	03/02/05	G414M1C6
			Dilution Factor: 1						
Beryllium									
	0.21	5.19	5.46	mg/kg	101		SW846 6010B	03/02/05	G414M1C7
	0.21	5.19	5.49	mg/kg	102	0.43	SW846 6010B	03/02/05	G414M1C8
			Dilution Factor: 1						
Cadmium									
	ND	5.19	4.01	mg/kg	77		SW846 6010B	03/02/05	G414M1C9
	ND	5.19	3.91	mg/kg	75	2.6	SW846 6010B	03/02/05	G414M1DA
			Dilution Factor: 1						
Chromium									
	6.2	20.8	24.0	mg/kg	86		SW846 6010B	03/02/05	G414M1DC
	6.2	20.8	26.5	mg/kg	98	10	SW846 6010B	03/02/05	G414M1DD
			Dilution Factor: 1						
Copper									
	13.4	26.0	36.8	mg/kg	90		SW846 6010B	03/02/05	G414M1DE
	13.4	26.0	38.7	mg/kg	98	4.9	SW846 6010B	03/02/05	G414M1DF
			Dilution Factor: 1						
Lead									
	1.8	51.9	49.9	mg/kg	93		SW846 6010B	03/02/05	G414M1DG
	1.8	51.9	50.2	mg/kg	93	0.54	SW846 6010B	03/02/05	G414M1DH
			Dilution Factor: 1						

(Continued on next page)

STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F5B230353 **Matrix.....:** SOLID
Date Sampled...: 02/14/05 **Date Received..:** 02/23/05

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Nickel									
	5.8	51.9	53.8	mg/kg	93		SW846 6010B	03/02/05	G414M1DJ
	5.8	51.9	55.9	mg/kg	97	3.8	SW846 6010B	03/02/05	G414M1DK
			Dilution Factor: 1						
Selenium									
	ND	208	195	mg/kg	94		SW846 6010B	03/02/05	G414M1DL
	ND	208	195	mg/kg	94	0.09	SW846 6010B	03/02/05	G414M1DM
			Dilution Factor: 1						
Silver									
	ND	5.19	4.80	mg/kg	93		SW846 6010B	03/02/05	G414M1DN
	ND	5.19	4.77	mg/kg	92	0.67	SW846 6010B	03/02/05	G414M1DP
			Dilution Factor: 1						
Bismuth									
	123	208	308	mg/kg	89		SW846 6010B	03/02/05	G414M1DQ
	123	208	330	mg/kg	99	6.7	SW846 6010B	03/02/05	G414M1DR
			Dilution Factor: 1						
Boron									
	3.1	208	196	mg/kg	93		SW846 6010B	03/02/05	G414M1DT
	3.1	208	196	mg/kg	93	0.01	SW846 6010B	03/02/05	G414M1DU
			Dilution Factor: 1						

MS Lot-Sample #: F5B230353-003 **Prep Batch #...:** 5075584
% Moisture.....: 3.7

Mercury									
	0.037	0.173	0.183	mg/kg	85		SW846 7471A	03/16-03/23/05	G414M1CX
	0.037	0.173	0.196	mg/kg	92	6.4	SW846 7471A	03/16-03/23/05	G414M1C0
			Dilution Factor: 1						

NOTE(S):

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

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F5B230353 Matrix.....: SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F5C020000-047 Prep Batch #...: 5061047							
Antimony	60.9	40.7	mg/kg	67	SW846 6010B	03/02/05	G5CRH1AQ
			Dilution Factor: 1				
Arsenic	161	144	mg/kg	90	SW846 6010B	03/02/05	G5CRH1AR
			Dilution Factor: 1				
Barium	252	221	mg/kg	88	SW846 6010B	03/02/05	G5CRH1AT
			Dilution Factor: 1				
Beryllium	94.4	91.0	mg/kg	96	SW846 6010B	03/02/05	G5CRH1AU
			Dilution Factor: 1				
Cadmium	128	121	mg/kg	95	SW846 6010B	03/02/05	G5CRH1AV
			Dilution Factor: 1				
Chromium	69.5	59.4	mg/kg	85	SW846 6010B	03/02/05	G5CRH1AW
			Dilution Factor: 1				
Copper	148	139	mg/kg	94	SW846 6010B	03/02/05	G5CRH1AX
			Dilution Factor: 1				
Lead	142	123	mg/kg	86	SW846 6010B	03/02/05	G5CRH1A0
			Dilution Factor: 1				
Nickel	147	136	mg/kg	93	SW846 6010B	03/02/05	G5CRH1A1
			Dilution Factor: 1				
Selenium	64.2	56.8	mg/kg	89	SW846 6010B	03/02/05	G5CRH1A2
			Dilution Factor: 1				
Silver	130	127	mg/kg	97	SW846 6010B	03/02/05	G5CRH1A3
			Dilution Factor: 1				
Bismuth	200	191	mg/kg	95	SW846 6010B	03/02/05	G5CRH1A4
			Dilution Factor: 1				
Boron	97.4	87.3	mg/kg	90	SW846 6010B	03/02/05	G5CRH1A5
			Dilution Factor: 1				

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STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F5B230353 Matrix.....: SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F5C160000-584 Prep Batch #...: 5075584							
Mercury	4.04	3.87	mg/kg	96	SW846 7471A	03/16-03/23/05	G6DW81AC
Dilution Factor: 5							

NOTE(S):

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

JUN RECEIVED

Date: 4 April 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Semivolatiles - Data Package No. W04523

FINAL COPY
~~PRELIMINARY COPY~~ Dayes 7/26/05

INTRODUCTION

This memo presents the results of data validation on Data Package No. W04523 prepared by Severn Trent (STL). 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
B19404	2/10/05	Soil	C	See note 1
B19405	2/8/05	Soil	C	See note 1
B19406	2/14/05	Soil	C	See note 1 *

1-Semivolatiles by 8270 (tributylphosphate & phenol), NWTPH-D and volatile petroleum hydrocarbons by 8015.
* - Phenol requested but not reported.

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/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 for 8270 and analyzed within 14 days of collection for 8015.

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".

Due to the holding time being exceeded by less than twice the limit, all tributylphosphate and phenol results in samples B19404 and B19405 were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than twice the limit, the volatile petroleum organic result in sample B19405 was qualified as an estimate and flagged "J".

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

All other holding times were acceptable.

- **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.

<u>Field Blanks</u>

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.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all phenol and tributylphosphate results were qualified as estimates and flagged "J".

All other matrix spike/matrix spike duplicate and blank spike results were acceptable.

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".

All 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.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all phenol and tributylphosphate results were qualified as estimates and flagged "J".

All other 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 required criteria. All kerosene, phenol and TPH-D results exceeded the RTQL Under the FHI statement of work, no qualification is required. All other results met the anaylyte specific RTQL.

- **Completeness**

Data package No. W04523 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 93%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less than twice the limit, all tributylphosphate and phenol results in samples B19404 and B19405 were qualified as estimates and flagged "J".

- Due to the holding time being exceeded by less than twice the limit, all tributylphosphate and phenol results in samples B19404 and B19405 were qualified as estimates and flagged "J".

- Due to the holding time being exceeded by less than twice the limit, the volatile petroleum organic result in sample B19405 was qualified as an estimate and flagged "J".

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

- Due to the lack of a matrix spike and matrix spike duplicate analysis, all phenol and tributylphosphate 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 kerosene, phenol and TPH-D results 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.

Appendix 1

Glossary of Data Reporting Qualifiers

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).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: W04523	REVIEWER: TLI	DATE: 5/4/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Phenol Tributylphosphate	J	B19404, B19405	Holding time
TPH-D Kerosene	J	All	Holding time
Volatile petroleum hydrocarbons	J	B19405	Holding time
Phenol Tributylphosphate	J	All	No MS/MSD 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.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD							
Laboratory: Severn Trent							
Case:	SDG: W04523						
Sample Number		B19404		B19405		B19406	
Remarks							
Sample Date		2/10/05		2/8/05		2/14/05	
Analysis Date		3/12/05		3/12/05		3/12/05	
Semivolatile (8270B)/TPH	RTQL	Result	Q	Result	Q	Result	Q
Phenol	330	ND	UJ	ND	UJ	NA	
Tributyl phosphate	3300	ND	UJ	ND	UJ	ND	UJ
TPH-D*	5	ND	UJ	ND	UJ	ND	UJ
Kersosene*	5	ND	UJ	ND	UJ	ND	UJ
Volatile Petroleum Hydrocarbons*	5	ND	U	ND	UJ	ND	U
* - Units are mg/kg							
NA - Not analyzed							

000011

* - The reported detection limit is above the TQL

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.

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

GC/MS Semivolatiles

Lot-Sample #...:	F5B230353-001	**Work Order #...:**	G412N1AP	**Matrix.....:**	SOLID
Date Sampled...:	02/10/05	**Date Received..:**	02/23/05		
Prep Date.....:	02/28/05	**Analysis Date..:**	03/12/05		
Prep Batch #...:	5059555				
Dilution Factor:	1				
% Moisture.....:	3.4	**Method.....:**	SW846 8270C		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Tributyl phosphate	ND UJ	420	ug/kg	340
Phenol	ND UJ	420	ug/kg	90

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	73	(40 - 103)
Phenol-d5	72	(36 - 105)
Nitrobenzene-d5	76	(45 - 114)
2-Fluorobiphenyl	78	(49 - 120)
2,4,6-Tribromophenol	66	(39 - 114)
Terphenyl-d14	63	(42 - 108)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19405

GC/MS Semivolatiles

Lot-Sample #...: F5B230353-002 Work Order #...: G414G1CD Matrix.....: SOLID
Date Sampled...: 02/08/05 Date Received..: 02/23/05
Prep Date.....: 02/28/05 Analysis Date..: 03/12/05
Prep Batch #...: 5059555
Dilution Factor: 1
% Moisture.....: 4.6 Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Tributyl phosphate	ND UJ	830	ug/kg	350
Phenol	ND UJ	830	ug/kg	91

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	73	(40 - 103)
Phenol-d5	73	(36 - 105)
Nitrobenzene-d5	75	(45 - 114)
2-Fluorobiphenyl	77	(49 - 120)
2,4,6-Tribromophenol	67	(39 - 114)
Terphenyl-d14	61	(42 - 108)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

GC/MS Semivolatiles

Lot-Sample #...:	F5B230353-003	Work Order #...:	G414M1CD	Matrix.....:	SOLID
Date Sampled...:	02/14/05	Date Received..:	02/23/05		
Prep Date.....:	02/28/05	Analysis Date..:	03/12/05		
Prep Batch #...:	5059555				
Dilution Factor:	1				
% Moisture.....:	3.7	Method.....:	SW846 8270C		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Tributyl phosphate	ND UJ	340	ug/kg	340

