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SAF-B05-003
100 BC Remaining Pipelines and Sewers - Soil Full Protocol
FINAL VALIDATION PACKAGE

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H3339

Waste Site: 1607-B2

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Date: 17 November 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines and Sewers – Soil Full Protocol – Waste Site 1607-B2
Subject: Semivolatile - Data Package No. H3339-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3339 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J03WW6	8/19/05	Soil	C	See note 1
J03VB8	8/19/05	Soil	C	See note 1
J03VB9	8/19/05	Soil	C	See note 1
J03VC0	8/19/05	Soil	C	See note 1
J03VC1	8/19/05	Soil	C	See note 1
J03VC1R	8/19/05	Soil	C	See note 1 & 2
J03VC2	8/19/05	Soil	C	See note 1
J03VC3	8/19/05	Soil	C	See note 1
J03VC4	8/19/05	Soil	C	See note 1
J03VC5	8/19/05	Soil	C	See note 1
J03VC6	8/19/05	Soil	C	See note 1
J03VC7	8/19/05	Soil	C	See note 1
J03VC8	8/19/05	Soil	C	See note 1
J03VC9	8/19/05	Soil	C	See note 1
J03VD0	8/19/05	Soil	C	See note 1
J03VD1	8/19/05	Soil	C	See note 1
J03VD2	8/19/05	Soil	C	See note 1

1 – Semivolatiles by 8270C.
2 – Reprepared and reanalyzed.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in all samples (except J03VD0) were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

One equipment blank (J03WW6) was submitted for analysis. Di-n-butylphthalate was detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and 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 below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to a LCS recovery outside QC limits (46%), the carbazole result in sample J03VC1R was qualified as an estimate and flagged "J".

Due to the lack of a matrix spike or matrix spike duplicate analysis, all results in sample J03VC1R were qualified as estimates and flagged "J".

All other accuracy 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".

Due to surrogate recoveries below 10%, all nitrobenzene-d5 (nitrobenzene, n-nitroso-di-n-propylamine, 4-chloroaniline, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,6-dinitrotoluene, n-nitrosodiphenylamine), phenol-d5 (phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 2-nitrophenol, 2,4, dinitrophenol, dimethyl phthalate, diethyl phthalate, di-n-butyl phthalate, butylbenzylphthalate, bis(2-ethylhexyl) phthalate, di-n-octylphthalate, isophorone), and 2-fluorophenol (2-chlorophenol, 2,4-dichlorophenol, 4-chloro-3-methyl phenol) associated results in

sample J03VC1 were rejected and flagged "R".

Due to a surrogate recovery outside QC limits (13%), all 2-fluorobiphenyl associated results (1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, 2-chloronaphthalene, hexachlorobenzene, hexachloroethane, 4-chloroaniline, hexachlorobutadiene, hexachlorocyclopentadiene, 3,3'-dichlorobenzidine) in sample J03VC1 were qualified as estimates and flagged "J".

Due to a surrogate recovery outside QC limits (22%), all 2-chlorophenol, 2,4-dichlorophenol and 4-chloro-3-methyl phenol results in sample J03VC4 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-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 an RPD outside QC limits (50%), all 3-nitroanaline results (except J03VC1R) were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (38%), all 4-nitrophenol results (except J03VC1R) were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (43%), all 4-nitroanaline results (except J03VC1R) were qualified as estimates and flagged "J".

Due to the lack of a matrix spike or matrix spike duplicate analysis, all results in sample J03VC1R were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J03VB9/J03VD2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. One-hundred thirty six analytes exceeded the RQL. Under the BHI statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. H3339-LLI 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 98%.

MAJOR DEFICIENCIES

Due to surrogate recoveries below 10%, all nitrobenzene-d5 (nitrobenzene, n-nitroso-di-n-propylamine, 4-chloroaniline, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,6-dinitrotoluene, n-nitrosodiphenylamine), phenol-d5 (phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 2-nitrophenol, 2,4, dinitrophenol, dimethyl phthalate, diethyl phthalate, di-n-butyl phthalate, butylbenzylphthalate, bis(2-ethylhexyl) phthalate, di-n-octylphthalate, isophorone), and 2-fluorophenol (2-chlorophenol, 2,4-dichlorophenol, 4-chloro-3-methyl phenol) associated results in sample J03VC1 were rejected and flagged "R".

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in all samples (except J03VD0) were qualified as undetected, raised to the RQL and flagged "U".

- Due to a LCS recovery outside QC limits (46%), the carbazole result in sample J03VC1R was qualified as an estimate and flagged "J".

- Due to the lack of a matrix spike or matrix spike duplicate analysis, all results in sample J03VC1R were qualified as estimates and flagged "J".

- Due to a surrogate recovery outside QC limits (13%), all 2-fluorobiphenyl associated results (1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, 2-chloronaphthalene, hexachlorobenzene, hexachloroethane, 4-chloroaniline, hexachlorobutadiene, hexachlorocyclopentadiene, 3,3'-dichlorobenzidine) in sample J03VC1 were qualified as estimates and flagged "J".

- Due to a surrogate recovery outside QC limits (22%), all 2-chlorophenol, 2,4-dichlorophenol and 4-chloro-3-methyl phenol results in sample J03VC4 were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (50%), all 3-nitroanaline results (except J03VC1R) were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (38%), all 4-nitrophenol results (except J03VC1R) were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (43%), all 4-nitroanaline results (except J03VC1R) were qualified as estimates and flagged "J".

- Due to the lack of a matrix spike or matrix spike duplicate analysis, all results in sample J03VC1R were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

One-hundred thirty six analytes exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators 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 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: H3339	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	All (except J03VD0)	Method blank contamination
All	J	J03VC1R	No MS/MSD
Carbazole	J	J03VC1R	LCS recovery
Nitrobenzene n-nitroso-di-n-propylamine 4-chloroaniline 2-nitroaniline 3-nitroaniline 4-nitroaniline 2,6-dinitrotoluene n-nitrosodiphenylamine phenol 2-methylphenol 4-methylphenol 2,4-dimethylphenol 2-nitrophenol 2,4, dinitrophenol dimethyl phthalate diethyl phthalate di-n-butyl phthalate butylbenzylphthalate bis(2-ethylhexyl) phthalate di-n-octylphthalate isophorone 2-chlorophenol 2,4-dichlorophenol 4-chloro-3-methyl phenol	R	J03VC1	Surrogate recovery (<10%)
1,3-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene, 1,2,4-trichlorobenzene 2-chloronaphthalene hexachlorobenzene hexachloroethane	J03VC1	J	Surrogate recovery

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

4-chloroaniline hexachlorobutadiene hexachlorocyclopentadiene 3,3'-dichlorobenzidine			
2-chlorophenol 2,4-dichlorophenol 4-chloro-3-methyl phenol	J03VC4	J	Surrogate recovery
3-nitroanaline 4-nitroanaline 4-nitrophenol	All except J03VC1R	J	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD
Laboratory: LLI SDG: H3339

Sample Number		J03VB8		J03VB9		J03VC0		J03VC1		J03VC1R		J03VC2		J03VC3		J03VC4		J03VC5	
Remarks										Reprep									
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05	
Analysis Date		8/25/05		8/25/05		8/25/05		8/25/05		9/1/05		8/25/05		8/25/05		8/25/05		8/25/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
bis(2-Chloroethyl)ether	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
2-Chlorophenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	UJ	340	U
1,3-Dichlorobenzene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
1,4-Dichlorobenzene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
1,2-Dichlorobenzene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
2-Methylphenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
2,2'-oxybis(1-chloropropane)	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
3 and/or 4-Methylphenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
N-Nitroso-di-n-propylamine	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
Hexachloroethane	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
Nitrobenzene	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
Isophorone	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
2-Nitrophenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
2,4-Dimethylphenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
bis(2-Chloroethoxy)methane	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
2,4-Dichlorophenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	UJ	340	U
1,2,4-Trichlorobenzene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
Naphthalene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	110		340	U	340	U
4-Chloroaniline	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
Hexachlorobutadiene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
4-Chloro-3-methylphenol	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	UJ	340	U
2-Methylnaphthalene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	150		340	U	340	U
Hexachlorocyclopentadiene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
2,4,6-Trichlorophenol	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
2,4,5-Trichlorophenol*	660	840	U	840	U	860	U	840	U	840	UJ	850	U	840	U	840	U	840	U
2-Chloronaphthalene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
2-Nitroaniline*	660	840	U	840	U	860	U	840	UR	840	UJ	850	U	840	U	840	U	840	U
Dimethylphthalate	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
Acenaphthylene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
2,6-Dinitrotoluene	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U

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.

* - RQL exceeded

000013

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: H3206																		
Sample Number		J03VB8		J03VB9		J03VC0		J03VC1		J03VC1R		J03VC2		J03VC3		J03VC4		J03VC5	
Remarks																			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05	
Analysis Date		8/25/05		8/25/05		8/25/05		8/25/05		9/1/05		8/25/05		8/25/05		8/25/05		8/25/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	840	UJ	840	UJ	860	UJ	840	UR	840	UJ	850	UJ	840	UJ	840	UJ	840	UJ
Acenaphthene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
2,4-Dinitrophenol*	660	840	U	840	U	860	U	840	UR	840	UJ	850	U	840	U	840	U	840	U
4-Nitrophenol*	660	840	UJ	840	UJ	860	UJ	840	UJ	840	UJ	850	UJ	840	UJ	840	UJ	840	UJ
Dibenzofuran	660	340	U	340	U	350	U	340	U	340	UJ	340	U	34		340	U	340	U
2,4-Dinitrotoluene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Diethylphthalate	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
4-Chlorophenyl-phenyl ether	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Fluorene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
4-Nitroaniline*	660	840	UJ	840	UJ	860	UJ	840	UR	840	UJ	850	UJ	840	UJ	840	UJ	840	UJ
4,6-Dinitro-2-methylphenol*	660	840	U	840	U	860	U	840	U	840	UJ	850	U	840	U	840	U	840	U
N-Nitrosodiphenylamine	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
4-Bromophenyl-phenyl ether	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Hexachlorobenzene	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
Pentachlorophenol*	660	840	U	840	U	860	U	840	U	840	UJ	850	U	840	U	840	U	840	U
Phenanthrene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	37		340	U	340	U
Anthracene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Carbazole	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Di-n-butylphthalate	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	21		340	U	340	U
Fluoranthene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Pyrene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Butylbenzylphthalate	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
3,3'-Dichlorobenzidine	660	340	U	340	U	350	U	340	UJ	340	UJ	340	U	340	U	340	U	340	U
Benzo(a)anthracene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Chrysene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	UR	660	UJ	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	340	U	340	U	350	U	340	UR	340	UJ	340	U	340	U	340	U	340	U
Benzo(b)fluoranthene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Benzo(k)fluoranthene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Benzo(a)pyrene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Indeno(1,2,3-cd)pyrene	660	340	U	24		350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Dibenz(a,h)anthracene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U
Benzo(g,h,i)perylene	660	340	U	340	U	350	U	340	U	340	UJ	340	U	340	U	340	U	340	U

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.

* - RQL exceeded

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: H3203																		
Sample Number		J03VC6		J03VC7		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2		J03WW6			
Remarks														Duplicate		E. Blank			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05			
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05			
Analysis Date		8/25/05		8/25/05		8/25/05		8/25/05		8/29/05		8/26/05		8/26/05		8/25/05			
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
bis(2-Chloroethyl)ether	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2-Chlorophenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
1,3-Dichlorobenzene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
1,4-Dichlorobenzene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
1,2-Dichlorobenzene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2-Methylphenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,2'-oxybis(1-chloropropane)	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
3 and/or 4-Methylphenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
N-Nitroso-di-n-propylamine	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Hexachloroethane	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Nitrobenzene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Isophorone	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2-Nitrophenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,4-Dimethylphenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
bis(2-Chloroethoxy)methane	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,4-Dichlorophenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
1,2,4-Trichlorobenzene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Naphthalene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
4-Chloroaniline	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Hexachlorobutadiene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
4-Chloro-3-methylphenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2-Methylnaphthalene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Hexachlorocyclopentadiene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,4,6-Trichlorophenol	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,4,5-Trichlorophenol*	660	850	U	840	U	840	U	840	U	840	U	840	U	840	U	830	U		
2-Chloronaphthalene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2-Nitroaniline*	660	850	U	840	U	840	U	840	U	840	U	840	U	840	U	830	U		
Dimethylphthalate	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Acenaphthylene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,6-Dinitrotoluene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		

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.

* - RQL exceeded

000015

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																				
Laboratory: LLI	SDG: H3203																			
Sample Number		J03VC6		J03VC7		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2		J03WW6				
Remarks														Duplicate		E. Blank				
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05				
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05				
Analysis Date		6/24/05		6/26/05		6/26/05		6/26/05		6/26/05		6/26/05		6/26/05		8/25/05				
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	850	UJ	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ	830	UJ		
Acenaphthene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,4-Dinitrophenol*	660	850	U	840	U	840	U	840	U	840	U	840	U	840	U	830	U		
4-Nitrophenol*	660	850	UJ	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ	830	UJ		
Dibenzofuran	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
2,4-Dinitrotoluene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Diethylphthalate	660	340	U	26		340	U	340	U	340	U	330	U	340	U	330	U		
4-Chlorophenyl-phenyl ether	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Fluorene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
4-Nitroaniline*	660	850	UJ	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ	830	UJ		
4,6-Dinitro-2-methylphenol*	660	850	U	840	U	840	U	840	U	840	U	840	U	840	U	830	U		
N-Nitrosodiphenylamine	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
4-Bromophenyl-phenyl ether	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Hexachlorobenzene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Pentachlorophenol*	660	850	U	840	U	840	U	840	U	840	U	840	U	840	U	830	U		
Phenanthrene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Anthracene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Carbazole	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Di-n-butylphthalate	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	72			
Fluoranthene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Pyrene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Butylbenzylphthalate	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
3,3'-Dichlorobenzidine	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Benzo(a)anthracene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Chrysene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	340	U	660	U	660	U	660	U		
Di-n-octylphthalate	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Benzo(b)fluoranthene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Benzo(k)fluoranthene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Benzo(a)pyrene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Indeno(1,2,3-cd)pyrene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Dibenz(a,h)anthracene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		
Benzo(g,h,i)perylene	660	340	U	340	U	340	U	340	U	340	U	330	U	340	U	330	U		

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.

* - RQL exceeded

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Report Date: 09/06/05 09:35 Page: 1a

	Cust ID:	J03WW6	J03VB8	J03VB8	J03VB8	J03VB9	J03VC0
Sample Information	RFW#:	001	002	002 MS	002 MSD	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	76 %	61 %	73 %	70 %	68 %	68 %
	2-Fluorobiphenyl	91 %	71 %	81 %	78 %	77 %	78 %
	Terphenyl-d14	122 %	92 %	77 %	95 %	107 %	101 %
	Phenol-d5	85 %	65 %	80 %	69 %	70 %	72 %
	2-Fluorophenol	88 %	60 %	75 %	74 %	68 %	70 %
	2,4,6-Tribromophenol	81 %	74 %	88 %	79 %	85 %	75 %
		fl	fl	fl	fl	fl	fl
Phenol		330 U	340 U	92 %	78 %	340 U	350 U
bis(2-Chloroethyl)ether		330 U	340 U	90 %	70 %	340 U	350 U
2-Chlorophenol		330 U	340 U	86 %	84 %	340 U	350 U
1,3-Dichlorobenzene		330 U	340 U	87 %	78 %	340 U	350 U
1,4-Dichlorobenzene		330 U	340 U	84 %	81 %	340 U	350 U
1,2-Dichlorobenzene		330 U	340 U	93 %	84 %	340 U	350 U
2-Methylphenol		330 U	340 U	88 %	80 %	340 U	350 U
2,2'-oxybis(1-Chloropropane)		330 U	340 U	86 %	72 %	340 U	350 U
4-Methylphenol		330 U	340 U	89 %	77 %	340 U	350 U
N-Nitroso-di-n-propylamine		330 U	340 U	101 %	76 %	340 U	350 U
Hexachloroethane		330 U	340 U	85 %	76 %	340 U	350 U
Nitrobenzene		330 U	340 U	87 %	77 %	340 U	350 U
Isophorone		330 U	340 U	101 %	89 %	340 U	350 U
2-Nitrophenol		330 U	340 U	86 %	84 %	340 U	350 U
2,4-Dimethylphenol		330 U	340 U	69 %	70 %	340 U	350 U
bis(2-Chloroethoxy)methane		330 U	340 U	90 %	83 %	340 U	350 U
2,4-Dichlorophenol		330 U	340 U	92 %	86 %	340 U	350 U
1,2,4-Trichlorobenzene		330 U	340 U	92 %	85 %	340 U	350 U
Naphthalene		330 U	340 U	90 %	84 %	340 U	350 U
4-Chloroaniline		330 U	340 U	121 * %	91 %	340 U	350 U
Hexachlorobutadiene		330 U	340 U	98 %	95 %	340 U	350 U
4-Chloro-3-methylphenol		330 U	340 U	92 %	86 %	340 U	350 U
2-Methylnaphthalene		330 U	340 U	92 %	84 %	340 U	350 U
Hexachlorocyclopentadiene		330 U	340 U	70 %	78 %	340 U	350 U
2,4,6-Trichlorophenol		330 U	340 U	97 %	88 %	340 U	350 U
2,4,5-Trichlorophenol		830 U	840 U	101 %	87 %	840 U	860 U

*= Outside of EPA CLP QC limits.

