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SAF-RC-025
100-BC Remaining Pipelines and Sewers - Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 — DR 08/30/06
INITIAL/DATE

COMMENTS:

SDG K0459 **SAF-RC-025**

Waste Site: 1607-B2

RECEIVED
SEP 25 2006
EDMC

Date: 23 August 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Site 1607-B2
Subject: Semivolatile - Data Package No. K0459-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0459 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
J12PW5	6/29/06	Soil	C	See note 1
J12PW6	6/29/06	Soil	C	See note 1
J12PW7	6/29/06	Soil	C	See note 1
J12PW8	6/29/06	Soil	C	See note 1

1– Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) 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, all bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No equipment 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 a matrix spike duplicate result outside QC limits (18%), all 2,4-dinitrophenol results 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 an RPD outside QC limits, all 2,4-dinitrophenol (43%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

· **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Thirty-two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

· **Completeness**

Data package No. K0459 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 method blank contamination, all bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".
- Due to a matrix spike duplicate result outside QC limits (18%), all 2,4-dinitrophenol results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all 2,4-dinitrophenol (43%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH 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

Thirty-two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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 WCH 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: K0459	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U	All	Blank contamination
2,4-Dinitrophenol	J	All	MS & 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: K0459								
Sample Number		J12PW5		J12PW6		J12PW7		J12PW8	
Remarks									
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06	
Extraction Date		7/10/06		7/10/06		7/10/06		7/10/06	
Analysis Date		7/26/06		7/25/06		7/26/06		7/27/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	340	U	340	U	330	U	330	U
bis(2-Chloroethyl)ether	660	340	U	340	U	330	U	330	U
2-Chlorophenol	660	340	U	340	U	330	U	330	U
1,3-Dichlorobenzene	660	340	U	340	U	330	U	330	U
1,4-Dichlorobenzene	660	340	U	340	U	330	U	330	U
1,2-Dichlorobenzene	660	340	U	340	U	330	U	330	U
2-Methylphenol	660	340	U	340	U	330	U	330	U
2,2'-oxybis(1-chloropropane)	660	340	U	340	U	330	U	330	U
3 and/or 4-Methylphenol	660	340	U	340	U	330	U	330	U
N-Nitroso-di-n-propylamine	660	340	U	340	U	330	U	330	U
Hexachloroethane	660	340	U	340	U	330	U	330	U
Nitrobenzene	660	340	U	340	U	330	U	330	U
Isophorone	660	340	U	340	U	330	U	330	U
2-Nitrophenol	660	340	U	340	U	330	U	330	U
2,4-Dimethylphenol	660	340	U	340	U	330	U	330	U
bis(2-Chloroethoxy)methane	660	340	U	340	U	330	U	330	U
2,4-Dichlorophenol	660	340	U	340	U	330	U	330	U
1,2,4-Trichlorobenzene	660	340	U	340	U	330	U	330	U
Naphthalene	660	340	U	340	U	330	U	330	U
4-Chloroaniline	660	340	U	340	U	330	U	330	U
Hexachlorobutadiene	660	340	U	340	U	330	U	330	U
4-Chloro-3-methylphenol	660	340	U	340	U	330	U	330	U
2-Methylnaphthalene	660	340	U	340	U	330	U	330	U
Hexachlorocyclopentadiene	660	340	U	340	U	330	U	330	U
2,4,6-Trichlorophenol	660	340	U	340	U	330	U	330	U
2,4,5-Trichlorophenol*	660	840	U	850	U	840	U	840	U
2-Chloronaphthalene	660	340	U	340	U	330	U	330	U
2-Nitroaniline*	660	840	U	850	U	840	U	840	U
Dimethylphthalate	660	340	U	340	U	330	U	330	U
Acenaphthylene	660	340	U	340	U	330	U	330	U
2,6-Dinitrotoluene	660	340	U	340	U	330	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

000011

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI	SDG: K0459								
Sample Number		J12PW5		J12PW6		J12PW7		J12PW8	
Remarks									
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06	
Extraction Date		7/10/06		7/10/06		7/10/06		7/10/06	
Analysis Date		7/26/06		7/25/06		7/26/06		7/27/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*		840	U	850	U	840	U	840	U
Acenaphthene	660	340	U	340	U	330	U	330	U
2,4-Dinitrophenol*	660	840	UJ	850	UJ	840	UJ	840	UJ
4-Nitrophenol*	660	840	U	850	U	840	U	840	U
Dibenzofuran	660	340	U	340	U	330	U	330	U
2,4-Dinitrotoluene	660	340	U	340	U	330	U	330	U
Diethylphthalate	660	340	U	340	U	330	U	330	U
4-Chlorophenyl-phenyl ether	660	340	U	340	U	330	U	330	U
Fluorene	660	340	U	340	U	330	U	330	U
4-Nitroaniline*	660	840	U	850	U	840	U	840	U
4,6-Dinitro-2-methylphenol*	660	840	U	850	U	840	U	840	U
N-Nitrosodiphenylamine	660	340	U	340	U	330	U	330	U
4-Bromophenyl-phenyl ether	660	340	U	340	U	330	U	330	U
Hexachlorobenzene	660	340	U	340	U	330	U	330	U
Pentachlorophenol*	660	840	U	850	U	840	U	840	U
Phenanthrene	660	340	U	340	U	330	U	330	U
Anthracene	660	340	U	340	U	330	U	330	U
Carbazole	660	340	U	340	U	330	U	330	U
Di-n-butylphthalate	660	19		340	U	29		24	
Fluoranthene	660	340	U	340	U	330	U	330	U
Pyrene	660	340	U	340	U	330	U	330	U
Butylbenzylphthalate	660	340	U	340	U	330	U	330	U
3,3'-Dichlorobenzidine	660	340	U	340	U	330	U	330	U
Benzo(a)anthracene	660	340	U	340	U	330	U	330	U
Chrysene	660	340	U	340	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	340	U	340	U	330	U	330	U
Benzo(b)fluoranthene	660	340	U	340	U	330	U	330	U
Benzo(k)fluoranthene	660	340	U	340	U	330	U	330	U
Benzo(a)pyrene	660	340	U	340	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	660	340	U	340	U	330	U	330	U
Dibenz(a,h)anthracene	660	340	U	340	U	330	U	330	U
Benzo(g,h,i)perylene	660	340	U	340	U	330	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

000012

Semivolatiles by GC/MS, HSL List

Report Date: 08/02/06 17:01

RFW Batch Number: 0607L425 Client: TNUHANFORD RC-025 K0459 Work Order: 11343606001 Page: 1a

