0071316

SAF-RC-020
100-BC Burial Grounds – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 — INITIAL/DATE

COMMENTS:

SDG K0494 SAF-RC-020

Waste Site: 118-B-1 Area 7

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OCT 24 2006
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Date: 21 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 118-B-1
Subject: Semivolatile - Data Package No. K0494-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0494 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
J12XC6	7/26/06	Soil	C	See note 1
J12XC7	7/26/06	Soil	C	See note 1
J12XC8	7/26/06	Soil	C	See note 1
J12XC9	7/26/06	Soil	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). 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 detected phenol, bis(2-ethylhexyl)phthalate and di-n-butylphthalate results were raised to the RQL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the

spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and matrix spike duplicate results outside QC limits (57% & 59%), all 1,2,4-trichlorobenzene 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 (65%), all 2,4-dinitrophenol 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. No semivolatile RQLs were specified.

- **Completeness**

Data package No. K0494 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 detected phenol, bis(2-ethylhexyl)phthalate and di-n-butylphthalate results were raised to the RQL, qualified as undetected and flagged "U".

- Due to matrix spike and matrix spike duplicate results outside QC limits (57% & 59%), all 1,2,4-trichlorobenzene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (65%), all 2,4-dinitrophenol 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: K0494	REVIEWER: TLI	Project: 118-B-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Phenol Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	U at RQL	All detected analytes	Blank contamination
1,2,4-Trichlorobenzene	J	All	MS/MSD recovery
2,4-Dinitrophenol	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI	SDG: K0494								
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Extraction Date		8/1/06		8/1/06		8/1/06		8/1/06	
Analysis Date		8/15/06		8/15/06		8/15/06		8/17/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Phenol		330	U	330	U	330	U	340	U
bis(2-Chloroethyl)ether		330	U	330	U	340	U	340	U
2-Chlorophenol		330	U	330	U	340	U	340	U
1,3-Dichlorobenzene		330	U	330	U	340	U	340	U
1,4-Dichlorobenzene		330	U	330	U	340	U	340	U
1,2-Dichlorobenzene		330	U	330	U	340	U	340	U
2-Methylphenol		330	U	330	U	340	U	340	U
2,2'-oxybis(1-chloropropane)		330	U	330	U	340	U	340	U
3 and/or 4-Methylphenol		330	U	330	U	340	U	340	U
N-Nitroso-di-n-propylamine		330	U	330	U	340	U	340	U
Hexachloroethane		330	U	330	U	340	U	340	U
Nitrobenzene		330	U	330	U	340	U	340	U
Isophorone		330	U	330	U	340	U	340	U
2-Nitrophenol		330	U	330	U	340	U	340	U
2,4-Dimethylphenol		330	U	330	U	340	U	340	U
bis(2-Chloroethoxy)methane		330	U	330	U	340	U	340	U
2,4-Dichlorophenol		330	U	330	U	340	U	340	U
1,2,4-Trichlorobenzene		330	UJ	330	UJ	340	UJ	340	UJ
Naphthalene		19		330	U	340	U	340	U
4-Chloroaniline		330	U	330	U	340	U	340	U
Hexachlorobutadiene		330	U	330	U	340	U	340	U
4-Chloro-3-methylphenol		330	U	330	U	340	U	340	U
2-Methylnaphthalene		26		330	U	340	U	340	U
Hexachlorocyclopentadiene		330	U	330	U	340	U	340	U
2,4,6-Trichlorophenol		330	U	330	U	340	U	340	U
2,4,5-Trichlorophenol*		840	U	850	U	850	U	840	U
2-Chloronaphthalene		330	U	330	U	340	U	340	U
2-Nitroaniline*		840	U	850	U	850	U	840	U
Dimethylphthalate		330	U	330	U	340	U	340	U
Acenaphthylene		330	U	330	U	340	U	340	U
2,6-Dinitrotoluene		330	U	330	U	340	U	340	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000010A

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI	SDG: K0494								
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Extraction Date		8/1/06		8/1/06		8/1/06		8/1/06	
Analysis Date		8/15/06		8/15/06		8/15/06		8/17/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*		840	U	850	U	850	U	840	U
Acenaphthene		330	U	330	U	340	U	340	U
2,4-Dinitrophenol*		840	UJ	850	UJ	850	UJ	840	UJ
4-Nitrophenol*		840	U	850	U	850	U	840	U
Dibenzofuran		330	U	330	U	340	U	340	U
2,4-Dinitrotoluene		330	U	330	U	340	U	340	U
Diethylphthalate		330	U	25		340	U	340	U
4-Chlorophenyl-phenyl ether		330	U	330	U	340	U	340	U
Fluorene		330	U	330	U	340	U	340	U
4-Nitroaniline*		840	U	850	U	850	U	840	U
4,6-Dinitro-2-methylphenol*		840	U	850	U	850	U	840	U
N-Nitrosodiphenylamine		330	U	330	U	340	U	340	U
4-Bromophenyl-phenyl ether		330	U	330	U	340	U	340	U
Hexachlorobenzene		330	U	330	U	340	U	340	U
Pentachlorophenol*		840	U	850	U	850	U	840	U
Phenanthrene		330	U	330	U	340	U	340	U
Anthracene		330	U	330	U	340	U	340	U
Carbazole		330	U	330	U	340	U	340	U
Di-n-butylphthalate		330	U	330	U	330	U	330	U
Fluoranthene		330	U	330	U	340	U	340	U
Pyrene		330	U	330	U	340	U	340	U
Butylbenzylphthalate		330	U	330	U	340	U	340	U
3,3'-Dichlorobenzidine		330	U	330	U	340	U	340	U
Benzo(a)anthracene		330	U	330	U	340	U	340	U
Chrysene		330	U	330	U	340	U	340	U
bis(2-Ethylhexyl)phthalate		330	U	330	U	330	U	330	U
Di-n-octylphthalate		330	U	330	U	340	U	340	U
Benzo(b)fluoranthene		330	U	330	U	340	U	340	U
Benzo(k)fluoranthene		330	U	330	U	340	U	340	U
Benzo(a)pyrene		330	U	330	U	340	U	340	U
Indeno(1,2,3-cd)pyrene		330	U	330	U	340	U	340	U
Dibenz(a,h)anthracene		330	U	330	U	340	U	340	U
Benzo(g,h,i)perylene		330	U	330	U	340	U	340	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000010B

000000006

	Cust ID:	J12XC6	J12XC7	J12XC8	J12XC8	J12XC8	J12XC9
Sample Information	RFW#:	001	002	003	003 MS	003 MSD	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	75 %	64 %	56 %	56 %	57 %	70 %
	2-Fluorobiphenyl	80 %	45 %	58 %	79 %	77 %	74 %
	Terphenyl-d14	72 %	36 %	75 %	81 %	77 %	89 %
	Phenol-d5	76 %	79 %	62 %	83 %	80 %	76 %
	2-Fluorophenol	73 %	70 %	57 %	74 %	73 %	70 %
	2,4,6-Tribromophenol	70 %	87 %	76 %	93 %	90 %	87 %
		fl	fl	fl	fl	fl	fl
Phenol		330 ~~41~~ 21 JB U	330 ~~42~~ 21 JB U	330 ~~20~~ 41 JB U	80 %	77 %	340 U
bis(2-Chloroethyl)ether		330 U	330 U	340 U	77 %	75 %	340 U
2-Chlorophenol		330 U	330 U	340 U	78 %	76 %	340 U
1,3-Dichlorobenzene		330 U	330 U	340 U	72 %	69 %	340 U
1,4-Dichlorobenzene		330 U	330 U	340 U	69 %	68 %	340 U
1,2-Dichlorobenzene		330 U	330 U	340 U	76 %	72 %	340 U
2-Methylphenol		330 U	330 U	340 U	81 %	78 %	340 U
2,2'-oxybis(1-Chloropropane)		330 U	330 U	340 U	73 %	71 %	340 U
4-Methylphenol		330 U	330 U	340 U	79 %	81 %	340 U
N-Nitroso-di-n-propylamine		330 U	330 U	340 U	77 %	78 %	340 U
Hexachloroethane		330 U	330 U	340 U	69 %	67 %	340 U
Nitrobenzene		330 U	330 U	340 U	56 %	58 %	340 U
Isophorone		330 U	330 U	340 U	64 %	68 %	340 U
2-Nitrophenol		330 U	330 U	340 U	63 %	63 %	340 U
2,4-Dimethylphenol		330 U	330 U	340 U	58 %	55 %	340 U
bis(2-Chloroethoxy)methane		330 U	330 U	340 U	62 %	62 %	340 U
2,4-Dichlorophenol		330 U	330 U	340 U	62 %	61 %	340 U
1,2,4-Trichlorobenzene		330 U J	330 U J	340 U J	57 * %	59 * %	340 U J
Naphthalene		19 J	330 U	340 U	58 %	58 %	340 U
4-Chloroaniline		330 U	330 U	340 U	67 %	65 %	340 U
Hexachlorobutadiene		330 U	330 U	340 U	64 %	64 %	340 U
4-Chloro-3-methylphenol		330 U	330 U	340 U	63 %	62 %	340 U
2-Methylnaphthalene		26 J	330 U	340 U	63 %	63 %	340 U
Hexachlorocyclopentadiene		330 U	330 U	340 U	79 %	61 %	340 U
2,4,6-Trichlorophenol		330 U	330 U	340 U	66 %	86 %	340 U
2,4,5-Trichlorophenol		840 U	840 U	840 U	88 %	86 %	840 U

*= Outside of EPA CLP QC limits.

9/19/06

000011

Cust ID:	J12XC6	J12XC7	J12XC8	J12XC8	J12XC8	J12XC9
RFW#:	001	002	003	003 MS	003 MSD	004
2-Chloronaphthalene	330 U	330 U	340 U	81 %	80 %	340 U
2-Nitroaniline	840 U	840 U	840 U	85 %	83 %	840 U
Dimethylphthalate	330 U	330 U	340 U	84 %	83 %	340 U
Acenaphthylene	330 U	330 U	340 U	83 %	83 %	340 U
2,6-Dinitrotoluene	330 U	330 U	340 U	82 %	85 %	340 U
3-Nitroaniline	840 U	840 U	840 U	104 %	92 %	840 U
Acenaphthene	330 U	330 U	340 U	79 %	80 %	340 U
2,4-Dinitrophenol	840 U J	840 U J	840 U J	59 %	30 %	840 U J
4-Nitrophenol	840 U	840 U	840 U	80 %	70 %	840 U
Dibenzofuran	330 U	330 U	340 U	84 %	82 %	340 U
2,4-Dinitrotoluene	330 U	330 U	340 U	93 %	88 %	340 U
Diethylphthalate	330 U	25 J	340 U	85 %	85 %	340 U
4-Chlorophenyl-phenylether	330 U	330 U	340 U	84 %	84 %	340 U
Fluorene	330 U	330 U	340 U	82 %	81 %	340 U
4-Nitroaniline	840 U	840 U	840 U	83 %	75 %	840 U
4,6-Dinitro-2-methylphenol	840 U	840 U	840 U	94 %	86 %	840 U
N-Nitrosodiphenylamine (1)	330 U	330 U	340 U	67 %	63 %	340 U
4-Bromophenyl-phenylether	330 U	330 U	340 U	78 %	71 %	340 U
Hexachlorobenzene	330 U	330 U	340 U	91 %	84 %	340 U
Pentachlorophenol	840 U	840 U	840 U	108 %	98 %	840 U
Phenanthrene	330 U	330 U	340 U	86 %	80 %	340 U
Anthracene	330 U	330 U	340 U	90 %	84 %	340 U
Carbazole	330 U	330 U	340 U	78 %	67 %	340 U
Di-n-butylphthalate	330 ~~180~~ 9/19/06 JB U	330 ~~74~~ 9/19/06 JB U	330 ~~53~~ 9/19/06 JB U	91 %	84 %	330 ~~69~~ 9/19/06 JB U
Fluoranthene	330 U	330 U	340 U	109 %	93 %	340 U
Pyrene	330 U	330 U	340 U	86 %	80 %	340 U
Butylbenzylphthalate	330 U	330 U	340 U	91 %	83 %	340 U
3,3'-Dichlorobenzidine	330 U	330 U	340 U	95 %	79 %	340 U
Benzo(a)anthracene	330 U	330 U	340 U	88 %	79 %	340 U
Chrysene	330 U	330 U	340 U	86 %	81 %	340 U
bis(2-Ethylhexyl)phthalate	330 ~~250~~ 9/19/06 JB U	330 ~~65~~ 9/19/06 JB U	330 ~~70~~ 9/19/06 JB U	87 %	82 %	330 ~~38~~ 9/19/06 JB U
Di-n-octyl phthalate	330 U	330 U	340 U	106 %	93 %	340 U
Benzo(b)fluoranthene	330 U	330 U	340 U	90 %	88 %	340 U
Benzo(k)fluoranthene	330 U	330 U	340 U	84 %	86 %	340 U
Benzo(a)pyrene	330 U	330 U	340 U	89 %	86 %	340 U
Indeno(1,2,3-cd)pyrene	330 U	330 U	340 U	85 %	80 %	340 U
Dibenz(a,h)anthracene	330 U	330 U	340 U	82 %	81 %	340 U
Benzo(g,h,i)perylene	330 U	330 U	340 U	83 %	80 %	340 U