JC 11/17/05

000017

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Page: 1b

Cust ID:	J03WW6		J03VB8		J03VB8		J03VB8		J03VB9		J03VC0	
RFW#:	001		002		002 MS		002 MSD		003		004	
2-Chloronaphthalene	330	U	340	U	99	%	87	%	340	U	350	U
2-Nitroaniline	830	U	840	U	99	%	74	%	840	U	860	U
Dimethylphthalate	330	U	340	U	94	%	86	%	340	U	350	U
Acenaphthylene	330	U	340	U	95	%	84	%	340	U	350	U
2,6-Dinitrotoluene	330	U	340	U	99	%	95	%	340	U	350	U
3-Nitroaniline	830	UJ	840	UJ	137	%	82	%	840	UJ	860	UJ
Acenaphthene	330	U	340	U	98	%	87	%	340	U	350	U
2,4-Dinitrophenol	830	U	840	U	64	%	48	%	840	U	860	U
4-Nitrophenol	830	UJ	840	UJ	99	%	67	%	840	UJ	860	UJ
Dibenzofuran	330	U	340	U	99	%	88	%	340	U	350	U
2,4-Dinitrotoluene	330	U	340	U	102	%	90	%	340	U	350	U
Diethylphthalate	330	U	340	U	93	%	87	%	340	U	350	U
4-Chlorophenyl-phenylether	330	U	340	U	92	%	85	%	340	U	350	U
Fluorene	330	U	340	U	94	%	84	%	340	U	350	U
4-Nitroaniline	830	UJ	840	UJ	91	%	59	%	840	UJ	860	UJ
4,6-Dinitro-2-methylphenol	830	U	840	U	112	%	83	%	840	U	860	U
N-Nitrosodiphenylamine (1)	330	U	340	U	82	%	71	%	340	U	350	U
4-Bromophenyl-phenylether	330	U	340	U	89	%	78	%	340	U	350	U
Hexachlorobenzene	330	U	340	U	106	%	91	%	340	U	350	U
Pentachlorophenol	830	U	840	U	114	%	89	%	840	U	860	U
Phenanthrene	330	U	340	U	100	%	85	%	340	U	350	U
Anthracene	330	U	340	U	102	%	86	%	340	U	350	U
Carbazole	330	U	340	U	89	%	65	%	340	U	350	U
Di-n-butylphthalate	72	J	340	U	93	%	93	%	340	U	350	U
Fluoranthene	330	U	340	U	102	%	84	%	340	U	350	U
Pyrene	330	U	340	U	93	%	105	%	340	U	350	U
Butylbenzylphthalate	330	U	340	U	86	%	109	%	340	U	350	U
3,3'-Dichlorobenzidine	330	U	340	U	100	%	78	%	340	U	350	U
Benzo(a)anthracene	330	U	340	U	98	%	91	%	340	U	350	U
Chrysene	330	U	340	U	98	%	93	%	340	U	350	U
bis(2-Ethylhexyl)phthalate	~~69 JB~~ U		~~26 JB~~ U		88	%	110	%	~~74 JB~~ U		~~53 JB~~ U	
Di-n-octyl phthalate	330	U	340	U	85	%	105	%	340	U	350	U
Benzo(b)fluoranthene	330	U	340	U	97	%	91	%	340	U	350	U
Benzo(k)fluoranthene	330	U	340	U	92	%	86	%	340	U	350	U
Benzo(a)pyrene	330	U	340	U	94	%	89	%	340	U	350	U
Indeno(1,2,3-cd)pyrene	330	U	340	U	84	%	101	%	24	JB	350	U
Dibenz(a,h)anthracene	330	U	340	U	85	%	101	%	340	U	350	U
Benzo(g,h,i)perylene	330	U	340	U	80	%	101	%	340	U	350	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

11/17/05

000018

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Report Date: 09/06/05 09:35 Page: 2a

	Cust ID:	J03VC1	J03VC1	J03VC2	J03VC3	J03VC4	J03VC5
Sample Information	RFW#:	005	005	006	007	008	009
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
			REPREP				
Surrogate Recovery	Nitrobenzene-d5	1 * %	73 %	69 %	65 %	30 %	65 %
	2-Fluorobiphenyl	13 * %	72 %	76 %	71 %	51 %	73 %
	Terphenyl-d14	99 %	114 %	105 %	88 %	99 %	104 %
	Phenol-d5	4 * %	77 %	75 %	66 %	44 %	67 %
	2-Fluorophenol	0 * %	80 %	78 %	70 %	22 * %	72 %
	2,4,6-Tribromophenol	51 %	56 %	64 %	69 %	68 %	69 %
		fl	fl	fl	fl	fl	fl
Phenol		340 U R	340 U J	340 U R	340 U	340 U	340 U
bis(2-Chloroethyl)ether		340 U	340 U	340 U	340 U	340 U	340 U
2-Chlorophenol		340 U R	340 U	340 U R	340 U	340 U J	340 U
1,3-Dichlorobenzene		340 U J	340 U	340 U	340 U	340 U	340 U
1,4-Dichlorobenzene		340 U J	340 U	340 U	340 U	340 U	340 U
1,2-Dichlorobenzene		340 U J	340 U	340 U	340 U	340 U	340 U
2-Methylphenol		340 U R	340 U	340 U R	340 U	340 U	340 U
2,2'-oxybis(1-Chloropropane)		340 U	340 U	340 U	340 U	340 U	340 U
4-Methylphenol		340 U R	340 U	340 U R	340 U	340 U	340 U
N-Nitroso-di-n-propylamine		340 U R	340 U	340 U R	340 U	340 U	340 U
Hexachloroethane		340 U J	340 U	340 U J	340 U	340 U	340 U
Nitrobenzene		340 U R	340 U	340 U R	340 U	340 U	340 U
Isophorone		340 U R	340 U	340 U R	340 U	340 U	340 U
2-Nitrophenol		340 U R	340 U	340 U R	340 U	340 U	340 U
2,4-Dimethylphenol		340 U R	340 U	340 U R	340 U	340 U	340 U
bis(2-Chloroethoxy)methane		340 U	340 U	340 U	340 U	340 U	340 U
2,4-Dichlorophenol		340 U R	340 U	340 U R	340 U	340 U J	340 U
1,2,4-Trichlorobenzene		340 U J	340 U	340 U J	340 U	340 U	340 U
Naphthalene		340 U	340 U	340 U J	110	340 U	340 U
4-Chloroaniline		340 U R	340 U	340 U R	340 U	340 U	340 U
Hexachlorobutadiene		340 U J	340 U	340 U	340 U	340 U	340 U
4-Chloro-3-methylphenol		340 U R	340 U	340 U R	340 U	340 U J	340 U
2-Methylnaphthalene		340 U	340 U	340 U	150	340 U	340 U
Hexachlorocyclopentadiene		340 U J	340 U	340 U	340 U	340 U	340 U
2,4,6-Trichlorophenol		340 U	340 U	340 U	340 U	340 U	340 U
2,4,5-Trichlorophenol		840 U	840 U	850 U	840 U	840 U	840 U

*= Outside of EPA CLP QC limits.

11/12/05

000019

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Page: 2b

Cust ID:	J03VC1	J03VC1	J03VC2	J03VC3	J03VC4	J03VC5
RFW#:	005	005 REPREP	006	007	008	009
2-Chloronaphthalene	340 U J	340 U J	340 U	340 U	340 U	340 U
2-Nitroaniline	840 U R	840 U	850 U	840 U	840 U	840 U
Dimethylphthalate	340 U R	340 U	340 U	340 U	340 U	340 U
Acenaphthylene	340 U	340 U	340 U	340 U	340 U	340 U
2,6-Dinitrotoluene	340 U B	340 U	340 U	340 U	340 U	340 U
3-Nitroaniline	840 U ~~J~~ R	840 U	850 U J	840 U J	840 U J	840 U J
Acenaphthene	340 U	340 U	340 U	340 U	340 U	340 U
2,4-Dinitrophenol	840 U R	840 U	850 U	840 U	840 U	840 U
4-Nitrophenol	840 U ~~J~~ R J	840 U	850 U J	840 U J	840 U J	840 U J
Dibenzofuran	340 U	340 U	340 U	34 J	340 U	340 U
2,4-Dinitrotoluene	340 U	340 U	340 U	340 U	340 U	340 U
Diethylphthalate	340 U R	340 U	340 U	340 U	340 U	340 U
4-Chlorophenyl-phenylether	340 U	340 U	340 U	340 U	340 U	340 U
Fluorene	340 U	340 U	340 U	340 U	340 U	340 U
4-Nitroaniline	840 U ~~J~~ R	840 U	850 U J	840 U J	840 U J	840 U J
4,6-Dinitro-2-methylphenol	840 U	840 U	850 U	840 U	840 U	840 U
N-Nitrosodiphenylamine (1)	340 U R	340 U	340 U	340 U	340 U	340 U
4-Bromophenyl-phenylether	340 U	340 U	340 U	340 U	340 U	340 U
Hexachlorobenzene	340 U J	340 U	340 U	340 U	340 U	340 U
Pentachlorophenol	840 U	840 U	850 U	840 U	840 U	840 U
Phenanthrene	340 U	340 U	340 U	37 J	340 U	340 U
Anthracene	340 U	340 U	340 U	340 U	340 U	340 U
Carbazole	340 U	340 U	340 U	340 U	340 U	340 U
Di-n-butylphthalate	340 U R	340 U	340 U	21 J	340 U	340 U
Fluoranthene	340 U	340 U	340 U	340 U	340 U	340 U
Pyrene	340 U	340 U	340 U	340 U	340 U	340 U
Butylbenzylphthalate	340 U B	340 U	340 U	340 U	340 U	340 U
3,3'-Dichlorobenzidine	340 U ~~J~~	340 U	340 U	340 U	340 U	340 U
Benzo(a)anthracene	340 U	340 U	340 U	340 U	340 U	340 U
Chrysene	340 U	340 U	340 U	340 U	340 U	340 U
bis(2-Ethylhexyl)phthalate	660 ~~25~~ ~~JB~~ U R	660 ~~36~~ ~~JB~~ U	660 ~~26~~ ~~JB~~ U	660 ~~24~~ ~~JB~~ U	660 ~~21~~ ~~JB~~ U	660 ~~21~~ ~~JB~~ U
Di-n-octyl phthalate	340 U R	340 U	340 U	340 U	340 U	340 U
Benzo(b)fluoranthene	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(k)fluoranthene	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(a)pyrene	340 U	340 U	340 U	340 U	340 U	340 U
Indeno(1,2,3-cd)pyrene	340 U	340 U	340 U	340 U	340 U	340 U
Dibenz(a,h)anthracene	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(g,h,i)perylene	340 U	340 U	340 U	340 U	340 U	340 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

11/17/05

000020

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Report Date: 09/06/05 09:35 Page: 3a

	Cust ID:	J03VC6	J03VC7	J03VC8	J03VC9	J03VD0	J03VD1
Sample Information	RFW#:	010	011	012	013	014	015
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	63 %	77 %	77 %	77 %	76 %	65 %
	2-Fluorobiphenyl	71 %	84 %	77 %	79 %	82 %	71 %
	Terphenyl-d14	102 %	96 %	118 %	100 %	91 %	95 %
	Phenol-d5	67 %	76 %	80 %	76 %	80 %	71 %
	2-Fluorophenol	68 %	71 %	81 %	76 %	77 %	75 %
	2,4,6-Tribromophenol	69 %	84 %	77 %	78 %	90 %	68 %
Phenol		340 U	340 U	340 U	340 U	340 U	330 U
bis(2-Chloroethyl)ether		340 U	340 U	340 U	340 U	340 U	330 U
2-Chlorophenol		340 U	340 U	340 U	340 U	340 U	330 U
1,3-Dichlorobenzene		340 U	340 U	340 U	340 U	340 U	330 U
1,4-Dichlorobenzene		340 U	340 U	340 U	340 U	340 U	330 U
1,2-Dichlorobenzene		340 U	340 U	340 U	340 U	340 U	330 U
2-Methylphenol		340 U	340 U	340 U	340 U	340 U	330 U
2,2'-oxybis(1-Chloropropane)		340 U	340 U	340 U	340 U	340 U	330 U
4-Methylphenol		340 U	340 U	340 U	340 U	340 U	330 U
N-Nitroso-di-n-propylamine		340 U	340 U	340 U	340 U	340 U	330 U
Hexachloroethane		340 U	340 U	340 U	340 U	340 U	330 U
Nitrobenzene		340 U	340 U	340 U	340 U	340 U	330 U
Isophorone		340 U	340 U	340 U	340 U	340 U	330 U
2-Nitrophenol		340 U	340 U	340 U	340 U	340 U	330 U
2,4-Dimethylphenol		340 U	340 U	340 U	340 U	340 U	330 U
bis(2-Chloroethoxy)methane		340 U	340 U	340 U	340 U	340 U	330 U
2,4-Dichlorophenol		340 U	340 U	340 U	340 U	340 U	330 U
1,2,4-Trichlorobenzene		340 U	340 U	340 U	340 U	340 U	330 U
Naphthalene		340 U	340 U	340 U	340 U	340 U	330 U
4-Chloroaniline		340 U	340 U	340 U	340 U	340 U	330 U
Hexachlorobutadiene		340 U	340 U	340 U	340 U	340 U	330 U
4-Chloro-3-methylphenol		340 U	340 U	340 U	340 U	340 U	330 U
2-Methylnaphthalene		340 U	340 U	340 U	340 U	340 U	330 U
Hexachlorocyclopentadiene		340 U	340 U	340 U	340 U	340 U	330 U
2,4,6-Trichlorophenol		340 U	340 U	340 U	340 U	340 U	330 U
2,4,5-Trichlorophenol		850 U	840 U	840 U	840 U	840 U	840 U

*= Outside of EPA CLP QC limits.

000021

11/17/05

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001

Cust ID:	J03VC6	J03VC7	J03VC8	J03VC9	J03VD0	J03VD1
RFW#:	010	011	012	013	014	015
2-Chloronaphthalene	340 U	340 U	340 U	340 U	340 U	330 U
2-Nitroaniline	850 U	840 U	840 U	840 U	840 U	840 U
Dimethylphthalate	340 U	340 U	340 U	340 U	340 U	330 U
Acenaphthylene	340 U	340 U	340 U	340 U	340 U	330 U
2,6-Dinitrotoluene	340 U	340 U	340 U	340 U	340 U	330 U
3-Nitroaniline	850 U J	840 U J	840 U J	840 U J	840 U J	840 U J
Acenaphthene	340 U	340 U	340 U	340 U	340 U	330 U
2,4-Dinitrophenol	850 U	840 U	840 U	840 U	840 U	840 U
4-Nitrophenol	850 U J	840 U J	840 U J	840 U J	840 U J	840 U J
Dibenzofuran	340 U	340 U	340 U	340 U	340 U	330 U
2,4-Dinitrotoluene	340 U	340 U	340 U	340 U	340 U	330 U
Diethylphthalate	340 U	26 J	340 U	340 U	340 U	330 U
4-Chlorophenyl-phenylether	340 U	340 U	340 U	340 U	340 U	330 U
Fluorene	340 U	340 U	340 U	340 U	340 U	330 U
4-Nitroaniline	850 U J	840 U J	840 U J	840 U J	840 U J	840 U J
4,6-Dinitro-2-methylphenol	850 U	840 U	840 U	840 U	840 U	840 U
N-Nitrosodiphenylamine (1)	340 U	340 U	340 U	340 U	340 U	330 U
4-Bromophenyl-phenylether	340 U	340 U	340 U	340 U	340 U	330 U
Hexachlorobenzene	340 U	340 U	340 U	340 U	340 U	330 U
Pentachlorophenol	850 U	840 U	840 U	840 U	840 U	840 U
Phenanthrene	340 U	340 U	340 U	340 U	340 U	330 U
Anthracene	340 U	340 U	340 U	340 U	340 U	330 U
Carbazole	340 U	340 U	340 U	340 U	340 U	330 U
Di-n-butylphthalate	340 U	340 U	340 U	340 U	340 U	330 U
Fluoranthene	340 U	340 U	340 U	340 U	340 U	330 U
Pyrene	340 U	340 U	340 U	340 U	340 U	330 U
Butylbenzylphthalate	340 U	340 U	340 U	340 U	340 U	330 U
3,3'-Dichlorobenzidine	340 U	340 U	340 U	340 U	340 U	330 U
Benzo(a)anthracene	340 U	340 U	340 U	340 U	340 U	330 U
Chrysene	340 U	340 U	340 U	340 U	340 U	330 U
bis(2-Ethylhexyl)phthalate	660 ~~27~~ ~~JB~~ U	660 ~~34~~ ~~JB~~ U	660 ~~27~~ ~~JB~~ U	660 ~~19~~ ~~JB~~ U	340 U	660 ~~27~~ ~~JB~~ U
Di-n-octyl phthalate	340 U	340 U	340 U	340 U	340 U	330 U
Benzo(b)fluoranthene	340 U	340 U	340 U	340 U	340 U	330 U
Benzo(k)fluoranthene	340 U	340 U	340 U	340 U	340 U	330 U
Benzo(a)pyrene	340 U	340 U	340 U	340 U	340 U	330 U
Indeno(1,2,3-cd)pyrene	340 U	340 U	340 U	340 U	340 U	330 U
Dibenz(a,h)anthracene	340 U	340 U	340 U	340 U	340 U	330 U
Benzo(g,h,i)perylene	340 U	340 U	340 U	340 U	340 U	330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

11/17/03

220000

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Report Date: 09/06/05 09:35 Page: 4a

	Cust ID:	J03VD2		SBLKNR		SBLKNR BS		SBLKNX		SBLKNX BS		SBLKNX BSD	
Sample Information	RFW#:	016		05LE0706-MB1		05LE0706-MB1		05LE0719-MB1		05LE0719-MB1		05LE0719-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	72	%	71	%	82	%	73	%	60	%	55	%
	2-Fluorobiphenyl	72	%	81	%	80	%	73	%	76	%	67	%
	Terphenyl-d14	89	%	104	%	100	%	106	%	91	%	82	%
	Phenol-d5	72	%	73	%	86	%	78	%	78	%	69	%
	2-Fluorophenol	76	%	76	%	81	%	84	%	71	%	65	%
	2,4,6-Tribromophenol	71	%	62	%	91	%	51	%	90	%	79	%
Phenol		340	U	330	U	96	%	330	U	82	%	79	%
bis(2-Chloroethyl)ether		340	U	330	U	99	%	330	U	85	%	85	%
2-Chlorophenol		340	U	330	U	91	%	330	U	78	%	78	%
1,3-Dichlorobenzene		340	U	330	U	95	%	330	U	84	%	82	%
1,4-Dichlorobenzene		340	U	330	U	92	%	330	U	80	%	81	%
1,2-Dichlorobenzene		340	U	330	U	98	%	330	U	85	%	85	%
2-Methylphenol		340	U	330	U	97	%	330	U	83	%	82	%
2,2'-oxybis(1-Chloropropane)		340	U	330	U	98	%	330	U	83	%	84	%
4-Methylphenol		340	U	330	U	95	%	330	U	80	%	81	%
N-Nitroso-di-n-propylamine		340	U	330	U	112	%	330	U	91	%	94	%
Hexachloroethane		340	U	330	U	91	%	330	U	86	%	87	%
Nitrobenzene		340	U	330	U	92	%	330	U	65	%	66	%
Isophorone		340	U	330	U	110	%	330	U	77	%	78	%
2-Nitrophenol		340	U	330	U	87	%	330	U	65	%	66	%
2,4-Dimethylphenol		340	U	330	U	79	%	330	U	58	%	57	%
bis(2-Chloroethoxy)methane		340	U	330	U	97	%	330	U	66	%	67	%
2,4-Dichlorophenol		340	U	330	U	94	%	330	U	65	%	66	%
1,2,4-Trichlorobenzene		340	U	330	U	97	%	330	U	63	%	63	%
Naphthalene		340	U	330	U	94	%	330	U	62	%	63	%
4-Chloroaniline		340	U	330	U	101	%	330	U	87	%	88	%
Hexachlorobutadiene		340	U	330	U	102	%	330	U	71	%	73	%
4-Chloro-3-methylphenol		340	U	330	U	99	%	330	U	70	%	69	%
2-Methylnaphthalene		340	U	330	U	101 *	%	330	U	64	%	66	%
Hexachlorocyclopentadiene		340	U	330	U	69	%	330	U	97	%	96	%
2,4,6-Trichlorophenol		340	U	330	U	93	%	330	U	84	%	84	%
2,4,5-Trichlorophenol		840	U	830	U	95	%	830	U	87	%	86	%

*= Outside of EPA CLP QC limits.