	Cust ID:	J12PW5		J12PW5		J12PW5		J12PW6		J12PW7		J12PW8	
Sample Information	RFW#:	001		001 MS		001 MSD		002		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	69	%	63	%	76	%	59	%	84	%	61	%
	2-Fluorobiphenyl	69	%	65	%	80	%	48	%	88	%	59	%
	Terphenyl-d14	94	%	74	%	95	%	63	%	106	%	80	%
	Phenol-d5	68	%	74	%	90	%	63	%	85	%	66	%
	2-Fluorophenol	67	%	70	%	83	%	58	%	85	%	65	%
	2,4,6-Tribromophenol	56	%	69	%	81	%	38	%	83	%	66	%
			fl		fl		fl		fl		fl		fl
Phenol		340	U	75	%	93	%	340	U	330	U	330	U
bis(2-Chloroethyl)ether		340	U	78	%	95	%	340	U	330	U	330	U
2-Chlorophenol		340	U	74	%	91	%	340	U	330	U	330	U
1,3-Dichlorobenzene		340	U	73	%	87	%	340	U	330	U	330	U
1,4-Dichlorobenzene		340	U	72	%	85	%	340	U	330	U	330	U
1,2-Dichlorobenzene		340	U	77	%	91	%	340	U	330	U	330	U
2-Methylphenol		340	U	72	%	92	%	340	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		340	U	79	%	98	%	340	U	330	U	330	U
4-Methylphenol		340	U	72	%	96	%	340	U	330	U	330	U
N-Nitroso-di-n-propylamine		340	U	85	%	112	%	340	U	330	U	330	U
Hexachloroethane		340	U	69	%	81	%	340	U	330	U	330	U
Nitrobenzene		340	U	70	%	80	%	340	U	330	U	330	U
Isophorone		340	U	78	%	95	%	340	U	330	U	330	U
2-Nitrophenol		340	U	71	%	85	%	340	U	330	U	330	U
2,4-Dimethylphenol		340	U	56	%	67	%	340	U	330	U	330	U
bis(2-Chloroethoxy)methane		340	U	71	%	89	%	340	U	330	U	330	U
2,4-Dichlorophenol		340	U	69	%	89	%	340	U	330	U	330	U
1,2,4-Trichlorobenzene		340	U	68	%	81	%	340	U	330	U	330	U
Naphthalene		340	U	71	%	85	%	340	U	330	U	330	U
4-Chloroaniline		340	U	55	%	62	%	340	U	330	U	330	U
Hexachlorobutadiene		340	U	75	%	85	%	340	U	330	U	330	U
4-Chloro-3-methylphenol		340	U	74	%	97	%	340	U	330	U	330	U
2-Methylnaphthalene		340	U	74	%	97	%	340	U	330	U	330	U
Hexachlorocyclopentadiene		340	U	69	%	80	%	340	U	330	U	330	U
2,4,6-Trichlorophenol		340	U	71	%	87	%	340	U	330	U	330	U
2,4,5-Trichlorophenol		840	U	73	%	92	%	850	U	840	U	840	U

*= Outside of EPA CLP QC limits.

JK 8/23/06

000013

000000008

RFW Batch Number: 0607B425

Cust ID:	J12PW5		J12PW5		J12PW5		J12PW6		J12PW7		J12PW8	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	340	U	70	%	89	%	340	U	330	U	330	U
2-Nitroaniline	840	U	75	%	96	%	850	U	840	U	840	U
Dimethylphthalate	340	U	77	%	96	%	340	U	330	U	330	U
Acenaphthylene	340	U	77	%	96	%	340	U	330	U	330	U
2,6-Dinitrotoluene	340	U	74	%	90	%	340	U	330	U	330	U
3-Nitroaniline	840	U	71	%	86	%	850	U	840	U	840	U
Acenaphthene	340	U	72	%	91	%	340	U	330	U	330	U
2,4-Dinitrophenol	840	U J	28	%	18 *	%	850	U J	840	U J	840	U J
4-Nitrophenol	840	U	78	%	103	%	850	U	840	U	840	U
Dibenzofuran	340	U	74	%	92	%	340	U	330	U	330	U
2,4-Dinitrotoluene	340	U	78	%	103	%	340	U	330	U	330	U
Diethylphthalate	340	U	75	%	94	%	340	U	330	U	330	U
4-Chlorophenyl-phenylether	340	U	71	%	88	%	340	U	330	U	330	U
Fluorene	340	U	72	%	92	%	340	U	330	U	330	U
4-Nitroaniline	840	U	67	%	89	%	850	U	840	U	840	U
4,6-Dinitro-2-methylphenol	840	U	66	%	67	%	850	U	840	U	840	U
N-Nitrosodiphenylamine (1)	340	U	55	%	64	%	340	U	330	U	330	U
4-Bromophenyl-phenylether	340	U	60	%	69	%	340	U	330	U	330	U
Hexachlorobenzene	340	U	70	%	78	%	340	U	330	U	330	U
Pentachlorophenol	840	U	75	%	86	%	850	U	840	U	840	U
Phenanthrene	340	U	76	%	90	%	340	U	330	U	330	U
Anthracene	340	U	79	%	95	%	340	U	330	U	330	U
Carbazole	340	U	72	%	83	%	340	U	330	U	330	U
Di-n-butylphthalate	19	J	73	%	83	%	340	U	29	J	24	J
Fluoranthene	340	U	79	%	91	%	340	U	330	U	330	U
Pyrene	340	U	78	%	101	%	340	U	330	U	330	U
Butylbenzylphthalate	340	U	78	%	94	%	340	U	330	U	330	U
3,3'-Dichlorobenzidine	340	U	61	%	58	%	340	U	330	U	330	U
Benzo(a)anthracene	340	U	76	%	90	%	340	U	330	U	330	U
Chrysene	340	U	75	%	92	%	340	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	LCO ~~120~~ JB	U	72	%	86	%	LCO ~~44~~ JB	U	LCO ~~83~~ JB	U	LCO ~~65~~ JB	U
Di-n-octyl phthalate	340	U	78	%	97	%	340	U	330	U	330	U
Benzo(b)fluoranthene	340	U	82	%	93	%	340	U	330	U	330	U
Benzo(k)fluoranthene	340	U	78	%	100	%	340	U	330	U	330	U
Benzo(a)pyrene	340	U	82	%	98	%	340	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	340	U	79	%	92	%	340	U	330	U	19	J
Dibenz(a,h)anthracene	340	U	78	%	89	%	340	U	330	U	18	J
Benzo(g,h,i)perylene	340	U	78	%	90	%	340	U	330	U	21	J

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

JR 8/23/06

000000009

000014

	Cust ID:	SBLKZZ		SBLKZZ BS	
Sample Information	RFW#:	06LE0552-MB1		06LE0552-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	88	%	62	%
	2-Fluorobiphenyl	88	%	68	%
	Terphenyl-d14	116	%	67	%
	Phenol-d5	105	%	74	%
	2-Fluorophenol	92	%	65	%
	2,4,6-Tribromophenol	87	%	68	%
Phenol		330	U	71	%
bis(2-Chloroethyl)ether		330	U	67	%
2-Chlorophenol		330	U	70	%
1,3-Dichlorobenzene		330	U	65	%
1,4-Dichlorobenzene		330	U	62	%
1,2-Dichlorobenzene		330	U	65	%
2-Methylphenol		330	U	69	%
2,2'-oxybis(1-Chloropropane)		330	U	65	%
4-Methylphenol		330	U	70	%
N-Nitroso-di-n-propylamine		330	U	74	%
Hexachloroethane		330	U	60	%
Nitrobenzene		330	U	65	%
Isophorone		330	U	74	%
2-Nitrophenol		330	U	66	%
2,4-Dimethylphenol		330	U	59	%
bis(2-Chloroethoxy)methane		330	U	69	%
2,4-Dichlorophenol		330	U	70	%
1,2,4-Trichlorobenzene		330	U	65	%
Naphthalene		330	U	68	%
4-Chloroaniline		330	U	78	%
Hexachlorobutadiene		330	U	73	%
4-Chloro-3-methylphenol		330	U	77	%
2-Methylnaphthalene		330	U	72	%
Hexachlorocyclopentadiene		330	U	70	%
2,4,6-Trichlorophenol		330	U	76	%
2,4,5-Trichlorophenol		830	U	79	%

*= Outside of EPA CLP QC limits.