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

JB 9/19/06

00000005

00000002

000000007

	Cust ID:	SBLKBA		SBLKBA BS	
Sample Information	RFW#:	06LK0619-MB1		06LK0619-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	69	%	56	%
	2-Fluorobiphenyl	72	%	82	%
	Terphenyl-d14	88	%	102	%
	Phenol-d5	80	%	83	%
	2-Fluorophenol	76	%	84	%
	2,4,6-Tribromophenol	90	%	113	%
Phenol		34	J	90	%
bis(2-Chloroethyl)ether		330	U	90	%
2-Chlorophenol		330	U	78	%
1,3-Dichlorobenzene		330	U	76	%
1,4-Dichlorobenzene		330	U	74	%
1,2-Dichlorobenzene		330	U	81	%
2-Methylphenol		330	U	87	%
2,2'-oxybis(1-Chloropropane)		330	U	85	%
4-Methylphenol		330	U	90	%
N-Nitroso-di-n-propylamine		330	U	96	%
Hexachloroethane		330	U	78	%
Nitrobenzene		330	U	62	%
Isophorone		330	U	68	%
2-Nitrophenol		330	U	67	%
2,4-Dimethylphenol		330	U	65	%
bis(2-Chloroethoxy)methane		330	U	68	%
2,4-Dichlorophenol		330	U	70	%
1,2,4-Trichlorobenzene		330	U	62	%
Naphthalene		330	U	62	%
4-Chloroaniline		330	U	76	%
Hexachlorobutadiene		330	U	67	%
4-Chloro-3-methylphenol		330	U	74	%
2-Methylnaphthalene		330	U	71	%
Hexachlorocyclopentadiene		330	U	82	%
2,4,6-Trichlorophenol		330	U	102	%
2,4,5-Trichlorophenol		830	U	107	%

*= Outside of EPA CLP QC limits.

K 9/19/06

000003

RFW#: 06LE0619-MB1 06LE0619-MB1

2-Chloronaphthalene	330	U	95	%
2-Nitroaniline	830	U	122	%
Dimethylphthalate	330	U	97	%
Acenaphthylene	330	U	103	%
2,6-Dinitrotoluene	330	U	100	%
3-Nitroaniline	830	U	120	%
Acenaphthene	330	U	99	%
2,4-Dinitrophenol	830	U	22	%
4-Nitrophenol	830	U	101	%
Dibenzofuran	330	U	99	%
2,4-Dinitrotoluene	330	U	106	%
Diethylphthalate	330	U	98	%
4-Chlorophenyl-phenylether	330	U	97	%
Fluorene	330	U	101	%
4-Nitroaniline	830	U	94	%
4,6-Dinitro-2-methylphenol	830	U	85	%
N-Nitrosodiphenylamine (1)	330	U	87	%
4-Bromophenyl-phenylether	330	U	91	%
Hexachlorobenzene	330	U	106	%
Pentachlorophenol	830	U	85	%
Phenanthrene	330	U	104	%
Anthracene	330	U	105	%
Carbazole	330	U	95	%
Di-n-butylphthalate	51	J	105	%
Fluoranthene	330	U	106	%
Pyrene	330	U	103	%
Butylbenzylphthalate	35	J	111	%
3,3'-Dichlorobenzidine	330	U	140	%
Benzo(a)anthracene	330	U	103	%
Chrysene	330	U	102	%
bis(2-Ethylhexyl)phthalate	70	J	114	%
Di-n-octyl phthalate	330	U	112	%
Benzo(b)fluoranthene	330	U	100	%
Benzo(k)fluoranthene	330	U	101	%
Benzo(a)pyrene	330	U	104	%
Indeno(1,2,3-cd)pyrene	330	U	112	%
Dibenz(a,h)anthracene	330	U	107	%
Benzo(g,h,i)perylene	330	U	105	%

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

9/19/06

000000008

000014

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L596
SDG/SAF # K0494/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-28-2006

SEMIVOLATILE

Four (4) soil samples were collected on 07-26-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 08-01-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 08-06,15,16,17-2006.

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. All 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. Two (2) of one hundred and twenty-eight (128) matrix spike recoveries were 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 blanks contained the common laboratory contaminant Phenol, Bis (2-Ethylhexy) phthalate, Di-n-butylphthalate and Butylbenzylpthalate at levels 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 part of the analytical data. Therefore, this report should only be reproduced in its entirety of 17 pages.

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

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.

Judy Stm

Ian Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/23/06
Date

kim\gorup\data\bna\tnu-hanford\0607-596.doc

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06MS290

Initiator: Robert Carles
Date: 8/23/06
Client: TMH Hazen RCOW

Batch: 06G7596
Samples: MS/MSD
Method: SW846/MCAWW/CLP/

Parameter: C6H
Matrix: Soil
Prep Batch: 06G679

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)

1,2,4 trichlorobenzene spike recovery out of control limits in MS/MSD (OK in BS)

2. Known or Probable Causes(s) Since all surrogates/other spikes OK not an extraction problem, specific matrix occurrence can occur with spike recoveries

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: 8/23/06

__ 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: _____ 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
8	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	9	X MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-In: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-020-039

Collector: C. Martinez, KM Singleton, R. Vicks	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code: 8D	Data Turnaround: Air Quality 21 days		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 118-B-1 Area 7		SAF No.: RC-020
Ice Chest No.: AFS-04-052	Field Logbook No.: EFL 1173-8	COA: 2119812006	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060586		Bill of Lading/Air Bill No.: see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~none~~ TRB 7-27-06

Cool to 4°c

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	G/P	G/P	aG	aG	G	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	0
Volume	250mL	125mL	120mL	120mL	120mL	500mL	125mL	125mL	500mL	60mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	Carbon-14; Tritium - H3	Nickel-63, Strontium-89,90 – Total Sr	Isotope Plutonium	Plutonium-24 See item #3
J12XC6	SOIL	7-26-06	0750	✓	✓	✓	✓	✓					
J12XC7	SOIL	7-26-06	0815	✓	✓	✓	✓	✓					
J12XC8	SOIL	7-26-06	0930	✓	✓	✓	✓	✓					
J12XC9	SOIL	7-26-06	1000	✓	✓	✓	✓	✓					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
KM Singleton	7-26-06 1515	3728 lab 3C	7-26-06 1515
3728/3C	7/27/06 1000	mstankovich	7/27/06 1000
mstankovich	7/27/06 1500	Fed Ex	
Fed Ex	7/28/06 1005		7-28-06 1005

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV) ~~(2) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]~~

3) Run Plutonium-241, from remaining material in 500ml plastic bottle 7-26-06

Personnel not available to Relinquish samples from 3728 Ref # 3C on 7/27/06

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquid, T=Tissue, WI=Wipe, L=Liquid, V=Vapor, O=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: 118-B-1			DATA PACKAGE: K0494		
VALIDATOR: TLR		LAB: LLI		DATE: 9/18/06	
			SDG: K0494		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J12XC6	J12XC7	J12XC8	J12XC9		
					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: MB – phenol – U at RQL – all detects
MB di-n-butylphthalate – " " " " "
MB – bis(2-ethylhexyl)phthalate – U at RQL – all detects

no FB

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

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

Comments: MS/MSD – 1,2,4-trichlorobenzene – J all

no PAs

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: 2,4-dinitrophenol - 65% - 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 9/19/0

None specified

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: 21 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Burial Grounds – Soil Full Protocol – Waste Site 118-B-1
Subject: Radiochemistry - Data Package No. K0494-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0494 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J12XC6	7/26/06	Soil	C	See note 1
J12XC7	7/26/06	Soil	C	See note 1
J12XC8	7/26/06	Soil	C	See note 1
J12XC9	7/26/06	Soil	C	See note 1

1 – Gamma spectroscopy, alpha spectroscopy, tritium, carbon-14, nickel-63, total strontium.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). 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 Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 65-135%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

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

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike 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 contract required detection limit (CRDL) and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Four analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0494 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of a matrix spike analysis, all tritium 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.

Four 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

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

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0494	REVIEWER: TH	Project: 118-B-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tritium	J	All	No MS 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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0494

7495-002 J12XC7

DATA SHEET

SDG	7495	Client/Case no	Hanford SDG K0494
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R607169-02	Client sample id	J12XC7
Dept sample id	7495-002	Location/Matrix	118-B-1 Area 7 SOLID
Received	07/31/06	Collected/Weight	07/26/06 08:15 2156 g
% solids	99.1	Custody/SAF No	RC-020-039 RC-020

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-0.580	1.8	3.1	400	U J	H
Carbon 14	14762-75-5	0.144	1.3	2.3	50	U	C
Nickel 63	13981-37-8	-0.140	2.2	3.8	30	U	NI_L
Total Strontium	SR-RAD	-0.045	0.18	0.33	1.0	U	SR
Americium 241	14596-10-2	0.028	0.11	0.21	1.0	U	AM
Uranium 233/234	U-233/234	0.602	0.29	0.27	1.0		U
Uranium 235	15117-96-1	0.086	0.086	0.33	1.0	U	U
Uranium 238	U-238	0.708	0.29	0.27	1.0		U
Plutonium 238	13981-16-3	0.267	0.54	0.85	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.18	0.68	1.0	U	PU
Plutonium 241	14119-32-5	-11.4	13	23	15	U	PU_L
Potassium 40	13966-00-2	26.5	1.2	0.38			GAM
Cobalt 60	10198-40-0	U		0.037	0.050	U	GAM
Cesium 137	10045-97-3	0.450	0.047	0.046	0.10		GAM
Radium 226	13982-63-3	1.04	0.084	0.075	0.10		GAM
Radium 228	15262-20-1	1.44	0.19	0.18	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	1.43	0.060	0.054			GAM
Thorium 232	TH-232	1.44	0.19	0.18			GAM
Uranium 235	15117-96-1	U		0.17		U	GAM
Uranium 238	U-238	U		4.5		U	GAM
Silver 108m	14391-65-2	U		0.029		U	GAM

100-BC Burial Grounds-Soil Full Prot

K 9/19/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/25/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0494