11/17/05

000023

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001

Cust ID:	J03VD2		SBLKNR		SBLKNR BS		SBLKNX		SBLKNX BS		SBLKNX BSD	
RFW#:	016		05LE0706-MB1		05LE0706-MB1		05LE0719-MB1		05LE0719-MB1		05LE0719-MB1	
2-Chloronaphthalene	340	U	330	U	98	%	330	U	84	%	82	%
2-Nitroaniline	840	U	830	U	96	%	830	U	96	%	95	%
Dimethylphthalate	340	U	330	U	102	%	330	U	91	%	87	%
Acenaphthylene	340	U	330	U	96	%	330	U	78	%	78	%
2,6-Dinitrotoluene	340	U	330	U	103	%	330	U	87	%	86	%
3-Nitroaniline	840	U J	830	U	108	%	830	U	97	%	92	%
Acenaphthene	340	U	330	U	99	%	330	U	84	%	83	%
2,4-Dinitrophenol	840	U	830	U	66	%	830	U	53	%	63	%
4-Nitrophenol	840	U J	830	U	85	%	830	U	110	%	110	%
Dibenzofuran	340	U	330	U	104	%	330	U	85	%	84	%
2,4-Dinitrotoluene	340	U	330	U	111	%	330	U	96	%	93	%
Diethylphthalate	340	U	330	U	103	%	330	U	93	%	91	%
4-Chlorophenyl-phenylether	340	U	330	U	97	%	330	U	80	%	79	%
Fluorene	340	U	330	U	97	%	330	U	82	%	82	%
4-Nitroaniline	840	U J	830	U	76	%	830	U	69	%	63	%
4,6-Dinitro-2-methylphenol	840	U	830	U	96	%	830	U	96	%	97	%
N-Nitrosodiphenylamine (1)	340	U	330	U	83	%	330	U	71	%	67	%
4-Bromophenyl-phenylether	340	U	330	U	92	%	330	U	82	%	77	%
Hexachlorobenzene	340	U	330	U	108	%	330	U	100	%	95	%
Pentachlorophenol	840	U	830	U	115	%	830	U	107	%	105	%
Phenanthrene	340	U	330	U	105	%	330	U	94	%	92	%
Anthracene	340	U	330	U	106	%	330	U	96	%	94	%
Carbazole	340	U	330	U	76	%	330	U	46 *	%	40 *	%
Di-n-butylphthalate	340	U	330	U	113	%	330	U	98	%	98	%
Fluoranthene	340	U	330	U	101	%	330	U	98	%	96	%
Pyrene	340	U	330	U	119	%	330	U	98	%	94	%
Butylbenzylphthalate	340	U	330	U	119	%	330	U	99	%	97	%
3,3'-Dichlorobenzidine	340	U	330	U	84	%	330	U	62	%	58	%
Benzo(a)anthracene	340	U	330	U	101	%	330	U	87	%	84	%
Chrysene	340	U	330	U	100	%	330	U	88	%	83	%
bis(2-Ethylhexyl)phthalate	100 ~~66~~ ~~JB~~ U		25	J	116	%	24	J	94	%	88	%
Di-n-octyl phthalate	340	U	330	U	106	%	330	U	110	%	105	%
Benzo(b)fluoranthene	340	U	330	U	96	%	330	U	110	%	101	%
Benzo(k)fluoranthene	340	U	330	U	97	%	330	U	93	%	90	%
Benzo(a)pyrene	340	U	330	U	94	%	330	U	94	%	89	%
Indeno(1,2,3-cd)pyrene	340	U	29	J	94	%	330	U	88	%	84	%
Dibenz(a,h)anthracene	340	U	330	U	95	%	330	U	79	%	76	%
Benzo(g,h,i)perylene	340	U	330	U	94	%	330	U	96	%	93	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

JC 11/12/05

000024

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD B05-003
LVL #: 0508L212
SDG/SAF # H3339/B05-003

W.O. #: 11343-606-001-9999-00
Date Received: 08-23-2005

SEMIVOLATILE

Sixteen (16) soil samples were collected on 08-19-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 08-24,29-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 08-25,26,29-2005 and 09-01-2005.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. Five (5) of one hundred forty-four (144) surrogate recoveries were outside acceptance criteria. The out of criteria sample J03VC1 was re-extracted on 08-29-2005, analyzed on 09-01-2005 and reported.
5. One (1) of one hundred twenty-eight (128) matrix spike recoveries was outside acceptance criteria.
6. Three (3) of one hundred ninety-two (192) blank spike recoveries were outside acceptance criteria.
7. The method blanks contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at levels less than the CRQL. The method blank 05LE0706-MB1 also contained the target compound Indeno (1,2,3-cd) pyrene at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/7/05
Date

000026

som\gorup\data\bna\tnu-hanford\0508-212.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 3 9 pages.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 0506421

Initiator: M. Mennally
Date: 8/30/05
Client: 300 Hanford

Batch: 0508L212
Samples: 002 MSD
Method: SW846/MCAWW/CLP/

Parameter: OHDGX
Matrix: Soil
Prep Batch: 0526070

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

- 002 MSD had low surrogate recovery @ 27% (range: 40-130).
- All other samples and QC were ok for spike and surrogate recoveries.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: 8/31/05

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: _____ Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

000027

QA-105-A-0805

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 4 of 4

Collector: Klesler JP/Bowers DA/Martinez CR	Company Contact: Doug Bowers; Telephone No.: 509 591-0701	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B-2 @ 100 BC	SAF No.: B05-003	Air Quality / 21 days
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5; COA: R607B2 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES/LIONVILLE	Offsite Property No.: A050357	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE ~~HAZARDS/REMARKS~~: None

Special Handling and/or Storage: Cool 4°C

SAMPLE ANALYSIS												
Preservation				None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container				aG	aG	aG	aG	aG	aG			
No. of Container(s)				1	1	1	1	1	1			
Volume				250mL	250mL	120mL	120mL	120mL	250mL			
				See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151			
Sample No.	Matrix *	Sample Date	Sample Time									
J03WW6	SOIL	8-19-05	0831	X			X					

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: 1049 Doug Bowers Bowers	8-19-05/1630	Received By/Stored In: RCF 2A 3728	8-19-05/1630
Relinquished By/Removed From: 3728 RCF 2A	8/22/05 1200	Received By/Stored In: DA Studer Paul Sagen	8/22/05 1200
Relinquished By/Removed From: DA Studer ERC Paul Sagen	8/22/05 1200	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX	8 23 05 10855	Received By/Stored In: W Smith	8-23-05/0855
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}. ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000028

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 1 of 4

Collector: Kiesler JP/Bowers DL/Martinez CR	Company Contact: Doug Bowers	Telephone No.: 509 531-0701	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround		
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B-2 @ 100 BC	SAF No.: B05-003	Air Quality: 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5	COA: R607022000	Method of Shipment: Fed EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050357	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				

Sample No.	Matrix *	Sample Date	Sample Time										
J03VB8	SOIL	8-19-05	0849	X	X	X	X	X	X			1	
J03VB9	SOIL		0848	X	X	X	X	X	X			2	
J03VC0	SOIL		~~0850~~ 0901	X	X	X	X	X	X			3	
J03VC1	SOIL		~~0900~~ 0910	X	X	X	X	X	X			4	
J03VC2	SOIL		0917	X	X	X	X	X	X			5	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Doug Bowers	Date/Time: 8-19-05/1630	Received By/Stored In: R.F 2A 3728	Date/Time: 8-19-05/1630
Relinquished By/Removed From: 3728 BEF2A	Date/Time: 8/22/05 1200	Received By/Stored In: DA Stryker	Date/Time: 8/22/05 1200
Relinquished By/Removed From: DA Stryker	Date/Time: 8/22/05 1200	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 8.23.05 1055	Received By/Stored In:	Date/Time: 8.23.05 1055
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

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium~~, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, ~~Strontium~~, ~~Thallium~~, ~~Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05 1630

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000039

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 2 of 4

Collector: Kistler JP / Bowers DH / Martinez CR	Company Contact: Doug Bowers — Telephone No.: 509 511-0701	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-D-2 @ 100 BC	SAF No.: B05-003	Air Quality: 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1172-5 — COA: R60702 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 4050357	Bill of Lading/Air Bill No.: 802 0SPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VC3 / SOIL / 8-19-05 / 0924	X	X	X	X	X	X			6	
J03VC4 / SOIL / ↓ / 0940	X	X	X	X	X	X			7	
J03VC5 / SOIL / ↓ / 0942	X	X	X	X	X	X			8	
J03VC6 / SOIL / ↓ / 0948	X	X	X	X	X	X			9	
J03VC7 / SOIL / ↓ / 1007	X	X	X	X	X	X			10	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From — Date/Time	Received By/Stored In — Date/Time
Doug Bowers / Bowers 8-19-05/1630	RCF 2A 3728 8-19-05/1630
3728 RCF 2A 8/22/05 1200	DA Stohn 8/22/05 1200
DA Stohn ERC 8/22/05 1200	FED EX
8-23-05 1085	8-23-05 1085

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000030

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 3 of 4

Collector: Kisler JP / Bowers DL / Martinez CR	Company Contact: Doug Bowers	Telephone No.: 509 531 0701	Project Coordinator: KESSNER, JH	Price Code	Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-D-2 @ 100 BC		SAF No.: B05-003	Air Quality	21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-022	Field Logbook No.: EFL 1173-5	COA: R60782 2000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A050557		Bill of Lading/Air Bill No.: 86E 05PC		

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VC8 / SOIL / 8-19-05 / 1007	X	X	X	X	X	X			11	
J03VC9 / SOIL / ↓ / 1009	X	X	X	X	X	X			3 w	
J03VD0 / SOIL / ↓ / 1018	X	X	X	X	X	X				
J03VD1 / SOIL / ↓ / 1026	X	X	X	X	X	X				
J03VD2 / SOIL / ↓ / 0850	X	X	X	X	X	X			2	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-19-05/1610	RoP 2A 3728	8-19-05/1610
3728 RoP 2A	8/22/05 1200	DA St Johnson	8/22/05 1200
DA St Johnson	8/22/05 1200	FED EX	
FED EX	8-23-05 0855		8-23-05 0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000031

RECEIVED
SEP 2005

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B05-003 H3339

DATE RECEIVED: 08/23/05

LVL LOT # :0508L212

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J03WW6	001	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VB8	002	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VB8	002 MS	S	05LE0706	08/19/05	08/24/05	08/29/05
J03VB8	002 MSD	S	05LE0706	08/19/05	08/24/05	08/26/05
J03VB9	003	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC0	004	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC1	005	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC1	005 R1	S	05LE0719	08/19/05	08/29/05	09/01/05
J03VC2	006	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC3	007	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC4	008	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC5	009	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC6	010	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC7	011	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC8	012	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VC9	013	S	05LE0706	08/19/05	08/24/05	08/25/05
J03VD0	014	S	05LE0706	08/19/05	08/24/05	08/29/05
J03VD1	015	S	05LE0706	08/19/05	08/24/05	08/26/05
J03VD2	016	S	05LE0706	08/19/05	08/24/05	08/25/05

LAB QC:

SBLKNR	MB1	S	05LE0706	N/A	08/24/05	08/25/05
SBLKNR	MB1 BS	S	05LE0706	N/A	08/24/05	08/25/05
SBLKNX	MB1	S	05LE0719	N/A	08/29/05	09/01/05
SBLKNX	MB1 BS	S	05LE0719	N/A	08/29/05	09/01/05
SBLKNX	MB1 BSD	S	05LE0719	N/A	08/29/05	09/01/05

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 1607-B2:1			DATA PACKAGE: H3339		
VALIDATOR: TLT		LAB: LCI		DATE: 11/16/05	
			SDG: H3339		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J03WW6	J03VB8	J03VB9	J03VC0	J03VC1	J03VC2
J03VC3	J03VC4	J03VC5	J03VC6	J03VC7	J03VC8
J03VC9	J03VD0	J03VD1	J03VD2	J03VC1R	
					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: all detects (except C1R) flagged U at RQL -
C1R - U at RQL

FB - di-n-butyl phthalate

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: ~~C1 - Surr 4 values~~ C4 - 1 surr - J all associated
C1R - No MS/MSD - J all
C1R - Carbazole 4/90 ~~[illegible]~~ LCS - J

C1 - 3 surr - UR
1 surr - J

no DAT

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:

C1R - No MS/MSD - J all

3-nitroaniline - 50% - J all

4-nitrophenol - 38% J all

4 nitroaniline - 43% J all

except C1R

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:

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: 8 x 17 = 134 cm

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 17 November 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines and Sewers – Soil Full Protocol – Waste Site 1607-B2
Subject: Inorganics - Data Package No. H3339-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3339 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J03WW6	8/19/05	Soil	C	See note 1
J03VB8	8/19/05	Soil	C	See note 1
J03VB9	8/19/05	Soil	C	See note 1
J03VC0	8/19/05	Soil	C	See note 1
J03VC1	8/19/05	Soil	C	See note 1
J03VC2	8/19/05	Soil	C	See note 1
J03VC3	8/19/05	Soil	C	See note 1
J03VC4	8/19/05	Soil	C	See note 1
J03VC5	8/19/05	Soil	C	See note 1
J03VC6	8/19/05	Soil	C	See note 1
J03VC7	8/19/05	Soil	C	See note 1
J03VC8	8/19/05	Soil	C	See note 1
J03VC9	8/19/05	Soil	C	See note 1
J03VD0	8/19/05	Soil	C	See note 1
J03VD1	8/19/05	Soil	C	See note 1
J03VD2	8/19/05	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). 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 28 days for mercury and 6 months for ICP metals.

All 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, the chromium results in sample J03WW6 was qualified as an estimate and flagged "UJ".

All preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J03WW6) was submitted for analysis. Boron, barium, manganese, vanadium and zinc were detected in the field blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. 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 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (36.7%), all antimony results were qualified as estimates and flagged "J".

All other accuracy 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 30%, 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

One set of field duplicate samples (J03VB9/J03VD2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. H3339 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to method blank contamination, the chromium results in sample J03WW6 was qualified as an estimate and flagged "UJ". Due to a matrix spike recovery outside QC limits (36.7%), all antimony results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with 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 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

METALS DATA QUALIFICATION SUMMARY*

SDG: H3339	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium	UJ	J03WW6	Blank contamination
Antimony	J	All	MS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD
Laboratory: LLI SDG: H3206

Sample Number		J03WW6		J03VB8		J03VB9		J03VC0		J03VC1		J03VC2		J03VC3		J03VC4		J03VC5		J03VC6	
Remarks		E. Blank																			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.07	U	0.07	U	0.07	U	0.11		0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Arsenic	10	0.42	U	4.6		5.1		6.6		4.1		5.3		4.1		6.3		6.0		10.6	
Boron		0.50		1.1		1.4		14.2		0.62	U	0.74		25.4		0.88		0.63	U	0.63	
Barium	2	0.93		101		88.7		186		100		155		642		115		139		191	
Beryllium		0.009	U	0.36		0.32		0.43		0.57		0.82		0.78		0.66		0.72		1.1	
Cadmium	0.2	0.04	U	0.04	U	0.04	U	0.04	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U
Cobalt		0.06	U	10.7		7.5		8.10		9.4		13.0		5.3		9.8		10.7		19.1	
Chromium	1	0.13	UJ	12.3		12.5		16.4		13.0		14.6		7.9		18.4		16.2		28.5	
Copper		0.12	U	25.3		17.5		20.8		21.8		27.8		20.9		25.2		25.6		46.5	
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.01	U	0.02	U	0.02	U	0.01	U	0.01	U	0.01	U	0.01	U
Manganese		2.2		434		430		388		432		575		289		468		528		856	
Molybdenum		0.16	U	0.47		0.41		1.7		0.68		0.67		1.1		0.91		0.76		0.87	
Nickel		0.12	U	13.8		13.8		16.7		14.4		17.5		10.2		18.4		17.9		31.9	
Lead	5	0.26	U	6.3		6.1		6.9		7.4		9.2		4.4		8.5		9.9		15.0	
Antimony	0.6	0.27	UJ	0.28	UJ	0.27	UJ	0.28	UJ	0.27	UJ	0.37	J	0.27	UJ	0.27	UJ	0.39	J	0.58	J
Selenium	1	0.39	U	0.39	U	0.39	U	0.40	U	0.39	U	0.39	U	0.39	U	0.39	U	0.39	U	0.39	U
Vanadium		0.09		61.4		33.8		37.9		41.4		57.5		31.2		46.2		44.7		73.9	
Zinc	1	1.1		60.2		40.5		44.8		51.0		65.9		34.4		57.6		59.7		101	