8/23/06

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Cust ID: SBLKZZ SBLKZZ BS

RFW#: 06LE0552-MB1 06LE0552-MB1

2-Chloronaphthalene	330	U	72	%
2-Nitroaniline	830	U	77	%
Dimethylphthalate	330	U	75	%
Acenaphthylene	330	U	78	%
2,6-Dinitrotoluene	330	U	77	%
3-Nitroaniline	830	U	90	%
Acenaphthene	330	U	72	%
2,4-Dinitrophenol	830	U J	47	%
4-Nitrophenol	830	U	76	%
Dibenzofuran	330	U	74	%
2,4-Dinitrotoluene	330	U	83	%
Diethylphthalate	330	U	76	%
4-Chlorophenyl-phenylether	330	U	74	%
Fluorene	330	U	76	%
4-Nitroaniline	830	U	72	%
4,6-Dinitro-2-methylphenol	830	U	58	%
N-Nitrosodiphenylamine (1)	330	U	53	%
4-Bromophenyl-phenylether	330	U	62	%
Hexachlorobenzene	330	U	71	%
Pentachlorophenol	830	U	83	%
Phenanthrene	330	U	71	%
Anthracene	330	U	75	%
Carbazole	330	U	71	%
Di-n-butylphthalate	330	U	71	%
Fluoranthene	330	U	78	%
Pyrene	330	U	68	%
Butylbenzylphthalate	330	U	69	%
3,3'-Dichlorobenzidine	330	U	77	%
Benzo(a)anthracene	330	U	76	%
Chrysene	330	U	75	%
bis(2-Ethylhexyl)phthalate	660 ~~20~~ J	U	72	%
Di-n-octyl phthalate	330	U	74	%
Benzo(b)fluoranthene	330	U	77	%
Benzo(k)fluoranthene	330	U	76	%
Benzo(a)pyrene	330	U	78	%
Indeno(1,2,3-cd)pyrene	330	U	69	%
Dibenz(a,h)anthracene	330	U	68	%
Benzo(g,h,i)perylene	330	U	68	%

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

K 8/23/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-025
LVL #: 0607L425
SDG/SAF # K0459/RC-025

W.O. #: 11343-606-001-9999-00
Date Received: 07-06-2006

SEMIVOLATILE

Four (4) soil samples were collected on 06-29-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 07-10-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 07-23,25,26,27-2006.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were extracted and analyzed within required holding time.

2. The sample results were reported on a dry-weight basis.

3. Non-target compounds were detected in the samples.

4. All surrogate recoveries were within acceptance criteria.

5. One (1) of one hundred twenty-eight (128) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. All blank spike recoveries were within acceptance criteria.

7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate 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").

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 9 pages.

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

LvLI
LIONVILLE LABORATORY INC.

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
for Laboratory Manager
Lionville Laboratory Incorporated

8/8/06
Date

som\gorup\data\bna\tnu-hanford\0607-425.doc

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06MS263

Initiator: Robert Carden
Date: 8/6/06
Client: TNU Hanford RE 025

Batch: 06074425
Samples: MSD
Method: (SW846)/MCAWW/CLP/

Parameter: 06025H
Matrix: Soil
Prep Batch: 06LE0552

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)

24 dichlorophenol spike recovery outside QC limits. 18% (20-120%) OK in MS/BS

2. Known or Probable Causes(s) acidic phenols exhibit erratic chromatographic behavior especially if the GC system is contaminated with high boiling materials

3. Discussion and Proposed Action Other Description: None

__ 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: 8/7/06

__ 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: 8/8/06 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		__ GC/LC: Kiger
__	__ Data Management: Stilwell	2	X MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-021	Page 1 of 1

Collector: C. Martinez, Kevin Singleton	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code: Air Quality	Data Turnaround: 15 days		
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B2: pipeline	SAF No.: RC-025	
Ice Chest No.: AFS-04-123	Field Logbook No.: EL-1585-6	COA: R607B22000	Method of Shipment: fed ex
Shipped To: ~~SBERLINE SERVICES~~ LIONVILLE, Lionville 06/29/06	Offsite Property No.: A060516		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	aG	G/P	aG	aG	aG	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	120g	120mL	250mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3	~~NRER-03~~; Strontium-89,90 -- Total Sr	Pesticides - 8081; ~~Chloro-Herbicides - EPA8151~~	6-29-06	

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Sample No.	Matrix *	Sample Date	Sample Time										
J12PW5	SOIL	6-29-06	1300	✓	✓	✓	✓	NA	NA	NA	✓		
J12PW6	SOIL	6-29-06	1308	✓	✓	✓	✓	↓	↓	↓	✓		
J12PW7	SOIL	6-29-06	1315	✓	✓	✓	✓	↓	↓	↓	✓		
J12PW8	SOIL	6-29-06	1325	✓	✓	✓	✓	↓	↓	↓	✓		
											TRB 7-3-06		

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	6-29-06 1700	3728 Ref 3B	6-29-06 1700
3728/3B	7/5/06 1030	M Stankovich	7/5/06 1030
M Stankovich WCH	7/5/06 1500	1-CD Ex	
1-CD Ex	7-6-06 0930	M Kennedy	7-6-06 0930

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)

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~

6-29-06

Personnel not available to relinquish samples from 3728 Ref # 3B on 7/5/06

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 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 1607-B2			DATA PACKAGE: K0459		
VALIDATOR: TLI		LAB: LLI		DATE: 8/20/06	
			SDG: K0459		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J12PW5	J12PW6	J12PW7	J12PW8		
					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: bis (2-ethylhexyl) phthalate – U at RQL all

no FB

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

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

Comments: 2,4-dinitrophenol – 187% MS – all J

no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: 2,4,-Dinitrophenol - 43% J all

6. SYSTEM PERFORMANCE (Levels D and E)

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

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

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

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

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: 32 over

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: 23 August 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Sites 1607-B2
Subject: Inorganics - Data Package No. K0459-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0459 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
J12PW5	6/29/06	Soil	C	See note 1
J12PW6	6/29/06	Soil	C	See note 1
J12PW7	6/29/06	Soil	C	See note 1
J12PW8	6/29/06	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) 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.

All preparation 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.