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	72	(40 - 103)
Phenol-d5	72	(36 - 105)
Nitrobenzene-d5	74	(45 - 114)
2-Fluorobiphenyl	77	(49 - 120)
2,4,6-Tribromophenol	72	(39 - 114)
Terphenyl-d14	66	(42 - 108)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

GC Semivolatiles

Lot-Sample #...:	F5B230353-001	Work Order #...:	G412N1CF	Matrix.....:	SOLID
Date Sampled...:	02/10/05	Date Received..:	02/23/05		
Prep Date.....:	02/28/05	Analysis Date..:	03/10/05		
Prep Batch #...:	5059552				
Dilution Factor:	1				
% Moisture.....:	3.4	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Kerosene	ND UJ	26	mg/kg	26
TPH - Diesel Range - WTPH-D	ND UJ	26	mg/kg	0.97

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	40	(10 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19405

GC Semivolatiles

Lot-Sample #...:	F5B230353-002	Work Order #...:	G414G1CE	Matrix.....:	SOLID
Date Sampled...:	02/08/05	Date Received..:	02/23/05		
Prep Date.....:	02/28/05	Analysis Date..:	03/10/05		
Prep Batch #...:	5059552				
Dilution Factor:	1				
% Moisture.....:	4.6	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Kerosene	ND UJ	26	mg/kg	26
TPH - Diesel Range - WTPH-D	ND UJ	26	mg/kg	0.99

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	45	(10 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

GC Semivolatiles

Lot-Sample #...: F5B230353-003	**Work Order #...:** G414M1CA	**Matrix.....:** SOLID
Date Sampled...: 02/14/05	**Date Received..:** 02/23/05	
Prep Date.....: 02/28/05	**Analysis Date..:** 03/10/05	
Prep Batch #...: 5059552		
Dilution Factor: 1		
% Moisture.....: 3.7	**Method.....:** SW846 8015 MOD	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Kerosene	ND UJ	26	mg/kg	26
TPH - Diesel Range - WTPH-D	ND UJ	26	mg/kg	0.98

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	43	(10 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

GC Volatiles

Lot-Sample #...:	F5B230353-001	Work Order #...:	G412N1AR	Matrix.....:	SOLID
Date Sampled...:	02/10/05	Date Received..:	02/23/05		
Prep Date.....:	02/24/05	Analysis Date..:	02/24/05		
Prep Batch #...:	5056081				
Dilution Factor:	1				
% Moisture.....:	3.4	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Volatile Petroleum Hydrocarbons	ND	0.10	mg/kg	0.021

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Trifluorotoluene	84	(28 - 124)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19405

GC Volatiles

Lot-Sample #...:	F5B230353-002	**Work Order #...:**	G414G1A9	**Matrix.....:**	SOLID
Date Sampled...:	02/08/05	**Date Received..:**	02/23/05		
Prep Date.....:	02/24/05	**Analysis Date..:**	02/24/05		
Prep Batch #...:	5056081				
Dilution Factor:	1				
% Moisture.....:	4.6	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Volatile Petroleum Hydrocarbons	ND UJ	0.10	mg/kg	0.021

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Trifluorotoluene	82	(28 - 124)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

GC Volatiles

Lot-Sample #...:	F5B230353-003	Work Order #...:	G414M1A9	Matrix.....:	SOLID
Date Sampled...:	02/14/05	Date Received..:	02/23/05		
Prep Date.....:	02/24/05	Analysis Date..:	02/24/05		
Prep Batch #...:	5056081				
Dilution Factor:	1				
% Moisture.....:	3.7	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Volatile Petroleum Hydrocarbons	ND	0.10	mg/kg	0.021

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Trifluorotoluene	78	(28 - 124)

5/1/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

This report contains the analytical results for the three samples received under chain of custody by STL St. Louis on February 23, 2005. These samples are associated with your F03-025 SAF.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt. The samples were received with only one day remaining in the extraction hold time for several tests. Due to RAD levels, a minimum volume was accepted by the laboratory. Due to the volume limitation,matrix QC was not performed for the following tests on a sample from this SDG: PCBs, BNA, pH and oil and grease.

The laboratory does not perform analysis for ethylene glycol.

Volatiles

The MSE initial calibration, E050215C, % RSD is greater than 15 % for dichlorodifluotomethane, freon 114, chloromethane, bromomethane, acetone,iodomethane, acetonitrile, methyl acetate, 2-butoxy ethanol, 2-butanone, methacrylonitrile, 2-chloroethyl vinyl ether, tetrachloroethene, trans-1,4-dichloro-2-butene and penatchloroethane. In those instances where the % RSD exceeds 15%, the initial calibration is acceptable provided the mean % RSD for all analytes in the calibration is less than 15%. The mean % RSD for this initial calibration is 10.6. The average RSD approach will lead to greater uncertainty for those analyte for which the %RSD is greater than 15%. The data user should review the associated quality control results carefully, with particular attention to the matrix spike and laboratory control sample results to determine if the calibration linearity poses a significant concern. 2-Butoxy ethanol does not meet the minimum five point calibration criteria (only four points). This analyte will not be analyzed behind this calibration. The continuing calibration fails for two of the CCCs (>20%) - Vinyl Chloride (41.87% low) and 1,1,-Dichloroethene (25.7% high). Freon 114 is 95% high (>60%, samples ND). The affected samples were rerun outside hold time but behind an acceptable calibration.

Methylene chloride was observed in the method blank above the reporting limit in batch 5056052. Methylene chloride is recognized as a laboratory contaminant. Concentrations up to five times the level observed in the method blank, in associated laboratory samples, may be attributed to its presence in the laboratory.

The LCS recoveries in batch 5060035 are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample purge efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

Due to QC failure, 1-butanol could not be reported from the 8260 analysis.

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

Semi-Volatiles

There was insufficient sample provided to perform the analysis at the method specified amount. A reduced sample amount was prepared. The reporting limit has been elevated accordingly. There was insufficient volume to perform an MS/MSD.

Metals

The MS (MSD) recovery for Antimony is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

Oil and Grease

A dilution was performed for method 413.1 due to limited sample volume. Reporting limits were adjusted accordingly.

Nitrate/Nitrite-N

The MS recovery for Nitrate is outside the established QC limits. A matrix interference is evident in the sample. Method performance is demonstrated by acceptable LCS and LCS-Duplicate recoveries. No further action is required.

Ammonia

The MS recovery for Ammonia is outside the established QC limits. A matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH-diesel/Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples, associated with this method blank, demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Samples were extracted out of hold. Samples were received with only one day remaining in the extraction holding time.
Affected Samples:
F5B230353 (1): B19404
F5B230353 (2): B19405

STL ST. LOUIS

SAMPLE SUMMARY

F5B230353

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
G412N	001	B19404	02/10/05	12:45
G414G	002	B19405	02/08/05	14:00
G414M	003	B19406	02/14/05	14:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

STL ST. LOUIS

METHODS SUMMARY

F5B230353

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Chloride	MCAWW 300.0A	MCAWW 300.0A
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3550
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Hexavalent Chromium	SW846 7196A	SW846 3060A
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A	SW846 7471A
Nitrate as N	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.1	
Nitrite as N	MCAWW 300.0A	MCAWW 300.0A
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Oil & Grease (Gravimetric)	SW846 9071A	
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Phosphate as P, Ortho	MCAWW 300.0A	MCAWW 300.0A
PCBs by SW-846 8082	SW846 8082	SW846 3550B/366
Semivolatile Organic Compounds by GC/MS	SW846 8270C	SW846 3550B
Soil and Waste pH	SW846 9045C	SW846 DI-LEACHA
Sulfate	MCAWW 300.0A	MCAWW 300.0A
Sulfide	SW846 9030	
Total Cyanide	SW846 9010A	SW846 9010A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B
Volatile Organics by GC/MS	SW846 8260B	SW846 5030B/826
Volatile Petroleum Hydrocarbons	SW846 8015 MOD	SW846 5030

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-178	PAGE 1 OF 2
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: 0216-Z-7; 2251-25.0'	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025	AIR QUALITY: ☐
ICE CHEST NO.: GRP-03-006	FIELD LOGBOOK NO.:	COA: 119143ES10	METHOD OF SHIPMENT: Federal Express	
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: 3u R3R E0004		BILL OF LADING/AIR BILL NO.: 3u R3R E0004	

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 MAB 2/22/05 Rad tu to B19414

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C												
TYPE OF CONTAINER	VOA												
NO. OF CONTAINER(S)	3												
VOLUME	40mL												
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS												

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	[redacted]
B19403	SOIL	2/15/05	1245	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
M.R. Pfister RJ 2/22/05	2105	M.R. Pfister M.R. Pfister 2/22/05	2105
M.R. Pfister M.R. Pfister 2/22/05	2105	Red 2X	

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Original COC attached to document chain of possession.

WO 24523

LABORATORY SECTION	RECEIVED BY: M Ward	TITLE:	DATE/TIME: 2-23-05 0900
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD:	DISPOSED BY:	DATE/TIME:

LOT # B19403 B19414

WO 24523

000026

6 of 10

14-6083-618(03/03)

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-178	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. SuRSR E0004		BILL OF LADING/AIR BILL NO. SuRSR E0004		

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.

(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol} PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

A-6003-618(03/03)

LOT F5E230253 W04523 7 of 104

000027

STL ST. LOUIS

LOT # F5B230253

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-127	PAGE 1 OF 2
COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8N; AIR QUALITY: ☐; DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: 216-Z-7; 17.5ft-20ft 226-25 BT 12/01/04	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-356 1	COA: 119143ES10	METHOD OF SHIPMENT: Governement Vehicle	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA	

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

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: B19414

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
TYPE OF CONTAINER	Gs*	aG	aG	Gs*	P	aG	aG			
NO. OF CONTAINER(S)	3	1	1	3	1	1	1			
VOLUME	40mL	120mL	120mL	40mL	500mL	250mL	120mL			
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	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										
~~B19403~~	~~SOIL~~	~~2/10/05~~	~~1245~~							X	MAB 2/22/05		
B19404 ①	SOIL	2/10/05	1245	X	BT 2-18-05	BT 2-18-05	BT 2-18-05	BT 2-18-05	BT 2-18-05				

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Riffeson/Rudy	2/10/05 1429	SITE FRIG	2/10/05 1429
Site Fridge	2/18/05 1130 AM	David Tyra/[signature]	2/18/05 1130 AM
2-7 Site fridge	2-22-05 0730	Kevin Aughes/[signature]	2-22-05 0780
Kevin Aughes/[signature]	0800 2-22-05	David Tyra/[signature]	2/22/05 0800
David Tyra/[signature]	2/22/05 0830	MO-026 Fridge #3	2/22/05 0830

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

① Sample number changed to B19403 MAB 2/22/05

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

W04523

000028

8 of 104

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-825-127	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-Z-7; ~~19.5ft-20ft~~ 22.5'-25' JT 12/01/04	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-356 1	COA 119143ES10	METHOD OF SHIPMENT Governement Vehicle		
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA		

SPECIAL INSTRUCTIONS

The lab is to analyze pH within 24 hours of sample receipt. The lab is to report kerosene range organics from the WTPH-D analysis. FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met.