Sample Number		J03VC7		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2									
Remarks												Duplicate									
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05									
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.07	U	0.07	U	0.07	U	0.07	U	0.09		0.20									
Arsenic	10	7.7		6.3		5.3		4.4		4.9		5.6									
Boron		2.0		0.63	U	2.3		0.61	U	1.4		1.7									
Barium	2	162		94.5		101		68.9		75.1		99.8									
Beryllium		0.70		0.48		0.47		0.36		0.33		0.41									
Cadmium	0.2	0.11	U	0.11	U	0.11	U	0.11	U	0.13		0.13									
Cobalt		12.8		8.2		8.0		6.9		6.8		8.3									
Chromium	1	21.5		14.6		14.6		12.4		12.3		14.6									
Copper		31.5		18.3		17.5		14.8		15.3		19.0									
Mercury	0.2	0.02		0.01	U	0.01	U	0.02	U	0.02	U	0.01	U								
Manganese		603		403		357		301		312		488									
Molybdenum		0.91		1.3		0.57		0.60		0.61		0.56									
Nickel		22.8		16.0		14.4		12.8		13.1		15.8									
Lead	5	10.4		6.6		6.6		5.4		4.8		5.9									
Antimony	0.6	0.43	J	0.28	UJ	0.42	J	0.49	J	0.42	J	0.27	UJ								
Selenium	1	0.39	U	0.39	U	0.39	U	0.38	U	0.39	U	0.39	U								
Vanadium		47.8		39.8		40.0		34.9		31.7		37.4									
Zinc	1	70.3		44.8		42.5		36.1		36.2		45.0									

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03WW6	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	0.42 u	MG/KG	0.42	1.0
		Boron, Total	0.50	MG/KG	0.21	1.0
		Barium, Total	0.93	MG/KG	0.009	1.0
		Beryllium, Total	0.009u	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	0.06 u	MG/KG	0.06	1.0
		Chromium, Total	0.13 J	MG/KG	0.06	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	2.2	MG/KG	0.02	1.0
		Molybdenum, Total	0.16 u	MG/KG	0.16	1.0
		Nickel, Total	0.12 u	MG/KG	0.12	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	0.09	MG/KG	0.05	1.0
		Zinc, Total	1.1	MG/KG	0.06	1.0
-002	J03VB8	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	4.6	MG/KG	0.43	1.0
		Boron, Total	1.1	MG/KG	0.21	1.0
		Barium, Total	101	MG/KG	0.009	1.0
		Beryllium, Total	0.36	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	10.7	MG/KG	0.06	1.0
		Chromium, Total	12.3	MG/KG	0.06	1.0
		Copper, Total	25.3	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	434	MG/KG	0.02	1.0
		Molybdenum, Total	0.47	MG/KG	0.17	1.0
		Nickel, Total	13.8	MG/KG	0.12	1.0
		Lead, Total	6.3	MG/KG	0.27	1.0
		Antimony, Total	0.28 u J	MG/KG	0.28	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	61.4	MG/KG	0.06	1.0
		Zinc, Total	60.2	MG/KG	0.06	1.0

11/12/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J03VB9	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	5.1	MG/KG	0.42	1.0
		Boron, Total	1.4	MG/KG	0.21	1.0
		Barium, Total	88.7	MG/KG	0.009	1.0
		Beryllium, Total	0.32	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	7.5	MG/KG	0.06	1.0
		Chromium, Total	12.5	MG/KG	0.06	1.0
		Copper, Total	17.5	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	430	MG/KG	0.02	1.0
		Molybdenum, Total	0.41	MG/KG	0.16	1.0
		Nickel, Total	13.8	MG/KG	0.12	1.0
		Lead, Total	6.1	MG/KG	0.26	1.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	33.8	MG/KG	0.05	1.0
		Zinc, Total	40.5	MG/KG	0.06	1.0
-004	J03VC0	Silver, Total	0.11	MG/KG	0.07	1.0
		Arsenic, Total	6.6	MG/KG	0.44	1.0
		Boron, Total	14.2	MG/KG	0.21	1.0
		Barium, Total	186	MG/KG	0.009	1.0
		Beryllium, Total	0.43	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	8.1	MG/KG	0.07	1.0
		Chromium, Total	16.4	MG/KG	0.07	1.0
		Copper, Total	20.8	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	388	MG/KG	0.02	1.0
		Molybdenum, Total	1.7	MG/KG	0.17	1.0
		Nickel, Total	16.7	MG/KG	0.12	1.0
		Lead, Total	6.9	MG/KG	0.27	1.0
		Antimony, Total	0.28 u J	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	37.9	MG/KG	0.06	1.0
		Zinc, Total	44.8	MG/KG	0.07	1.0

11/17/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J03VC1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	4.1	MG/KG	0.42	1.0
		Boron, Total	0.62 u	MG/KG	0.62	3.0
		Barium, Total	100	MG/KG	0.009	1.0
		Beryllium, Total	0.57	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	9.4	MG/KG	0.06	1.0
		Chromium, Total	13.0	MG/KG	0.06	1.0
		Copper, Total	21.8	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	432	MG/KG	0.02	1.0
		Molybdenum, Total	0.68	MG/KG	0.16	1.0
		Nickel, Total	14.4	MG/KG	0.12	1.0
		Lead, Total	7.4	MG/KG	0.78	3.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	41.4	MG/KG	0.05	1.0
		Zinc, Total	51.0	MG/KG	0.06	1.0
-006	J03VC2	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	5.3	MG/KG	0.42	1.0
		Boron, Total	0.74	MG/KG	0.62	3.0
		Barium, Total	155	MG/KG	0.009	1.0
		Beryllium, Total	0.82	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	13.0	MG/KG	0.06	1.0
		Chromium, Total	14.6	MG/KG	0.06	1.0
		Copper, Total	27.8	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	575	MG/KG	0.02	1.0
		Molybdenum, Total	0.67	MG/KG	0.16	1.0
		Nickel, Total	17.5	MG/KG	0.12	1.0
		Lead, Total	9.2	MG/KG	0.78	3.0
		Antimony, Total	0.37 J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	57.5	MG/KG	0.05	1.0
		Zinc, Total	65.9	MG/KG	0.06	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J03VC3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	4.1	MG/KG	0.42	1.0
		Boron, Total	25.4	MG/KG	0.62	3.0
		Barium, Total	642	MG/KG	0.009	1.0
		Beryllium, Total	0.78	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	5.3	MG/KG	0.06	1.0
		Chromium, Total	7.9	MG/KG	0.06	1.0
		Copper, Total	20.9	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	289	MG/KG	0.02	1.0
		Molybdenum, Total	1.1	MG/KG	0.16	1.0
		Nickel, Total	10.2	MG/KG	0.12	1.0
		Lead, Total	4.4	MG/KG	0.78	3.0
		Antimony, Total	0.27 uJ	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	31.2	MG/KG	0.05	1.0
		Zinc, Total	34.4	MG/KG	0.06	1.01
-008	J03VC4	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	6.3	MG/KG	0.43	1.0
		Boron, Total	0.88	MG/KG	0.63	3.0
		Barium, Total	115	MG/KG	0.009	1.0
		Beryllium, Total	0.66	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	9.8	MG/KG	0.06	1.0
		Chromium, Total	18.4	MG/KG	0.06	1.0
		Copper, Total	25.2	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	468	MG/KG	0.02	1.0
		Molybdenum, Total	0.91	MG/KG	0.16	1.0
		Nickel, Total	18.4	MG/KG	0.12	1.0
		Lead, Total	8.5	MG/KG	0.79	3.0
		Antimony, Total	0.27 uJ	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	46.2	MG/KG	0.05	1.0
		Zinc, Total	57.6	MG/KG	0.06	1.0

11/17/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J03VC5	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	6.0	MG/KG	0.43	1.0
		Boron, Total	0.63 u	MG/KG	0.63	3.0
		Barium, Total	139	MG/KG	0.009	1.0
		Beryllium, Total	0.72	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	10.7	MG/KG	0.06	1.0
		Chromium, Total	16.2	MG/KG	0.06	1.0
		Copper, Total	25.6	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	528	MG/KG	0.02	1.0
		Molybdenum, Total	0.76	MG/KG	0.17	1.0
		Nickel, Total	17.9	MG/KG	0.12	1.0
		Lead, Total	9.9	MG/KG	0.80	3.0
		Antimony, Total	0.39 J	MG/KG	0.28	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	44.7	MG/KG	0.06	1.0
		Zinc, Total	59.7	MG/KG	0.06	1.0
-010	J03VC6	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	10.6	MG/KG	0.43	1.0
		Boron, Total	0.63 u	MG/KG	0.63	3.0
		Barium, Total	191	MG/KG	0.009	1.0
		Beryllium, Total	1.1	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	19.1	MG/KG	0.06	1.0
		Chromium, Total	28.5	MG/KG	0.06	1.0
		Copper, Total	46.5	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	856	MG/KG	0.02	1.0
		Molybdenum, Total	0.87	MG/KG	0.16	1.0
		Nickel, Total	31.9	MG/KG	0.12	1.0
		Lead, Total	15.0	MG/KG	0.79	3.0
		Antimony, Total	0.58 J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	73.9	MG/KG	0.05	1.0
		Zinc, Total	101	MG/KG	0.06	1.0

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J03VC7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	7.7	MG/KG	0.42	1.0
		Boron, Total	2.0	MG/KG	0.62	3.0
		Barium, Total	162	MG/KG	0.009	1.0
		Beryllium, Total	0.70	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	12.8	MG/KG	0.06	1.0
		Chromium, Total	21.5	MG/KG	0.06	1.0
		Copper, Total	31.5	MG/KG	0.12	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Manganese, Total	603	MG/KG	0.02	1.0
		Molybdenum, Total	0.91	MG/KG	0.16	1.0
		Nickel, Total	22.8	MG/KG	0.12	1.0
		Lead, Total	10.4	MG/KG	0.79	3.0
		Antimony, Total	0.43 J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	47.8	MG/KG	0.05	1.0
		Zinc, Total	70.3	MG/KG	0.06	1.0
-012	J03VC8	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	6.3	MG/KG	0.43	1.0
		Boron, Total	0.63 u	MG/KG	0.63	3.0
		Barium, Total	94.5	MG/KG	0.009	1.0
		Beryllium, Total	0.48	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	8.2	MG/KG	0.06	1.0
		Chromium, Total	14.6	MG/KG	0.06	1.0
		Copper, Total	18.3	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	403	MG/KG	0.02	1.0
		Molybdenum, Total	1.3	MG/KG	0.17	1.0
		Nickel, Total	16.0	MG/KG	0.12	1.0
		Lead, Total	6.6	MG/KG	0.80	3.0
		Antimony, Total	0.28 u J	MG/KG	0.28	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	39.8	MG/KG	0.06	1.0
		Zinc, Total	44.8	MG/KG	0.06	1.0

11/17/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-013	J03VC9	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	5.3	MG/KG	0.43	1.0
		Boron, Total	2.3	MG/KG	0.63	3.0
		Barium, Total	101	MG/KG	0.009	1.0
		Beryllium, Total	0.47	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	8.0	MG/KG	0.06	1.0
		Chromium, Total	14.6	MG/KG	0.06	1.0
		Copper, Total	17.5	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	357	MG/KG	0.02	1.0
		Molybdenum, Total	0.57	MG/KG	0.16	1.0
		Nickel, Total	14.4	MG/KG	0.12	1.0
		Lead, Total	6.6	MG/KG	0.80	3.0
		Antimony, Total	0.42 J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	40.0	MG/KG	0.05	1.0
		Zinc, Total	42.5	MG/KG	0.06	1.0
-014	J03VD0	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	4.4	MG/KG	0.42	1.0
		Boron, Total	0.61 u	MG/KG	0.61	3.0
		Barium, Total	68.9	MG/KG	0.009	1.0
		Beryllium, Total	0.36	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	6.9	MG/KG	0.06	1.0
		Chromium, Total	12.4	MG/KG	0.06	1.0
		Copper, Total	14.8	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	301	MG/KG	0.02	1.0
		Molybdenum, Total	0.60	MG/KG	0.16	1.0
		Nickel, Total	12.8	MG/KG	0.12	1.0
		Lead, Total	5.4	MG/KG	0.77	3.0
		Antimony, Total	0.49 J	MG/KG	0.27	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
		Vanadium, Total	34.9	MG/KG	0.05	1.0
		Zinc, Total	36.1	MG/KG	0.06	1.0

11/17/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-015	J03VD1	Silver, Total	0.09	MG/KG	0.07	1.0
		Arsenic, Total	4.9	MG/KG	0.42	1.0
		Boron, Total	1.4	MG/KG	0.21	1.0
		Barium, Total	75.1	MG/KG	0.009	1.0
		Beryllium, Total	0.33	MG/KG	0.009	1.0
		Cadmium, Total	0.13	MG/KG	0.04	1.0
		Cobalt, Total	6.8	MG/KG	0.06	1.0
		Chromium, Total	12.3	MG/KG	0.06	1.0
		Copper, Total	15.3	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	312	MG/KG	0.02	1.0
		Molybdenum, Total	0.61	MG/KG	0.16	1.0
		Nickel, Total	13.1	MG/KG	0.12	1.0
		Lead, Total	4.8	MG/KG	0.26	1.0
		Antimony, Total	0.42 J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	31.7	MG/KG	0.05	1.0
		Zinc, Total	36.2	MG/KG	0.06	1.0
-016	J03VD2	Silver, Total	0.20	MG/KG	0.07	1.0
		Arsenic, Total	5.6	MG/KG	0.42	1.0
		Boron, Total	1.7	MG/KG	0.21	1.0
		Barium, Total	99.8	MG/KG	0.009	1.0
		Beryllium, Total	0.41	MG/KG	0.009	1.0
		Cadmium, Total	0.13	MG/KG	0.04	1.0
		Cobalt, Total	8.3	MG/KG	0.06	1.0
		Chromium, Total	14.6	MG/KG	0.06	1.0
		Copper, Total	19.0	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	488	MG/KG	0.02	1.0
		Molybdenum, Total	0.56	MG/KG	0.16	1.0
		Nickel, Total	15.8	MG/KG	0.12	1.0
		Lead, Total	5.9	MG/KG	0.26	1.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	37.4	MG/KG	0.05	1.0
		Zinc, Total	45.0	MG/KG	0.06	1.0

11/17/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B05-003
LVL#: 0508L212
SDG/SAF#: H3339/B05-003

W.O.#: 11343-606-001-9999-00
Date Received: 08-23-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 16 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of ending CCV's in files TA0906C, and TA0909C. Associated samples were rerun in files TA0910B, and with 3-fold dilutions for Boron, Cadmium, and Lead due to sample matrix, in file TA0912C.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 34 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J03VB6	Antimony	100	100.1

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/29/05
Date

jjw/m08-212

LVLI
LIONVILLE LABORATORY INC.

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 1 of 1
Collector: Klosler JP / Bowers DA / Martinez CR	Company Contact: Doug Bowers; Telephone No.: 509 591-0701	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B-2 @ 100 BC	SAF No.: B05-003	Air Quality / 21 days
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5; COA: R607B2 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050357	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container	aG	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250mL	250mL	120mL	120mL	120mL	250mL					
SAMPLE ANALYSIS	See Item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081, Chloro-Herbicides - EPA8151					
Sample No.	Matrix *	Sample Date	Sample Time								
J03WW6	SOIL	8-19-05	0831	X			X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	8-19-05/1630	RCF 2A 3728	8-19-05/1630
3728 RCF 2A	8/22/05 1200	DA Stjohn Pound Sogen	8/22/05 1200
DA Stjohn ERC Pound Sogen	8/22/05 1200	FED EX	
FED EX	8 23 05 0855	W Smith	8-23-05/0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}. ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}. Mercury - 7471 - (CV)

8-19-05

Matrix *: S=Soil; SE=Sediment; SO=Solid; Sl=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solid; DL=Drum Liquid; T=Tissue; Wi=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

220000

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 1 of 1

Collector: Kiesler JP/Bowers DL/Martinez CR	Company Contact: Doug Bowers	Telephone No.: 509 531-0701	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround		
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B-2 @ 100 BC	SAF No.: B05-003	Air Quality: 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5	COA: R607B2 2000	Method of Shipment: Fed EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050357	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081, Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VB8 / SOIL / 8-19-05 / 0843	X	X	X	X	X	X			1	
J03VB9 / SOIL / 0848	X	X	X	X	X	X			2	
J03VC0 / SOIL / 8-19-05 / ~~0850~~ 0900	X	X	X	X	X	X			3	
J03VC1 / SOIL / 8-19-05 / ~~0900~~ 0910	X	X	X	X	X	X			4	
J03VC2 / SOIL / 0917	X	X	X	X	X	X			5	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-19-05/1630	R.F 2A 3728	8-19-05/1630
3728 BEF2A	8/22/05 1200	DA Stryker	8/22/05 1200
DA Stryker EXC	8/22/05 1200	FED EX	
FED EX	8.23.05 1085	D. Smith	8.23.05 1085

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium~~, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, ~~Strontium~~, ~~Thallium~~, ~~Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000023

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 2 of 4

Collector: Kistler JP / Bowers DL / Martinez CR	Company Contact: Doug Bowers — Telephone No.: 509 511-0701	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-D-2 @ 100 BC	SAF No.: B05-003	Air Quality / 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1171-5 — COA: R60TD2 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 4050357	Bill of Lading/Air Bill No.: 88E 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VC3 / SOIL / 8-19-05 / 0924	X	X	X	X	X	X			6	
J03VC4 / SOIL / ↓ / 0940	X	X	X	X	X	X			7	
J03VC5 / SOIL / ↓ / 0942	X	X	X	X	X	X			8	
J03VC6 / SOIL / ↓ / 0948	X	X	X	X	X	X			9	
J03VC7 / SOIL / ↓ / 1004	X	X	X	X	X	X			10	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	8-19-05 / 1630	AIT 2A 3728	8-19-05 / 1630
3728 REF 2A	8/22/05 1200	DA ST JOHN	8/22/05 1200
DA ST JOHN ERC	8/22/05 1200	FED EX	
	8.23.05 / 0855		8.23.05 / 0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000024