Due to a matrix spike recovery outside QC limits (56.6%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (45.5%), all silicon 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

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K0459 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 a matrix spike recovery outside QC limits (56.6%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (45.5%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH 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

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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 WCH 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: K0459	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD									
Lab: LLI	SDG: K0459								
Sample Number		J12PW5		J12PW6		J12PW7		J12PW8	
Remarks									
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.07	U	0.07	U	0.07	U	0.07	U
Aluminum		5980		7540		6310		5870	
Arsenic	10	2.6		5.2		3.6		3.0	
Boron		1.2		2.2		2.7		1.9	
Barium	2	69.2		175		94.4		80.2	
Beryllium		0.38		0.50		0.47		0.36	
Calcium		4050		31200		5010		3260	
Cadmium	0.2	0.07	U	0.43		0.07	U	0.07	U
Cobalt		7.2		8.9		8.5		6.0	
Chromium	1	9.6		11.4		8.7		11.2	
Copper		14.3		24.3		17.9		13.7	
Iron		15900		18700		17400		13700	
Mercury	0.2	0.02	U	0.92		0.01	U	0.01	U
Potassium		1370		1990		1360		1450	
Lithium		6.8		10.1		7.0		6.3	
Magnesium		4030		5240		4190		3440	
Manganese		301		382		350		271	
Molybdenum		0.28	U	0.33		0.40		0.35	
Sodium		151		390		216		159	
Nickel		10.9		11.7		10.6		10.6	
Phosohorous		849		926		932		684	
Lead	5	4.3		9.6		5.4		4.4	
Antimony		0.42	UJ	0.42	UJ	0.42	UJ	0.42	UJ
Selenium	1	0.45	U	0.45	U	0.45	U	0.44	U
Silicon		396	J	584	J	377	J	473	J
Tin		1.0	U	1.0	U	1.0	U	1.0	U
Strontium		26.0		86.2		33.4		25.7	
Titanium		967		1170		1100		697	
Thallium		0.67	U	0.67	U	0.67	U	0.66	U
Uranium		0.84	U	0.85	U	0.84	U	0.83	U
Vanadium		36.7		41.4		39.8		32.3	
Zinc	1	37.2		67.0		40.2		37.2	
Zirconium		18		22.0		22.2		11.8	

000010

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J12PW5	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5980	MG/KG	2.3	1.0
		Arsenic, Total	2.6	MG/KG	0.58	1.0
		Boron, Total	1.2	MG/KG	0.23	1.0
		Barium, Total	69.2	MG/KG	0.02	1.0
		Beryllium, Total	0.38	MG/KG	0.02	1.0
		Calcium, Total	4050	MG/KG	1.6	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	7.2	MG/KG	0.13	1.0
		Chromium, Total	9.6	MG/KG	0.12	1.0
		Copper, Total	14.3	MG/KG	0.12	1.0
		Iron, Total	15900	MG/KG	0.52	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1370	MG/KG	2.2	1.0
		Lithium, Total	6.8	MG/KG	0.03	1.0
		Magnesium, Total	4030	MG/KG	0.93	1.0
		Manganese, Total	301	MG/KG	0.03	1.0
		Molybdenum, Total	0.28 u	MG/KG	0.28	1.0
		Sodium, Total	151	MG/KG	0.73	1.0
		Nickel, Total	10.9	MG/KG	0.23	1.0
		Phosphorus, Total	849	MG/KG	0.86	1.0
		Lead, Total	4.3	MG/KG	0.30	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	396 J	MG/KG	2.2	1.0
		Tin, Total	1.0 u	MG/KG	1.0	1.0
		Strontium, Total	26.0	MG/KG	0.01	1.0
		Titanium, Total	967	MG/KG	0.03	1.0
		Thallium, Total	0.67 u	MG/KG	0.67	1.0
		Uranium, Total	0.84 u	MG/KG	0.84	1.0
		Vanadium, Total	36.7	MG/KG	0.09	1.0
		Zinc, Total	37.2	MG/KG	0.15	1.0
		Zirconium, Total	18.0	MG/KG	1.0	1.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J12PW6	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	7540	MG/KG	2.3	1.0
		Arsenic, Total	5.2	MG/KG	0.59	1.0
		Boron, Total	2.2	MG/KG	0.23	1.0
		Barium, Total	175	MG/KG	0.02	1.0
		Beryllium, Total	0.50	MG/KG	0.02	1.0
		Calcium, Total	31200	MG/KG	1.6	1.0
		Cadmium, Total	0.43	MG/KG	0.07	1.0
		Cobalt, Total	6.9	MG/KG	0.13	1.0
		Chromium, Total	11.4	MG/KG	0.13	1.0
		Copper, Total	24.3	MG/KG	0.12	1.0
		Iron, Total	18700	MG/KG	0.52	1.0
		Mercury, Total	0.92	MG/KG	0.02	1.0
		Potassium, Total	1990	MG/KG	2.2	1.0
		Lithium, Total	10.1	MG/KG	0.03	1.0
		Magnesium, Total	5240	MG/KG	0.94	1.0
		Manganese, Total	382	MG/KG	0.03	1.0
		Molybdenum, Total	0.33	MG/KG	0.28	1.0
		Sodium, Total	390	MG/KG	0.73	1.0
		Nickel, Total	11.7	MG/KG	0.23	1.0
		Phosphorus, Total	926	MG/KG	0.87	1.0
		Lead, Total	9.6	MG/KG	0.30	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	584 J	MG/KG	2.2	1.0
		Tin, Total	1.0 u	MG/KG	1.0	1.0
		Strontium, Total	86.2	MG/KG	0.01	1.0
		Titanium, Total	1170	MG/KG	0.03	1.0
		Thallium, Total	0.67 u	MG/KG	0.67	1.0
		Uranium, Total	0.85 u	MG/KG	0.85	1.0
		Vanadium, Total	41.4	MG/KG	0.09	1.0
		Zinc, Total	67.0	MG/KG	0.15	1.0
		Zirconium, Total	22.0	MG/KG	1.0	1.0

PR 8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J12PW7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	6310	MG/KG	2.3	1.0
		Arsenic, Total	3.6	MG/KG	0.58	1.0
		Boron, Total	2.7	MG/KG	0.23	1.0
		Barium, Total	94.4	MG/KG	0.02	1.0
		Beryllium, Total	0.47	MG/KG	0.02	1.0
		Calcium, Total	5010	MG/KG	1.6	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	8.5	MG/KG	0.13	1.0
		Chromium, Total	8.7	MG/KG	0.12	1.0
		Copper, Total	17.9	MG/KG	0.11	1.0
		Iron, Total	17400	MG/KG	0.52	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1360	MG/KG	2.2	1.0
		Lithium, Total	7.0	MG/KG	0.03	1.0
		Magnesium, Total	4190	MG/KG	0.93	1.0
		Manganese, Total	350	MG/KG	0.03	1.0
		Molybdenum, Total	0.40	MG/KG	0.28	1.0
		Sodium, Total	216	MG/KG	0.73	1.0
		Nickel, Total	10.6	MG/KG	0.23	1.0
		Phosphorus, Total	932	MG/KG	0.86	1.0
		Lead, Total	5.4	MG/KG	0.30	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	377 J	MG/KG	2.2	1.0
		Tin, Total	1.0 u	MG/KG	1.0	1.0
		Strontium, Total	33.4	MG/KG	0.01	1.0
		Titanium, Total	1100	MG/KG	0.03	1.0
		Thallium, Total	0.67 u	MG/KG	0.67	1.0
		Uranium, Total	0.84 u	MG/KG	0.84	1.0
		Vanadium, Total	39.8	MG/KG	0.09	1.0
		Zinc, Total	40.2	MG/KG	0.15	1.0
		Zirconium, Total	22.2	MG/KG	1.0	1.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J12PW8	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5870	MG/KG	2.2	1.0
		Arsenic, Total	3.0	MG/KG	0.58	1.0
		Boron, Total	1.9	MG/KG	0.23	1.0
		Barium, Total	80.2	MG/KG	0.02	1.0
		Beryllium, Total	0.36	MG/KG	0.02	1.0
		Calcium, Total	3260	MG/KG	1.5	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	6.0	MG/KG	0.13	1.0
		Chromium, Total	11.2	MG/KG	0.12	1.0
		Copper, Total	13.7	MG/KG	0.11	1.0
		Iron, Total	13700	MG/KG	0.51	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1450	MG/KG	2.1	1.0
		Lithium, Total	6.3	MG/KG	0.03	1.0
		Magnesium, Total	3440	MG/KG	0.92	1.0
		Manganese, Total	271	MG/KG	0.03	1.0
		Molybdenum, Total	0.35	MG/KG	0.27	1.0
		Sodium, Total	159	MG/KG	0.72	1.0
		Nickel, Total	10.6	MG/KG	0.23	1.0
		Phosphorus, Total	684	MG/KG	0.85	1.0
		Lead, Total	4.4	MG/KG	0.29	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.44 u	MG/KG	0.44	1.0
		Silicon, Total	473 J	MG/KG	2.1	1.0
		Tin, Total	1.0 u	MG/KG	1.0	1.0
		Strontium, Total	25.7	MG/KG	0.009	1.0
		Titanium, Total	697	MG/KG	0.03	1.0
		Thallium, Total	0.66 u	MG/KG	0.66	1.0
		Uranium, Total	0.83 u	MG/KG	0.83	1.0
		Vanadium, Total	32.3	MG/KG	0.09	1.0
		Zinc, Total	37.2	MG/KG	0.15	1.0
		Zirconium, Total	11.8	MG/KG	1.0	1.0