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Butanol}
(2)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} 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 {Ethylene glycol}
(4)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on ~~{Antimony-125, Cesium-134}~~ Isotopic Plutonium; Isotopic Uranium; Neptunium-237; Americium-241; Tritium
(5)ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Copper, Nickel, Silver} ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Lead, Mercury, Selenium, Uranium} ICP Metals - 6010A (Add-on) {Bismuth}
(6)IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Cations (IC) - 300.7 {Nitrogen in ammonium} Cyanide (Total) - 335.2; pH (Soil) - 9045;

A-6003-618(03/03)

LOT # F5B230253 W04523 000029 9 of 104

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-179	PAGE 1 OF 2
COLLECTOR: Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8N; DATA TURNAROUND
SAMPLING LOCATION: 216-Z-7; 17.5'-201	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025	AIR QUALITY ☐; 45 Days / 45 Days
ICE CHEST NO.: GRP-03-006	FIELD LOGBOOK NO.	COA: 119143E510	METHOD OF SHIPMENT: Federal Express	
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: 2u RSR E0004		BILL OF LADING/AIR BILL NO.: 2u RSR E0004	

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 [illegible] 2/22/05 Rad Info B19415

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C												
TYPE OF CONTAINER	wGl*												
NO. OF CONTAINER(S)	3												
VOLUME	40ml.												
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS												

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	[redacted]									
B19405	SOIL	2/8/05	1400	X									

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[illegible]	2/22/05 0930	[illegible]	2/22/05
[illegible]	2/22/05 0930	[illegible]	

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Original COC attached to document chain of possession

LABORATORY SECTION	RECEIVED BY: MWard	TITLE	DATE/TIME: 2.23.05 9∞
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

LOT # E0025 WO# 5523 000030

10 of 10

A-6003-618(03/03)

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-179	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. SW RSR E0004		BILL OF LADING/AIR BILL NO. SW RSR E0004		

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.

(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol} PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

LOT # F03-025-179

W04523

000031

11 of 104

7-6003-618(03/03)

STL ST. LOUIS

LOT # E5B1025

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F03-025-180 | PAGE 1 OF 2

COLLECTOR: Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 216-Z-7; 27.5'-30.0'	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025
ICE CHEST NO.: GRP-03-006	FIELD LOGBOOK NO.:	COA: 119143E510	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Severn Trent St. Louis	OFFSITE PROPERTY NO.: 2u RSR E0004		BILL OF LADING/AIR BILL NO.: 2u RSR E0004

PRICE CODE: 8N | AIR QUALITY: ☐ | DATA TURNAROUND: 45 Days / 45 Days

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 MAB 2/20/05 Rad fu to B19416

SPECIAL HANDLING AND/OR STORAGE: N/A

PRESERVATION	Cool 4C	Cool 4C									
TYPE OF CONTAINER	nGs*	nG									
NO. OF CONTAINER(S)	3	1									
VOLUME	40mL	120mL									
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS									

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B19406	SOIL	2/14/05	1400	X	X								

WO# 5523

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MD-026	2/22/05 0855	M.H. Ballinger/M.H. Ballinger	2/22/05 0855
M.H. Ballinger/M.H. Ballinger	2/22/05	PLF 8X	

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Original COC attached to document chain of possession.

LABORATORY SECTION	RECEIVED BY: M. Ward	TITLE:	DATE/TIME: 2-23-05 09:00
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD:	DISPOSED BY:	DATE/TIME:

14 OF 19

F-A-6003-618(03/03)

000032

STL ST. LOUIS

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-180	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE BN AIR QUALITY ☐	DATA TURNAROUND 45 Days
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		
ICE CHEST NO.	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Severn Trent St. Louis	OFFSITE PROPERTY NO. See RSR E0004		BILL OF LADING/AIR BILL NO. See RSR E0004		

SPECIAL INSTRUCTIONS

FH acknowledges that the analytical holding time for NO2, NO3, PO4 by EPA Method 300.0 will not be met. Analyze pH within 24 hours of receipt, and report kerosene range organics from the WTPH-D. This sample transferred from WSCF.

(1)VOA - 8260A (TCL); Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G; Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Ethylene glycol}

(2)PCBs - 8082; 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); Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Ammonia - 350.1; Total Cyanide - 9010; pH (Soil) - 9045; Activity Scan;

A-6003-618(03/03)

LOT # F5E230253 W04523 15 of 104

000033

Appendix 5

Data Validation Supporting Documentation

000034

HNF-20433 REV 0

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: W04523		
VALIDATOR: TLI		LAB: ST		DATE: 4/29/05	
			SDG: W04523		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
B19404	B19405	B19406			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments:

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

GC/MS tuning/performance check acceptable? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

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

Comments: NO FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

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

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

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

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

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

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

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

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

Comments: NO TBP or phenol MS/MSD – J all

No PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: NU TBP or phenol MS/MSD - J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No (N/A)
Iinternal 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: SV - 04 + 05 <2x J all
VPH - 05 <2x J all
Diesel & kerosen - 04 05 06 <2x J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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

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

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

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

Comments: ~~Phenol~~ - 04 05 06

Kerosene - 04 05 06

TPH-D - 04 05 06

06 - missing phenol

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

STL ST. LOUIS

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: F5B230353 Work Order #...: G49HC1AD Matrix.....: SOLID
MB Lot-Sample #: F5B280000-555

Prep Date.....: 02/28/05
Analysis Date..: 03/12/05 Prep Batch #...: 5059555
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Phenol	ND	400	ug/kg	SW846 8270C
Tributyl phosphate	ND	330	ug/kg	SW846 8270C

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	74	(40 - 103)
Phenol-d5	75	(36 - 105)
Nitrobenzene-d5	76	(45 - 114)
2-Fluorobiphenyl	79	(49 - 120)
2,4,6-Tribromophenol	68	(39 - 114)
Terphenyl-d14	62	(42 - 108)

NOTE(S):

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

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #...: F5B230353 Work Order #...: G49HC1AE-LCS Matrix.....: SOLID
LCS Lot-Sample#: F5B280000-555 G49HC1AF-LCSD
Prep Date.....: 02/28/05 Analysis Date..: 03/12/05
Prep Batch #...: 5059555
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Phenol	3330	2330	ug/kg	70		SW846 8270C
	3330	2260	ug/kg	68	3.1	SW846 8270C

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	73	(50 - 98)
	70	(50 - 98)
Phenol-d5	73	(51 - 95)
	71	(51 - 95)
Nitrobenzene-d5	76	(50 - 111)
	74	(50 - 111)
2-Fluorobiphenyl	78	(57 - 117)
	76	(57 - 117)
2,4,6-Tribromophenol	75	(53 - 108)
	73	(53 - 108)
Terphenyl-d14	59	(49 - 107)
	58	(49 - 107)

NOTE(S):

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

Bold print denotes control parameters

STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: F5B230353 Work Order #...: G414M1CU-MS Matrix.....: SOLID
MS Lot-Sample #: F5B230353-003 G414M1CV-MSD
Date Sampled...: 02/14/05 Date Received..: 02/23/05
Prep Date.....: 02/24/05 Analysis Date..: 02/24/05
Prep Batch #...: 5056081
Dilution Factor: 1 % Moisture.....: 3.7

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Volatile Petroleum Hydrocarbons	ND	1.04	0.954	mg/kg	92		SW846 8015 MOD
	ND	1.04	1.08	mg/kg	104	13	SW846 8015 MOD

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Trifluorotoluene	93	(28 - 124)
	90	(28 - 124)

NOTE(S):

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

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

STL ST. LOUIS

METHOD BLANK REPORT

GC Volatiles

Client Lot #...: F5B230353 Work Order #...: G446K1AA Matrix.....: SOLID
MB Lot-Sample #: F5B250000-081
Prep Date.....: 02/24/05
Analysis Date..: 02/24/05 Prep Batch #...: 5056081
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Volatile Petroleum Hydrocarbons	ND	0.10	mg/kg	SW846 8015 MOD

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Trifluorotoluene	85	(28 - 124)

NOTE(S):

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

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: F5B230353 Work Order #...: G446K1AC Matrix.....: SOLID
LCS Lot-Sample#: F5B250000-081
Prep Date.....: 02/24/05 Analysis Date..: 02/24/05
Prep Batch #...: 5056081
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Volatile Petroleum Hydrocarbons	1.00	1.03	mg/kg	103	SW846 8015 MO

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Trifluorotoluene	97	(85 - 108)

NOTE(S):

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

Bold print denotes control parameters

STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: F5B230353 Work Order #...: G414M1EF-MS Matrix.....: SOLID
MS Lot-Sample #: F5B230353-003 G414M1EG-MSD
Date Sampled...: 02/14/05 Date Received..: 02/23/05
Prep Date.....: 02/28/05 Analysis Date..: 03/10/05
Prep Batch #...: 5059552
Dilution Factor: 1 % Moisture.....: 3.7

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
TPH - Diesel Range - WTPH	ND	85.1	82.7	mg/kg	97 a		SW846 8015 MOD
	ND	84.8	74.1	mg/kg	87 a	11	SW846 8015 MOD

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	72	(10 - 150)
	63	(10 - 150)

NOTE(S):

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

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

STL ST. LOUIS

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: F5B230353
MB Lot-Sample #: F5B280000-552
Analysis Date..: 03/10/05
Dilution Factor: 1

Work Order #...: G49FP1AA
Prep Date.....: 02/28/05
Prep Batch #...: 5059552

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Kerosene	ND	25	mg/kg	SW846 8015 MOD
TPH - Diesel Range - WTPH	ND	25	mg/kg	SW846 8015 MOD

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	77 *	(78 - 150)

NOTE(S):

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

* Surrogate recovery is outside stated control limits.

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: F5B230353 Work Order #...: G49FP1AC Matrix.....: SOLID
LCS Lot-Sample#: F5B280000-552
Prep Date.....: 02/28/05 Analysis Date..: 03/10/05
Prep Batch #...: 5059552
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
TPH - Diesel Range - WTPH	83.3	77.1	mg/kg	93	SW846 8015 MO

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	129	(78 - 150)

NOTE(S):

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

Bold print denotes control parameters

JUN RECEIVED

Date: 4 April 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Volatiles - Data Package No. W04523

FINAL COPY ~~PRELIMINARY COPY~~ Daynes 7/26/05

INTRODUCTION

This memo presents the results of data validation on Data Package No. W04523 prepared by Severn Trent (STL). 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
B19404	2/10/05	Soil	C	See note 1
B19404*	2/10/05	Soil	C	See note 1
B19405	2/8/05	Soil	C	See note 1
B19406	2/14/05	Soil	C	See note 1

1 - Volatile by 8260A.
* - Reanalyzed outside hold time.