7495-003 J12XC8

DATA SHEET

SDG	7495	Client/Case no	Hanford SDG K0494
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R607169-03	Client sample id	J12XC8
Dept sample id	7495-003	Location/Matrix	118-B-1 Area 7 SOLID
Received	07/31/06	Collected/Weight	07/26/06 09:30 2005 g
% solids	98.6	Custody/SAF No	RC-020-039 RC-020

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-1.30	1.8	3.1	400	UJ	H
Carbon 14	14762-75-5	-0.422	1.3	2.2	50	U	C
Nickel 63	13981-37-8	0.516	2.1	3.5	30	U	NI_L
Total Strontium	SR-RAD	0.031	0.15	0.30	1.0	U	SR
Americium 241	14596-10-2	0	0.060	0.23	1.0	U	AM
Uranium 233/234	U-233/234	0.718	0.33	0.25	1.0		U
Uranium 235	15117-96-1	0.040	0.079	0.30	1.0	U	U
Uranium 238	U-238	0.424	0.26	0.25	1.0		U
Plutonium 238	13981-16-3	-0.071	0.14	0.54	1.0	U	PU
Plutonium 239/240	PU-239/240	0.071	0.14	0.54	1.0	U	PU
Plutonium 241	14119-32-5	-7.39	17	28	15	U	PU_L
Potassium 40	13966-00-2	33.6	1.9	0.59			GAM
Cobalt 60	10198-40-0	U		0.082	0.050	U	GAM
Cesium 137	10045-97-3	0.271	0.088	0.091	0.10		GAM
Radium 226	13982-63-3	1.17	0.17	0.15	0.10		GAM
Radium 228	15262-20-1	2.14	0.34	0.31	0.20		GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.24	0.10	U	GAM
Europium 155	14391-16-3	U		0.19	0.10	U	GAM
Thorium 228	14274-82-9	1.80	0.13	0.11			GAM
Thorium 232	TH-232	2.14	0.34	0.31			GAM
Uranium 235	15117-96-1	U		0.28		U	GAM
Uranium 238	U-238	U		8.9		U	GAM
Silver 108m	14391-65-2	U		0.054		U	GAM

100-BC Burial Grounds-Soil Full Prot

9/19/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/25/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0494

7495-004 J12XC9

DATA SHEET

SDG	7495	Client/Case no	Hanford SDG K0494
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R607169-04	Client sample id	J12XC9
Dept sample id	7495-004	Location/Matrix	118-B-1 Area 7 SOLID
Received	07/31/06	Collected/Weight	07/26/06 10:00 2186 g
% solids	98.9	Custody/SAF No	RC-020-039 RC-020

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-0.879	1.8	3.1	400	U J	H
Carbon 14	14762-75-5	-0.574	1.3	2.2	50	U	C
Nickel 63	13981-37-8	2.41	2.3	3.7	30	U	NI_L
Total Strontium	SR-RAD	0.051	0.17	0.33	1.0	U	SR
Americium 241	14596-10-2	0.058	0.12	0.22	1.0	U	AM
Uranium 233/234	U-233/234	0.292	0.22	0.28	1.0		U
Uranium 235	15117-96-1	0.044	0.088	0.34	1.0	U	U
Uranium 238	U-238	0.729	0.30	0.28	1.0		U
Plutonium 238	13981-16-3	-0.129	0.26	0.98	1.0	U	PU
Plutonium 239/240	PU-239/240	0.129	0.26	0.98	1.0	U	PU
Plutonium 241	14119-32-5	-12.3	15	26	15	U	PU_L
Potassium 40	13966-00-2	12.8	0.57	0.21			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	0.297	0.020	0.018	0.10		GAM
Radium 226	13982-63-3	0.536	0.042	0.039	0.10		GAM
Radium 228	15262-20-1	0.728	0.092	0.088	0.20		GAM
Europium 152	14683-23-9	0.104	0.037	0.052	0.10		GAM
Europium 154	15585-10-1	U		0.067	0.10	U	GAM
Europium 155	14391-16-3	U		0.072	0.10	U	GAM
Thorium 228	14274-82-9	0.595	0.027	0.026			GAM
Thorium 232	TH-232	0.728	0.092	0.088			GAM
Uranium 235	15117-96-1	U		0.085		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Silver 108m	14391-65-2	U		0.015		U	GAM

100-BC Burial Grounds-Soil Full Prot

9/19/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/25/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0494 was composed of four solid (soil) samples designated under SAF No. RC-020 with a Project Designation of: 100-BC Burial Grounds-Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on August 25, 2006.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.6 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

2.7 Plutonium-241 Analysis

The tracer yield for the QC blank was 18%, less than the minimum protocol requirement of 20%. No other problems were encountered during the course of the analyses.

2.8 Americium-241 Analysis

No problems were encountered during the course of the analyses.

2.9 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

Melissa Mannion — 8/13/6

Melissa C. Mannion
Senior Program Manager

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-039	Page 1 of 2

Collector: C. Martinez, Kevin Snyder, R. Voeks	Company Contact: C. Martinez; Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH	Price Code: 8D; Data Turnaround: Air Quality 21 days
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 118-B-1 Area 7 K0494 (7495)	SAF No.: RC-020	
Ice Chest No.: AFS-04-053	Field Logbook No.: EFL 1173-8; COA: R118012000	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060570	Bill of Lading/Air Bill No.: see OSPC 7-26-06	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

none

000018

SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions	Carbon-14; Tritium - H3	Nickel-63; Strontium-89,90 – Total Sr	Isotopic Plutonium	Plutonium-241 See item #3
Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	G/P	G/P	aG	aG	G	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	0
Volume	250mL	125mL	120mL	120mL	120mL	500mL	125mL	125mL	500mL	60mL

Sample No.	Matrix *	Sample Date	Sample Time										
J12XC6	SOIL	7-26-06	0750						✓	✓	✓	✓	
J12XC7	SOIL	7-26-06	0815						✓	✓	✓	✓	
J12XC8	SOIL	7-26-06	0930						✓	✓	✓	✓	
J12XC9	SOIL	7-26-06	1000						✓	✓	✓	✓	

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Rob Voeks	7/26/06 1522	3728B Ref 3C	7/26/06 1522
Relinquished By/Removed From: 3728 #3C	7-27-06 1045	[illegible]	7-27-06 1045
Relinquished By/Removed From: [illegible]	7-27-06 1500	Fed Ex	
Relinquished By/Removed From: FED EX		Received By/Stored In: [illegible]	07/31/06 9:15
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]

3) Run Plutonium-241, from remaining material in 500ml plastic bottle.

Personnel not available to relinquish samples from 3728 Ref # 3C on 7/27/06

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)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-039	Page 2 of 2

Collector: C. Martinez, Kevin Sizelkin, R. Vocks	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code: 8D	Data Turnaround: 21 days	Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 118-B-1 Area 7 K0494 (7495)
SAF No.: RC-020	Air Quality	Ice Chest No.: AFS-04-053	Field Logbook No.: EFL 1173-8
COA: R1/EB/2000	Method of Shipment: FED EX	Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: A060570
Bill of Lading/Air Bill No.: see OSPC			

POSSIBLE SAMPLE HAZARDS/REMARKS
none

Special Handling and/or Storage
none

000019

Preservation	None	None	Cool 4C	Cool 4C
Type of Container	G/P	G/P	aG	aG
No. of Container(s)	0	0	1	1
Volume	60mL	60mL	250mL	250mL
SAMPLE ANALYSIS	Americium-241	Isotopic Uranium	Pesticides - 8081	Chloro-Herbicides - EPA8151
	See item #3	See item #3		

Sample No.	Matrix *	Sample Date	Sample Time
J12XC6	SOIL	7-26-06	0750
J12XC7	SOIL	7-26-06	0815
J12XC8	SOIL	7-26-06	0930
J12XC9	SOIL	7-26-06	1000

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Rob Vocks	7/26/06 1502	3728B Ref-3C	7/26/06 1502
Relinquished By/Removed From	3728 #3C	7-27-06 1045	J.R. Edmundson	7-27-06 1045
Relinquished By/Removed From	J.R. Edmundson for DCH / J.R. Edmundson	7-27-06 1500	Fed Ex	
Relinquished By/Removed From	Fed Ex		Received By/Stored In: FM	07/31/06 9:15
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS
3) Run Americium-241 and Isotopic Uranium from remaining material in 500ml plastic bottle.

Personnel not available to Relinquish samples from 3728 Ref# 3C on 7/27/06

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

BH-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-B-1		DATA PACKAGE:	K0494	
VALIDATOR:	TLI	LAB: EB		DATE: 9/18/06	
			SDG:	K0494	
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	C-14	Ni-63	
SAMPLES/MATRIX					
J12XC6	J12XC7	J12XC8	J12XC9		
					Soil

1. Completeness ..... ☐ N/A

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

Comments: _____

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

Instruments/detectors calibrated? ..... Yes No N/A

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

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

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

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

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

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

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

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

Comments: _____

4. Background Counts (Levels D, E) ..... ☒ N/A

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

Background Counts acceptable? ..... Yes No N/A

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

Comments: _____

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

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

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

Analytes detected in method blank? ..... Yes No N/A

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

Comments:

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

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

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

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

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

Comments: _____

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

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

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

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

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

Comments: _____

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

Matrix spike analyzed? ..... Yes No N/A

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

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

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

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

Comments: no 3H MS - J alf

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

Comments: no Field QC

12. Holding Times (All levels)

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

Comments: _____

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

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

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

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

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

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

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

Comments: 24 ours

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0494

7495-006 Method Blank

METHOD BLANK

SDG 7495 Client/Case no Hanford SDG K0494
Contact Melissa C. Mannion Contract No. 630

Lab sample id R607169-06 Client sample id Method Blank
Dept sample id 7495-006 Material/Matrix SOLID
SAF No RC-020

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-1.28	2.0	3.5	400	U	H
Carbon 14	14762-75-5	-0.272	1.5	2.5	50	U	C
Nickel 63	13981-37-8	0	1.9	3.2	30	U	NI_L
Total Strontium	SR-RAD	0.103	0.17	0.33	1.0	U	SR
Americium 241	14596-10-2	0.063	0.19	0.30	1.0	U	AM
Uranium 233/234	U-233/234	0	0.080	0.31	1.0	U	U
Uranium 235	15117-96-1	0.048	0.097	0.37	1.0	U	U
Uranium 238	U-238	0	0.080	0.31	1.0	U	U
Plutonium 238	13981-16-3	0	0.15	0.57	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.15	0.57	1.0	U	PU
Plutonium 241	14119-32-5	-12.4	28	47	15	U	PU_L
Potassium 40	13966-00-2	U		0.38		U	GAM
Cobalt 60	10198-40-0	U		0.015	0.050	U	GAM
Cesium 137	10045-97-3	U		0.016	0.10	U	GAM
Radium 226	13982-63-3	U		0.032	0.10	U	GAM
Radium 228	15262-20-1	U		0.095	0.20	U	GAM
Europium 152	14683-23-9	U		0.037	0.10	U	GAM
Europium 154	15585-10-1	U		0.042	0.10	U	GAM
Europium 155	14391-16-3	U		0.043	0.10	U	GAM
Thorium 228	14274-82-9	U		0.021		U	GAM
Thorium 232	TH-232	U		0.095		U	GAM
Uranium 235	15117-96-1	U		0.054		U	GAM
Uranium 238	U-238	U		1.6		U	GAM
Silver 108m	14391-65-2	U		0.010		U	GAM

100-BC Burial Grounds-Soil Full Prot

QC-BLANK #58088

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/25/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0494