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 3 of 4

Collector: Kisler JP, / Bowers DL / Martinez CR	Company Contact: Doug Bowers — Telephone No.: 509 531 0701	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-D-2 @ 100 BC	SAF No.: B05-003	Air Quality — 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5 — COA: R60782 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A050357	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See Item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081, Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VC8 / SOIL / 8-19-05 / 1007	X	X	X	X	X	X				
J03VC9 / SOIL / / 1009	X	X	X	X	X	X			4	
J03VD0 / SOIL / / 1018	X	X	X	X	X	X			SW	
J03VD1 / SOIL / / 1026	X	X	X	X	X	X				
J03VD2 / SOIL / ✓ / 0850	X	X	X	X	X	X			2	

520000

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	8-19-05/1630	BOP DA 3728	8-19-05/1630
3728 RCF 2A	8/22/05 1200	2A STORAGE	8/22/05 1200
DA STORAGE	8/22/05 1200	FED EX	
FED EX	8-23-05 0855		8/23/05 0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 1407:82:1 10030		DATA PACKAGE: H3339	
VALIDATOR: TLF	LAB: LLT	DATE: 11/11/05	
		SDG: H3337	

ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX					
J03WW4	J03UB8	J03UB9	J03VC0	J03VC1	J03VC2
J03VC3	J03VC4	J03VC5	J03VC6	J03CU7	J03CU8
J03VC9	J03VD0	J03VD1	J03VD2		

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: CR - wwl — UJ

FB - Boron, barium, manganese, vanadium & zinc

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:

antimony - MS 36.7% J all no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

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

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

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

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

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

Transcription/calculation errors? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

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

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

MSA performed as required? ..... Yes No N/A

MSA results acceptable? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

8. HOLDING TIMES (all levels)

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/13/05

CLIENT: TNUHANFORD B05-003 H3339

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L212

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0497-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.47 u	MG/KG	0.47	1.0
		Boron, Total	0.23 u	MG/KG	0.23	1.0
		Barium, Total	0.04	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	0.07 u	MG/KG	0.07	1.0
		Chromium, Total	0.08	MG/KG	0.07	1.0
		Copper, Total	0.13 u	MG/KG	0.13	1.0
		Manganese, Total	0.03	MG/KG	0.02	1.0
		Molybdenum, Total	0.18 u	MG/KG	0.18	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.29 u	MG/KG	0.29	1.0
		Antimony, Total	0.30 u	MG/KG	0.30	1.0
		Selenium, Total	0.48	MG/KG	0.43	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.08	MG/KG	0.07	1.0
BLANK1	05C0215-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L212

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J03VB8	Silver, Total	4.1	0.07u	4.6	89.1	1.0
		Arsenic, Total	174	4.6	182	93.1	1.0
		Boron, Total	81.3	1.1	91.0	88.1	1.0
		Barium, Total	270	101	182	92.9	1.0
		Beryllium, Total	4.7	0.36	4.6	94.3	1.0
		Cadmium, Total	4.2	0.04u	4.6	91.3	1.0
		Cobalt, Total	52.9	10.7	45.5	92.7	1.0
		Chromium, Total	30.6	12.3	18.2	100.6	1.0
		Copper, Total	47.8	25.3	22.7	99.1	1.0
		Manganese, Total	483	434	45.5	107.9*	1.0
		Molybdenum, Total	87.0	0.47	91.0	95.1	1.0
		Nickel, Total	58.1	13.8	45.5	97.4	1.0
		Lead, Total	49.9	6.3	45.5	95.8	1.0
		Antimony, Total	16.7	0.28u	45.5	36.7	1.0
		Selenium, Total	162	0.39u	182	88.8	1.0
		Vanadium, Total	96.9	61.4	45.5	78.0	1.0
		Zinc, Total	101	60.2	45.5	90.5	1.0
-003	J03VB9	Mercury, Total	0.18	0.02u	0.15	115.1	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339 LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J03VB8	Silver, Total	0.07u	0.07u	NC	1.0
		Arsenic, Total	4.6	4.8	4.3	1.0
		Boron, Total	1.1	0.90	19.9	1.0
		Barium, Total	101	105	3.7	1.0
		Beryllium, Total	0.36	0.38	5.6	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Cobalt, Total	10.7	10.7	0.00	1.0
		Chromium, Total	12.3	11.6	5.9	1.0
		Copper, Total	25.3	25.1	0.79	1.0
		Manganese, Total	434	449	3.3	1.0
		Molybdenum, Total	0.47	0.43	9.5	1.0
		Nickel, Total	13.8	14.0	1.4	1.0
		Lead, Total	6.3	6.6	4.7	1.0
		Antimony, Total	0.28u	0.27u	NC	1.0
		Selenium, Total	0.39u	0.38u	NC	1.0
		Vanadium, Total	61.4	57.6	6.4	1.0
		Zinc, Total	60.2	58.6	2.7	1.0
-003REP	J03VB9	Mercury, Total	0.02u	0.01u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3339

LVL LOT #: 0508L212

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0497-LC1	Silver, LCS	46.5	50.0	MG/KG	93.0
		Arsenic, LCS	979	1000	MG/KG	97.9
		Boron, LCS	494	500	MG/KG	98.8
		Barium, LCS	477	500	MG/KG	95.3
		Beryllium, LCS	23.8	25.0	MG/KG	95.2
		Cadmium, LCS	23.6	25.0	MG/KG	94.4
		Cobalt, LCS	240	250	MG/KG	96.2
		Chromium, LCS	48.3	50.0	MG/KG	96.6
		Copper, LCS	121	125	MG/KG	96.9
		Manganese, LCS	73.6	75.0	MG/KG	98.1
		Molybdenum, LCS	481	500	MG/KG	96.2
		Nickel, LCS	191	200	MG/KG	95.3
		Lead, LCS	238	250	MG/KG	95.0
		Antimony, LCS	281	300	MG/KG	93.6
		Selenium, LCS	964	1000	MG/KG	96.4
		Vanadium, LCS	239	250	MG/KG	95.6
		Zinc, LCS	95.0	100	MG/KG	95.0
LCS1	05C0215-LC1	Mercury, LCS	6.7	6.2	MG/KG	107.8

Date: 17 November 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines and Sewers – Soil Full Protocol – Waste Site 1607-B2
Subject: Volatile - Data Package No. H3339-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3339 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J03VB8	8/19/05	Soil	C	See note 1
J03VB9	8/19/05	Soil	C	See note 1
J03VC0	8/19/05	Soil	C	See note 1
J03VC1	8/19/05	Soil	C	See note 1
J03VC2	8/19/05	Soil	C	See note 1
J03VC3	8/19/05	Soil	C	See note 1
J03VC4	8/19/05	Soil	C	See note 1
J03VC5	8/19/05	Soil	C	See note 1
J03VC6	8/19/05	Soil	C	See note 1
J03VC7	8/19/05	Soil	C	See note 1
J03VC7R	8/19/05	Soil	C	See note 1 & 2
J03VC8	8/19/05	Soil	C	See note 1
J03VC9	8/19/05	Soil	C	See note 1
J03VD0	8/19/05	Soil	C	See note 1
J03VD1	8/19/05	Soil	C	See note 1
J03VD2	8/19/05	Soil	C	See note 1

1 – Volatile organics by 8260B.
2 – Re-prepared and reanalyzed.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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 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".

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the methylene chloride results in all samples (except J03VC5, J03VC9 and J03VC7R) were qualified as undetected, raised to the RQL and flagged "U".

Due to method blank contamination, the methylene chloride results in samples J03VC5, J03VC9 and J03VC7R were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and 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 below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to the matrix spike and matrix spike duplicate being prepared in a different preparation batch, all volatile organic results in samples J03VB8, J03VC1, J03VC4, J03VC7 and J03VC8 were qualified as estimates and flagged "J".

All other accuracy 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 +/-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 matrix spike and matrix spike duplicate being prepared in a different preparation batch, all volatile organic results in samples J03VB8, J03VC1, J03VC4, J03VC7 and J03VC8 were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J03VB9/J03VD2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. One-hundred six analytes were reported above the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. H3339-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to method blank contamination, the methylene chloride results in all samples (except J03VC5, J03VC9 and J03VD0) were qualified as undetected, raised to the RQL and flagged "U". Due to method blank contamination, the methylene chloride results in samples J03VC5, J03VC9 and J03VD0 were qualified as undetected and flagged "U". Due to the matrix spike and matrix spike duplicate being prepared in a different preparation batch, all volatile organic results in samples J03VB8, J03VC1, J03VC4, J03VC7 and J03VC8 were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

One-hundred six analytes were reported above the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators 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 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

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: H3339	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	J03VC7R, J03VC5 J03VC9	Method blank contamination
Methylene chloride	U at RQL	All except J03VC7R, J03VC5, J03VC9	Method blank contamination
All	J	J03VB8, J03VC1, J03VC4, J03VC7, J03VC8	No MS/MSD in the preparation batch.

* - 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: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI																			
Case:	SDG: H3339																		
Sample Number		J03VB8		J03VB9		J03VC0		J03VC1		J03VC2		J03VC3		J03VC4		J03VC5		J03VC6	
Remarks																			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Analysis Date		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05	
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	11	UJ	10	U	11	U	11	UJ	10	U	10	U	9	UJ	10	U	11	U
Bromomethane	10	11	UJ	10	U	11	U	11	UJ	10	U	10	U	9	UJ	10	U	11	U
Vinyl Chloride	10	11	UJ	10	U	11	U	11	UJ	10	U	10	U	9	UJ	10	U	11	U
Chloroethane	10	11	UJ	10	U	11	U	11	UJ	10	U	10	U	9	UJ	10	U	11	U
Methylene Chloride	10	10	UJ	10	U	10	U	10	UJ	10	U	10	U	10	UJ	11	U	10	U
Acetone	10	6	J	5		11	U	5	J	3		5		14	J	7		7	
Carbon Disulfide	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
1,1-Dichloroethene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
1,1-Dichloroethane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
1,2-Dichloroethene (total)	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Chloroform	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
1,2-Dichloroethane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
2-Butanone	10	11	UJ	10	U	11	U	11	UJ	10	U	10	U	9	UJ	10	U	11	U
1,1,1-Trichloroethane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Carbon Tetrachloride	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Bromodichloromethane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
1,2-Dichloropropane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
cis-1,3-Dichloropropene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Trichloroethene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Dibromochloromethane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
1,1,2-Trichloroethane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Benzene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
trans-1,3-Dichloropropene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Bromoform	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
4-Methyl-2-pentanone	10	11	UJ	10	U	11	U	11	UJ	10	U	10	U	9	UJ	10	U	11	U
2-Hexanone	10	11	UJ	10	U	11	U	11	UJ	10	U	10	U	9	UJ	10	U	11	U
Tetrachloroethene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
1,1,2,2-Tetrachloroethane	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Toluene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Chlorobenzene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Ethylbenzene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Styrene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
Xylene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
cis-1,2-Dichloroethene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	U
trans-1,2-Dichloroethene	10	6	UJ	5	U	6	U	6	UJ	5	U	5	U	4	UJ	5	U	6	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.

000011

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX (ug/Kg)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI																			
Case:	SDG: H3339																		
Sample Number		J03VC7		J03VC7R		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2					
Remarks				Rerep										Duplicate					
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05					
Analysis Date		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05		08/25/05					
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	11	UJ	11	U	10	UJ	10	U	10	U	11	U	10	U				
Bromomethane	10	11	UJ	11	U	10	UJ	10	U	10	U	11	U	10	U				
Vinyl Chloride	10	11	UJ	11	U	10	UJ	10	U	10	U	11	U	10	U				
Chloroethane	10	11	UJ	11	U	10	UJ	10	U	10	U	11	U	10	U				
Methylene Chloride	10	10	UJ	13	U	10	UJ	11	U	10	U	10	U	10	U				
Acetone	10	22	J	6		5	J	9		6		6		7					
Carbon Disulfide	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
1,1-Dichloroethene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
1,1-Dichloroethane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
1,2-Dichloroethene (total)	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Chloroform	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
1,2-Dichloroethane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
2-Butanone	10	11	UJ	11	U	10	UJ	10	U	10	U	11	U	10	U				
1,1,1-Trichloroethane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Carbon Tetrachloride	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Bromodichloromethane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
1,2-Dichloropropane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
cis-1,3-Dichloropropene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Trichloroethene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Dibromochloromethane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
1,1,2-Trichloroethane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Benzene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
trans-1,3-Dichloropropene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Bromoform	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
4-Methyl-2-pentanone	10	11	UJ	11	U	10	UJ	10	U	10	U	11	U	10	U				
2-Hexanone	10	11	UJ	11	U	10	UJ	10	U	10	U	11	U	10	U				
Tetrachloroethene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
1,1,2,2-Tetrachloroethane	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Toluene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Chlorobenzene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Ethylbenzene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Styrene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
Xylene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
cis-1,2-Dichloroethene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	U				
trans-1,2-Dichloroethene	10	6	UJ	6	U	5	UJ	5	U	5	U	6	U	5	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.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

RFW Batch Number: **0508L212** Client: **TNUHANFORD B05-003 H3339** Work Order: 11343606001 Page: 1a

Report Date: 08/31/05 10:59

	Cust ID:	J03VB8	J03VB9	J03VC0	J03VC1	J03VC2	J03VC3
Sample Information	RFW#:	002	003	004	005	006	007
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.06	0.980	1.04	1.06	1.02	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	1,2-Dichloroethane-d4	109 %	123 %	117 %	111 %	118 %	126 %
	Toluene-d8	106 %	112 %	106 %	107 %	105 %	110 %
	Bromofluorobenzene	112 %	121 %	108 %	109 %	110 %	118 %
		fl	fl	fl	fl	fl	fl
Chloromethane		11 U J	10 U	11 U	11 U J	10 U	10 U
Bromomethane		11 U	10 U	11 U	11 U	10 U	10 U
Vinyl Chloride		11 U	10 U	11 U	11 U	10 U	10 U
Chloroethane		11 U	10 U	11 U	11 U	10 U	10 U
Methylene Chloride		~~10 4 JB~~ U	~~10 7 B~~ U	~~10 7 B~~ U	~~10 5 JB~~ U	~~10 8 B~~ U	~~10 8 B~~ U
Acetone		6 J	5 J	11 U	5 J	3 J	5 J
Carbon Disulfide		6 U	5 U	6 U	6 U	5 U	5 U
1,1-Dichloroethene		6 U	5 U	6 U	6 U	5 U	5 U
1,1-Dichloroethane		6 U	5 U	6 U	6 U	5 U	5 U
Trans-1,2-dichloroethene		6 U	5 U	6 U	6 U	5 U	5 U
Cis-1,2-dichloroethene		6 U	5 U	6 U	6 U	5 U	5 U
Chloroform		6 U	5 U	6 U	6 U	5 U	5 U
1,2-Dichloroethane		6 U	5 U	6 U	6 U	5 U	5 U
2-Butanone		11 U	10 U	11 U	11 U	10 U	10 U
1,1,1-Trichloroethane		6 U	5 U	6 U	6 U	5 U	5 U
Carbon Tetrachloride		6 U	5 U	6 U	6 U	5 U	5 U
Bromodichloromethane		6 U	5 U	6 U	6 U	5 U	5 U
1,2-Dichloropropane		6 U	5 U	6 U	6 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	5 U	6 U	6 U	5 U	5 U
Trichloroethene		6 U	5 U	6 U	6 U	5 U	5 U
Dibromochloromethane		6 U	5 U	6 U	6 U	5 U	5 U
1,1,2-Trichloroethane		6 U	5 U	6 U	6 U	5 U	5 U
Benzene		6 U	5 U	6 U	6 U	5 U	5 U
Trans-1,3-Dichloropropene		6 U	5 U	6 U	6 U	5 U	5 U
Bromoform		6 U	5 U	6 U	6 U	5 U	5 U
4-Methyl-2-pentanone		11 U	10 U	11 U	11 U	10 U	10 U
2-Hexanone		11 U	10 U	11 U	11 U	10 U	10 U
Tetrachloroethene		6 U	5 U	6 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	5 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

11/17/01

000013

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Page: 1b

Cust ID:	J03VB8	J03VB9	J03VC0	J03VC1	J03VC2	J03VC3
RFW#:	002	003	004	005	006	007
Toluene	6 U J	5 U	6 U	6 U J	5 U	5 U
Chlorobenzene	6 U	5 U	6 U	6 U	5 U	5 U
Ethylbenzene	6 U	5 U	6 U	6 U	5 U	5 U
Styrene	6 U	5 U	6 U	6 U	5 U	5 U
Xylene (total)	6 U	5 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

11/17/05

000014

Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

RFW Batch Number: **0508L212** Client: **TNUHANFORD B05-003 H3339** Work Order: 11343606001 Page: 2a Report Date: 08/31/05 10:59

	Cust ID:	J03VC4	J03VC5	J03VC6	J03VC7	J03VC7	J03VC8
Sample Information	RFW#:	008	009	010	011	011	012
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.893	1.02	1.04	1.11	1.04	0.943
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
						REPREP	
Surrogate Recovery	1,2-Dichloroethane-d4	115 %	122 %	117 %	117 %	117 %	134 %
	Toluene-d8	106 %	108 %	102 %	109 %	107 %	120 %
	Bromofluorobenzene	108 %	114 %	107 %	117 %	115 %	127 * %
		fl	fl	fl	fl	fl	fl
Chloromethane		9 U J	10 U	11 U	11 U J	11 U	10 U J
Bromomethane		9 U	10 U	11 U	11 U	11 U	10 U
Vinyl Chloride		9 U	10 U	11 U	11 U	11 U	10 U
Chloroethane		9 U	10 U	11 U	11 U	11 U	10 U
Methylene Chloride		10 ~~4 BJ~~ U	11 ~~B~~ U	10 ~~8 B~~ U	10 ~~5 JB~~ U	13 ~~B~~ U	10 ~~4 JB~~ U
Acetone		14	7 J	7 J	22	6 J	5 J
Carbon Disulfide		4 U	5 U	6 U	6 U	6 U	5 U
1,1-Dichloroethene		4 U	5 U	6 U	6 U	6 U	5 U
1,1-Dichloroethane		4 U	5 U	6 U	6 U	6 U	5 U
Trans-1,2-dichloroethene		4 U	5 U	6 U	6 U	6 U	5 U
Cis-1,2-dichloroethene		4 U	5 U	6 U	6 U	6 U	5 U
Chloroform		4 U	5 U	6 U	6 U	6 U	5 U
1,2-Dichloroethane		4 U	5 U	6 U	6 U	6 U	5 U
2-Butanone		9 U	10 U	11 U	11 U	11 U	10 U
1,1,1-Trichloroethane		4 U	5 U	6 U	6 U	6 U	5 U
Carbon Tetrachloride		4 U	5 U	6 U	6 U	6 U	5 U
Bromodichloromethane		4 U	5 U	6 U	6 U	6 U	5 U
1,2-Dichloropropane		4 U	5 U	6 U	6 U	6 U	5 U
cis-1,3-Dichloropropene		4 U	5 U	6 U	6 U	6 U	5 U
Trichloroethene		4 U	5 U	6 U	6 U	6 U	5 U
Dibromochloromethane		4 U	5 U	6 U	6 U	6 U	5 U
1,1,2-Trichloroethane		4 U	5 U	6 U	6 U	6 U	5 U
Benzene		4 U	5 U	6 U	6 U	6 U	5 U
Trans-1,3-Dichloropropene		4 U	5 U	6 U	6 U	6 U	5 U
Bromoform		4 U	5 U	6 U	6 U	6 U	5 U
4-Methyl-2-pentanone		9 U	10 U	11 U	11 U	11 U	10 U
2-Hexanone		9 U	10 U	11 U	11 U	11 U	10 U
Tetrachloroethene		4 U	5 U	6 U	6 U	6 U	5 U
1,1,2,2-Tetrachloroethane		4 U	5 U	6 U	6 U	6 U	5 U

*= Outside of EPA CLP QC limits.