8/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-025
LVL#: 0607L425
SDG/SAF#: K0459/RC-025

W.O.#: 11343-606-001-9999-00
Date Received: 07-06-06

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 4 soil samples.

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

   The samples were rerun for Aluminum, Beryllium, Iron, and Zirconium, along with the Phosphorous analysis, due to sample matrix.

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

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

6. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 45.5%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

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 25 pages.

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

9. The matrix spike (MS) recoveries for 7 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

10. 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:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J12PW5	Aluminum	44,000	90.2
	Iron	44,000	80.9
	Manganese	2,000	87.3
	Phosphorous	4,000	94.3
	Antimony	100	95.7
	Silicon	2,100	92.6
	Titanium	2,100	84.5

11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. 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.

13. 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.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/24/02
Date

jjw/m07-425

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-021	Page 1 of 1

Collector: C. Martinez, Kevin Singleton	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 15 days		
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B2: pipeline	SAF No.: RC-025	Air Quality
Ice Chest No.: AFS-04-123	Field Logbook No.: EL-1585-6	COA: R607B22000	Method of Shipment: fed ex
Shipped To: ~~SBERLINE SERVICES LIONVILLE~~ Lionville 06/29/06	Offsite Property No.: A060516		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
none

Special Handling and/or Storage
cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C	
Type of Container	aG	G/P	aG	aG	aG	G/P	G/P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	
Volume	250g	120g	120mL	250mL	500mL	120mL	120mL	250mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3	Nickel-63; Strontium-89,90 -- Total Sr	Pesticides - 8081 ~~Chloro-Herbicides - SPA8151~~	

Sample No.	Matrix *	Sample Date	Sample Time									
J12PW5	SOIL	6-29-06	1300	✓	✓	✓	✓	NA	NA	NA	✓	
J12PW6	SOIL	6-29-06	1308	✓	✓	✓	✓				✓	
J12PW7	SOIL	6-29-06	1315	✓	✓	✓	✓				✓	
J12PW8	SOIL	6-29-06	1325	✓	✓	✓	✓	✓	✓	✓	✓	
											TRS 7-2-06	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	6-29-06 1700	3728 Ref 3B	6-29-06 1700
3228/3B	7/5/06 1030	MBL / mstankovich	7/5/06 1030
MBL mstankovich	7/5/06 1500	FED EX	
FED EX	7-6-06 0930	Nemanich	7-6-06 0930

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)

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~

6-29-06

Personnel not available to relinquish samples from 3728 Ref # 3B on 7/5/06

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

BHLEE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 1607-B2			DATA PACKAGE: K0459		
VALIDATOR: TLF		LAB: LLI		DATE: 8/20/06	
			SDG: K0459		

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

SAMPLES/MATRIX
J12PW5 J12PW6 J12PW7 J12PW8
soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

ICP interference checks acceptable? ..... Yes No N/A

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

ICV and CCV checks acceptable? ..... Yes No N/A

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: antimony - 56.6% J all - MS

Silicon 45.5% - J all - LCS

no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

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

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

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

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

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/21/06

CLIENT: TNUHANFORD RC-025 K0459 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0434-MB1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	2.5	MG/KG	2.4	1.0
		Arsenic, Total	0.61 u	MG/KG	0.61	1.0
		Boron, Total	0.24 u	MG/KG	0.24	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	2.4	MG/KG	1.6	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.14 u	MG/KG	0.14	1.0
		Chromium, Total	0.13 u	MG/KG	0.13	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	0.78	MG/KG	0.54	1.0
		Potassium, Total	2.3 u	MG/KG	2.3	1.0
		Lithium, Total	0.04	MG/KG	0.03	1.0
		Magnesium, Total	0.97 u	MG/KG	0.97	1.0
		Manganese, Total	0.03 u	MG/KG	0.03	1.0
		Molybdenum, Total	0.29 u	MG/KG	0.29	1.0
		Sodium, Total	0.76 u	MG/KG	0.76	1.0
		Nickel, Total	0.24 u	MG/KG	0.24	1.0
		Phosphorus, Total	0.90 u	MG/KG	0.90	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.44 u	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	2.3 u	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	0.01	MG/KG	0.01	1.0
		Titanium, Total	0.03 u	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.88 u	MG/KG	0.88	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.16 u	MG/KG	0.16	1.0
		Zirconium, Total	1.1 u	MG/KG	1.1	1.0
BLANK1	06C0133-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459

LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J12PW5	Silver, Total	4.1	0.07u	4.8	85.4	1.0
		Aluminum, Total	6940	5980	192	496.9*	1.0
		Arsenic, Total	174	2.6	192	89.4	1.0
		Boron, Total	84.7	1.2	95.9	87.1	1.0
		Barium, Total	249	69.2	192	93.8	1.0
		Beryllium, Total	4.8	0.38	4.8	92.1	1.0
		Calcium, Total	6180	4050	2400	88.6	1.0
		Cadmium, Total	4.4	0.07u	4.8	91.7	1.0
		Cobalt, Total	51.8	7.2	47.9	93.1	1.0
		Chromium, Total	28.2	9.6	19.2	96.9	1.0
		Copper, Total	37.2	14.3	24.0	95.4	1.0
		Iron, Total	14600	15900	95.9	-1300. *	1.0
		Potassium, Total	3590	1370	2400	92.3	1.0
		Lithium, Total	109	6.8	95.9	106.7	1.0
		Magnesium, Total	6100	4030	2400	86.2	1.0
		Manganese, Total	322	301	47.9	44.0*	1.0
		Molybdenum, Total	91.3	0.28u	95.9	95.2	1.0
		Sodium, Total	2450	151	2400	95.8	1.0
		Nickel, Total	55.4	10.9	47.9	92.9	1.0
		Phosphorus, Total	892	849	95.9	44.4*	1.0
		Lead, Total	48.3	4.3	47.9	91.9	1.0
		Antimony, Total	27.1	0.42u	47.9	56.6	1.0
		Selenium, Total	159	0.45u	192	82.8	1.0
		Silicon, Total	677	396	95.9	293.1*	1.0
		Tin, Total	90.7	1.0 u	95.9	94.6	1.0
		Strontium, Total	116	26.0	95.9	93.6	1.0
		Titanium, Total	972	967	95.9	5.0*	1.0
		Thallium, Total	180	0.67u	192	93.7	1.0
		Uranium, Total	83.1	0.84u	95.9	86.7	1.0
		Vanadium, Total	78.0	36.7	47.9	86.2	1.0
		Zinc, Total	78.1	37.2	47.9	85.4	1.0
		Zirconium, Total	440	18.0	480	88.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459

LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	J12PW8	Mercury, Total	0.16	0.01u	0.15	108.8	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J12PW5	Silver, Total	0.07u	0.07u	NC	1.0
		Aluminum, Total	5980	5340	11.3	1.0
		Arsenic, Total	2.6	2.5	3.9	1.0
		Boron, Total	1.2	0.98	19.9	1.0
		Barium, Total	69.2	62.4	10.3	1.0
		Beryllium, Total	0.38	0.32	16.8	1.0
		Calcium, Total	4050	3920	3.2	1.0
		Cadmium, Total	0.07u	0.07u	NC	1.0
		Cobalt, Total	7.2	6.7	7.2	1.0
		Chromium, Total	9.6	8.6	11.0	1.0
		Copper, Total	14.3	13.0	9.5	1.0
		Iron, Total	15900	14400	10	1.0
		Potassium, Total	1370	1240	10.2	1.0
		Lithium, Total	6.8	6.0	12.5	1.0
		Magnesium, Total	4030	3700	8.7	1.0
		Manganese, Total	301	284	5.6	1.0
		Molybdenum, Total	0.28u	0.29	~~NC~~ 200 corrected value MW 7/21/06	1.0
		Sodium, Total	151	139	7.9	1.0
		Nickel, Total	10.9	9.8	10.6	1.0
		Phosphorus, Total	849	899	5.7	1.0
		Lead, Total	4.3	4.0	7.2	1.0
		Antimony, Total	0.42u	0.42u	NC	1.0
		Selenium, Total	0.45u	0.45u	NC	1.0
		Silicon, Total	396	375	5.6	1.0
		Tin, Total	1.0 u	1.0 u	NC	1.0
		Strontium, Total	26.0	24.7	5.1	1.0
		Titanium, Total	967	859	11.8	1.0
		Thallium, Total	0.67u	0.67u	NC	1.0
		Uranium, Total	0.84u	0.84u	NC	1.0
		Vanadium, Total	36.7	32.0	13.7	1.0
		Zinc, Total	37.2	33.7	9.9	1.0
		Zirconium, Total	18.0	15.8	13.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-004REP	J12PW8	Mercury, Total	0.01u	0.01u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/21/06

CLIENT: TNUHANFORD RC-025 K0459

LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0434-LC1	Silver, LCS	49.2	50.0	MG/KG	98.4
		Aluminum, LCS	464	500	MG/KG	92.9
		Arsenic, LCS	926	1000	MG/KG	92.6
		Boron, LCS	466	500	MG/KG	93.2
		Barium, LCS	484	500	MG/KG	96.9
		Beryllium, LCS	24.2	25.0	MG/KG	96.8
		Calcium, LCS	2490	2500	MG/KG	99.4
		Cadmium, LCS	24.1	25.0	MG/KG	96.4
		Cobalt, LCS	252	250	MG/KG	100.6
		Chromium, LCS	50.7	50.0	MG/KG	101.4
		Copper, LCS	123	125	MG/KG	98.5
		Iron, LCS	460	500	MG/KG	92.0
		Potassium, LCS	2320	2500	MG/KG	92.8
		Lithium, LCS	505	500	MG/KG	101.1
		Magnesium, LCS	2400	2500	MG/KG	96.0
		Manganese, LCS	76.0	75.0	MG/KG	101.3
		Molybdenum, LCS	508	500	MG/KG	101.5
		Sodium, LCS	2420	2500	MG/KG	96.7
		Nickel, LCS	196	200	MG/KG	98.2
		Phosphorus, LCS	83.9	100	MG/KG	83.9
		Lead, LCS	243	250	MG/KG	97.2
		Antimony, LCS	287	300	MG/KG	95.7
		Selenium, LCS	864	1000	MG/KG	86.4
		Silicon, LCS	228	500	MG/KG	45.5
		Tin, LCS	516	500	MG/KG	103.3
		Strontium, LCS	488	500	MG/KG	97.6
		Titanium, LCS	498	500	MG/KG	99.5
		Thallium, LCS	985	1000	MG/KG	98.5
		Uranium, LCS	97.9	100	MG/KG	97.9
		Vanadium, LCS	254	250	MG/KG	101.6
		Zinc, LCS	95.6	100	MG/KG	95.6
		Zirconium, LCS	473	500	MG/KG	94.6
LCS1	06C0133-LC1	Mercury, LCS	6.4	6.2	MG/KG	103.3

Date: 23 August 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100BC Remaining Pipeline & Sewers – Soil Full Protocol - Waste Site 1607-B2
Subject: Pesticide/PCB - Data Package No. K0459-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0459 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
J12PW5	6/29/06	Soil	C	See note 1
J12PW6	6/29/06	Soil	C	See note 1
J12PW7	6/29/06	Soil	C	See note 1
J12PW8	6/29/06	Soil	C	See note 1

1 – Pesticides by 8081A & PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) 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 the lack of a matrix spike, matrix spike duplicate or 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 the lack of a matrix spike or matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicate samples were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All toxaphene

results exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data Package No. K0459 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 deficiency was noted:

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

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH 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 toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: K0459	REVIEWER: TLI	Project: 1607-B2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS/MSD/LCS analysis

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI	SDG: K0459								
Sample Number		J12PW5		J12PW6		J12PW7		J12PW8	
Remarks									
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06	
Extraction Date		7/7/06		7/7/06		7/7/06		7/7/06	
Analysis Date		7/16/06		7/16/06		7/16/06		7/16/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	13	U	14	U	13	U	13	U
Aroclor-1221	100	13	U	14	U	13	U	13	U
Aroclor-1232	100	13	U	14	U	13	U	13	U
Aroclor-1242	100	13	U	14	U	13	U	13	U
Aroclor-1248	100	13	U	14	U	13	U	13	U
Aroclor-1254	100	13	U	14	U	13	U	13	U
Aroclor-1260	100	13	U	14	U	13	U	13	U
Sample Number		J12PW5		J12PW6		J12PW7		J12PW8	
Remarks									
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06	
Extraction Date		7/7/06		7/7/06		7/7/06		7/7/06	
Analysis Date		7/17/06		7/18/06		7/18/06		7/18/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.3	U	1.3	U	1.3	U	1.3	U
Gamma-BHC (Lindane)	5	1.3	U	1.3	U	1.3	U	1.3	U
Beta-BHC	5	1.3	U	1.3	U	1.3	U	1.3	U
Heptachlor	5	1.3	U	1.3	U	1.3	U	1.3	U
Delta-BHC	5	1.3	U	1.3	U	1.3	U	1.3	U
Aldrin	5	1.3	U	1.3	U	1.3	U	1.3	U
Heptachlor Epoxide	5	1.3	U	1.3	U	0.33		0.60	
gamma-Chlordane	5	1.3	U	1.3	U	1.3	U	0.43	
Endosulfan I	5	1.3	U	1.3	U	1.3	U	1.3	U
alpha-Chlordane	5	1.3	U	1.3	U	1.3	U	0.87	
4,4'-DDE	5	1.3	U	2.2		1.3	U	1.3	U
Dieldrin	5	1.3	U	1.3	U	1.3	U	1.3	U
Endrin	5	1.3	U	1.3	U	1.3	U	1.3	U
4,4'-DDD	5	1.3	U	1.3	U	1.3	U	1.3	U
Endosulfan II	5	1.3	U	1.3	U	1.3	U	1.3	U
4,4'-DDT	5	1.3	U	1.3	U	1.3	U	11	
Endrin Aldehyde	5	1.3	U	1.3	U	1.3	U	1.3	U
Endosulfan sulfate	5	1.3	U	0.40		1.3	U	1.3	U
Methoxyclor	5	1.3	U	1.3	U	1.3	U	15	
Endrin Ketone	5	1.3	U	1.3	U	1.3	U	1.3	U
Toxaphene	5	13	UJ	13	UJ	13	UJ	13	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.