7495-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7495

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0494

Contract No. 630

Lab sample id R607169-05

Dept sample id 7495-005

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-020

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	896	30	9.2	400		H	903	36	99	83-117	80-120
Carbon 14	2020	41	7.9	50		C	2130	85	95	84-116	80-120
Nickel 63	254	6.5	3.1	30		NI_L	268	11	95	84-116	80-120
Total Strontium	11.5	0.65	0.29	1.0		SR	10.7	0.43	108	81-119	80-120
Americium 241	21.4	2.0	0.22	1.0		AM	22.4	0.90	96	84-116	80-120
Uranium 233/234	17.7	2.1	1.0	1.0		U	19.3	0.77	92	81-119	80-120
Uranium 235	16.3	2.0	0.25	1.0		U	15.7	0.63	104	78-122	80-120
Uranium 238	20.7	2.3	0.97	1.0		U	21.0	0.84	99	81-119	80-120
Plutonium 238	21.4	3.6	0.74	1.0		PU	26.2	1.0	82	78-122	80-120
Plutonium 239/240	25.0	3.9	0.74	1.0		PU	29.0	1.2	86	78-122	80-120
Plutonium 241	227	18	22	15		PU_L	220	8.8	103	84-116	80-120
Cobalt 60	0.780	0.055	0.024	0.050		GAM	0.767	0.031	102	74-126	80-120
Cesium 137	0.822	0.050	0.036	0.10		GAM	0.818	0.033	100	75-125	80-120

100-BC Burial Grounds-Soil Full Prot

QC-LCS #58087

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 1.06
Report date 08/25/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0494

7495-007 J12XC8

DUPLICATE

SDG 7495		Client/Case no Hanford	SDG K0494
Contact Melissa C. Mannion		Contract No. 630	
DUPLICATE	ORIGINAL		
ab sample id R607169-07	Lab sample id R607169-03	Client sample id J12XC8	
pt sample id 7495-007	Dept sample id 7495-003	Location/Matrix 118-B-1 Area 7	SOLID
	Received 07/31/06	Collected/Weight 07/26/06 09:30	2005 g
% solids 98.6	% solids 98.6	Custody/SAF No RC-020-039	RC-020

ALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
itium	-1.12	1.7	3.0	400	U	H	-1.30	1.8	3.1	U	-		0.1
rbon 14	-0.202	1.3	2.2	50	U	C	-0.422	1.3	2.2	U	-		0.2
ckel 63	-1.42	2.1	3.6	30	U	NI_L	0.516	2.1	3.5	U	-		1.3
tal Strontium	0.136	0.16	0.30	1.0	U	SR	0.031	0.15	0.30	U	-		1.0
ericium 241	-0.056	0.037	0.14	1.0	U	AM	0	0.060	0.23	U	-		1.6
anium 233/234	0.644	0.31	0.29	1.0		U	0.718	0.33	0.25		11	100	0.3
anium 235	0	0.092	0.35	1.0	U	U	0.040	0.079	0.30	U	-		0.7
anium 238	0.607	0.31	0.29	1.0		U	0.424	0.26	0.25		36	118	0.9
utonium 238	0.079	0.16	0.60	1.0	U	PU	-0.071	0.14	0.54	U	-		1.4
utonium 239/240	0	0.16	0.60	1.0	U	PU	0.071	0.14	0.54	U	-		0.7
utonium 241	-4.18	15	26	15	U	PU_L	-7.39	17	28	U	-		0.3
tassium 40	32.6	1.7	0.64			GAM	33.6	1.9	0.59		3	34	0.3
balt 60	U		0.063	0.050	U	GAM	U		0.082	U	-		0.4
sium 137	0.232	0.069	0.072	0.10		GAM	0.271	0.088	0.091		16	74	0.6
dium 226	1.14	0.12	0.10	0.10		GAM	1.17	0.17	0.15		3	42	0.2
dium 228	1.64	0.25	0.24	0.20		GAM	2.14	0.34	0.31		26	46	1.7
ropium 152	U		0.13	0.10	U	GAM	U		0.17	U	-		0.4
ropium 154	U		0.19	0.10	U	GAM	U		0.24	U	-		0.3
ropium 155	U		0.15	0.10	U	GAM	U		0.19	U	-		0.3
orium 228	1.83	0.11	0.097			GAM	1.80	0.13	0.11		2	35	0.1
orium 232	1.64	0.25	0.24			GAM	2.14	0.34	0.31		26	46	1.7
anium 235	U		0.22		U	GAM	U		0.28	U	-		0.3
anium 238	U		6.9		U	GAM	U		8.9	U	-		0.4
lver 108m	U		0.042		U	GAM	U		0.054	U	-		0.3

0-BC Burial Grounds-Soil Full Prot

-DUP#3 58089

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	08/25/06

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: EB									
Case	SDG: K0494								
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	-1.72	UJ	-0.580	UJ	-1.30	UJ	-0.879	UJ
Carbon-14	50	0.369	U	0.144	U	-0.422	U	-0.574	U
Nickel-63	30	-1.37	U	-0.140	U	0.516	U	2.41	U
Total strontium	1	0.219	U	-0.045	U	0.031	U	0.051	U
Americium-241		0	U	0.028	U	0	U	0.058	U
Uranium-233/234		0.473		0.602		0.718		0.292	
Uranium-235		0	U	0.086	U	0.040	U	0.044	U
Uranium-238		0.574		0.708		0.424		0.729	
Plutonium-238	1	-0.104	U	0.267	U	-0.071	U	-0.129	U
Plutonium-239/240	1	0	U	0	U	0.071	U	0.129	U
Plutonium-241		-3.98	U	-11.4	U	-7.39	U	-12.3	U
Potassium-40		26.8		26.5		33.6		12.8	
Cobalt 60	0.05	U	U*	U	U	U	U*	U	U
Cesium 137	0.1	0.578		0.450		0.271		0.297	
Radium-226		1.12		1.04		1.17		0.536	
Radium-228		1.48		1.44		2.14		0.728	
Europium 152	0.2	U	U	U	U	U	U	0.104	U
Europium 154	0.2	U	U*	U	U	U	U*	U	U
Europium 155		U	U	U	U	U	U	U	U
Thorium-228		1.42		1.43		1.80		0.595	
Thorium-232		1.48		1.44		2.14		0.728	
Uranium-235(gea)		U	U	U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U	U	U
Silver-108m	0.1	U	U	U	U	U	U	U	U

000010

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0494

7495-001 J12XC6

DATA SHEET

SDG	7495	Client/Case no	Hanford SDG K0494
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R607169-01	Client sample id	J12XC6
Dept sample id	7495-001	Location/Matrix	118-B-1 Area 7 SOLID
Received	07/31/06	Collected/Weight	07/26/06 07:50 2155 g
% solids	99.3	Custody/SAF No	RC-020-039 RC-020

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-1.72	2.0	3.4	400	U J	H
Carbon 14	14762-75-5	0.369	1.5	2.5	50	U	C
Nickel 63	13981-37-8	-1.37	2.1	3.7	30	U	NI_L
Total Strontium	SR-RAD	0.219	0.16	0.27	1.0	U	SR
Americium 241	14596-10-2	0	0.12	0.22	1.0	U	AM
Uranium 233/234	U-233/234	0.473	0.27	0.26	1.0		U
Uranium 235	15117-96-1	0	0.082	0.31	1.0	U	U
Uranium 238	U-238	0.574	0.28	0.26	1.0		U
Plutonium 238	13981-16-3	-0.104	0.42	1.0	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.21	0.80	1.0	U	PU
Plutonium 241	14119-32-5	-3.98	14	24	15	U	PU_L
Potassium 40	13966-00-2	26.8	1.8	0.61			GAM
Cobalt 60	10198-40-0	U		0.076	0.050	U	GAM
Cesium 137	10045-97-3	0.578	0.089	0.086	0.10		GAM
Radium 226	13982-63-3	1.12	0.15	0.13	0.10		GAM
Radium 228	15262-20-1	1.48	0.35	0.34	0.20		GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.23	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	1.42	0.12	0.11			GAM
Thorium 232	TH-232	1.48	0.35	0.34			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.8		U	GAM
Silver 108m	14391-65-2	U		0.049		U	GAM

100-BC Burial Grounds-Soil Full Prot

R 9/19/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/25/06

Date: 21 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 118-B-1
Subject: Pesticide/PCB/Herbicide - Data Package No. K0494-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0494 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
J12XC6	7/26/06	Soil	C	See note 1
J12XC7	7/26/06	Soil	C	See note 1
J12XC8	7/26/06	Soil	C	See note 1
J12XC9	7/26/06	Soil	C	See note 1

1– Pesticides by 8081, PCBs by 8082 & chlorinated herbicides by 8151A.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). 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 and picloram results were qualified as estimates and flagged "J".

Due to matrix spike duplicate recoveries outside QC limits, all dicamba (18%) and 2,4-DB (13%) results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (134%), the dieldrin result in sample J12XC6 was qualified as an estimate and flagged "J".

Due to an LCS recovery outside QC limits (55%), all aldrin 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.

Due to surrogate recoveries outside QC limits, all detected pesticide results were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

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

Due to RPDs outside QC limits, all dicamba (76%), 2,4,5-T (36%) and 2,4-DB (112%) 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 analytes met the RQL.

- **Completeness**

Data Package No. K0494 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene and picloram results were qualified as estimates and flagged "J".
- Due to matrix spike duplicate recoveries outside QC limits, all dicamba (18%) and 2,4-DB (13%) results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits (134%), the dieldrin result in sample J12XC6 was qualified as an estimate and flagged "J".
- Due to an LCS recovery outside QC limits (55%), all aldrin results were qualified as estimates and flagged "J".

- Due to surrogate recoveries outside QC limits, all detected pesticide results were qualified as estimates and flagged "J".

- Due to RPDs outside QC limits, all dicamba (76%), 2,4,5-T (36%) and 2,4-DB (112%) 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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/HERBICIDE DATA QUALIFICATION SUMMARY*

SDG: K0494	REVIEWER: TU	Project: 118 B-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene Picloram	J	All	No MS/MSD/LCS
Dicamba 2,4-DB	J	All	MSD recovery
Dieldrin	J	J12XC6	MS recovery
Aldrin	J	All	LCS recovery
All detected pesticide results	J	All	Surrogate recovery
Dicamba 2,4,5-T 2,4-DB	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI	SDG: K0494								
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Extraction Date		7/31/06		7/31/06		7/31/06		7/31/06	
Analysis Date		8/4/06		8/4/06		8/4/06		8/4/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	16.5	13	U	13	U	13	U	13	U
Aroclor-1221	16.5	13	U	13	U	13	U	13	U
Aroclor-1232	16.5	13	U	13	U	13	U	13	U
Aroclor-1242	16.5	13	U	13	U	13	U	13	U
Aroclor-1248	16.5	13	U	13	U	13	U	13	U
Aroclor-1254	16.5	13	U	13	U	13	U	13	U
Aroclor-1260	16.5	13	U	13	U	13	U	13	U

Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Extraction Date		7/31/06		7/31/06		7/31/06		7/31/06	
Analysis Date		8/9/06		8/9/06		8/9/06		8/9/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC		1.3	U	1.3	U	1.3	U	1.3	U
Gamma-BHC (Lindane)		1.3	U	1.3	U	1.3	U	1.3	U
Beta-BHC		1.3	U	1.3	U	1.3	U	1.3	U
Heptachlor		1.3	U	1.3	U	1.3	U	1.3	U
Delta-BHC		1.3	U	1.3	U	1.3	U	1.3	U
Aldrin		1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Heptachlor Epoxide		1.3	U	1.3	U	1.3	U	1.3	U
gamma-Chlordane		1.3	U	1.3	U	1.3	U	1.3	U
Endosulfan I		1.3	U	1.3	U	1.3	U	1.3	U
alpha-Chlordane		12	J	1.3	U	1.3	U	1.3	U
4,4'-DDE		15	J	1.3	U	1.3	U	15	J
Dieldrin		1.7	J	1.3	U	1.3	U	1.3	U
Endrin		1.3	U	1.3	U	1.3	U	1.3	U
4,4'-DDD		1.3	U	1.3	U	1.3	U	1.3	U
Endosulfan II		1.3	U	1.3	U	1.3	U	1.3	U
4,4'-DDT		1.3	U	1.3	U	1.3	U	1.3	U
Endrin Aldehyde		1.3	U	1.3	U	1.3	U	1.3	U
Endosulfan sulfate		1.3	U	1.3	U	1.3	U	1.3	U
Methoxyclor		9.1	J	1.3	U	1.3	U	1.3	U
Endrin Ketone		7.8	J	1.3	U	1.3	U	1.3	U
Toxaphene		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.