11/17/05

000015

RFW Batch Number: **0508L212** Client: **TNUHANFORD B05-003 H3339** Work Order: 11343606001 Page: 2b

Cust ID:	J03VC4	J03VC5	J03VC6	J03VC7	J03VC7	J03VC8
RFW#:	008	009	010	011	011 REPREP	012
Toluene	4 U J	5 U	6 U	6 U J	6 U	5 U J
Chlorobenzene	4 U	5 U	6 U	6 U	6 U	5 U
Ethylbenzene	4 U	5 U	6 U	6 U	6 U	5 U
Styrene	4 U	5 U	6 U	6 U	6 U	5 U
Xylene (total)	4 U	5 U	6 U	6 U	6 U	5 U

*= Outside of EPA CLP QC limits.

JR
11/17/05

000016

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

RFW Batch Number: **0508L212** Client: **TNUHANFORD B05-003 H3339** Work Order: 11343606001 Page: 3a Report Date: 08/31/05 10:59

	Cust ID:	J03VC8	J03VC8	J03VC9	J03VD0	J03VD1	J03VD2
Sample Information	RFW#:	012 MS	012 MSD	013	014	015	016
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.04	1.04	1.02	1.09	1.04
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	1,2-Dichloroethane-d4	131 %	129 %	125 %	127 %	124 %	122 %
	Toluene-d8	113 %	110 %	107 %	110 %	106 %	105 %
	Bromofluorobenzene	124 * %	118 %	113 %	120 %	115 %	113 %
		fl	fl	fl	fl	fl	fl
Chloromethane		120 %	119 %	10 U	10 U	11 U	10 U
Bromomethane		160 %	165 %	10 U	10 U	11 U	10 U
Vinyl Chloride		117 %	121 %	10 U	10 U	11 U	10 U
Chloroethane		141 %	134 %	10 U	10 U	11 U	10 U
Methylene Chloride		107 %	106 %	11 ~~B~~ U	10 ~~B~~ U	10 ~~B~~ U	10 ~~B~~ U
Acetone		200 %	180 %	9 U	6 J	6 U	7 J
Carbon Disulfide		116 %	113 %	5 U	5 U	6 U	5 U
1,1-Dichloroethene		120 %	115 %	5 U	5 U	6 U	5 U
1,1-Dichloroethane		125 %	124 %	5 U	5 U	6 U	5 U
Trans-1,2-dichloroethene		108 %	108 %	5 U	5 U	6 U	5 U
Cis-1,2-dichloroethene		107 %	105 %	5 U	5 U	6 U	5 U
Chloroform		120 %	119 %	5 U	5 U	6 U	5 U
1,2-Dichloroethane		136 %	131 %	5 U	5 U	6 U	5 U
2-Butanone		136 %	136 %	10 U	10 U	11 U	10 U
1,1,1-Trichloroethane		116 %	115 %	5 U	5 U	6 U	5 U
Carbon Tetrachloride		102 %	103 %	5 U	5 U	6 U	5 U
Bromodichloromethane		108 %	108 %	5 U	5 U	6 U	5 U
1,2-Dichloropropane		119 %	116 %	5 U	5 U	6 U	5 U
cis-1,3-Dichloropropene		117 %	110 %	5 U	5 U	6 U	5 U
Trichloroethene		105 %	105 %	5 U	5 U	6 U	5 U
Dibromochloromethane		97 %	96 %	5 U	5 U	6 U	5 U
1,1,2-Trichloroethane		119 %	114 %	5 U	5 U	6 U	5 U
Benzene		117 %	115 %	5 U	5 U	6 U	5 U
Trans-1,3-Dichloropropene		117 %	113 %	5 U	5 U	6 U	5 U
Bromoform		89 %	91 %	5 U	5 U	6 U	5 U
4-Methyl-2-pentanone		155 * %	149 %	10 U	10 U	11 U	10 U
2-Hexanone		165 %	165 %	10 U	10 U	11 U	10 U
Tetrachloroethene		99 %	100 %	5 U	5 U	6 U	5 U
1,1,2,2-Tetrachloroethane		144 * %	133 * %	5 U	5 U	6 U	5 U

*= Outside of EPA CLP QC limits.

10/17/05

000012

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Page: 3b

Cust ID:	J03VC8		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2	
RFW#:	012 MS		012 MSD		013		014		015		016	
Toluene	115	%	111	%	5	U	5	U	6	U	5	U
Chlorobenzene	110	%	107	%	5	U	5	U	6	U	5	U
Ethylbenzene	110	%	108	%	5	U	5	U	6	U	5	U
Styrene	117	%	112	%	5	U	5	U	6	U	5	U
Xylene (total)	110	%	106	%	5	U	5	U	6	U	5	U

*= Outside of EPA CLP QC limits.

000018

11/17/4

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Page: 4a

Report Date: 08/31/05 10:59

Sample Information	Cust ID:	VBLKDJ	VBLKDJ BS	VBLKDN	VBLKDN BS
	RFW#:	05LVG253-MB1	05LVG253-MB1	05LVG254-MB1	05LVG254-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	1,2-Dichloroethane-d4	106 %	110 %	117 %	126 %
	Toluene-d8	103 %	102 %	108 %	107 %
	Bromofluorobenzene	103 %	102 %	119 %	112 %
Chloromethane		10 U	100 %	10 U	98 %
Bromomethane		10 U	112 %	10 U	121 %
Vinyl Chloride		10 U	103 %	10 U	98 %
Chloroethane		10 U	97 %	10 U	105 %
Methylene Chloride		2 J	90 %	2 J	86 %
Acetone		10 U	160 %	10 U	130 %
Carbon Disulfide		5 U	104 %	5 U	97 %
1,1-Dichloroethene		5 U	111 %	5 U	101 %
1,1-Dichloroethane		5 U	109 %	5 U	107 %
Trans-1,2-dichloroethene		5 U	99 %	5 U	91 %
Cis-1,2-dichloroethene		5 U	99 %	5 U	92 %
Chloroform		5 U	105 %	5 U	102 %
1,2-Dichloroethane		5 U	111 %	5 U	113 %
2-Butanone		10 U	99 %	10 U	125 %
1,1,1-Trichloroethane		5 U	99 %	5 U	96 %
Carbon Tetrachloride		5 U	86 %	5 U	85 %
Bromodichloromethane		5 U	96 %	5 U	95 %
1,2-Dichloropropane		5 U	103 %	5 U	102 %
cis-1,3-Dichloropropene		5 U	104 %	5 U	99 %
Trichloroethene		5 U	104 %	5 U	88 %
Dibromochloromethane		5 U	89 %	5 U	86 %
1,1,2-Trichloroethane		5 U	106 %	5 U	100 %
Benzene		5 U	103 %	5 U	98 %
Trans-1,3-Dichloropropene		5 U	104 %	5 U	102 %
Bromoform		5 U	85 %	5 U	81 %
4-Methyl-2-pentanone		10 U	112 %	10 U	123 %
2-Hexanone		10 U	102 %	10 U	124 %
Tetrachloroethene		5 U	94 %	5 U	82 %
1,1,2,2-Tetrachloroethane		5 U	105 %	5 U	114 %

*= Outside of EPA CLP QC limits.

11/17/05

000013

RFW Batch Number: **0508L212** Client: **TNUHANFORD B05-003 H3339** Work Order: 11343606001 Page: 4b

Cust ID:	VBLKDJ		VBLKDJ BS		VBLKDN		VBLKDN BS	
RFW#:	05LVG253-MB1		05LVG253-MB1		05LVG254-MB1		05LVG254-MB1	
Toluene	5	U	102	%	5	U	94	%
Chlorobenzene	5	U	100	%	5	U	93	%
Ethylbenzene	5	U	99	%	5	U	91	%
Styrene	5	U	104	%	5	U	96	%
Xylene (total)	5	U	100	%	5	U	90	%

*= Outside of EPA CLP QC limits.

000020

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Page: 4b

Cust ID:	VBLKDJ		VBLKDJ BS		VBLKDN		VBLKDN BS	
RFW#:	05LVG253-MB1		05LVG253-MB1		05LVG254-MB1		05LVG254-MB1	
Toluene	5	U	102	%	5	U	94	%
Chlorobenzene	5	U	100	%	5	U	93	%
Ethylbenzene	5	U	99	%	5	U	91	%
Styrene	5	U	104	%	5	U	96	%
Xylene (total)	5	U	100	%	5	U	90	%

*= Outside of EPA CLP QC limits.

000020

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD B05-003
LVL #: 0508L212
SDG/SAF # H3339/B05-003

W.O. #: 11343-606-001-9999-00
Date Received: 08-23-2005

GC/MS VOLATILE

Fifteen (15) soil samples were collected on 08-19-2005.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 08-24,25-2005.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. Two (2) of sixty-six (66) surrogate recoveries were outside acceptance criteria. The analysis of associated matrix spike samples fulfills the reanalysis requirement of sample J03VC8.
5. Three (3) of sixty-eight (68) matrix spike recoveries were outside acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blanks contained the common laboratory contaminant Methylene Chloride at levels less than the CRQL.
8. Internal standard area criteria were not met for sample J03VC7. The sample was reanalyzed on 08-25-2005 and reported.
9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9. 1. 2005
Date

000022

som\group\data\voa\tnu-hanford\0508-212.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 3 8 pages.

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-026 | Page 1 of 4

Collector: Kiesler JP / Bowers DL / Martinez CR

Company Contact: Doug Bowers | Telephone No.: 509 531-0701

Project Coordinator: KESSNER, JH

Price Code: Air Quality

Data Turnaround: 21 day

Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol

Sampling Location: 1607-B-2 @ 100 BC

SAF No.: B05-003

Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027

Field Logbook No.: EFL 1173-5

COA: R607022000

Method of Shipment: Fed EX

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: A050357

Bill of Lading/Air Bill No.: SEE OSR

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container	aG	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250mL	250mL	120mL	120mL	120mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151					

Sample No.	Matrix *	Sample Date	Sample Time									
J03VB8	SOIL	8-19-05	0849	X	X	X	X	X	X			1
J03VB9	SOIL		0848	X	X	X	X	X	X			2
J03VC0	SOIL		~~0850~~ 0901	X	X	X	X	X	X			3
J03VC1	SOIL		~~0904~~ 0910	X	X	X	X	X	X			4
J03VC2	SOIL		0917	X	X	X	X	X	X			5

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-19-05/1630	R.F 2A 3728	8-19-05/1630
3728 BEF2A	8/22/05 1200	DASTON Quint Sign	8/22/05 1200
DASTON Exc Daniel Sign	8/22/05 1200	FED EX	
FED EX	8.23.05 1085		8.23.05 1085

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium~~, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, ~~Strontium~~, ~~Thallium~~, ~~Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000023

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 2 of 4

Collector: Kistler JP/Bowers DL/Martinez CR	Company Contact: Doug Bowers — Telephone No.: 509 511-0701	Project Coordinator: KESSNER, JH	Price Code: Air Quality — Data Turnaround: 21 day
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-D-2 @ 100 BC	SAF No.: B05-003	
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1172-5 — COA: R60TD2 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 4050357	Bill of Lading/Air Bill No.: 8OE 08PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VC3 / SOIL / 8-19-05 / 0924	X	X	X	X	X	X			6	
J03VC4 / SOIL / ↓ / 0940	X	X	X	X	X	X			7	
J03VC5 / SOIL / ↓ / 0942	X	X	X	X	X	X			8	
J03VC6 / SOIL / ↓ / 0948	X	X	X	X	X	X			9	
J03VC7 / SOIL / ↓ / 1004	X	X	X	X	X	X			10	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-19-05/1630	AIR 2A 3728	8-19-05/1630
3728 REF 2A	8/22/05 1200	DAW PAU	8/22/05 1200
DA 3728 REF 2A	8/22/05 1200	FED EX	
	8.23.05 1085		8.23.05 1085

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 3 of 4

Collector: Kisler JP, / Bowers DL / Martinez CR	Company Contact: Doug Bowers — Telephone No.: 509 531 0701	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-D-2 @ 100 BC	SAF No.: B05-003	Air Quality: 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5 — COA: R60782 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A050357	Bill of Lading/Air Bill No.: 86E 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081, Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VC8 / SOIL / 8-19-05 / 1007	X	X	X	X	X	X			1	
J03VC9 / SOIL / / 1009	X	X	X	X	X	X			3 w	
J03VD0 / SOIL / / 1018	X	X	X	X	X	X				
J03VD1 / SOIL / / 1026	X	X	X	X	X	X				
J03VD2 / SOIL / ↓ / 0850	X	X	X	X	X	X			2	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	8-19-05/1610	BOP 2A 3728	8-19-05/1610
3728 BOP 2A	8/22/05 1200	BA ST Johnson	8/22/05 1200
BA ST Johnson	8/22/05 1200	FED EX	
FED EX	8-23-05 0855		8-23-05 0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000025

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 1607-B2:1			DATA PACKAGE: H3339		
VALIDATOR: TLF		LAB: LLI		DATE: 11/11/05	
			SDG: H3339		

ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX					
~~J03VB6~~	J03VB8	J03VB9	J03VC0	J03VC1	J03VC2
J03VC3	J03VC4	J03VC5	J03VC6	J03VC7	J03VC8
J03VC9	J03VD0	J03VD1	J03VD2		
					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: methylene chloride C7R ~~C8~~ VC9 VCS – U
" " – all other U at RQL

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: MS – B8, C1, C4, C7, C8 – no MS/MSD in prep batch – J all

no pgs

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: ms/msd not prepared w/ B8, C1, C4, C7+8 - 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:

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: 7x15 + 1 = 106 am

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 17 November 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines and Sewers – Soil Full Protocol – Waste Site 1607-B2
Subject: PCB/Pesticide/Herbicide - Data Package No. H3339-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3339-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J03VB8	8/19/05	Soil	C	See note 1
J03VB9	8/19/05	Soil	C	See note 1
J03VC0	8/19/05	Soil	C	See note 1
J03VC1	8/19/05	Soil	C	See note 1
J03VC2	8/19/05	Soil	C	See note 1
J03VC3	8/19/05	Soil	C	See note 1
J03VC4	8/19/05	Soil	C	See note 1
J03VC5	8/19/05	Soil	C	See note 1
J03VC6	8/19/05	Soil	C	See note 1
J03VC7	8/19/05	Soil	C	See note 1
J03VC8	8/19/05	Soil	C	See note 1
J03VC9	8/19/05	Soil	C	See note 1
J03VD0	8/19/05	Soil	C	See note 1
J03VD1	8/19/05	Soil	C	See note 1
J03VD2	8/19/05	Soil	C	See note 1

1 – Pesticides by 8081A, PCBs by 8082 and chlorinated pesticides by 8151A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). 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 RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range 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 low matrix spike recoveries for all pesticide analytes (except toxaphene), all pesticide results (except toxaphene) were qualified as estimates and flagged "J".

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene 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 all pesticide RPDs (except toxaphene) being outside QC limits, all pesticide results (except toxaphene) were qualified as estimates and flagged "J".

Due to RPDs outside QC limits, all dicamba (33%), dichloroprop (33%), 2,4,5-TP (32%) and 2,4,5-T results were qualified as estimates and flagged "J".

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

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J03VB9/J03VD2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All undetected methoxychlor, toxaphene, dalapon, dicamba, dichloroprop, 2,4-D and 2,4-DB results exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data Package No. H3339 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 lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

- Due to low matrix spike recoveries for all pesticide analytes (except toxaphene), all pesticide results (except toxaphene) were qualified as estimates and flagged "J".

- Due to all pesticide RPDs (except toxaphene) being outside QC limits, all pesticide results (except toxaphene) were qualified as estimates and flagged "J".