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/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".

Due to the holding time being exceeded by less than twice the limit, all volatile organic results in sample B19405 were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than twice the limit, all volatile organic results in sample B19404R were qualified as estimates and flagged "J".

All other 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, the methylene chloride result in sample B19404 was qualified as undetected and flagged "U".

All other method blank results were acceptable.

<u>Field Blanks</u>

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.

Due to the lack of a matrix spike/matrix spike duplicate analysis, all sample results in samples B19404 and B19404R were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, the methylene chloride (120%) result in samples B19405 and B19406 were qualified as estimates and flagged "J".

All other accuracy and blank spike results were acceptable.

Surrogate Recovery

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

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to the lack of a matrix spike/matrix spike duplicate analysis, all sample results in samples B19404 and B19404R were qualified as estimates and flagged "J".

All other 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 required criteria. Forty-eight volatile organic analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package No. W04523 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

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less than twice the limit, all volatile organic results in sample B19405 were qualified as estimates and flagged "J".
- Due to the holding time being exceeded by less than twice the limit, all volatile organic results in sample B19404R were qualified as estimates and flagged "J".
- Due to method blank contamination, the methylene chloride result in sample B19404 was qualified as undetected and flagged "U".
- Due to the lack of a matrix spike/matrix spike duplicate analysis, all sample results in samples B19404 and B19404R were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, the methylene chloride (120%) result in samples B19405 and B19406 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.

Forty-eight volatile organic 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.

Appendix 1

Glossary of Data Reporting Qualifiers

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).

Appendix 2

Summary of Data Qualification

VOLATILE DATA QUALIFICATION SUMMARY*

SDG: W04523	REVIEWER: TLI	DATE: 5/4/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	B19405, B19404R	Holding time
Methylene chloride	U	B19404	Blank contamination
All	J	B19404, B19404R	No MS/MSD
Methylene chloride	J	B19405, B19406	LCS 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.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD									
Laboratory: Severn Trent									
Case:	SDG: H4523								
Sample Number		B19404		B19404R		B19405		B19406	
Remarks				Reanalysis					
Sample Date		2/10/05		2/10/05		2/8/05		2/14/05	
VOA	RTQL	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane		ND	UJ	ND	UJ	ND	UJ	ND	U
Bromomethane		ND	UJ	ND	UJ	1.1	J	ND	U
Chloroethane		ND	UJ	ND	UJ	ND	UJ	ND	U
Acetone	20	ND	UJ	ND	UJ	ND	UJ	ND	U
1,1-Dichloroethene		ND	UJ	ND	UJ	ND	UJ	ND	U
Acetonitrile		ND	UJ	ND	UJ	ND	UJ	ND	U
Methylene Chloride	5	8.0	UJ	24	J	4.3	J	3.1	J
Carbon Disulfide		ND	UJ	ND	UJ	ND	UJ	ND	U
1,1-Dichloroethane	10	ND	UJ	ND	UJ	ND	UJ	ND	U
2-Butanone	10	ND	UJ	ND	UJ	ND	UJ	ND	U
1,2-Dichloroethene (total)		ND	UJ	ND	UJ	ND	UJ	ND	U
Chloroform	5	ND	UJ	ND	UJ	ND	UJ	ND	U
1,1,1-Trichloroethane	5	ND	UJ	ND	UJ	ND	UJ	ND	U
Carbon Tetrachloride	5	ND	UJ	ND	UJ	ND	UJ	ND	U
1,2-Dichloroethane	5	ND	UJ	ND	UJ	ND	UJ	ND	U
Benzene	5	ND	UJ	ND	UJ	ND	UJ	ND	U
Trichloroethene		ND	UJ	ND	UJ	2.0	J	ND	U
1,2-Dichloropropane		ND	UJ	ND	UJ	ND	UJ	ND	U
Dibromochloromethane		ND	UJ	ND	UJ	ND	UJ	ND	U
4-Methyl-2-pentanone		ND	UJ	ND	UJ	ND	UJ	ND	U
cis-1,3-Dichloropropene		ND	UJ	ND	UJ	ND	UJ	ND	U
Toluene	5	ND	UJ	ND	UJ	ND	UJ	ND	U
trans-1,3-Dichloropropene		ND	UJ	ND	UJ	ND	UJ	ND	U
1,1,2-Trichloroethane	5	ND	UJ	ND	UJ	ND	UJ	ND	U
2-Hexanone		ND	UJ	ND	UJ	ND	UJ	ND	U
Tetrachloroethene		ND	UJ	ND	UJ	ND	UJ	ND	U
Dibromochloromethane		ND	UJ	ND	UJ	ND	UJ	ND	U
Chlorobenzene	5	ND	UJ	ND	UJ	ND	UJ	ND	U
Ethylbenzene	5	ND	UJ	ND	UJ	ND	UJ	ND	U
Vinyl Chloride		ND	UJ	ND	UJ	ND	UJ	ND	U
Xylenes (total)	5	ND	UJ	ND	UJ	ND	UJ	ND	U
Styrene		ND	UJ	ND	UJ	ND	UJ	ND	U
Bromoform		ND	UJ	ND	UJ	ND	UJ	ND	U
1,1,2,2-Tetrachloroethane		ND	UJ	ND	UJ	ND	UJ	ND	U
1,2,4-Trimethylbenzene		ND	UJ	ND	UJ	ND	UJ	ND	U
n-Hexane		ND	UJ	ND	UJ	ND	UJ	ND	U

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

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

GC/MS Volatiles

Lot-Sample #...: F5B230353-001 Work Order #...: G412N1AK Matrix.....: SOLID
Date Sampled...: 02/10/05 Date Received..: 02/23/05
Prep Date.....: 02/24/05 Analysis Date..: 02/24/05
Prep Batch #...: 5056052
Dilution Factor: 1
% Moisture.....: 3.4 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	ND J	10	ug/kg	0.96
Bromomethane	ND	10	ug/kg	0.66
Chloroethane	ND	10	ug/kg	0.58
Acetone	ND	21	ug/kg	1.3
1,1-Dichloroethene	ND	5.2	ug/kg	0.69
Acetonitrile	ND	52	ug/kg	5.5
Methylene chloride	8.0 ~~B~~ U	5.2	ug/kg	2.7
Carbon disulfide	ND	5.2	ug/kg	0.28
1,1-Dichloroethane	ND	5.2	ug/kg	0.56
2-Butanone	ND	21	ug/kg	1.1
1,2-Dichloroethene (total)	ND	10	ug/kg	0.63
Chloroform	ND	5.2	ug/kg	0.54
1,1,1-Trichloroethane	ND	5.2	ug/kg	0.57
Carbon tetrachloride	ND	5.2	ug/kg	0.47
1,2-Dichloroethane	ND	5.2	ug/kg	0.44
Benzene	ND	5.2	ug/kg	0.32
Trichloroethene	ND	5.2	ug/kg	0.46
1,2-Dichloropropane	ND	5.2	ug/kg	0.48
Bromodichloromethane	ND	5.2	ug/kg	0.40
4-Methyl-2-pentanone	ND	21	ug/kg	0.93
cis-1,3-Dichloropropene	ND	5.2	ug/kg	0.28
Toluene	ND	5.2	ug/kg	0.34
trans-1,3-Dichloropropene	ND	5.2	ug/kg	0.41
1,1,2-Trichloroethane	ND	5.2	ug/kg	0.78
2-Hexanone	ND	21	ug/kg	1.3
Tetrachloroethene	ND	5.2	ug/kg	0.57
Dibromochloromethane	ND	5.2	ug/kg	0.27
Chlorobenzene	ND	5.2	ug/kg	0.56
Ethylbenzene	ND	5.2	ug/kg	0.46
Vinyl chloride	ND	5.2	ug/kg	0.74
Xylenes (total)	ND	10	ug/kg	1.3
Styrene	ND	5.2	ug/kg	0.49
Bromoform	ND	5.2	ug/kg	0.64
1,1,2,2-Tetrachloroethane	ND	5.2	ug/kg	0.76
1,2,4-Trimethylbenzene	ND	5.2	ug/kg	0.59
n-Hexane	ND	10	ug/kg	0.87

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5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

GC/MS Volatiles

Lot-Sample #...: F5B230353-001 **Work Order #...:** G412N2AK **Matrix.....:** SOLID
Date Sampled...: 02/10/05 **Date Received..:** 02/23/05
Prep Date.....: 03/01/05 **Analysis Date..:** 03/01/05
Prep Batch #...: 5061073
Dilution Factor: 1
% Moisture.....: 3.4 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	ND J	10	ug/kg	0.96
Bromomethane	ND	10	ug/kg	0.66
Chloroethane	ND	10	ug/kg	0.58
Acetone	ND	21	ug/kg	1.3
1,1-Dichloroethene	ND	5.2	ug/kg	0.69
Acetonitrile	ND	52	ug/kg	5.5
Methylene chloride	**24**	**5.2**	**ug/kg**	**2.7**
Carbon disulfide	ND	5.2	ug/kg	0.28
1,1-Dichloroethane	ND	5.2	ug/kg	0.56
2-Butanone	ND	21	ug/kg	1.1
1,2-Dichloroethene (total)	ND	10	ug/kg	0.63
Chloroform	ND	5.2	ug/kg	0.54
1,1,1-Trichloroethane	ND	5.2	ug/kg	0.57
Carbon tetrachloride	ND	5.2	ug/kg	0.47
1,2-Dichloroethane	ND	5.2	ug/kg	0.44
Benzene	ND	5.2	ug/kg	0.32
Trichloroethene	ND	5.2	ug/kg	0.46
1,2-Dichloropropane	ND	5.2	ug/kg	0.48
Bromodichloromethane	ND	5.2	ug/kg	0.40
4-Methyl-2-pentanone	ND	21	ug/kg	0.93
cis-1,3-Dichloropropene	ND	5.2	ug/kg	0.28
Toluene	ND	5.2	ug/kg	0.34
trans-1,3-Dichloropropene	ND	5.2	ug/kg	0.41
1,1,2-Trichloroethane	ND	5.2	ug/kg	0.78
2-Hexanone	ND	21	ug/kg	1.3
Tetrachloroethene	ND	5.2	ug/kg	0.57
Dibromochloromethane	ND	5.2	ug/kg	0.27
Chlorobenzene	ND	5.2	ug/kg	0.56
Ethylbenzene	ND	5.2	ug/kg	0.46
Vinyl chloride	ND	5.2	ug/kg	0.74
Xylenes (total)	ND	10	ug/kg	1.3
Styrene	ND	5.2	ug/kg	0.49
Bromoform	ND	5.2	ug/kg	0.64
1,1,2,2-Tetrachloroethane	ND	5.2	ug/kg	0.76
1,2,4-Trimethylbenzene	ND	5.2	ug/kg	0.59
n-Hexane	ND	10	ug/kg	0.87