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

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI	SDG: K0494								
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Extraction Date		7/31/06		7/31/06		7/31/06		7/31/06	
Analysis Date		8/10/06		8/10/06		8/14/06		8/11/06	
Chlorinated Herbicides	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Dalapon		32		20		16		34	U
Dicamba		33	UJ	13	J	34	UJ	34	UJ
Dichloroprop		33	U	37		34	U	60	
2,4-D		26		33	U	20		13	
2,4,5-TP (Silvex)		17	U	17	U	17	U	17	U
2,4,5-T		17	UJ	17	UJ	17	UJ	17	UJ
Dinoseb		17	U	17	U	17	U	17	U
2,4-DB		27	J	17	UJ	17	UJ	17	UJ
Pentachlorophenol		17	U	17	U	17	U	17	U
Picloram		17	UJ	14	J	17	UJ	17	UJ

000012

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.

RFW Batch Number: 0607L596 Client: TNUHANFORD RC-020 K0494 Work Order: 11343606001 Page: 1

	Cust ID:	J12XC6	J12XC7	J12XC7	J12XC7	J12XC8	J12XC9
Sample Information	RFW#:	001	002	002 MS	002 MSD	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		96 %	94 %	94 %	92 %	88 %	91 %
Decachlorobiphenyl		103 %	102 %	105 %	104 %	97 %	108 %
Aroclor-1016		13 U	13 U	89 %	90 %	13 U	13 U
Aroclor-1221		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1232		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1242		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1248		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1254		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1260		13 U	13 U	92 %	95 %	13 U	13 U

	Cust ID:	PBLKMP	PBLKMP BS
Sample Information	RFW#:	06LE0618-MB1	06LE0618-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		90 %	90 %
Decachlorobiphenyl		94 %	95 %
Aroclor-1016		13 U	82 %
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	76 %

K 9/19/06

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

000000005

0900013

RFW Batch Number: 0607L596 Client: TMUHANFORD RC-020 K0494 Work Order: 11343606001 Page: 1

	Cust ID:	J12XC6	J12XC6	J12XC6	J12XC7	J12XC8	J12XC9
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	116 %	121 * %	130 * %	127 * %	124 * %	131 * %
	Decachlorobiphenyl	130 * %	146 * %	143 * %	136 * %	128 * %	141 * %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.3 U	94 %	104 %	1.3 U	1.3 U	1.3 U
gamma-BHC (Lindane)		1.3 U	96 %	102 %	1.3 U	1.3 U	1.3 U
Beta-BHC		1.3 U	133 * %	136 * %	1.3 U	1.3 U	1.3 U
Heptachlor		1.3 U	140 * %	146 * %	1.3 U	1.3 U	1.3 U
Delta-BHC		1.3 U	95 %	94 %	1.3 U	1.3 U	1.3 U
Aldrin		1.3 U J	111 %	89 %	1.3 U J	1.3 U J	1.3 U J
Heptachlor epoxide		1.3 U	163 * %	156 * %	1.3 U	1.3 U	1.3 U
gamma-Chlordane		1.3 U	146 * %	144 * %	1.3 U	1.3 U	1.3 U
Endosulfan I		1.3 U	140 * %	140 * %	1.3 U	1.3 U	1.3 U
alpha-Chlordane		12 ~~1~~ J	107 %	107 %	1.3 U	1.3 U	1.3 U
4,4'-DDE		15 ~ J	100 %	99 %	1.3 U	1.3 U	15 J
Dieldrin		1.7 ~~1~~ J	134 * %	129 %	1.3 U	1.3 U	1.3 U
Endrin		1.3 U	150 %	149 %	1.3 U	1.3 U	1.3 U
4,4'-DDD		1.3 U	128 * %	125 * %	1.3 U	1.3 U	1.3 U
Endosulfan II		1.3 U	131 * %	130 * %	1.3 U	1.3 U	1.3 U
4,4'-DDT		1.3 U	127 %	126 %	1.3 U	1.3 U	1.3 U
Endrin aldehyde		1.3 U	144 * %	140 * %	1.3 U	1.3 U	1.3 U
Endosulfan sulfate		1.3 U	117 %	116 %	1.3 U	1.3 U	1.3 U
Methoxychlor		9.1 ~~1~~ J	141 %	143 %	1.3 U	1.3 U	1.3 U
Endrin ketone		7.8 J	116 %	114 %	1.3 U	1.3 U	1.3 U
Toxaphene		13 U J	13 U	13 U	13 U J	13 U J	13 U J

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

9/19/06

000000006

0000014

	Cust ID:	PBLKMP	PBLKMP BS
Sample Information	RFW#:	06LE0618-MB1	06LE0618-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG

Surrogate:	Tetrachloro-m-xylene	107	%	101	%
	Decachlorobiphenyl	102	%	95	%
Alpha-BHC		0.33	U	109	%
gamma-BHC (Lindane)		0.33	U	108	%
Beta-BHC		0.33	U	103	%
Heptachlor		0.33	U	108	%
Delta-BHC		0.33	U	86	%
Aldrin		0.33	U	55 *	%
Heptachlor epoxide		0.33	U	102	%
gamma-Chlordane		0.33	U	102	%
Endosulfan I		0.33	U	108	%
alpha-Chlordane		0.33	U	101	%
4,4'-DDE		0.33	U	112	%
Dieldrin		0.33	U	105	%
Endrin		0.33	U	116	%
4,4'-DDD		0.33	U	110	%
Endosulfan II		0.33	U	102	%
4,4'-DDT		0.33	U	120	%
Endrin aldehyde		0.33	U	97	%
Endosulfan sulfate		0.33	U	97	%
Methoxychlor		0.33	U	119	%
Endrin ketone		0.33	U	100	%
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

9/12/06

9/15/06

000000007

000015

RFW Batch Number: 0607L596 Client: TNUHANFORD RC-020 K0494 Work Order: 11343606001 Page: 1

	Cust ID:	J12XC6	J12XC6	J12XC6	J12XC7	J12XC8	J12XC9
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:	DCAA	65 %	77 %	88 %	101 %	46 %	57 %
		fl	fl	fl	fl	fl	fl
Dalapon		32	54 %	57 %	20 J	16 J	34 U
Dicamba		33 UJ	40 %	18 * %	13 J	34 UJ	34 UJ
Dichloroprop		33 U	54 %	49 %	37	34 U	60
2,4-D		26	39 %	55 %	33 U	20	13
2,4,5-TP (Silvex)		17 U	84 %	83 %	17 U	17 U	17 U
2,4,5-T		17 UJ	65 %	45 %	17 UJ	17 UJ	17 UJ
Dinoseb		17 U	61 %	57 %	17 U	17 U	17 U
2,4-DB		27 J	46 %	13 * %	17 UJ	17 UJ	17 UJ
Pentachlorophenol		17 U	81 %	75 %	17 U	17 U	17 U
Picloram		17 UJ	NS %	NS %	14 J	17 UJ	17 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

000006

000016

9/19/06

9/19/06

	Cust ID:	PBLKNC		PBLKNC BS	
Sample Information	RFW#:	06LE0620-MB1		06LE0620-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	UG/KG		UG/KG	
Surrogate:	DCAA	74	%	54	%
			fl		fl
Dalapon		33	U	38	%
Dicamba		33	U	32	%
Dichloroprop		33	U	43	%
2,4-D		33	U	41	%
2,4,5-TP (Silvex)		17	U	67	%
2,4,5-T		17	U	54	%
Dinoseb		17	U	64	%
2,4-DB		17	U	73	%
Pentachlorophenol		17	U	65	%
Picloram		17	U	NS	%

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

000017

9/19/06

0000000087

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L596
SDG/SAF # K0494/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-28-2006

PCB

Four (4) soil samples were collected on 07-26-2006.

The samples and their associated QC samples were extracted on 07-31-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 08-03,04-2006. 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. All 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 Silica Gel, Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3630C, 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 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
Laboratory Manager
Lionville Laboratory Incorporated

8/17/04
Date

som\r:\group\data\pest\tm hanford\0607-596pcbs

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LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L596
SDG/SAF # K0494/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-28-2006

CHLORINATED PESTICIDES

Four (4) soil samples were collected on 07-26-2006.

The samples and their associated QC samples were extracted on 07-31-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 08-04,09-2006. 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. All 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 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. Eleven (11) of sixteen (16) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. One (1) of twenty (20) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
7. Seventeen (17) of forty (40) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
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.

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

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LIONVILLE LABORATORY INC.

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.

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

8/17/06
Date

som\r:\group\data\pest\tnu hanford\0607-596.pst

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06GC386

Initiator: Brenda Stevens
Date: 8/10/06
Client: TNU

Batch: 06072596
Samples: 1, 1MS, 1MSD, 2, 3, 4, MB1S
Method: SW846/MCAWW/CLP/

Parameter: Pest
Matrix: soil
Prep Batch: 06LE0018

1. Reason for SDR

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

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

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

c. Problem (Include all relevant specific results; attach data if necessary)
① Surrogate recoveries for samples 1, 1MS, 1MSD, 2, 3, and 4 are elevated
② 1MS and 1MSD have elevated spike levels. No impact on samples
③ Aldrin in MB1S is below control criteria

2. Known or Probable Causes(s)

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

Other Description:
Narrate - minimal comparison sample data for sample 004 (some high bias ≈ 10-20%)

4. Project Manager Instructions...signature/date: [signature] 8/10/06
__ 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: [signature]
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

Other Explanation:

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

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

QA-105-A-0805

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L596
SDG/SAF # K0494/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-28-2006

HERBICIDE

Four (4) soil samples were collected on 07-26-2006.

The samples and their associated QC samples were extracted on 07-31-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 08-10,11,14-2006. The extraction and analysis procedures were based on method 8151A.