000010

PCBs by GC

Report Date: 07/26/06 17:54

RFW Batch Number: 0607L425 Client: TNUHANFORD RC-025 K0459 Work Order: 11343606001 Page: 1

000000005

	Cust ID:	J12PW5	J12PW5	J12PW5	J12PW6	J12PW7	J12PW8
Sample Information	RFW#:	001	001 MS	001 MSD	002	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: Tetrachloro-m-xylene		95 %	95 %	95 %	90 %	98 %	95 %
Decachlorobiphenyl		98 %	97 %	98 %	98 %	104 %	101 %
Aroclor-1016		13 U	98 %	97 %	14 U	13 U	13 U
Aroclor-1221		13 U	13 U	13 U	14 U	13 U	13 U
Aroclor-1232		13 U	13 U	13 U	14 U	13 U	13 U
Aroclor-1242		13 U	13 U	13 U	14 U	13 U	13 U
Aroclor-1248		13 U	13 U	13 U	14 U	13 U	13 U
Aroclor-1254		13 U	13 U	13 U	14 U	13 U	13 U
Aroclor-1260		13 U	101 %	101 %	14 U	13 U	13 U

000011

	Cust ID:	PBLKLD	PBLKLD BS
Sample Information	RFW#:	06LE0550-MB1	06LE0550-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		94 %	93 %
Decachlorobiphenyl		96 %	97 %
Aroclor-1016		13 U	95 %
Aroclor-1221		13 U	13 U
Aroclor-1232		13 U	13 U
Aroclor-1242		13 U	13 U
Aroclor-1248		13 U	13 U
Aroclor-1254		13 U	13 U
Aroclor-1260		13 U	98 %

8/23/06

8/23/06

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

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 07/18/06 18:01

RFW Batch Number: 0607L425 Client: TNUHANFORD RC-025 K0459 Work Order: 11343606001 Page: 1

	Cust ID:	J12PW5		J12PW5		J12PW5		J12PW6		J12PW7		J12PW8	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		004	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	4.00		4.00		4.00		4.00		4.00		4.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	90	%	93	%	100	%	100	%	94	%	104	%
	Decachlorobiphenyl	116	%	105	%	107	%	122	%	115	%	121	%
			fl		fl		fl		fl		fl		fl
Alpha-BHC		1.3	U	73	%	77	%	1.3	U	1.3	U	1.3	U
gamma-BHC (Lindane)		1.3	U	85	%	89	%	1.3	U	1.3	U	1.3	U
Beta-BHC		1.3	U	86	%	90	%	1.3	U	1.3	U	1.3	U
Heptachlor		1.3	U	74	%	76	%	1.3	U	1.3	U	1.3	U
Delta-BHC		1.3	U	60	%	62	%	1.3	U	1.3	U	1.3	U
Aldrin		1.3	U	85	%	88	%	1.3	U	1.3	U	1.3	U
Heptachlor epoxide		1.3	U	92	%	94	%	1.3	U	0.33	J.I	0.60	J
gamma-Chlordane		1.3	U	87	%	90	%	1.3	U	1.3	U	0.43	J.I
Endosulfan I		1.3	U	90	%	93	%	1.3	U	1.3	U	1.3	U
alpha-Chlordane		1.3	U	91	%	93	%	1.3	U	1.3	U	0.87	J.I
4,4'-DDE		1.3	U	70	%	72	%	2.2		1.3	U	1.3	U
Dieldrin		1.3	U	73	%	77	%	1.3	U	1.3	U	1.3	U
Endrin		1.3	U	80	%	87	%	1.3	U	1.3	U	1.3	U
4,4'-DDD		1.3	U	70	%	71	%	1.3	U	1.3	U	1.3	U
Endosulfan II		1.3	U	92	%	96	%	1.3	U	1.3	U	1.3	U
4,4'-DDT		1.3	U	81	%	84	%	1.3	U	1.3	U	11	
Endrin aldehyde		1.3	U	78	%	73	%	1.3	U	1.3	U	1.3	U
Endosulfan sulfate		1.3	U	85	%	89	%	0.40	J	1.3	U	1.3	U
Methoxychlor		1.3	U	70	%	72	%	1.3	U	1.3	U	15	.I
Endrin ketone		1.3	U	99	%	100	%	1.3	U	1.3	U	1.3	U
Toxaphene		13	UJ	13	U	13	U	13	UJ	13	UJ	13	UJ

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

JR 8/23/06

7/29/06

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0000000005

	Cust ID:	PBLKLD		PBLKLD BS	
Sample Information	RFW#:	06LE0550-MB1		06LE0550-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	UG/KG		UG/KG	
Surrogate: Tetrachloro-m-xylene		92	%	98	%
Decachlorobiphenyl		96	%	102	%
Alpha-BHC		0.33	U	96	%
gamma-BHC (Lindane)		0.33	U	104	%
Beta-BHC		0.33	U	101	%
Heptachlor		0.33	U	96	%
Delta-BHC		0.33	U	86	%
Aldrin		0.33	U	106	%
Heptachlor epoxide		0.33	U	105	%
gamma-Chlordane		0.33	U	106	%
Endosulfan I		0.33	U	106	%
alpha-Chlordane		0.33	U	105	%
4,4'-DDE		0.33	U	95	%
Dieldrin		0.33	U	100	%
Endrin		0.33	U	106	%
4,4'-DDD		0.33	U	89	%
Endosulfan II		0.33	U	104	%
4,4'-DDT		0.33	U	103	%
Endrin aldehyde		0.33	U	91	%
Endosulfan sulfate		0.33	U	104	%
Methoxychlor		0.33	U	103	%
Endrin ketone		0.33	U	102	%
Toxaphene		3.3	U	3.3	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

8/23/06

7/19/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-025
LVL #: 0607L425
SDG/SAF # K0459/RC-025

W.O. #: 11343-606-001-9999-00
Date Received: 07-06-2006

PCB

Four (4) soil samples were collected on 06-29-2006.

The samples and their associated QC samples were extracted on 07-07-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 07-16-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. The samples were extracted and analyzed within required holding time.

2. The sample results were reported on a dry-weight basis.

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.

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 8 pages.

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LIONVILLE LABORATORY INC.