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M 5/1/05

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19405

GC/MS Volatiles

Lot-Sample #...: F5B230353-002 **Work Order #...:** G414G1A6 **Matrix.....:** SOLID
Date Sampled...: 02/08/05 **Date Received..:** 02/23/05
Prep Date.....: 02/28/05 **Analysis Date..:** 02/28/05
Prep Batch #...: 5060035
Dilution Factor: 1
% Moisture.....: 4.6 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	ND	10	ug/kg	0.98
Bromomethane	**1.1**	**10**	**ug/kg**	**0.67**
Chloroethane	ND	10	ug/kg	0.59
Acetone	ND	21	ug/kg	1.4
1,1-Dichloroethene	ND	5.2	ug/kg	0.70
Acetonitrile	ND	52	ug/kg	5.6
Methylene chloride	**4.3**	**5.2**	**ug/kg**	**2.8**
Carbon disulfide	ND	5.2	ug/kg	0.28
1,1-Dichloroethane	ND	5.2	ug/kg	0.57
2-Butanone	ND	21	ug/kg	1.2
1,2-Dichloroethene (total)	ND	10	ug/kg	0.64
Chloroform	ND	5.2	ug/kg	0.55
1,1,1-Trichloroethane	ND	5.2	ug/kg	0.58
Carbon tetrachloride	ND	5.2	ug/kg	0.47
1,2-Dichloroethane	ND	5.2	ug/kg	0.44
Benzene	ND	5.2	ug/kg	0.33
Trichloroethene	**2.0**	**5.2**	**ug/kg**	**0.46**
1,2-Dichloropropane	ND	5.2	ug/kg	0.48
Bromodichloromethane	ND	5.2	ug/kg	0.41
4-Methyl-2-pentanone	ND	21	ug/kg	0.94
cis-1,3-Dichloropropene	ND	5.2	ug/kg	0.28
Toluene	ND	5.2	ug/kg	0.35
trans-1,3-Dichloropropene	ND	5.2	ug/kg	0.42
1,1,2-Trichloroethane	ND	5.2	ug/kg	0.79
2-Hexanone	ND	21	ug/kg	1.3
Tetrachloroethene	ND	5.2	ug/kg	0.58
Dibromochloromethane	ND	5.2	ug/kg	0.27
Chlorobenzene	ND	5.2	ug/kg	0.57
Ethylbenzene	ND	5.2	ug/kg	0.46
Vinyl chloride	ND	5.2	ug/kg	0.74
Xylenes (total)	ND	10	ug/kg	1.3
Styrene	ND	5.2	ug/kg	0.49
Bromoform	ND	5.2	ug/kg	0.65
1,1,2,2-Tetrachloroethane	ND	5.2	ug/kg	0.77
1,2,4-Trimethylbenzene	ND	5.2	ug/kg	0.60
n-Hexane	ND	10	ug/kg	0.88

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STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

GC/MS Volatiles

Lot-Sample #...: F5B230353-003 **Work Order #...:** G414M1A6 **Matrix.....:** SOLID
Date Sampled...: 02/14/05 **Date Received..:** 02/23/05
Prep Date.....: 02/28/05 **Analysis Date..:** 02/28/05
Prep Batch #...: 5060035
Dilution Factor: 1
% Moisture.....: 3.7 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	ND	10	ug/kg	0.97
Bromomethane	ND	10	ug/kg	0.66
Chloroethane	ND	10	ug/kg	0.58
Acetone	ND	21	ug/kg	1.3
1,1-Dichloroethene	ND	5.2	ug/kg	0.70
Acetonitrile	ND	52	ug/kg	5.5
Methylene chloride	**3.1** J	**5.2**	**ug/kg**	**2.7**
Carbon disulfide	ND	5.2	ug/kg	0.28
1,1-Dichloroethane	ND	5.2	ug/kg	0.56
2-Butanone	ND	21	ug/kg	1.2
1,2-Dichloroethene (total)	ND	10	ug/kg	0.63
Chloroform	ND	5.2	ug/kg	0.54
1,1,1-Trichloroethane	ND	5.2	ug/kg	0.57
Carbon tetrachloride	ND	5.2	ug/kg	0.47
1,2-Dichloroethane	ND	5.2	ug/kg	0.44
Benzene	ND	5.2	ug/kg	0.32
Trichloroethene	ND	5.2	ug/kg	0.46
1,2-Dichloropropane	ND	5.2	ug/kg	0.48
Bromodichloromethane	ND	5.2	ug/kg	0.40
4-Methyl-2-pentanone	ND	21	ug/kg	0.93
cis-1,3-Dichloropropene	ND	5.2	ug/kg	0.28
Toluene	ND	5.2	ug/kg	0.34
trans-1,3-Dichloropropene	ND	5.2	ug/kg	0.42
1,1,2-Trichloroethane	ND	5.2	ug/kg	0.78
2-Hexanone	ND	21	ug/kg	1.3
Tetrachloroethene	ND	5.2	ug/kg	0.57
Dibromochloromethane	ND	5.2	ug/kg	0.27
Chlorobenzene	ND	5.2	ug/kg	0.56
Ethylbenzene	ND	5.2	ug/kg	0.46
Vinyl chloride	ND	5.2	ug/kg	0.74
Xylenes (total)	ND	10	ug/kg	1.3
Styrene	ND	5.2	ug/kg	0.49
Bromoform	ND	5.2	ug/kg	0.64
1,1,2,2-Tetrachloroethane	ND	5.2	ug/kg	0.76
1,2,4-Trimethylbenzene	ND	5.2	ug/kg	0.59
n-Hexane	ND	10	ug/kg	0.87

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5/1/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

This report contains the analytical results for the three samples received under chain of custody by STL St. Louis on February 23, 2005. These samples are associated with your F03-025 SAF.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt. The samples were received with only one day remaining in the extraction hold time for several tests. Due to RAD levels, a minimum volume was accepted by the laboratory. Due to the volume limitation,matrix QC was not performed for the following tests on a sample from this SDG: PCBs, BNA, pH and oil and grease.

The laboratory does not perform analysis for ethylene glycol.

Volatiles

The MSE initial calibration, E050215C, % RSD is greater than 15 % for dichlorodifluotomethane, freon 114, chloromethane, bromomethane, acetone,iodomethane, acetonitrile, methyl acetate, 2-butoxy ethanol, 2-butanone, methacrylonitrile, 2-chloroethyl vinyl ether, tetrachloroethene, trans-1,4-dichloro-2-butene and penatchloroethane. In those instances where the % RSD exceeds 15%, the initial calibration is acceptable provided the mean % RSD for all analytes in the calibration is less than 15%. The mean % RSD for this initial calibration is 10.6. The average RSD approach will lead to greater uncertainty for those analyte for which the %RSD is greater than 15%. The data user should review the associated quality control results carefully, with particular attention to the matrix spike and laboratory control sample results to determine if the calibration linearity poses a significant concern. 2-Butoxy ethanol does not meet the minimum five point calibration criteria (only four points). This analyte will not be analyzed behind this calibration. The continuing calibration fails for two of the CCCs (>20%) - Vinyl Chloride (41.87% low) and 1,1,-Dichloroethene (25.7% high). Freon 114 is 95% high (>60%, samples ND). The affected samples were rerun outside hold time but behind an acceptable calibration.

Methylene chloride was observed in the method blank above the reporting limit in batch 5056052. Methylene chloride is recognized as a laboratory contaminant. Concentrations up to five times the level observed in the method blank, in associated laboratory samples, may be attributed to its presence in the laboratory.

The LCS recoveries in batch 5060035 are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample purge efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

Due to QC failure, 1-butanol could not be reported from the 8260 analysis.

Case Narrative
LOT NUMBER: F5B230353
SDG: W04523

Semi-Volatiles

There was insufficient sample provided to perform the analysis at the method specified amount. A reduced sample amount was prepared. The reporting limit has been elevated accordingly. There was insufficient volume to perform an MS/MSD.

Metals

The MS (MSD) recovery for Antimony is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

Oil and Grease

A dilution was performed for method 413.1 due to limited sample volume. Reporting limits were adjusted accordingly.

Nitrate/Nitrite-N

The MS recovery for Nitrate is outside the established QC limits. A matrix interference is evident in the sample. Method performance is demonstrated by acceptable LCS and LCS-Duplicate recoveries. No further action is required.

Ammonia

The MS recovery for Ammonia is outside the established QC limits. A matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH-diesel/Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples, associated with this method blank, demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Samples were extracted out of hold. Samples were received with only one day remaining in the extraction holding time.
Affected Samples:
F5B230353 (1): B19404
F5B230353 (2): B19405

STL ST. LOUIS

SAMPLE SUMMARY

F5B230353

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
G412N	001	B19404	02/10/05	12:45
G414G	002	B19405	02/08/05	14:00
G414M	003	B19406	02/14/05	14:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F5B230353

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Chloride	MCAWW 300.0A	MCAWW 300.0A
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3550
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Hexavalent Chromium	SW846 7196A	SW846 3060A
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A	SW846 7471A
Nitrate as N	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.1	
Nitrite as N	MCAWW 300.0A	MCAWW 300.0A
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Oil & Grease (Gravimetric)	SW846 9071A	
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Phosphate as P, Ortho	MCAWW 300.0A	MCAWW 300.0A
PCBs by SW-846 8082	SW846 8082	SW846 3550B/366
Semivolatile Organic Compounds by GC/MS	SW846 8270C	SW846 3550B
Soil and Waste pH	SW846 9045C	SW846 DI-LEACHA
Sulfate	MCAWW 300.0A	MCAWW 300.0A
Sulfide	SW846 9030	
Total Cyanide	SW846 9010A	SW846 9010A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B
Volatile Organics by GC/MS	SW846 8260B	SW846 5030B/826
Volatile Petroleum Hydrocarbons	SW846 8015 MOD	SW846 5030

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

LOT # F5B230253

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-127	PAGE 1 OF 2

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
Pope/Pfister/Tyra/Wiberg	TRENT, STEVE	373-5689	TRENT, SJ	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION: 216-Z-7; 12.5ft-20ft 226-25 ST 12/01/04	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025		
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-356 1	COA: 119143ES10	METHOD OF SHIPMENT: Government Vehicle		
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA		

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

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: B19414

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
TYPE OF CONTAINER	Gs*	aG	aG	Gs*	P	aG	aG			
NO. OF CONTAINER(S)	3	1	1	3	1	1	1			
VOLUME	40mL	120mL	120mL	40mL	500mL	250mL	120mL			
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	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											
~~B19403~~	~~SOIL~~	~~2/10/05~~	~~1245~~									X	MAB 2/22/05	
B19404 ①	SOIL	2/10/05	1245	X	2-18-0	2-18-0	2-18-0	2-18-0	2-18-0					

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RFSchwabe	2/10/05 1429	SITE FRIG	2/10/05 1429
Site Fridge	2/18/05 1120 MM	David Tyra	2/18/05 1130 MM
2-7S, to fridge	2-22-05 0730	Kevin Hughes	2-22-05 0730
Kevin Hughes	2-22-05 0800	David Tyra	2/22/05 0800
David Tyra	2/22/05 0830	MO-026 Fridge #3	2/22/05 0830

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

① Sample number changed to B19403 MAB 2/22/05

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

W04523

000021

8 of 104

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-127	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-Z-7; ~~17-5ft-20ft~~ 22.5'-25' SOT 12/01/04	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-356 1	COA 119143ES10	METHOD OF SHIPMENT Governement Vehicle		
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA		

SPECIAL INSTRUCTIONS

The lab is to analyze pH within 24 hours of sample receipt. The lab is to report kerosene range organics from the WTPH-D analysis. FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met.