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. All samples were extracted and analyzed within required holding time.
2. All sample results were reported on a dry-weight basis.
3. The method blank was below the reporting limits for all target compounds.
4. All obtainable surrogate recoveries were within acceptance criteria
5. All blank spike recoveries were within acceptance criteria.
6. Two (2) of eighteen (18) matrix spike recoveries were outside acceptance criteria.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria with the exception of CCVs analyzed on 08-11-2006 at 12:48 A.M. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

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9. 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.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/18/06
Date

kim\r:\group\data\herb\tmu\0607-596.doc

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06GC374

Initiator: Eric Laager
Date: 8/2/06
Client: TMI

Batch: 06072596
Samples: CCV
Method: SW846/MCAWW/CLP/ 8151

Parameter: OHB6X
Matrix: Soil
Prep Batch: [0620]

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)
CCV recoveries on ~~primary~~ column exceed cntrl criteria
RTX-35

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

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

Other Description: Permit - all ~~[illegible]~~ other from RTX200 column; RTX-35 used for confirmation only

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

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

5. Final Action...signature/date: _____ 8/7/6

Other Explanation:

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

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

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

QA-105-A-0805

Collector: C. Martinez, KM Singleton, R. Vicks	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code: 8D	Data Turnaround: Air Quality 21 dry		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 118-B-1 Area 7		SAF No.: RC-020
Ice Chest No.: AES-04-052	Field Logbook No.: EFL 1173-8	COA: 2119812006	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / (IONVILLE)	Offsite Property No.: A060586		Bill of Lading/Air Bill No.: see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~none~~ TRE 7-27-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	G/P	G/P	sG	sG	G	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	0
Volume	250mL	125mL	120mL	120mL	120mL	500mL	125mL	125mL	500mL	60ml

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See Item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See Item (2) in Special Instructions	Carbon-14, Tritium - H3	Nickel-63, Strontium-89,90 - Total Sr	Isotopic Plutonium	Plutonium See # 3
J12XC6	SOIL	7-26-06	0750	✓	✓	✓	✓	✓					
J12XC7	SOIL	7-26-06	0815	✓	✓	✓	✓	✓					
J12XC8	SOIL	7-26-06	0930	✓	✓	✓	✓	✓					
J12XC9	SOIL	7-26-06	1000	✓	✓	✓	✓	✓					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
KM Singleton	7-26-06 1515	3728 BC	7-26-06 1515
3728/3C	7/27/06 1000	mstankovich	7/27/06 1000
mstankovich	7/27/06 1000	Fed Ex	
Fed Ex	7/28/06 1005		7-28-06 1005

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)
~~(2) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]~~
3) Run Plutonium-241 from remaining material in 500ml plastic bottle 7-26-06

Personnel not available to Relinquish samples from 3728 Ref # 3C on 7/27/06

Matrix: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum S, DL=Drum L, 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)

000027

Collector C. Martinez	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 118-B-1 Area 7		SAF No. RC-020
Ice Chest No. AFS-04-052	Field Logbook No. EFL 1173-8	COA R118 01 2000	Method of Shipment FED EX
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060586		Bill of Lading/Air Bill No. see OSPC

Price Code 8D

Data Turnaround

Air Quality

21 days

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~none~~ TRE 7-27-06

Cool to 4°C

Preservation	None	None	Cool 4C	Cool 4C								
Type of Container	G/P	G/P	aG	aG								
No. of Container(s)	0	0	1	1								
Volume	60mL	60mL	250mL	250mL								
SAMPLE ANALYSIS	Americium-241	Isotopic Uranium	Pesticides - 8081	Chloro-Herbicides - EPA8151								
	See item 3	See item 3										

Sample No.	Matrix *	Sample Date	Sample Time										
J12XC6	SOIL	7-26-06	0750			✓	✓						
J12XC7	SOIL	7-26-06	0815			✓	✓						
J12XC8	SOIL	7-26-06	0930			✓	✓						
J12XC9	SOIL	7-26-06	1000			✓	✓						

000028

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
KM Singleton	7-26-06 1515	3728 Ref 3C	7-26-06 1515
3728/3C	7/27/06 1000	MS Muntbouch	7/27/06 1000
MS Muntbouch	7/27/06 1500	Fed Ex	
	7-28-06 1005		7-28-06 1005

SPECIAL INSTRUCTIONS

3) Run Americium-241 and Isotopic Uranium from remaining material in 500ml plastic bottle.

7-26-06

Personnel not available to relinquish samples from 3728 Ref # 3C on 7/29/06

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
V=Other

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

BHI-EE-011 (06/29/2005)

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 118-B-1			DATA PACKAGE: K0494		
VALIDATOR: TLI		LAB: LLI		DATE: 9/18/06	
			SDG: K0494		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)	8151A	
SAMPLES/MATRIX					
J12XC6	J12XC7	J12XC8	J12XC9		
					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: pest - detects in all - J - surrogates
MSD - dicamba, 2,4-DB - J all LCS - Aldrin - J all
MS - dieldrin - J all detects
no toxaphene - MS/MSD/LCS - J all no PAHs
no picloram - MS/MSD/LCS - J all

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: dicamba (762), 2,4-D (342), 2,4,5-T (362), 2,4-DB (1122) - Jall
no tox MS/MSD - Jall
" picloram " " - Jall

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

Comments: _____

Date: 21 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 118-B-1
Subject: Wet Chemistry - Data Package No. K0494-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0494 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
J12XC6	7/26/06	Soil	C	See note 1
J12XC7	7/26/06	Soil	C	See note 1
J12XC8	7/26/06	Soil	C	See note 1
J12XC9	7/26/06	Soil	C	See note 1

1– Chromium VI by 7196A.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). 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 65% to 135%. 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 64% 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 135% 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 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than

or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

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

- **Completeness**

Data package K0494 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: K0494	REVIEWER: TLH	Project: 118-B-1	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: K0494								
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.20	U	0.30		0.27		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.

000009

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/07/06

CLIENT: TNUHANFORD RC-020 K0494 LVL LOT #: 0607L596
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J12XC6	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-002	J12XC7	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.30	MG/KG	0.20	1.0
-003	J12XC8	% Solids	98.9	%	0.01	1.0
		Chromium VI	0.27	MG/KG	0.20	1.0
-004	J12XC9	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

9/19/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020 K0494
LVL#: 0607L596

W.O.#: 11343-606-001-9999-00
Date Received: 07-28-06

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 a sample that met LvLI's sample acceptance policy.

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

6. The Laboratory Control Sample (LCS) for 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 analysis for Percent Solids was within the 20% Relative Percent Difference (RPD) control limit however replicate analysis for Chromium VI was outside the control limit that may be attributed to sample inhomogeneity.

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

Date 8/16/06

njp\07-596

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 12 pages.

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-020-039 | Page 1 of 2

Collector: C. Martinez, KM Singleton, R. Vucks	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code: 8D	Data Turnaround: Air Quality 21 day		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 118-B-1 Area 7		SAF No.: RC-020
Ice Chest No.: AES-04-052	Field Logbook No.: EFL 1173-8	COA: 21981200 6	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060586		Bill of Lading/Air Bill No.: see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~none~~ TRB 7-27-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	G/P	G/P	aG	aG	G	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	0
Volume	250mL	125mL	120mL	120mL	120mL	500mL	125mL	125mL	500mL	60mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions	Carbon-14, Tritium - HJ	Nickel-63, Strontium-89,90 - Total Sr	Isotopic Plutonium	Plutonium-2 See item #3
J12XC6	SOIL	7-26-06	0750	✓	✓	✓	✓	✓					
J12XC7	SOIL	7-26-06	0815	✓	✓	✓	✓	✓					
J12XC8	SOIL	7-26-06	0930	✓	✓	✓	✓	✓					
J12XC9	SOIL	7-26-06	1000	✓	✓	✓	✓	✓					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
KM Singleton	7-26-06 1515	3728 Ref 3C	7-26-06 1515
3728/3C	7/27/06 1000	M Stankovich	7/27/06 1000
M Stankovich	7/27/06 1500	Fed Ex	
Fed Ex	7/28/06 1005		7-28-06 1005

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV) ~~(2) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]~~

3) Run Plutonium-241, from remaining material in 500mL plastic bottle

7-26-06

Personnel not available to Relinquish samples from 3728 Ref #3C on 7/27/06

Matrix *

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

BHI-EE-011 (08/29/2005)

0000013

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-1			DATA PACKAGE: K0494		
VALIDATOR: TLE		LAB: LLI		DATE: 9/17/06	
			SDG: K0494		
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					
J12XC6	J12XC7	J12XC8	J12XC9		
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/07/06

CLIENT: INUHANFORD RC-020 K0494 LVL LOT #: 0607L596
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI079-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/07/06

CLIENT: INUHANFORD RC-020 K0494 LVL LOT #: 0607L596
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J12XC6	Soluble Chromium VI	4.2	0.20u	4.0	100.8	1.0
		Insoluble Chromium VI	1280	0.20u	1280	99.9	100
BLANK10	06LVI079-MB1	Soluble Chromium VI	8.1	0.20u	8.0	101.7	1.0
		Insoluble Chromium VI	1170	0.20u	1180	99.4	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/07/06

CLIENT: TNUHANFORD RC-020 X0494 LVL LOT #: 0607L596

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
001REP	J12XC6	Chromium VI	0.20u	0.22	pc 36.6	1.0
004REP	J12XC9	% Solids	99.4	99.5	0.070	1.0

Date: 21 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Burial Grounds – Soil Full Protocol - Waste Site 118-B-1
Subject: Volatile Organics - Data Package No. K0494-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0494 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
J12XC6	7/26/06	Soil	C	VOAs by 8260B
J12XC7	7/26/06	Soil	C	VOAs by 8260B
J12XC8	7/26/06	Soil	C	VOAs by 8260B
J12XC9	7/26/06	Soil	C	VOAs by 8260B

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

All holding times were met.

- **Method Blanks**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All 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.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. No VOA RQLs were specified.

- **Completeness**

Data package No. K0494 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K0494	REVIEWER: TH	Project: 118-B-1	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

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX (UG/KG)

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI									
Case:	SDG: K0494								
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9	
Remarks									
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06	
Analysis Date		8/8/06		8/8/06		8/8/06		8/8/06	
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane		10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U
Methylene Chloride		10		5	U	5	U	6	
Acetone		8		10		10	U	10	U
Carbon Disulfide		5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	5	U	5	U	5	U
1,1-Dichloroethane		5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	5	U
Chloroform		5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U
Carbon Tetrachloride		9		10		5	U	10	
Bromodichloromethane		5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U
Trichloroethene		5	U	5	U	5	U	5	U
Dibromochloromethane		5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U
Benzene		5	U	5	U	5	U	5	U
trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	5	U
Toluene		5	U	5	U	5	U	5	U
Chlorobenzene		5	U	5	U	5	U	5	U
Ethylbenzene		5	U	5	U	5	U	5	U
Styrene		5	U	5	U	5	U	5	U
Xylene		5	U	5	U	5	U	5	U
cis-1,2-Dichloroethene		5	U	5	U	5	U	5	U
trans-1,2-Dichloroethene		5	U	5	U	5	U	5	U

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

Volatiles by GC/MS, HSL List

Report Date: 08/28/06 10:11

RFW Batch Number: 0607L596 Client: TNUHANFORD RC-020 K0494 Work Order: 11343606001 Page: 1a

	Cust ID:	J12XC6	J12XC7	J12XC7	J12XC7	J12XC8	J12XC9
Sample Information	RFW#:	001	002	002 MS	002 MSD	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	0.980	1.02	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	104 %	102 %	99 %	102 %	96 %	98 %
	Bromofluorobenzene	117 %	114 %	112 %	116 %	113 %	115 %
	1,2-Dichloroethane-d4	104 %	101 %	116 %	115 %	105 %	107 %
		fl	fl	fl	fl	fl	fl
Chloromethane		10 U	10 U	102 %	105 %	10 U	10 U
Bromomethane		10 U	10 U	295 * %	307 * %	10 U	10 U
Vinyl Chloride		10 U	10 U	119 %	114 %	10 U	10 U
Chloroethane		10 U	10 U	122 %	122 %	10 U	10 U
Methylene Chloride		10	5 U	155 %	153 %	5 U	6.
Acetone		8 J	10 J	276 %	268 %	10 U	10 U
Carbon Disulfide		5 U	5 U	121 %	122 %	5 U	5 U
1,1-Dichloroethene		5 U	5 U	119 %	125 %	5 U	5 U
1,1-Dichloroethane		5 U	5 U	123 %	124 %	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	115 %	117 %	5 U	5 U
Chloroform		5 U	5 U	126 %	130 %	5 U	5 U
1,2-Dichloroethane		5 U	5 U	121 %	120 %	5 U	5 U
2-Butanone		10 U	10 U	237 * %	227 * %	10 U	10 U
1,1,1-Trichloroethane		5 U	5 U	124 %	127 %	5 U	5 U
Carbon Tetrachloride		9	10	130 %	131 %	5 U	10
Bromodichloromethane		5 U	5 U	145 * %	146 * %	5 U	5 U
1,2-Dichloropropane		5 U	5 U	119 %	118 %	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	92 %	112 %	5 U	5 U
Trichloroethene		5 U	5 U	127 %	130 %	5 U	5 U
Dibromochloromethane		5 U	5 U	168 * %	167 * %	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	126 %	127 %	5 U	5 U
Benzene		5 U	5 U	117 %	119 %	5 U	5 U
Trans-1,3-Dichloropropene		5 U	5 U	115 %	116 %	5 U	5 U
Bromoform		5 U	5 U	164 * %	160 * %	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	119 %	118 %	10 U	10 U
2-Hexanone		10 U	10 U	151 %	139 %	10 U	10 U
Tetrachloroethene		5 U	5 U	131 %	136 %	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	129 %	130 %	5 U	5 U
Toluene		5 U	5 U	115 %	119 %	5 U	5 U

*= Outside of EPA CLP QC limits.