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

8/1/6
Date

som\r:\group\data\pest\tnu hanford\0607-425.pcbs

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

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-025
LVL #: 0607L425
SDG/SAF # K0459/RC-025

W.O. #: 11343-606-001-9999-00
Date Received: 07-06-2006

CHLORINATED PESTICIDES

Four (4) soil samples were collected on 06-29-2006.

The samples and their associated QC samples were extracted on 07-07-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 07-17,18-2006. 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. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were extracted and analyzed within required holding time.
2. All sample results were reported on a wet-weight basis.
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. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All samples required a 4-fold instrument dilution due to the nature of the sample matrix. The reporting limits were adjusted to reflect the necessary dilution.
9. The initial calibrations associated with this data set were within acceptance criteria.
10. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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

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LIONVILLE LABORATORY INC.

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.

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

7/21/a
Date

som\r:\group\data\pest\tnu hanford\0607-425.pst

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-021	Page 1 of 1

Collector: C. Martinez, Kevin Singleton	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code: Air Quality	Data Turnaround: 15 days		
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B2: pipeline	SAF No.: RC-025	
Ice Chest No.: AFS-04-123	Field Logbook No.: EL-1585-6	COA: R607B22000	Method of Shipment: fed ex
Shipped To: ~~SBERENE SERVICES~~ LIONVILLE, Lionville 06/29/06	Offsite Property No.: A060516		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
none

Special Handling and/or Storage
cool 4 degrees centigrade

000019

SAMPLE ANALYSIS											
Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	aG	G/P	aG	aG	aG	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	120g	120mL	250mL	500mL	120mL	120mL	250mL		
	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3	~~Nickel-63~~; Strontium-89,90 -- Total Sr	Pesticides - 8081, Chloro-Herbicides - ~~EPA~~8151		
Sample No.	Matrix *	Sample Date	Sample Time								
J12PW5	SOIL	6-29-06	1300	✓	✓	✓	✓	NA	NA	NA	✓
J12PW6	SOIL	6-29-06	1308	✓	✓	✓	✓	↓	↓	↓	✓
J12PW7	SOIL	6-29-06	1315	✓	✓	✓	✓	↓	↓	↓	✓
J12PW8	SOIL	6-29-06	1325	✓	✓	✓	✓	↓	↓	↓	✓
											TRB 7-2-06

6-29-06

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Kevin Singleton	Date/Time: 6-29-06 1700	Received By/Stored In: 3728 Ref 3B	Date/Time: 6-29-06 1700
Relinquished By/Removed From: 3728/3B	Date/Time: 7/5/06 1030	Received By/Stored In: mstankovich	Date/Time: 7/5/06 1030
Relinquished By/Removed From: WCH mstankovich	Date/Time: 7/5/06 1500	Received By/Stored In: FedEx	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 7-6-06 0930	Received By/Stored In: Vernardy	Date/Time: 7-6-06 0930
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)
~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154,~~ Europium-155}

6-29-06

Personnel not available to relinquish samples from 3728 Ref # 3B on 7/5/06

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 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	1607-B2		DATA PACKAGE:	K0459	
VALIDATOR:	TLI	LAB:	LLI	DATE:	8/20/06
			SDG:	K0459	

ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		

SAMPLES/MATRIX			
J12PW5	J12PW6	J12PW7	J12PW8
			Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

Surrogates analyzed? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no toxaphen MS, MSD or LCS no PAS

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: all toxaphene area

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: 23 August 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Subsite 1607-B2
Subject: Wet Chemistry - Data Package No. K0459-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0459 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
J12PW5	6/29/06	Soil	C	See note 1
J12PW6	6/29/06	Soil	C	See note 1
J12PW7	6/29/06	Soil	C	See note 1
J12PW8	6/29/06	Soil	C	See note 1

1– Chromium VI by 7196A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) 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

No field duplicates were submitted for analysis.

- **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 K0459 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

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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 WCH 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: K0459	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

Project: WASHINGTON CLOSURE HANFORD									
Lab: LLI	SDG: K0459								
Sample Number		J12PW5		J12PW6		J12PW7		J12PW8	
Remarks									
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.20	U	0.20	U	0.20	U	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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/14/06

CLIENT: TNU-HANFORD RC-025 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J12PW5	% Solids	99.3	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-002	J12PW6	% Solids	97.9	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-003	J12PW7	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-004	J12PW8	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

8/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-025 K0459
LVL#: 0607L425

W.O.#: 11343-606-001-9999-00
Date Received: 07-06-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 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. LvLI certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

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 Samples (LCS) for Chromium VI were within the laboratory control limits.

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

8. The replicate analyses for Chromium VI and Percent Solids 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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/27/06
Date

njp\i07-425

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 11 pages.

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-021	Page 1 of 1

Collector: C. Martinez, Kevin Singleton	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 1607-B2: pipeline		SAF No.: RC-025
Ice Chest No.: AFS-04-123	Field Logbook No.: EL-1585-6	COA: R607B22000	Method of Shipment: fed ex
Shipped To: ~~EBERLINE SERVICES LIONVILLE~~ Lionville 06/29/06	Offsite Property No.: A060516		Bill of Lading/Air Bill No.: See OSPC

Price Code: Air Quality — Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS: none

Special Handling and/or Storage: cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	aG	G/P	aG	aG	aG	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	120g	120mL	250mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3	~~Nickel-63~~; Strontium-89,90 – Total Sr	Pesticides - 8081, Chloro-Herbicides - ~~SW~~8151		
Sample No.	Matrix *	Sample Date	Sample Time							
J12PW5	SOIL	6-29-06	1300	✓	✓	✓	✓	NA	NA	NA	✓
J12PW6	SOIL	6-29-06	1308	✓	✓	✓	✓				✓
J12PW7	SOIL	6-29-06	1315	✓	✓	✓	✓				✓
J12PW8	SOIL	6-29-06	1325	✓	✓	✓	✓	✓	✓	✓	✓

TRB 7-3-06

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: Kevin Singleton	Received By/Stored In: 3728 Ref 3B	6-29-06 1700
Relinquished By/Removed From: 3728/3B	Received By/Stored In: mstankovich	7/5/06 1030
Relinquished By/Removed From: WCH mstankovich	Received By/Stored In: FedEx	7/5/06 1500
Relinquished By/Removed From: FedEx	Received By/Stored In: K Newnady	7-6-06 0930
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)

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154~~ Europium-155}

6-29-06

Personnel not available to relinquish samples from 3728 Ref # 3B on 7/5/06

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 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	1607-B2		DATA PACKAGE:	K0459	
VALIDATOR:	TLI	LAB: LLI		DATE: 8/20/06	
			SDG:	K0459	

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
J12PW5 J12PW6 J12PW7 J12PW8
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 07/14/06

CLIENT: TNU-HANFORD RC-025

LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI070-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/14/06

CLIENT: TNU-HANFORD RC-025 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J12PW5	Soluble Chromium VI	3.5	0.20u	4.0	88.6	1.0
		Insoluble Chromium VI	1250	0.20u	1250	100.4	100
BLANK10	06LVI070-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.7	1.0
		Insoluble Chromium VI	1180	0.20u	1130	104.0	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/14/06

CLIENT: TNU-HANFORD RC-025 LVL LOT #: 0607L425

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J12PW5	Chromium VI	0.20u	0.20u	NC	1.0
-004REP	J12PW8	% Solids	99.8	99.8	0.050	1.0