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Butanol}
(2)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA – 8270A (Add-On) {Tributyl phosphate} 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 {Ethylene glycol}
(4)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on ~~{Antimony-125, Cesium-134}~~ TMOS1HOH Isotopic Plutonium; Isotopic Uranium; Neptunium-237; Americium-241;
(5)ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Copper, Nickel, Silver} ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Lead, Mercury, Selenium, Uranium} ICP Metals - 6010A (Add-on) {Bismuth}
(6)IC Anions - 300.0 {Chloride, Fluoride, Nitrogen In Nitrate, Nitrogen In Nitrite, Phosphate, Sulfate} Cations (IC) - 300.7 {Nitrogen In ammonium} Cyanide (Total) - 335.2; pH (Soil) - 9045;

A-8003-618(03/03)

LOT # F5B230253 W04523 000022 9 OF 104

STL ST. LOUIS

LOT # F5B230253

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-128	PAGE 1 OF 2
COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8N; AIR QUALITY: ☐; DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: 216-Z-7; ~~22.5ft-26ft~~ 17.5'-20' BT 12/01/04	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil		SAF NO.: F03-025	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-356 1	COA: 119143E510	METHOD OF SHIPMENT: Governement Vehicle	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie TO: B19415

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
TYPE OF CONTAINER	Gs*	aG	aG	Gs*	P	aG	aG			
NO. OF CONTAINER(S)	3	1	1	3	1	1	1			
VOLUME	40mL	120mL	120mL	40mL	500mL	250mL	120mL			
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS GEA	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS			

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B19405	SOIL	2-8-05	1400	X	X	X	X	X	X	X			

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: JSPAPS/[signature] 2-8-05	DATE/TIME: 1500	RECEIVED BY/STORED IN: Z-7 Rma fridge 2-8-05	DATE/TIME: 1500
RELINQUISHED BY/REMOVED FROM: Z-7-SITE FRIG 2-15-05	DATE/TIME: 1340	RECEIVED BY/STORED IN: RPFISTSD/[signature] 2-15-05	DATE/TIME: 1340
RELINQUISHED BY/REMOVED FROM: RPFISTSD/[signature] 2-15-05	DATE/TIME: 1435	RECEIVED BY/STORED IN: MO-026 FRIG #3 2-15-05	DATE/TIME: 1435
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

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

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

W04523

000023

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-128	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-Z-7; ~~22-SR-25R~~ 17'15' - 20' ST 12/01/04	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	AIR QUALITY ☐	45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-356 1	COA 119143ES10	METHOD OF SHIPMENT Government Vehicle		
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA		

SPECIAL INSTRUCTIONS

The lab is to analyze pH within 24 hours of sample receipt. The lab is to report kerosene range organics from the WTPH-D analysis. FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met.

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Butanol}
(2)Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} 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 {Ethylene glycol}
(4)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - ~~Add-on {Antimony-125, Cesium-134}~~ Isotopic Plutonium; Isotopic Uranium; Neptunium-237; Americium-241; TMC 8-11-04 / EXPEDITE GEA - 24 hr. turnaround.
(5)ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Copper, Nickel, Silver} ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Lead, Mercury, Selenium, Uranium} ICP Metals - 6010A (Add-on) {Bismuth}
(6)IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate} Cations (IC) - 300.7 {Nitrogen in ammonium} Cyanide (Total) - 335.2; pH (Soil) - 9045;

A-6083-618(03/03)

LOT # F5B230253 W04523 000024 13 of 104

LOT # F5B230253

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-129	PAGE 1 OF 2
COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: TRENT, STEVE — TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8N — DATA TURNAROUND: 45 Days / 45 Days — AIR QUALITY ☐
SAMPLING LOCATION: 216-Z-7; 27.5ft-30ft	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil	SAF NO.: F03-025	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-356 1 — COA: 119143ES10	METHOD OF SHIPMENT: Governement Vehicle	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: NA	BILL OF LADING/AIR BILL NO.: NA	

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

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie ID: B19410

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
TYPE OF CONTAINER	Gs*	aG	aG	Gs*	P	aG	aG			
NO. OF CONTAINER(S)	3	1	1	3	1	1	1			
VOLUME	40mL	120mL	120mL	40mL	500mL	250mL	120mL			
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	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										
B19406	SOIL	2/14/05	1400	X	X	X	X	X	X	X			

CHAIN OF POSSESSION	SIGN/ PRINT NAMES
RELINQUISHED BY/REMOVED FROM — DATE/TIME: [illegible] 2/14/05 1445	RECEIVED BY/STORED IN: FRIDGE Z7 — DATE/TIME: 2/14/05 1445
RELINQUISHED BY/REMOVED FROM: Fridge Z-7 / [illegible] — DATE/TIME: 2/15/05 0930	RECEIVED BY/STORED IN: [illegible] / David Tyra — DATE/TIME: 2/15/05 0930
RELINQUISHED BY/REMOVED FROM: [illegible] / David Tyra — DATE/TIME: 2/15/05 1010	RECEIVED BY/STORED IN: Fridge Z7 — DATE/TIME: 2/15/05 1010
RELINQUISHED BY/REMOVED FROM: ~~Site Fridge Z-7, 2/18/05 1130 AM~~	RECEIVED BY/STORED IN: ~~David Tyra / [illegible] 2/18/05 1130 AM~~
RELINQUISHED BY/REMOVED FROM: Z-7 site Fridge — DATE/TIME: 2/22/05 0730	RECEIVED BY/STORED IN: David Tyra / [illegible] — DATE/TIME: 2/22/05 0730
RELINQUISHED BY/REMOVED FROM: David Tyra / [illegible] — DATE/TIME: 2/22/05 0830	RECEIVED BY/STORED IN: MO-026, Fridge #3 — DATE/TIME: 2/22/05 0830
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Expedite GEA - 24 hr turnaround 12/04/04

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

W04523

000025

STL ST. LOUIS

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-129	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐
SAMPLING LOCATION 216-Z-7; 27.5ft-30ft	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025	DATA TURNAROUND 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-356 1	COA 119143E510	METHOD OF SHIPMENT Governement Vehicle	
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA	

SPECIAL INSTRUCTIONS

The lab is to analyze pH within 24 hours of sample receipt. The lab is to report kerosene range organics from the WTPH-D analysis. FH acknowledges that the analytical holding time for Nitrate, Nitrite and Phosphate by EPA Method 300.0 will not be met.

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol)
(2)Semi-VOA - 8270A (TCL) (Phenol) Semi-VOA – 8270A (Add-On) (Tributyl phosphate) 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 (Ethylene glycol)
(4)Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Gamma Spec - ~~Add-on (Antimony-125, Cesium-134)~~ mm 8-11-01 Isotopic Plutonium; Isotopic Uranium; Neptunium-237; Americium-241;
(5)ICP/MS - 200.8 (TAL) (Antimony, Barium, Cadmium, Chromium, Copper, Nickel, Silver) ICP/MS - 200.8 (Add-on) (Arsenic, Beryllium, Lead, Mercury, Selenium, Uranium) ICP Metals - 6010A (Add-on) (Bismuth)
(6)IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate) Cations (IC) - 300.7 (Nitrogen in ammonium) Cyanide (Total) - 335.2; pH (Soil) - 9045;

A-6003-618(03/03)

LOT # F5B230253 W04523 000026 17 of 104

Appendix 5

Data Validation Supporting Documentation

HNF-20433 REV 0

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: W04523		
VALIDATOR: TLI		LAB: ST		DATE: 4/29/05	
			SDG: W04523		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX
B19404 B19405 B19406
~~B19405~~ 4/29/05
B19404R (re-analysis)
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:

HNF-20433 REV 0

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: ~~S+C Methylene chloride - to RDE~~ 4/12/05

404 ~~+ 404~~ methylene chloride - U
4/12/05

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 MS - 404 + 404R - J all
~~(no MC - U for blank)~~ 4/26 KJ all

LCS - 405 + 406 - methylene chloride (120%) ~~J all~~
~~(no qual - U for blank)~~ 4/25

NO PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

MS/MSD samples analyzed? ..... Yes (No) N/A

MS/MSD RPD values acceptable? ..... (Yes) No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)

MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)

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

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

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

Comments: 404 & 404R – No MS/MSD J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No (N/A)

Iinternal 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: 404R – 19 days
405 – 20 days } J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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

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

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

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

Comments:

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: acetone - all
~~1,1-dichloroethylene~~
2-butanone - all
chloroform - all
1,1,1-trichloroethane - all
chlorobenzene - all
ethylbenzene - all
xylenes - all
carbon tet - all
1,2-dichloroethane - all
Benzene - all
toluene - all
1,1,2-trichloroethane - all

Appendix 6

Additional Documentation Requested by Client

STL ST. LOUIS

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F5B230353
MB Lot-Sample #: F5B250000-052
Analysis Date..: 02/24/05
Dilution Factor: 1