RR 9/19/06

0000011

000000008

Cust ID:	J12XC6	J12XC7	J12XC7	J12XC7	J12XC8	J12XC9
RFW#:	001	002	002 MS	002 MSD	003	004
Chlorobenzene	5 U	5 U	111 %	112 %	5 U	5 U
Ethylbenzene	5 U	5 U	104 %	108 %	5 U	5 U
Styrene	5 U	5 U	103 %	105 %	5 U	5 U
Xylene (total)	5 U	5 U	102 %	105 %	5 U	5 U
cis-1,2-dichloroethene	5 U	5 U	117 %	118 %	5 U	5 U
trans-1,2-dichloroethene	5 U	5 U	113 %	116 %	5 U	5 U

*= Outside of EPA CLP QC limits.

9/19/02

000000009

000012

000000010

Sample Information	Cust ID:	VBLKKA		VBLKKA BS	
	RFW#:	06LVK145-MB1		06LVK145-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	106	%	102	%
	Bromofluorobenzene	114	%	108	%
	1,2-Dichloroethane-d4	102	%	105	%
Chloromethane		10	U	95	%
Bromomethane		10	U	241 *	%
Vinyl Chloride		10	U	110	%
Chloroethane		10	U	106	%
Methylene Chloride		5	U	104	%
Acetone		10	U	255	%
Carbon Disulfide		5	U	115	%
1,1-Dichloroethene		5	U	109	%
1,1-Dichloroethane		5	U	105	%
1,2-Dichloroethene (total)		5	U	103	%
Chloroform		5	U	107	%
1,2-Dichloroethane		5	U	100	%
2-Butanone		10	U	223 *	%
1,1,1-Trichloroethane		5	U	108	%
Carbon Tetrachloride		5	U	116	%
Bromodichloromethane		5	U	119	%
1,2-Dichloropropane		5	U	98	%
cis-1,3-Dichloropropene		5	U	100	%
Trichloroethene		5	U	114	%
Dibromochloromethane		5	U	131 *	%
1,1,2-Trichloroethane		5	U	99	%
Benzene		5	U	100	%
Trans-1,3-Dichloropropene		5	U	93	%
Bromoform		5	U	132	%
4-Methyl-2-pentanone		10	U	133	%
2-Hexanone		10	U	162	%
Tetrachloroethene		5	U	117	%
1,1,2,2-Tetrachloroethane		5	U	94	%
Toluene		5	U	99	%

*= Outside of EPA CLP QC limits.

9/19/06

000013

Cust ID: VBLKKK VBLKKK BS

RFW#: 06LVK145-MB1 06LVK145-MB1

Chlorobenzene	5	U	99	%
Ethylbenzene	5	U	92	%
Styrene	5	U	96	%
Xylene (total)	5	U	94	%
cis-1,2-dichloroethene	5	U	101	%
trans-1,2-dichloroethene	5	U	104	%

*= Outside of EPA CLP QC limits.

9/12/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L596
SDG/SAF # K0494/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-28-2006

GC/MS VOLATILE

Four (4) soil samples were collected on 07-26-2006.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 08-08-2006.

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. The sample was analyzed within required holding time.
2. Non-target compounds were detected in the sample.
3. All surrogate recoveries were within acceptance criteria.
4. Ten (10) of seventy (70) matrix spike recoveries were outside acceptance criteria.
5. Three (3) of thirty-five (35) blank spike recoveries were outside acceptance criteria.
6. Internal standard area criteria was met.
7. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
8. The CCL analyzed on 08/08/06 on instrument 5970K did not meet in 40%D in house criteria for the compound Bromomethane. Bromomethane was not detected in these samples, however the elevated response caused higher recoveries in the MS, MSD AND BS. Minimal impact on data.

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 20 pages.

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

9. 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.

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

for Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/28/06
Date

kim\group\data\voa\tnu-hanford\0607-596.doc

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06VT170

Initiator: Jim Daley
Date: 09 Aug 2006
Client: TNO

Batch: 06071582/596/604/603/524
Samples: ALL
Method: (SW846)/MCAWW/CLP/

Parameter: VOA
Matrix: Solids
Prep Batch:

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)

Bromomethane response factor running high ~ % difference for this cpnd greater than in-house limits; likewise, % Recovery for spike running high

2. Known or Probable Causes(s)

Ability to detect this cpnd not impacted. Since cpnd was not present in any samples no impact on data

3. Discussion and Proposed Action Other Description:

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

NARRATE

4. Project Manager Instructions...signature/date: 8/9/06

__ 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: _____ Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative 06071603 Beth Berio 8/28/06
__ Hard Copy COC Revised 06071604 Beth Berio 8/28/06
__ Electronic COC Revised 06071502 Beth Berio 8/28/06
__ EDD Corrections Completed 06071596 Beth Berio 8/28/06

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
2	X Initiator Daly	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-In: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-020-039 | Page 1 of 2

Collector: C. Martinez, KM Singleton, R. Vucks	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code: 8D	Data Turnaround: 21 days		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 118-B-1 Area 7		SAF No.: RC-020
Air Quality			
Ice Chest No.: AFS-04-052	Field Logbook No.: EFL 1173-8	COA: 2118812006	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060586		Bill of Lading/Air Bill No.: see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~none~~ TRB 7-27-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	G/P	G/P	sG	sG	G	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	0
Volume	250mL	125mL	120mL	120mL	120mL	500mL	125mL	125mL	500mL	60mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions	Carbon-14, Tritium - HJ	Nickel-63, Strontium-89,90 - Total Sr	Isotopic Plutonium	Plutonium-241 See il #3
J12XC6	SOIL	7-26-06	0750	✓	✓	✓	✓	✓					
J12XC7	SOIL	7-26-06	0815	✓	✓	✓	✓	✓					
J12XC8	SOIL	7-26-06	0930	✓	✓	✓	✓	✓					
J12XC9	SOIL	7-26-06	1000	✓	✓	✓	✓	✓					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
KM Singleton	7-26-06 1515	3728 lab 3C	7-26-06 1515
3728 lab 3C	7/27/06 1000	mstankovich	7/27/06 0900
mstankovich	7/27/06 1500	Fed Ex	
Fed Ex	7/28/06 1005		7-28-06 1005

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)
~~(2) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]~~
3) Run Plutonium-241 from remaining material in 500ml plastic bottle 7-26-06

Personnel not available to Relinquish samples from 3728 Ref# 3C on 7/27/06

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

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

BHI-EE-011 (08/29/2005)

000019

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 118-B-1			DATA PACKAGE: K0494		
VALIDATOR: TLI		LAB: LCL		DATE: 9/18/06	
			SDG: K0494		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J12XC6	J12XC7	J12XC8	J12XC9		
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: no FB

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

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

Comments: no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A
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: no RQL specified

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: 21 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 118-B-1
Subject: Inorganic - Data Package No. K0494-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0494 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
J12XC6	7/26/06	Soil	C	See note 1
J12XC7	7/26/06	Soil	C	See note 1
J12XC8	7/26/06	Soil	C	See note 1
J12XC9	7/26/06	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). 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 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (50.2%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (33%), 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. K0494 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 (50.2%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (33%), 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: K0494	REVIEWER: TJ	Project: 118-B-1	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: K0494																		
Sample Number		J12XC6		J12XC7		J12XC8		J12XC9											
Remarks																			
Sample Date		7/26/06		7/26/06		7/26/06		7/26/06											
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver		0.19	U	0.19	U	0.20	U	0.20	U										
Aluminum		4980		6090		4610		5610											
Arsenic	10	3.8		3.1		3.1		2.8											
Boron		18.1		2.7		1.3		7.7											
Barium	20	145		75.1		53.7		119											
Beryllium		0.30		0.31		0.19		0.27											
Calcium		7420		4550		4270		6150											
Cadmium	0.5	0.19	U	0.19	U	0.20	U	0.20	U										
Cobalt		6.3		7.6		6.3		7.4											
Chromium	1	7.6		9.5		7.3		8.0											
Copper		25.7		14.4		11.7		17.2											
Iron		17000		18700		15900		18000											
Mercury	0.2	0.02	U	0.01	U	0.02	U	0.02											
Potassium		904		1510		1040		1310											
Magnesium		4440		4140		3410		4220											
Manganese		254		340		270		318											
Molybdenum		2.1		0.80	U	0.81	U	0.81	U										
Sodium		189		129		87.6		173											
Nickel		8.6		10.7		9.4		10.4											
Lead	10	12.9		6.0		3.6		8.3											
Antimony		1.2	UJ	1.2	UJ	1.2	UJ	1.2	UJ										
Selenium	10	1.3	U	1.3	U	1.3	U	1.3	U										
Silicon		392	J	456	J	425	J	414	J										
Vanadium		36.4		40.9		32.7		38.0											
Zinc		48.7		41.0		31.1		44.5											

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/14/06

CLIENT: TNUHANFORD RC-020 K0494

LVL LOT #: 0607LS96

WORK ORDER: 11243-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J12XC6	Silver, Total	0.19 u	MG/KG	0.19	3.0
		Aluminum, Total	4980	MG/KG	8.0	3.0
		Arsenic, Total	3.8	MG/KG	1.7	3.0
		Boron, Total	18.1	MG/KG	0.67	3.0
		Barium, Total	145	MG/KG	0.06	3.0
		Beryllium, Total	0.30	MG/KG	0.06	3.0
		Calcium, Total	7420	MG/KG	4.6	3.0
		Cadmium, Total	0.19 u	MG/KG	0.19	3.0
		Cobalt, Total	6.3	MG/KG	0.39	3.0
		Chromium, Total	7.6	MG/KG	0.26	3.0
		Copper, Total	25.7	MG/KG	0.33	3.0
		Iron, Total	17000	MG/KG	9.7	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	904	MG/KG	6.3	3.0
		Magnesium, Total	4440	MG/KG	2.7	3.0
		Manganese, Total	254	MG/KG	0.08	3.0
		Molybdenum, Total	2.1	MG/KG	0.81	3.0
		Sodium, Total	189	MG/KG	2.1	3.0
		Nickel, Total	8.6	MG/KG	0.67	3.0
		Lead, Total	12.9	MG/KG	0.86	3.0
		Antimony, Total	1.2 uJ	MG/KG	1.2	3.0
		Selenium, Total	1.3 J	MG/KG	1.3	3.0
		Silicon, Total	392	MG/KG	6.3	3.0
		Vanadium, Total	36.4	MG/KG	0.25	3.0
		Zinc, Total	48.7	MG/KG	0.45	3.0