- Due to RPDs outside QC limits, all dicamba (33%), dichloroprop (33%), 2,4,5-TP (32%) and 2,4,5-T results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, 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 methoxychlor, toxaphene, dalapon, dicamba, dichloroprop, 2,4-D and 2,4-DB results exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

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

PEST/PCB/HERBICIDE DATA QUALIFICATION SUMMARY*

SDG: H3339	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All pesticides except toxaphene	J	All	MS recovery and RPD
Toxaphene	J	All	No MS, MSD or LCS
Dicamba Dichloroprop 2,4,5-TP 2,4,5-T	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD
Laboratory: LLI SDG: H3339

Sample Number		J03VB8		J03VB9		J03VC0		J03VC1		J03VC2		J03VC3		J03VC4		J03VC5		J03VC6		J03VC7	
Remarks																					
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05	
Analysis Date		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	13	U	13	U	14	U	13	U	14	U	13	U	13	U	13	U	14	U	13	U
Aroclor-1221	20	13	U	13	U	14	U	13	U	14	U	13	U	13	U	13	U	14	U	13	U
Aroclor-1232	20	13	U	13	U	14	U	13	U	14	U	13	U	13	U	13	U	14	U	13	U
Aroclor-1242	20	13	U	13	U	14	U	13	U	14	U	13	U	13	U	13	U	14	U	13	U
Aroclor-1248	20	13	U	13	U	14	U	13	U	14	U	13	U	13	U	13	U	14	U	13	U
Aroclor-1254	20	13	U	13	U	14	U	13	U	14	U	13	U	13	U	13	U	14	U	13	U
Aroclor-1260	20	13	U	13	U	14	U	13	U	14	U	13	U	13	U	13	U	14	U	13	U

Sample Number		J03VB8		J03VB9		J03VC0		J03VC1		J03VC2		J03VC3		J03VC4		J03VC5		J03VC6		J03VC7	
Remarks																					
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05	
Analysis Date		8/25/06		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Beta-BHC	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Delta-BHC	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Gamma-BHC (Lindane)	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Heptachlor	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Aldrin	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Heptachlor Epoxide	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Endosulfan I	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Dieldrin	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	J	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
4,4'-DDE	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
Endrin	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
Endosulfan II	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
4,4'-DDD	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	1.7	J	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
Endosulfan Sulfate	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
4,4'-DDT	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
Methoxychlor	5	17	UJ	17	UJ	17	UJ	17	UJ	17	UJ	17	UJ	17	UJ	17	UJ	17	UJ	17	UJ
Endrin Ketone	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
Endrin Aldehyde	5	3.4	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	2.2	J	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ
alpha-Chlordane	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
gamma-Chlordane	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ
Toxaphene	5	170	UJ	170	UJ	170	UJ	170	UJ	170	UJ	170	UJ	170	UJ	170	UJ	170	UJ	170	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.

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD	
Laboratory: Lionville Laboratory Inc.	
Case:	SDG: H3206

Sample Number		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2					
Remarks															
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05					
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05					
Analysis Date		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05					
PCB/Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	13	U	13	U	13	U	13	U	13	U				
Aroclor-1221	20	13	U	13	U	13	U	13	U	13	U				
Aroclor-1232	20	13	U	13	U	13	U	13	U	13	U				
Aroclor-1242	20	13	U	13	U	13	U	13	U	13	U				
Aroclor-1248	20	13	U	13	U	13	U	13	U	13	U				
Aroclor-1254	20	13	U	13	U	13	U	13	U	13	U				
Aroclor-1260	20	13	U	13	U	13	U	13	U	13	U				

Sample Number		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2					
Remarks															
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05					
Extraction Date		8/24/05		8/24/05		8/24/05		8/24/05		8/24/05					
Analysis Date		8/26/05		8/26/05		8/26/05		8/26/05		8/26/05					
Pesticide		Result	Q	Result	Q	Result	Q	Result		Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Beta-BHC	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Delta-BHC	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Gamma-BHC (Lindane)	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Heptachlor	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Aldrin	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Heptachlor Epoxide	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Endosulfan I	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Dieldrin	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
4,4'-DDE	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
Endrin	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
Endosulfan II	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
4,4'-DDD	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
Endosulfan Sulfate	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
4,4'-DDT	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
Methoxychlor	5	17	UJ	17	UJ	17	UJ	17	UJ	17	UJ				
Endrin Ketone	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
Endrin Aldehyde	5	3.4	UJ	3.4	UJ	3.3	UJ	3.3	UJ	3.4	UJ				
alpha-Chlordane	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
gamma-Chlordane	5	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ				
Toxaphene	5	170	UJ	170	UJ	170	UJ	170	UJ	170	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.

HERBICIDE ANALYSIS, SOIL MATRIX (ug/Kg)

Project: WASHINGTON CLOSURE HANFORD	
Laboratory: LLI	
Case:	SDG: H3339

Sample Number		J03VB8		J03VB9		J03VC0		J03VC1		J03VC2		J03VC3		J03VC4		J03VC5		J03VC6	
Remarks																			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Analysis Date		8/30/05		8/30/05		8/30/05		8/30/05		8/30/05		8/30/05		8/30/05		8/30/05		8/30/05	
Herbicides	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Dalapon	100	840	U	840	U	860	U	840	U	850	U	840	U	840	U	840	U	850	U
Dicamba	100	340	UJ	340	UJ	350	UJ	340	UJ	340	UJ	340	UJ	340	UJ	340	UJ	340	UJ
Dichloroprop	100	840	UJ	840	UJ	860	UJ	840	UJ	850	UJ	840	UJ	840	UJ	840	UJ	850	UJ
2,4-D	100	170	U	170	U	170	U	170	U	170	U	170	U	170	U	170	U	170	U
2,4,5-TP (Silvex)	100	84	UJ	84	UJ	86	UJ	84	UJ	85	UJ	84	UJ	84	UJ	84	UJ	23	J
2,4,5-T	100	31	J	84	UJ	24	J	84	UJ	31	J	20	J	32	J	29	J	30	J
2,4-DB	100	840	U	840	U	860	U	840	U	850	U	840	U	840	U	840	U	850	U
Dinoseb	100	84	U	84	U	86	U	84	U	85	U	84	U	84	U	84	U	18	

Sample Number		J03VC7		J03VC8		J03VC9		J03VD0		J03VCD1		J03VD2							
Remarks																			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05							
Analysis Date		8/30/05		8/30/05		8/30/05		8/30/05		8/30/05		8/30/05							
Herbicides	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Dalapon	100	840	U	840	U	840	U	840	U	840	U	840	U						
Dicamba	100	340	UJ	340	UJ	340	UJ	330	UJ	330	UJ	340	UJ						
Dichloroprop	100	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ	840	UJ						
2,4-D	100	170	U	170	U	170	U	170	U	170	U	110							
2,4,5-TP (Silvex)	100	84	UJ	84	UJ	84	UJ	84	UJ	84	UJ	84	UJ						
2,4,5-T	100	84	UJ	30	J	49	J	84	UJ	30	J	58	J						
2,4-DB	100	250		840	U	840	U	840	U	840	U	840	U						
Dinoseb	100	21		84	U	84	U	84	U	84	U	27							

000013

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.

Lionville Laboratory, Inc.

PCBs by GC

RFW Batch Number: **0508L212** Client: **TNU-HANFORD B05-003** Work Order: 11343606001 Page: 1 Report Date: 08/26/05 10:38

Sample Information	Cust ID:	J03VB8	J03VB8	J03VB8	J03VB9	J03VC0	J03VC1
	RFW#:	002	002 MS	002 MSD	003	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	100 %	93 %	96 %	100 %	93 %	96 %
	Decachlorobiphenyl	110 %	106 %	109 %	108 %	107 %	102 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		13 U	97 %	99 %	13 U	14 U	13 U
Aroclor-1221		13 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1232		13 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1242		13 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1248		13 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1254		13 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1260		13 U	96 %	98 %	13 U	14 U	13 U

Sample Information	Cust ID:	J03VC2	J03VC3	J03VC4	J03VC5	J03VC6	J03VC7
	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	98 %	90 %	99 %	88 %	94 %	96 %
	Decachlorobiphenyl	107 %	108 %	106 %	103 %	103 %	113 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1221		14 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1232		14 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1242		14 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1248		14 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1254		14 U	13 U	13 U	13 U	14 U	13 U
Aroclor-1260		14 U	13 U	13 U	13 U	14 U	13 U

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

11/17/05

000014

Lionville Laboratory, Inc.

PCBs by GC

RFW Batch Number: **0508L212** Client: **TNU-HANFORD B05-003** Work Order: 11343606001 Page: 2

Report Date: 08/26/05 10:38

	Cust ID:	J03VC8	J03VC9	J03VD0	J03VD1	J03VD2	PBLKSH
Sample Information	RFW#:	012	013	014	015	016	05LE0705-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	106 %	101 %	91 %	100 %	102 %	96 %
	Decachlorobiphenyl	115 %	112 %	101 %	108 %	111 %	105 %
Aroclor-1016		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1221		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1232		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1242		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1248		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1254		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1260		13 U	13 U	13 U	13 U	13 U	13 U

	Cust ID:	PBLKSH BS
Sample Information	RFW#:	05LE0705-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG
Surrogate:	Tetrachloro-m-xylene	97 %
	Decachlorobiphenyl	109 %
Aroclor-1016		85 %
Aroclor-1221		13 U
Aroclor-1232		13 U
Aroclor-1242		13 U
Aroclor-1248		13 U
Aroclor-1254		13 U
Aroclor-1260		98 %

11/17/05

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

8/29/15

000015

Lionville Laboratory, Inc.

Pesticides/PCB by GC, Special List

RFW Batch Number: 0508L212 Client: TNU-HANFORD B05-003 Work Order: 11343606001 Report Date: 08/26/05 14:40 Page: 1

Sample Information	Cust ID:	J03VB8	J03VB8	J03VB8	J03VB9	J03VC0	J03VC1
	RFW#:	002	002 MS	002 MSD	003	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Decachlorobiphenyl	116 %	17 * %	121 %	118 %	108 %	110 %
	Tetrachloro-m-xylene	115 %	14 * %	119 * %	116 %	101 %	105 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.7 U J	18 * %	108 %	1.7 U J	1.7 U J	1.7 U J
Beta-BHC		1.7 U	17 * %	117 %	1.7 U	1.7 U	1.7 U
Delta-BHC		1.7 U	19 * %	109 %	1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)		1.7 U	19 * %	107 %	1.7 U	1.7 U	1.7 U
Heptachlor		1.7 U	6 * %	94 %	1.7 U	1.7 U	1.7 U
Aldrin		1.7 U	19 * %	106 %	1.7 U	1.7 U	1.7 U
Heptachlor epoxide		1.7 U	15 * %	98 %	1.7 U	1.7 U	1.7 U
Endosulfan I		1.7 U	17 * %	102 %	1.7 U	1.7 U	1.7 U
Dieldrin		1.7 U	19 * %	109 %	1.7 U	1.7 U	1.7 U
4,4'-DDE		3.4 U	17 * %	98 %	3.4 U	3.5 U	3.4 U
Endrin		3.4 U	19 * %	103 %	3.4 U	3.5 U	3.4 U
Endosulfan II		3.4 U	20 * %	107 %	3.4 U	3.5 U	3.4 U
4,4'-DDD		3.4 U	20 * %	112 %	3.4 U	3.5 U	3.4 U
Endosulfan sulfate		3.4 U	20 * %	107 %	3.4 U	3.5 U	3.4 U
4,4'-DDT		3.4 U	19 * %	105 %	3.4 U	3.5 U	3.4 U
Methoxychlor		17 U	21 * %	92 %	17 U	17 U	17 U
Endrin ketone		3.4 U	20 * %	108 %	3.4 U	3.5 U	3.4 U
Endrin aldehyde		3.4 U	17 * %	96 %	3.4 U	3.5 U	3.4 U
alpha-Chlordane		1.7 U	8 * %	99 %	1.7 U	1.7 U	1.7 U
gamma-Chlordane		1.7 U	18 * %	104 %	1.7 U	1.7 U	1.7 U
Toxaphene		170 U	170 U	170 U	170 U	170 U	170 U

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

11/17/05

000016

Lionville Laboratory, Inc.

Pesticides/PCB by GC, Special List

RFW Batch Number: 0508L212 Client: TNU-HANFORD B05-003 Work Order: 11343606001 Page: 2 Report Date: 08/26/05 14:40

	Cust ID:	J03VC2	J03VC3	J03VC4	J03VC5	J03VC6	J03VC7
Sample Information	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Decachlorobiphenyl	111 %	95 %	120 %	114 %	119 %	102 %
	Tetrachloro-m-xylene	111 %	85 %	108 %	103 %	109 %	88 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.7 U J	1.7 U J	1.7 U J	1.7 U J	1.7 U J	1.7 U J
Beta-BHC		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Delta-BHC		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Aldrin		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor epoxide		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan I		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dieldrin		1.7 U	1.7	1.7 U	1.7 U	1.7 U	1.7 U
4,4'-DDE		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
Endrin		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
Endosulfan II		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
4,4'-DDD		3.4 U	1.7 ~~U~~	3.4 U	3.4 U	3.4 U	3.4 U
Endosulfan sulfate		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
4,4'-DDT		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
Methoxychlor		17 U	17 U	17 U	17 U	17 U	17 U
Endrin ketone		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
Endrin aldehyde		3.4 U	2.2 ~~U~~	3.4 U	3.4 U	3.4 U	3.4 U
alpha-Chlordane		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Toxaphene		170 U	170 U	170 U	170 U	170 U	170 U

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

11/17/05

000017

Lionville Laboratory, Inc.

Pesticides/PCB by GC, Special List

RFW Batch Number: 0508L212 Client: TNU-HANFORD B05-003 Work Order: 11343606001 Page: 3

Report Date: 08/26/05 14:40

	Cust ID:	J03VC8	J03VC9	J03VD0	J03VD1	J03VD2	PBLKSH
Sample Information	RFW#:	012	013	014	015	016	05LE0705-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Decachlorobiphenyl	104 %	108 %	111 %	106 %	105 %	103 %
	Tetrachloro-m-xylene	85 %	101 %	102 %	98 %	92 %	96 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.7 U J	1.7 U J	1.7 U J	1.7 U J	1.7 U J	1.7 U
Beta-BHC		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Delta-BHC		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Aldrin		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor epoxide		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan I		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dieldrin		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
4,4'-DDE		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
Endrin		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
Endosulfan II		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
4,4'-DDD		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
Endosulfan sulfate		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
4,4'-DDT		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
Methoxychlor		17 U	17 U	17 U	17 U	17 U	17 U
Endrin ketone		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
Endrin aldehyde		3.4 U	3.4 U	3.3 U	3.3 U	3.4 U	3.3 U
alpha-Chlordane		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Toxaphene		170 U	170 U	170 U	170 U	170 U	170 U

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

11/17/05

000018

Lionville Laboratory, Inc.

Pesticides/PCB by GC, Special List

RFW Batch Number: **0508L212** Client: **TNU-HANFORD B05-003** Work Order: 11343606001 Report Date: 08/26/05 14:40 Page: 4

Cust ID: **PBLKSH BS**

Sample Information

RFW#: **05LE0705-MB1**
Matrix: SOIL
D.F.: 1.00
Units: UG/KG

Surrogate:	Decachlorobiphenyl	115	%
	Tetrachloro-m-xylene	108	%

Alpha-BHC	104	%
Beta-BHC	114	%
Delta-BHC	107	%
gamma-BHC (Lindane)	98	%
Heptachlor	116	%
Aldrin	101	%
Heptachlor epoxide	119	%
Endosulfan I	102	%
Dieldrin	107	%
4,4'-DDE	97	%
Endrin	104	%
Endosulfan II	106	%
4,4'-DDD	111	%
Endosulfan sulfate	107	%
4,4'-DDT	101	%
Methoxychlor	100	%
Endrin ketone	110	%
Endrin aldehyde	94	%
alpha-Chlordane	117	%
gamma-Chlordane	101	%
Toxaphene	170	U

11/17/05

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

8/29/05

000019

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Lionville Laboratory, Inc.
Herbicides, Special List

RFW Batch Number: **0508L212** Client: **TNUHANFORD B05-003 H3339** Work Order: 11343606001 Page: 1 Report Date: 08/30/05 12:37

Sample Information							
	Cust ID:	J03VB8	J03VB8	J03VB8	J03VB9	J03VC0	J03VC1
	RFW#:	002	002 MS	002 MSD	003	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	5.00	5.00	5.00	5.00	5.00	5.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Surrogate:	DCAA	54 %	62 %	27 * %	40 %	121 %	57 %
Dalapon		840 U	71 %	69 %	840 U	860 U	840 U
Dicamba		340 U J	53 %	38 %	340 U J	350 U J	340 U J
Dichloroprop		840 U J	92 %	66 %	840 U J	860 U J	840 U J
2,4-D		170 U	53 %	65 %	170 U	170 U	170 U
2,4,5-TP (Silvex)		84 U J	135 %	98 %	84 U J	86 U J	84 U J
2,4,5-T		31 ~~U~~ J	51 %	80 %	84 U J	24 ~~U~~ J	84 U J
2,4-DB		840 U	124 %	126 %	840 U	860 U	840 U
Dinoseb		84 U	130 %	105 %	84 U	86 U	84 U

Sample Information							
	Cust ID:	J03VC2	J03VC3	J03VC4	J03VC5	J03VC6	J03VC7
	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	5.00	5.00	5.00	5.00	5.00	5.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Surrogate:	DCAA	63 %	97 %	75 %	59 %	54 %	64 %
Dalapon		850 U	840 U	840 U	840 U	850 U	840 U
Dicamba		340 U J	340 U J	340 U J	340 U J	340 U J	340 U J
Dichloroprop		850 U J	840 U J	840 U J	840 U J	850 U J	840 U J
2,4-D		170 U	170 U	170 U	170 U	170 U	170 U
2,4,5-TP (Silvex)		85 U J	84 U J	84 U J	84 U J	23 ~~U~~ J	84 U J
2,4,5-T		31 ~~U~~ J	20 ~~U~~ J	32 ~~U~~ J	29 J	30 ~~U~~ J	84 U J
2,4-DB		850 U	840 U	840 U	840 U	850 U	250
Dinoseb		85 U	84 U	84 U	84 U	18	21

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

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11/17/05

Lionville Laboratory, Inc.

Herbicides, Special List

RFW Batch Number: 0508L212 Client: TNUHANFORD B05-003 H3339 Work Order: 11343606001 Page: 2

Report Date: 08/30/05 12:37

	Cust ID:	J03VC8	J03VC9	J03VD0	J03VD1	J03VD2	PBLKSF
Sample Information	RFW#:	012	013	014	015	016	05LE0704-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	5.00	5.00	5.00	5.00	5.00	1.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Surrogate:	DCAA	76 %	65 %	115 %	50 %	54 %	119 %
Dalapon		840 U	840 U	840 U	840 U	840 U	170 U
Dicamba		340 U J	340 U J	330 U J	330 U J	340 U J	67 U
Dichloroprop		840 U J	840 U J	840 U J	840 U J	840 U J	170 U
2,4-D		170 U	170 U	170 U	170 U	110	33 U
2,4,5-TP (Silvex)		84 U J	84 U J	84 U J	84 U J	84 U J	17 U
2,4,5-T		30 ~~I~~ J	49 ~~I~~ J	84 U J	30 ~~I~~ J	58 ~~I~~ J	17 U
2,4-DB		840 U	840 U	840 U	840 U	840 U	170 U
Dinoseb		84 U	84 U	84 U	84 U	27	17 U

	Cust ID:	PBLKSF BS
Sample Information	RFW#:	05LE0704-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	ug/kg
Surrogate:	DCAA	89 %
Dalapon		71 %
Dicamba		91 %
Dichloroprop		88 %
2,4-D		85 %
2,4,5-TP (Silvex)		96 %
2,4,5-T		94 %
2,4-DB		119 %
Dinoseb		88 %

K 11/17/05

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

000031

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD B05-003
LVL #: 0508L212
SDG/SAF # H3339/B05-003

W.O. #: 11343-606-001-9999-00
Date Received: 08-23-2005

PCB

Fifteen (15) soil samples were collected on 08-19-2005.