Work Order #...: G44471AA
Prep Date.....: 02/24/05
Prep Batch #...: 5056052

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Chloromethane	ND	10	ug/kg	SW846 8260B
Bromomethane	ND	10	ug/kg	SW846 8260B
Chloroethane	ND	10	ug/kg	SW846 8260B
Acetone	ND	20	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/kg	SW846 8260B
Acetonitrile	ND	50	ug/kg	SW846 8260B
Methylene chloride	6.0	5.0	ug/kg	SW846 8260B
Carbon disulfide	ND	5.0	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Butanone	ND	20	ug/kg	SW846 8260B
1,2-Dichloroethene (total)	ND	10	ug/kg	SW846 8260B
Chloroform	ND	5.0	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
Benzene	ND	5.0	ug/kg	SW846 8260B
Trichloroethene	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloropropane	ND	5.0	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.0	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
Toluene	ND	5.0	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Hexanone	ND	20	ug/kg	SW846 8260B
Tetrachloroethene	ND	5.0	ug/kg	SW846 8260B
Dibromochloromethane	ND	5.0	ug/kg	SW846 8260B
Chlorobenzene	ND	5.0	ug/kg	SW846 8260B
Ethylbenzene	ND	5.0	ug/kg	SW846 8260B
Vinyl chloride	ND	5.0	ug/kg	SW846 8260B
Xylenes (total)	ND	10	ug/kg	SW846 8260B
Styrene	ND	5.0	ug/kg	SW846 8260B
Bromoform	ND	5.0	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	ND	5.0	ug/kg	SW846 8260B
n-Hexane	ND	10	ug/kg	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	86	(80 - 130)

(Continued on next page)

STL ST. LOUIS

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F5B230353 **Work Order #...:** G44471AA **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Dibromofluoromethane	98	(78 - 130)		
1,2-Dichloroethane-d4	97	(72 - 134)		
4-Bromofluorobenzene	82	(68 - 150)		

NOTE(S):

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

STL ST. LOUIS

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F5B230353 Work Order #...: G49NJ1AA Matrix.....: SOLID
MB Lot-Sample #: F5C010000-035
Prep Date.....: 02/28/05
Analysis Date..: 02/28/05 Prep Batch #...: 5060035
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Chloromethane	ND	10	ug/kg	SW846 8260B
Bromomethane	ND	10	ug/kg	SW846 8260B
Chloroethane	ND	10	ug/kg	SW846 8260B
Acetone	ND	20	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/kg	SW846 8260B
Acetonitrile	ND	50	ug/kg	SW846 8260B
Methylene chloride	ND	5.0	ug/kg	SW846 8260B
Carbon disulfide	ND	5.0	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Butanone	ND	20	ug/kg	SW846 8260B
1,2-Dichloroethene (total)	ND	10	ug/kg	SW846 8260B
Chloroform	ND	5.0	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
Benzene	ND	5.0	ug/kg	SW846 8260B
Trichloroethene	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloropropane	ND	5.0	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.0	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
Toluene	ND	5.0	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Hexanone	ND	20	ug/kg	SW846 8260B
Tetrachloroethene	ND	5.0	ug/kg	SW846 8260B
Dibromochloromethane	ND	5.0	ug/kg	SW846 8260B
Chlorobenzene	ND	5.0	ug/kg	SW846 8260B
Ethylbenzene	ND	5.0	ug/kg	SW846 8260B
Vinyl chloride	ND	5.0	ug/kg	SW846 8260B
Xylenes (total)	ND	10	ug/kg	SW846 8260B
Styrene	ND	5.0	ug/kg	SW846 8260B
Bromoform	ND	5.0	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	ND	5.0	ug/kg	SW846 8260B
n-Hexane	ND	10	ug/kg	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	100	(80 - 130)

(Continued on next page)

STL ST. LOUIS

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F5B230353 Work Order #...: G5CVX1AA Matrix.....: SOLID
MB Lot-Sample #: F5C020000-073

Prep Date.....: 03/01/05
Analysis Date..: 03/01/05 Prep Batch #...: 5061073
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Chloromethane	ND	10	ug/kg	SW846 8260B
Bromomethane	1.3 J	10	ug/kg	SW846 8260B
Chloroethane	ND	10	ug/kg	SW846 8260B
Acetone	ND	25	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/kg	SW846 8260B
Acetonitrile	ND	50	ug/kg	SW846 8260B
Methylene chloride	ND	5.0	ug/kg	SW846 8260B
Carbon disulfide	ND	5.0	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Butanone	ND	20	ug/kg	SW846 8260B
1,2-Dichloroethene (total)	ND	10	ug/kg	SW846 8260B
Chloroform	ND	5.0	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
Benzene	ND	5.0	ug/kg	SW846 8260B
Trichloroethene	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloropropane	ND	5.0	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.0	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
Toluene	ND	5.0	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Hexanone	ND	20	ug/kg	SW846 8260B
Tetrachloroethene	ND	5.0	ug/kg	SW846 8260B
Dibromochloromethane	ND	5.0	ug/kg	SW846 8260B
Chlorobenzene	ND	5.0	ug/kg	SW846 8260B
Ethylbenzene	ND	5.0	ug/kg	SW846 8260B
Vinyl chloride	ND	5.0	ug/kg	SW846 8260B
Xylenes (total)	ND	10	ug/kg	SW846 8260B
Styrene	ND	5.0	ug/kg	SW846 8260B
Bromoform	ND	5.0	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	ND	5.0	ug/kg	SW846 8260B
n-Hexane	ND	12	ug/kg	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	98	(80 - 130)

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STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F5B230353
MS Lot-Sample #: F5B230353-003
Date Sampled...: 02/14/05
Prep Date.....: 02/28/05
Prep Batch #...: 5060035
Dilution Factor: 1

Work Order #...: G414M1CM-MS
G414M1CN-MSD
Date Received..: 02/23/05
Analysis Date..: 02/28/05
% Moisture.....: 3.7

Matrix.....: SOLID

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Chloromethane	ND	52.3	33.3	ug/kg	64		SW846 8260B
	ND	51.6	36.0	ug/kg	70	7.8	SW846 8260B
Bromomethane	ND	52.3	44.3	ug/kg	85		SW846 8260B
	ND	51.6	43.4	ug/kg	84	2.1	SW846 8260B
Chloroethane	ND	52.3	48.6	ug/kg	93		SW846 8260B
	ND	51.6	51.1	ug/kg	99	4.9	SW846 8260B
Acetone	ND	52.3	46.5	ug/kg	89		SW846 8260B
	ND	51.6	55.6	ug/kg	108	18	SW846 8260B
1,1-Dichloroethene	ND	52.3	45.1	ug/kg	86		SW846 8260B
	ND	51.6	45.8	ug/kg	89	1.5	SW846 8260B
Methylene chloride	3.1	52.3	45.6	ug/kg	81		SW846 8260B
	3.1	51.6	44.4	ug/kg	80	2.6	SW846 8260B
Carbon disulfide	ND	52.3	44.3	ug/kg	85		SW846 8260B
	ND	51.6	46.8	ug/kg	91	5.5	SW846 8260B
1,1-Dichloroethane	ND	52.3	49.0	ug/kg	94		SW846 8260B
	ND	51.6	49.9	ug/kg	97	1.9	SW846 8260B
2-Butanone	ND	52.3	59.9	ug/kg	114		SW846 8260B
	ND	51.6	61.4	ug/kg	119	2.4	SW846 8260B
1,2-Dichloroethene (total)	ND	105	98.7	ug/kg	94		SW846 8260B
	ND	103	97.4	ug/kg	94	1.4	SW846 8260B
Chloroform	ND	52.3	50.2	ug/kg	96		SW846 8260B
	ND	51.6	50.9	ug/kg	99	1.3	SW846 8260B
1,1,1-Trichloroethane	ND	52.3	52.1	ug/kg	100		SW846 8260B
	ND	51.6	52.6	ug/kg	102	0.89	SW846 8260B
Carbon tetrachloride	ND	52.3	52.8	ug/kg	101		SW846 8260B
	ND	51.6	49.8	ug/kg	96	5.9	SW846 8260B
1,2-Dichloroethane	ND	52.3	49.4	ug/kg	94		SW846 8260B
	ND	51.6	50.8	ug/kg	98	2.8	SW846 8260B
Benzene	ND	52.3	50.8	ug/kg	97		SW846 8260B
	ND	51.6	48.8	ug/kg	95	4.0	SW846 8260B
Trichloroethene	ND	52.3	55.6	ug/kg	106		SW846 8260B
	ND	51.6	54.5	ug/kg	106	2.0	SW846 8260B
1,2-Dichloropropane	ND	52.3	51.7	ug/kg	99		SW846 8260B
	ND	51.6	53.1	ug/kg	103	2.6	SW846 8260B
Bromodichloromethane	ND	52.3	50.1	ug/kg	96		SW846 8260B
	ND	51.6	51.1	ug/kg	99	2.0	SW846 8260B
4-Methyl-2-pentanone	ND	52.3	33.5	ug/kg	64		SW846 8260B
	ND	51.6	34.0	ug/kg	66	1.5	SW846 8260B

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STL ST. LOUIS

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F5B230353 Work Order #...: G414M1CM-MS Matrix.....: SOLID
MS Lot-Sample #: F5B230353-003 G414M1CN-MSD

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
cis-1,3-Dichloropropene	ND	52.3	51.3	ug/kg	98		SW846 8260B
	ND	51.6	52.3	ug/kg	101	2.0	SW846 8260B
Toluene	ND	52.3	49.7	ug/kg	95		SW846 8260B
	ND	51.6	50.3	ug/kg	97	1.1	SW846 8260B
trans-1,3-Dichloropropene	ND	52.3	53.7	ug/kg	103		SW846 8260B
	ND	51.6	57.1	ug/kg	111	6.1	SW846 8260B
1,1,2-Trichloroethane	ND	52.3	50.4	ug/kg	96		SW846 8260B
	ND	51.6	52.7	ug/kg	102	4.4	SW846 8260B
2-Hexanone	ND	52.3	45.5	ug/kg	87		SW846 8260B
	ND	51.6	48.5	ug/kg	94	6.3	SW846 8260B
Tetrachloroethene	ND	52.3	50.4	ug/kg	96		SW846 8260B
	ND	51.6	49.0	ug/kg	95	2.8	SW846 8260B
Dibromochloromethane	ND	52.3	51.5	ug/kg	98		SW846 8260B
	ND	51.6	49.5	ug/kg	96	3.9	SW846 8260B
Chlorobenzene	ND	52.3	50.2	ug/kg	96		SW846 8260B
	ND	51.6	51.7	ug/kg	100	2.8	SW846 8260B
Ethylbenzene	ND	52.3	47.7	ug/kg	91		SW846 8260B
	ND	51.6	50.1	ug/kg	97	5.0	SW846 8260B
Vinyl chloride	ND	52.3	44.8	ug/kg	86		SW846 8260B
	ND	51.6	48.0	ug/kg	93	7.0	SW846 8260B
Styrene	ND	52.3	52.2	ug/kg	100		SW846 8260B
	ND	51.6	50.1	ug/kg	97	4.0	SW846 8260B
Bromoform	ND	52.3	53.4	ug/kg	102		SW846 8260B
	ND	51.6	57.3	ug/kg	111	7.1	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	52.3	50.5	ug/kg	96		SW846 8260B
	ND	51.6	53.9	ug/kg	104	6.5	SW846 8260B
n-Hexane	ND	52.3	39.2	ug/kg	75		SW846 8260B
	ND	51.6	40.4	ug/kg	78	3.0	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	93	(80 - 130)
	96	(80 - 130)
Dibromofluoromethane	97	(78 - 130)
	96	(78 - 130)
1,2-Dichloroethane-d4	92	(72 - 134)
	89	(72 - 134)
4-Bromofluorobenzene	96	(68 - 150)
	99	(68 - 150)

NOTE(S):

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

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F5B230353 Work Order #...: G44471AC Matrix.....: SOLID
LCS Lot-Sample#: F5B250000-052
Prep Date.....: 02/24/05 Analysis Date..: 02/24/05
Prep Batch #...: 5056052
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Chloromethane	50.0	29.3	ug/kg	59	SW846 8260B
Bromomethane	50.0	39.2	ug/kg	78	SW846 8260B
Chloroethane	50.0	47.7	ug/kg	95	SW846 8260B
Acetone	50.0	38.3	ug/kg	77	SW846 8260B
1,1-Dichloroethene	50.0	47.4	ug/kg	95	SW846 8260B
Methylene chloride	50.0	29.9	ug/kg	60	SW846 8260B
Carbon disulfide	50.0	44.6	ug/kg	89	SW846 8260B
1,1-Dichloroethane	50.0	41.4	ug/kg	83	SW846 8260B
2-Butanone	50.0	25.7	ug/kg	51	SW846 8260B
1,2-Dichloroethene (total)	100	93.3	ug/kg	93	SW846 8260B
Chloroform	50.0	45.4	ug/kg	91	SW846 8260B
1,1,1-Trichloroethane	50.0	46.1	ug/kg	92	SW846 8260B
Carbon tetrachloride	50.0	52.2	ug/kg	104	SW846 8260B
1,2-Dichloroethane	50.0	45.7	ug/kg	91	SW846 8260B
Benzene	50.0	48.6	ug/kg	97	SW846 8260B
Trichloroethene	50.0	46.7	ug/kg	93	SW846 8260B
1,2-Dichloropropane	50.0	44.1	ug/kg	88	SW846 8260B
Bromodichloromethane	50.0	51.6	ug/kg	103	SW846 8260B
4-Methyl-2-pentanone	50.0	47.1	ug/kg	94	SW846 8260B
cis-1,3-Dichloropropene	50.0	55.7	ug/kg	111	SW846 8260B
Toluene	50.0	44.4	ug/kg	89	SW846 8260B
trans-1,3-Dichloropropene	50.0	46.5	ug/kg	93	SW846 8260B
1,1,2-Trichloroethane	50.0	45.3	ug/kg	91	SW846 8260B
2-Hexanone	50.0	37.6	ug/kg	75	SW846 8260B
Tetrachloroethene	50.0	35.7	ug/kg	71	SW846 8260B
Dibromochloromethane	50.0	48.3	ug/kg	97	SW846 8260B
Chlorobenzene	50.0	50.6	ug/kg	101	SW846 8260B
Ethylbenzene	50.0	50.8	ug/kg	102	SW846 8260B
Vinyl chloride	50.0	57.1	ug/kg	114	SW846 8260B
Styrene	50.0	55.6	ug/kg	111	SW846 8260B
Bromoform	50.0	51.8	ug/kg	104	SW846 8260B
1,1,2,2-Tetrachloroethane	50.0	52.8	ug/kg	106	SW846 8260B
n-Hexane	50.0	41.9	ug/kg	84	SW846 8260B

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STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F5B230353 Work Order #...: G5CVX1AC Matrix.....: SOLID
LCS Lot-Sample#: F5C020000-073
Prep Date.....: 03/01/05 Analysis Date..: 03/01/05
Prep Batch #...: 5061073
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Chloromethane	50.0	38.7	ug/kg	77	SW846 8260B
Bromomethane	50.0	52.1	ug/kg	104	SW846 8260B
Chloroethane	50.0	61.1	ug/kg	122	SW846 8260B
Acetone	50.0	45.3	ug/kg	91	SW846 8260B
1,1-Dichloroethene	50.0	40.7	ug/kg	81	SW846 8260B
Methylene chloride	50.0	38.6	ug/kg	77	SW846 8260B
Carbon disulfide	50.0	41.3	ug/kg	83	SW846 8260B
1,1-Dichloroethane	50.0	44.9	ug/kg	90	SW846 8260B
2-Butanone	50.0	54.2	ug/kg	108	SW846 8260B
1,2-Dichloroethene (total)	100	89.6	ug/kg	90	SW846 8260B
Chloroform	50.0	46.8	ug/kg	94	SW846 8260B
1,1,1-Trichloroethane	50.0	47.1	ug/kg	94	SW846 8260B
Carbon tetrachloride	50.0	45.8	ug/kg	92	SW846 8260B
1,2-Dichloroethane	50.0	45.9	ug/kg	92	SW846 8260B
Benzene	50.0	44.6	ug/kg	89	SW846 8260B
Trichloroethene	50.0	46.4	ug/kg	93	SW846 8260B
1,2-Dichloropropane	50.0	48.3	ug/kg	97	SW846 8260B
Bromodichloromethane	50.0	46.7	ug/kg	93	SW846 8260B
4-Methyl-2-pentanone	50.0	31.3	ug/kg	63	SW846 8260B
cis-1,3-Dichloropropene	50.0	48.5	ug/kg	97	SW846 8260B
Toluene	50.0	46.8	ug/kg	94	SW846 8260B
trans-1,3-Dichloropropene	50.0	53.5	ug/kg	107	SW846 8260B
1,1,2-Trichloroethane	50.0	47.9	ug/kg	96	SW846 8260B
2-Hexanone	50.0	42.0	ug/kg	84	SW846 8260B
Tetrachloroethene	50.0	49.9	ug/kg	100	SW846 8260B
Dibromochloromethane	50.0	47.7	ug/kg	95	SW846 8260B
Chlorobenzene	50.0	51.1	ug/kg	102	SW846 8260B
Ethylbenzene	50.0	49.4	ug/kg	99	SW846 8260B
Vinyl chloride	50.0	55.0	ug/kg	110	SW846 8260B
Styrene	50.0	50.7	ug/kg	101	SW846 8260B
Bromoform	50.0	56.3	ug/kg	113	SW846 8260B
1,1,2,2-Tetrachloroethane	50.0	54.4	ug/kg	109	SW846 8260B
n-Hexane	50.0	37.9	ug/kg	76	SW846 8260B

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STL ST. LOUIS

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F5B230353 Work Order #...: G49NJ1AC Matrix.....: SOLID
LCS Lot-Sample#: F5C010000-035
Prep Date.....: 02/28/05 Analysis Date..: 02/28/05
Prep Batch #...: 5060035
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Chloromethane	50.0	39.9	ug/kg	80	SW846 8260B
Bromomethane	50.0	55.9	ug/kg	112	SW846 8260B
Chloroethane	50.0	69.6	ug/kg	139	SW846 8260B
Acetone	50.0	60.7	ug/kg	121	SW846 8260B
1,1-Dichloroethene	50.0	58.5	ug/kg	117	SW846 8260B
Methylene chloride	50.0	60.2 a	ug/kg	120	SW846 8260B
Carbon disulfide	50.0	61.0	ug/kg	122	SW846 8260B
1,1-Dichloroethane	50.0	62.6 a	ug/kg	125	SW846 8260B
2-Butanone	50.0	74.7 a	ug/kg	149	SW846 8260B
1,2-Dichloroethene (total)	100	117	ug/kg	117	SW846 8260B
Chloroform	50.0	49.1	ug/kg	98	SW846 8260B
1,1,1-Trichloroethane	50.0	49.7	ug/kg	99	SW846 8260B
Carbon tetrachloride	50.0	50.0	ug/kg	100	SW846 8260B
1,2-Dichloroethane	50.0	48.0	ug/kg	96	SW846 8260B
Benzene	50.0	49.8	ug/kg	100	SW846 8260B
Trichloroethene	50.0	50.5	ug/kg	101	SW846 8260B
1,2-Dichloropropane	50.0	49.9	ug/kg	100	SW846 8260B
Bromodichloromethane	50.0	47.1	ug/kg	94	SW846 8260B
4-Methyl-2-pentanone	50.0	30.7	ug/kg	61	SW846 8260B
cis-1,3-Dichloropropene	50.0	49.9	ug/kg	100	SW846 8260B
Toluene	50.0	46.9	ug/kg	94	SW846 8260B
trans-1,3-Dichloropropene	50.0	51.5	ug/kg	103	SW846 8260B
1,1,2-Trichloroethane	50.0	47.1	ug/kg	94	SW846 8260B
2-Hexanone	50.0	44.0	ug/kg	88	SW846 8260B
Tetrachloroethene	50.0	48.1	ug/kg	96	SW846 8260B
Dibromochloromethane	50.0	48.8	ug/kg	98	SW846 8260B
Chlorobenzene	50.0	50.0	ug/kg	100	SW846 8260B
Ethylbenzene	50.0	45.2	ug/kg	90	SW846 8260B
Vinyl chloride	50.0	55.6	ug/kg	111	SW846 8260B
Styrene	50.0	51.6	ug/kg	103	SW846 8260B
Bromoform	50.0	53.4	ug/kg	107	SW846 8260B
1,1,2,2-Tetrachloroethane	50.0	53.0	ug/kg	106	SW846 8260B
n-Hexane	50.0	54.0	ug/kg	108	SW846 8260B

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STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

GC/MS Volatiles

Lot-Sample #...: F5B230353-001 Work Order #...: G412N1AK Matrix.....: SOLID

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	98	(80 - 130)
Dibromofluoromethane	92	(78 - 130)
1,2-Dichloroethane-d4	105	(72 - 134)
4-Bromofluorobenzene	86	(68 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19404

GC/MS Volatiles

Lot-Sample #...: F5B230353-001 Work Order #...: G412N2AK Matrix.....: SOLID

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	98	(80 - 130)
Dibromofluoromethane	103	(78 - 130)
1,2-Dichloroethane-d4	94	(72 - 134)
4-Bromofluorobenzene	86	(68 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19405

GC/MS Volatiles

Lot-Sample #...: F5B230353-002 Work Order #...: G414G1A6 Matrix.....: SOLID

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	95	(80 - 130)
Dibromofluoromethane	96	(78 - 130)
1,2-Dichloroethane-d4	92	(72 - 134)
4-Bromofluorobenzene	86	(68 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B19406

GC/MS Volatiles

Lot-Sample #...: F5B230353-003 Work Order #...: G414M1A6 Matrix.....: SOLID

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	96	(80 - 130)
Dibromofluoromethane	97	(78 - 130)
1,2-Dichloroethane-d4	94	(72 - 134)
4-Bromofluorobenzene	85	(68 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.