The samples and their associated QC samples were extracted on 08-24-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 08-25,26-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.
11. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/30/05
Date

kim\r:\group\data\pest\tnu hanford\0508-212.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

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LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD B05-003
LVL #: 0508L212
SDG/SAF # H3339/B05-003

W.O. #: 11343-606-001-9999-00
Date Received: 08-23-2005

CHLORINATED PESTICIDES

Fifteen (15) soil samples were collected on 08-19-2005.

The samples and their associated QC samples were extracted on 08-24-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 08-25,26-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.
4. The method blank was below the reporting limits for all target compounds.
5. Three (3) of thirty-eight (38) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR #05GC417) has been enclosed.
6. All blank spike recoveries were within acceptance criteria.
7. Twenty (20) of forty (40) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR #05GC417) has been enclosed.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
12. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/30/05
Date

kim\r:\group\data\pest\tnu hanford\0508-212.pes

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 15 pages.

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 056C417

Initiator: M. McAnally
Date: 8/26/05
Client: TMU HANFORD

Batch: 0508L212
Samples: 002 m3
Method: SW846/MCAWW/CLP/

Parameter: 060X
Matrix: Soil
Prep Batch: 0528D705

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle) signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

- 002 m3 low for spike & surr recovery @ ~10-20% recoveries.
- MSD and BS were OK.
- Blank was clean.

2. Known or Probable Causes(s) - Suspect incorrect spike amount added.

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Reports

4. Project Manager Instructions...signature/date: _____

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: _____ Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
I	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD B05-003
LVL #: 0508L212
SDG/SAF # H3339/B05-003

W.O. #: 11343-606-001-9999-00
Date Received: 08-23-2005

HERBICIDE

Fifteen (15) soil samples were collected on 08-19-2005.

The samples and their associated QC samples were extracted on 08-24-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 08-29,30-2005. The extraction and analysis procedures were based on method 8151A.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The method blank was below the reporting limits for all target compounds.
4. One (1) of nineteen (19) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All samples required a 5-fold dilution due to the matrix interferences.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/6/05
Date

som\r:\group\data\herb\tnu\0508-212 doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 3 pages.

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 05MS273

Initiator: SS
Date: 8-26-05
Client: TNU-Hanford

Batch: 05OSL212
Samples: 005
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: SOIL
Prep Batch: 05LE0706

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
__ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy
__ Missing Sample/Extract __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

low surrogate recovery on sample 005 (J03VC1)

2. Known or Probable Causes(s)

loss during extraction

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:

re-extract

8/26/05

4. Project Manager Instructions...signature/date: _____

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

reextracted in batch 05LE0719 8/29/05
PGC 9/1/05

5. Final Action...signature/date: Sam 9/6/05

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	1	X MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Melnis
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 1 of 4

Collector: Kiesler JP/Bowers DL/Martinez CR	Company Contact: Doug Bowers	Telephone No.: 509 511-0701	Project Coordinator: KESSNER, JH
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B-2 @ 100 BC		SAF No.: B05-003
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5	COA: R607B22000	Method of Shipment: Fed EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050357		Bill of Lading/Air Bill No.: SEE OSR

Price Code: Air Quality

Data Turnaround: 21 day

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container	aG	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250mL	250mL	120mL	120mL	120mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081, Chloro-Herbicides - EPA8151					
Sample No. / Matrix * / Sample Date / Sample Time											
J03VB8 / SOIL / 8-19-05 / 0843	X	X	X	X	X	X				1	
J03VB9 / SOIL / / 0848	X	X	X	X	X	X				2	
J03VC0 / SOIL / / ~~0850~~ 0901	X	X	X	X	X	X				3	
J03VC1 / SOIL / / ~~0904~~ 0910	X	X	X	X	X	X				4	
J03VC2 / SOIL / / 0917	X	X	X	X	X	X				5	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-19-05/1630	R.F 2A 3728	8-19-05/1630
3728 RF2A	8/22/05 1200	DA Stowe	8/22/05 1200
DA Stowe	8/22/05 1200	FED EX	
FED EX	8.23.05 1085		8.23.05 1085

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium~~, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, ~~Strontium~~, ~~Thallium~~, ~~Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium~~, ~~Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

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Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 2 of 4

Collector: Kessler JP / Bowers DH / Martinez CR	Company Contact: Doug Bowers — Telephone No.: 509 511-0701	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B-2 @ 100 BC	SAF No.: B05-003	Air Quality: 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1171-5 — COA: R60702 2000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 4050357	Bill of Lading/Air Bill No.: 8QE 05PQ	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

SAMPLE ANALYSIS												
Preservation				None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container				aG	aG	aG	aG	aG	aG			
No. of Container(s)				1	1	1	1	1	1			
Volume				250mL	250mL	120mL	120mL	120mL	250mL			
				See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081, Chloro-Herbicides - EPA8151			
Sample No.	Matrix *	Sample Date	Sample Time									
J03VC3	SOIL	8-19-05	0924	X	X	X	X	X	X		6	
J03VC4	SOIL		0940	X	X	X	X	X	X		7	
J03VC5	SOIL		0942	X	X	X	X	X	X		8	
J03VC6	SOIL		0948	X	X	X	X	X	X		9	
J03VC7	SOIL		1007	X	X	X	X	X	X		10	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-19-05/1630	AT 2A 3728	8-19-05/1630
3728 REF 2A	8/22/05 1200	DAS PAU	8/22/05 1200
PA SP PAU ERC	8/22/05 1200	FED EX	
	8.23.05 10855		8.23.05 10855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

500059

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-026 | Page 3 of 4

Collector: Kistler JP, / Bowers DL / Martinez CR	Company Contact: Doug Bowers	Telephone No.: 509 531 0701	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround		
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-D-2 @ 100 BC	SAF No.: B05-003	Air Quality: 21 day
Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5	COA: R60782 2000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A050357		Bill of Lading/Air Bill No.: 86E 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				
Sample No. / Matrix * / Sample Date / Sample Time										
J03VC8 / SOIL / 8-19-05 / 1007	X	X	X	X	X	X				
J03VC9 / SOIL / / 1009	X	X	X	X	X	X			4	
J03VD0 / SOIL / / 1018	X	X	X	X	X	X			5 W	
J03VD1 / SOIL / / 1026	X	X	X	X	X	X				
J03VD2 / SOIL / ✓ / 0850	X	X	X	X	X	X			2	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	8-19-05/1630	BOP 2A 3728	8-19-05/1630
3728 BOP 2A	8/22/05 1200	2A ST JOHN	8/22/05 1200
2A ST JOHN	8/22/05 1200	FED EX	
FED EX	8-23-05 0855		8-23-05 0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000030

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 1607-B2:1			DATA PACKAGE: H3339		
VALIDATOR: TLI		LAB: LLI		DATE: 11/11/01	
			SDG: H3339		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)	8121A	
SAMPLES/MATRIX					
J03VB8	J03VB9	J03VC0	J03VC1	J03VC2	J03VC3
J03VC4	J03VC5	J03VC6	J03VC7	J03VC8	J03VC9
J03VD0	J03VD1	J03VD2			
					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 PBS

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: all pest MS low - J all (except toxaphene)
no MS for toxaphene - J all
" LCS " "
no DLS

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: all pest RPDs outside limit J all (except toxaphene)
toxaphene - no MS/MSD - J all

dicamba, dichloroprop + 2,4,5-TP - RPDs out - J all
2,4,5-T

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

Comments: methoxychlor + toxaphene over
dalapon, dicamba dichloroprop 2,4-D, 2,4-DB all under over

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A
Lot check performed? ..... Yes No N/A
Check recoveries acceptable? ..... Yes No N/A
GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries acceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 17 November 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines and Sewers – Soil Full Protocol – Waste Site 1607-B2
Subject: Wet Chemistry - Data Package No. H3339-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3339-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J03VB8	8/19/05	Soil	C	See note 1
J03VB9	8/19/05	Soil	C	See note 1
J03VC0	8/19/05	Soil	C	See note 1
J03VC1	8/19/05	Soil	C	See note 1
J03VC2	8/19/05	Soil	C	See note 1
J03VC3	8/19/05	Soil	C	See note 1
J03VC4	8/19/05	Soil	C	See note 1
J03VC5	8/19/05	Soil	C	See note 1
J03VC6	8/19/05	Soil	C	See note 1
J03VC7	8/19/05	Soil	C	See note 1
J03VC8	8/19/05	Soil	C	See note 1
J03VC9	8/19/05	Soil	C	See note 1
J03VD0	8/19/05	Soil	C	See note 1
J03VD1	8/19/05	Soil	C	See note 1
J03VD2	8/19/05	Soil	C	See note 1

1 – Chromium VI by 7196A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). 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 30 days for chromium VI.

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

All holding times were 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 field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. 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 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70%

and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy 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 30%, 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

One set of field duplicate samples (J03VB9/J03VD2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. H3339-LLI 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

None found.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with 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 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: H3339	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
Comments: No qualifiers assigned			

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: H3339																		
Sample Number		J03VB8		J03VB9		J03VC0		J03VC1		J03VC2		J03VC3		J03VC4		J03VC5		J03VC6	
Remarks																			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.20	U	0.24		0.21		0.20	U	0.24		0.32		0.20	U	0.20	U	0.20	U
Sample Number		J03VC7		J03VC8		J03VC9		J03VD0		J03VD1		J03VD2							
Remarks																			
Sample Date		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05		8/19/05							
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.33		0.20	U	0.20	U	0.20	U	0.24		0.20	U						

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.

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/26/05

CLIENT: TNU-HANFORD B05-003 H3339
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L212

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03WW6	% Solids	100	%	0.01	1.0
-002	J03VB8	% Solids	99.0	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-003	J03VB9	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.24	MG/KG	0.20	1.0
-004	J03VC0	% Solids	96.6	%	0.01	1.0
		Chromium VI	0.21	MG/KG	0.21	1.0
-005	J03VC1	% Solids	99.1	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-006	J03VC2	% Solids	98.6	%	0.01	1.0
		Chromium VI	0.24	MG/KG	0.20	1.0
-007	J03VC3	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.32	MG/KG	0.20	1.0
-008	J03VC4	% Solids	99.1	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

11/17/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/26/05

CLIENT: TNU-HANFORD B05-003 H3339
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L212

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J03VC5	% Solids	99.1	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-010	J03VC6	% Solids	98.5	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-011	J03VC7	% Solids	98.9	%	0.01	1.0
		Chromium VI	0.33	MG/KG	0.20	1.0
-012	J03VC8	% Solids	99.1	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-013	J03VC9	% Solids	99.5	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-014	J03VD0	% Solids	99.5	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-015	J03VD1	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.24	MG/KG	0.20	1.0
-016	J03VD2	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

11/17/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B05-003 H3339
LVL#: 0508L212

W.O.#: 11343-606-001-9999-00
Date Received: 08-23-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 16 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Chromium VI was within the method criteria.

6. The Laboratory Control Sample (LCS) for Soluble Chromium VI was within the laboratory control limits of 80-120% however LCS for Insoluble Chromium VI was above the control limits at 121.8%

7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.

8. The replicate analyses for Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

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

12 Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9.1.2005
Date

njp\i08-212

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 18 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 1 of 4

Collector: Kiesler JP/Bowers DL/Martinez CR	Company Contact: Doug Bowers	Telephone No.: 509 531-0701	Project Coordinator: KESSNER, JH
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B-2 @ 100 BC		SAF No.: B05-003
Ice Chest No.: ERC-02-003, ERC-02-004 AND ERC-99-027	Field Logbook No.: EFL 1173-5	COA: R607B22000	Method of Shipment: Fed EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050357		Bill of Lading/Air Bill No.: SEE OSR

Price Code: Air Quality

Data Turnaround: 21 day

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				

Sample No.	Matrix *	Sample Date	Sample Time									
J03VB8	SOIL	8-19-05	0843	X	X	X	X	X	X			1
J03VB9	SOIL		0848	X	X	X	X	X	X			2
J03VC0	SOIL		~~0850~~ 0901	X	X	X	X	X	X			3
J03VC1	SOIL		~~0900~~ 0910	X	X	X	X	X	X			4
J03VC2	SOIL		0917	X	X	X	X	X	X			5

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: Doug Bowers	8-19-05/1630	Received By/Stored In: R.F 2A 3728	8-19-05/1630
Relinquished By/Removed From: 3728 BERA	8/22/05 1200	Received By/Stored In:	8/22/05 1200
Relinquished By/Removed From: BASOD HW EXC	8/22/05 1200	Received By/Stored In: PCD EX	
Relinquished By/Removed From: Fed Ex	8.23.05 1085	Received By/Stored In:	8.23.05 1085
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium~~, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, ~~Strontium~~, ~~Thallium~~, ~~Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

Matrix *: S=Soil, SE=Sediment, SO=Solid, Sl=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquid, T=Tissue, Wi=Wipe, L=Liquid, V=Vegetation, N=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

0000015

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-026 | Page 2 of 4

Collector: Kiesler JP / Bowers DL / Martinez CR

Company Contact: Doug Bowers | Telephone No.: 509 511-0701

Project Coordinator: KESSNER, JH

Price Code | Data Turnaround: 21 day

Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol

Sampling Location: 1607-D-2 @ 100 DC

SAF No.: B05-003

Air Quality

Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-99-027

Field Logbook No.: EFL 1171-5 | COA: B60702 2000

Method of Shipment: Fed Ex

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: 4050357

Bill of Lading/Air Bill No.: 882 0SPC

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081; Chloro-Herbicides - EPA8151				

Sample No.	Matrix *	Sample Date	Sample Time										
J03VC3	SOIL	8-19-05	0924	X	X	X	X	X	X				
J03VC4	SOIL		0940	X	X	X	X	X	X			6	
J03VC5	SOIL		0942	X	X	X	X	X	X			7	
J03VC6	SOIL		0948	X	X	X	X	X	X			8	
J03VC7	SOIL		1004	X	X	X	X	X	X			9	
												10	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-19-05/1630	Art 24 1728	8-19-05/1630
3728 REF 24	8/22/05 1200	DA 24	8/22/05 1200
DA 24	8/22/05 1200	FED EX	
	8.23.05 1085		8.23.05 10855

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000016

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B05-003-026	Page 3 of 4

Collector: Kisler JP, / Bowers DL / Martinez CR

Company Contact: Doug Bowers — Telephone No.: 509 531 0701

Project Coordinator: KESSNER, JH

Price Code: Air Quality — Data Turnaround: 21 day

Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol

Sampling Location: 1607-D-2 @ 100 BC

SAF No.: B05-003

Ice Chest No.: ERC-02-002, ERC-02-004 AND ERC-97027

Field Logbook No.: EFL 1173-5 — COA: R60782 2000

Method of Shipment: Fed Ex

Shipped To: EBERLINE SERVICES LIONVILLE

Offsite Property No.: A050357

Bill of Lading/Air Bill No.: 86E 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4°C

Preservation			None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container			aG	aG	aG	aG	aG	aG				
No. of Container(s)			1	1	1	1	1	1				
Volume			250mL	250mL	120mL	120mL	120mL	250mL				
SAMPLE ANALYSIS			See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081, Chloro-Herbicides - EPA8151				
Sample No.	Matrix *	Sample Date	Sample Time									
J03VC8	SOIL	8-19-05	1007	X	X	X	X	X	X			
J03VC9	SOIL		1009	X	X	X	X	X	X			1
J03VD0	SOIL		1018	X	X	X	X	X	X			3 w
J03VD1	SOIL		1026	X	X	X	X	X	X			
J03VD2	SOIL		0850	X	X	X	X	X	X			2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	8-19-05/1610	RP 2A 3728	8-19-05/1610
3728 RP 2A	8/22/05 1200	DA St John	8/22/05 1200
DA St John	8/22/05 1200	FED EX	
FED EX	8-23-05 0855		8-23-05 0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {~~Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Lithium, Magnesium~~, Manganese, Molybdenum, Nickel, ~~Phosphorus, Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium, Strontium, Thallium, Tin~~, Vanadium}; ICP Metals - 6010A (Add-on) {~~Titanium, Uranium~~, Zinc, ~~Zirconium~~}; Mercury - 7471 - (CV)

8-19-05

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

000017

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 1607-B2:1			DATA PACKAGE: H3339		
VALIDATOR: TLP		LAB: LLI		DATE: 11/11/05	
			SDG: H3339		

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	TDS	TKN	Phosphate		

SAMPLES/MATRIX					
~~J03W4~~ H1	J03VB8	J03VB9	J03VC0	J03VC2	J03VC3
J03VC1	J03VC4	J03VC5	J03VC6	J03VC7	J03VC8
J03VC9	J03VD0	J03VD1	J03VD2		
					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:

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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/26/05

CLIENT: TNU-HANFORD B05-003 H3339
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L212

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LVI057-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/26/05

CLIENT: TNU-HANFORD B05-003 H3339
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L212

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J03VB8	Soluble Chromium VI	3.8	0.20u	4.0	88.8	1.0
		Insoluble Chromium VI	1200	0.20u	1160	103.9	100
BLANK10	05LVI057-MB1	Soluble Chromium VI	4.1	0.20u	4.0	101.3	1.0
		Insoluble Chromium VI	1340	0.20u	1100	121.8	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/26/05

CLIENT: TNU-HANFORD B05-003 H3339
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L212

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J03WW6	% Solids	100	100	0.00	1.0
-002REP	J03VB8	Chromium VI	0.20u	0.21	~~NC~~ mg.1-05 22.9	1.0