KV 9/19/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/14/06

LIENT: TNUHANFORD RC-020 K0494 LVL LOT #: 0607L596

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
002	J12XC7	Silver, Total	0.19 u	MG/KG	0.19	3.0
		Aluminum, Total	6090	MG/KG	7.9	3.0
		Arsenic, Total	3.1	MG/KG	1.7	3.0
		Boron, Total	2.7	MG/KG	0.66	3.0
		Barium, Total	75.1	MG/KG	0.06	3.0
		Beryllium, Total	0.31	MG/KG	0.06	3.0
		Calcium, Total	4550	MG/KG	4.5	3.0
		Cadmium, Total	0.19 u	MG/KG	0.19	3.0
		Cobalt, Total	7.6	MG/KG	0.39	3.0
		Chromium, Total	9.5	MG/KG	0.36	3.0
		Copper, Total	14.4	MG/KG	0.33	3.0
		Iron, Total	18700	MG/KG	9.6	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1510	MG/KG	6.3	3.0
		Magnesium, Total	4140	MG/KG	2.7	3.0
		Manganese, Total	240	MG/KG	0.08	3.0
		Molybdenum, Total	0.80 u	MG/KG	0.80	3.0
		Sodium, Total	125	MG/KG	2.1	3.0
		Nickel, Total	10.7	MG/KG	0.66	3.0
		Lead, Total	6.0	MG/KG	0.86	3.0
		Antimony, Total	1.2 u J	MG/KG	1.2	3.0
		Selenium, Total	1.3 u J	MG/KG	1.3	3.0
		Silicon, Total	456	MG/KG	6.3	3.0
		Vanadium, Total	40.9	MG/KG	0.25	3.0
		Zinc, Total	41.0	MG/KG	0.44	3.0

9/19/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/14/06

CLIENT: TNUHANFORD RC-020 K0494 LVL LOT #: 0607L696

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J12XC8	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	4610	MG/KG	8.1	3.0
		Arsenic, Total	3.1	MG/KG	1.7	3.0
		Boron, Total	1.3	MG/KG	0.67	3.0
		Barium, Total	53.7	MG/KG	0.06	3.0
		Beryllium, Total	0.19	MG/KG	0.06	3.0
		Calcium, Total	4270	MG/KG	4.6	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	6.3	MG/KG	0.39	3.0
		Chromium, Total	7.3	MG/KG	0.37	3.0
		Copper, Total	11.7	MG/KG	0.34	3.0
		Iron, Total	15900	MG/KG	9.8	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1040	MG/KG	6.4	3.0
		Magnesium, Total	3410	MG/KG	2.7	3.0
		Manganese, Total	270	MG/KG	0.08	3.0
		Molybdenum, Total	0.81 u	MG/KG	0.81	3.0
		Sodium, Total	87.6	MG/KG	2.1	3.0
		Nickel, Total	9.4	MG/KG	0.67	3.0
		Lead, Total	3.6	MG/KG	0.87	3.0
		Antimony, Total	1.2 u J	MG/KG	1.2	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	425 J	MG/KG	6.4	3.0
		Vanadium, Total	32.7	MG/KG	0.25	3.0
		Zinc, Total	31.1	MG/KG	0.45	3.0

KW 9/19/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/14/06

CLIENT: TNUHANFORD RC-020 K0494

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

LVL LOT #: 0607L596

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J12XC9	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	5610	MG/KG	8.1	3.0
		Arsenic, Total	2.8	MG/KG	1.7	3.0
		Boron, Total	7.7	MG/KG	0.67	3.0
		Barium, Total	119	MG/KG	0.06	3.0
		Beryllium, Total	0.27	MG/KG	0.06	3.0
		Calcium, Total	6150	MG/KG	4.6	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	7.4	MG/KG	0.39	3.0
		Chromium, Total	8.0	MG/KG	0.36	3.0
		Copper, Total	17.2	MG/KG	0.34	3.0
		Iron, Total	18000	MG/KG	9.8	3.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	1310	MG/KG	6.3	3.0
		Magnesium, Total	4220	MG/KG	2.7	3.0
		Manganese, Total	318	MG/KG	0.08	3.0
		Molybdenum, Total	0.81 u	MG/KG	0.81	3.0
		Sodium, Total	173	MG/KG	2.1	3.0
		Nickel, Total	10.4	MG/KG	0.67	3.0
		Lead, Total	8.3	MG/KG	0.87	3.0
		Antimony, Total	1.2 u J	MG/KG	1.2	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	414 J	MG/KG	6.3	3.0
		Vanadium, Total	38.0	MG/KG	0.25	3.0
		Zinc, Total	44.5	MG/KG	0.45	3.0

9/19/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020
LVL#: 0607L596
SDG/SAF#: K0494/RC-020

W.O.#: 11343-606-001-9999-00
Date Received: 07-28-06

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 reported with 3-fold dilutions for ICP metals 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), 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 33.0%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

9. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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 24 pages.

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

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
J12XC6	Aluminum	66,000	98.1
	Iron	66,000	113.6
	Antimony	300	100.8
	Silicon	6,300	102.2

11. The duplicate analyses for 2 analytes were 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

8/15/02
Date

jjw/m07-596

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-020-039

Collector: C. Martinez, KM. Singleton, R. Vocks	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 118-B-1 Area 7		SAF No.: RC-020
Ice Chest No.: AFS-04-052	Field Logbook No.: EFL 1173-8	COA: Z1180120006	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060586		Bill of Lading/Air Bill No.: see OSPC

Price Code: 8D — Air Quality — Data Turnaround: 21 days

7-27-06

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~none~~ TRB 7-27-06

Cool to 4°C

SAMPLE ANALYSIS

Preservation				None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container				G/P	G/P	aG	aG	G	G/P	G/P	G/P	G/P	G/P
No. of Container(s)				1	1	1	1	1	1	1	1	1	0
Volume				250mL	125mL	120mL	120mL	120mL	500mL	125mL	125mL	500mL	60mL
				See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions	Carbon-14, Tritium - H3	Nickel-63; Strontium-89,90 - Total Sr	Isotopic Plutonium	Plutonium-24 See item #3
Sample No.	Matrix *	Sample Date	Sample Time										
J12XC6	SOIL	7-26-06	0750	✓	✓	✓	✓	✓					
J12XC7	SOIL	7-26-06	0815	✓	✓	✓	✓	✓					
J12XC8	SOIL	7-26-06	0930	✓	✓	✓	✓	✓					
J12XC9	SOIL	7-26-06	1000	✓	✓	✓	✓	✓					

0000018

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
KM Singleton / [signature]	7-26-06 1515	3728 Ref 3C	7-26-06 1515
3728/3C	7/27/06 1000	[signature]	7/27/06 1000
[signature]	7/27/06 1530	Red Ex	
Red Ex	7/28/06 1005	[signature]	7-28-06 1005

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)
~~(1) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]~~

3) Run Plutonium-241 from remaining material in small plastic bottle 7-26-06

Personnel not available to Relinquish samples from 3728 Ref # 3C on 7/27/06

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

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 118-B-1			DATA PACKAGE: K0494		
VALIDATOR: JLT		LAB: LLI		DATE: 9/18/06	
			SDG: K0494		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J12XC4 J12XC7 J12XC8 J12XC9					
					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 PB

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

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

Comments: MS antimony - 50,230 - J all no PQS
LCS Silicon - 3330 - J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments:

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A
ICP serial dilution %D values acceptable? ..... Yes No N/A
ICP post digestion spike required? ..... Yes No N/A
ICP post digestion spike values acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

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: Selenium — all blanks

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/14/06

CLIENT: TNUHANFORD RC-020 K0494

LVL LOT #: 0607L596

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0481-MB1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	2.9 u	MG/KG	2.9	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	2.9	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	3.5 u	MG/KG	3.5	1.0
		Potassium, Total	2.3 u	MG/KG	2.3	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
		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
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.62	MG/KG	0.16	1.0
BLANK1	06C0151-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/14/06

CLIENT: TNUHANFORD RC-020 K0494 LVL LOT #: 0607L596

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J12XC6	Silver, Total	4.4	0.19u	4.6	95.7	3.0
		Aluminum, Total	5840	4980	186	461.3*	3.0
		Arsenic, Total	176	3.8	186	92.6	3.0
		Boron, Total	102	18.1	92.8	90.7	3.0
		Barium, Total	318	145	186	93.5	3.0
		Beryllium, Total	4.8	0.30	4.6	97.8	3.0
		Calcium, Total	10100	7420	2320	114.5	3.0
		Cadmium, Total	4.4	0.19u	4.6	95.7	3.0
		Cobalt, Total	51.3	6.3	46.4	97.0	3.0
		Chromium, Total	25.4	7.6	18.6	95.7	3.0
		Copper, Total	49.0	25.7	23.2	100.4	3.0
		Iron, Total	16600	17000	92.8	-400. *	3.0
		Potassium, Total	3100	904	2320	94.5	3.0
		Magnesium, Total	6870	4440	2320	104.8	3.0
		Manganese, Total	289	254	46.4	75.4*	3.0
		Molybdenum, Total	90.2	2.1	92.8	94.9	3.0
		Sodium, Total	3430	189	2320	96.4	3.0
		Nickel, Total	53.1	8.6	46.4	95.9	3.0
		Lead, Total	60.0	12.9	46.4	101.5	3.0
		Antimony, Total	23.3	1.2 u	46.4	50.2	3.0
		Selenium, Total	170	1.3 u	186	91.0	3.0
		Silicon, Total	785	392	92.8	422.8*	3.0
		Vanadium, Total	75.4	36.4	46.4	84.1	3.0
		Zinc, Total	95.5	48.7	46.4	100.9	3.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/14/06

CLIENT: TNUHANFORD RC-020 K0494 LVL LOT #: 06071L596

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J12XC7	Mercury, Total	0.19	0.01u	0.15	123.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/14/06

CLIENT: INUHANFORD RC-020 K0494 LVL LOT #: 0607L596

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J12XC6	Silver, Total	0.19u	0.19u	NC	3.0
		Aluminum, Total	4980	5360	7.3	3.0
		Arsenic, Total	3.8	4.4	14.6	3.0
		Boron, Total	18.1	15.2	16.8	3.0
		Barium, Total	145	138	4.5	3.0
		Beryllium, Total	0.30	0.32	4.5	3.0
		Calcium, Total	7420	7190	3.1	3.0
		Cadmium, Total	0.19u	0.19u	NC	3.0
		Cobalt, Total	6.2	7.1	11.9	3.0
		Chromium, Total	7.6	8.3	8.8	3.0
		Copper, Total	25.7	29.1	12.4	3.0
		Iron, Total	17000	18000	6.1	3.0
		Potassium, Total	904	1020	12.4	3.0
		Magnesium, Total	4440	4570	2.8	3.0
		Manganese, Total	254	264	3.7	3.0
		Molybdenum, Total	2.1	3.6	52.6	3.0
		Sodium, Total	189	200	5.9	3.0
		Nickel, Total	8.6	13.0	40.7	3.0
		Lead, Total	12.9	13.4	3.8	3.0
		Antimony, Total	1.2 u	1.2 u	NC	3.0
		Selenium, Total	1.3 u	1.3 u	NC	3.0
		Silicon, Total	392	372	5.3	3.0
		Vanadium, Total	36.4	35.3	3.1	3.0
		Zinc, Total	48.7	54.0	10.3	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/14/06

CLIENT: TNUHANFORD RC-020 K0494 LVL LOT #: 0607L596

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J12XC7	Mercury, Total	0.01u	0.01	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 08/14/06

CLIENT: TNUHANFORD RC-020 K0494 LVL LOT #: 0607L596

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0481-LC1	Silver, LCS	48.5	50.0	MG/KG	97.0
		Aluminum, LCS	477	500	MG/KG	95.5
		Arsenic, LCS	933	1000	MG/KG	93.3
		Boron, LCS	469	500	MG/KG	93.8
		Barium, LCS	480	500	MG/KG	95.9
		Beryllium, LCS	24.4	25.0	MG/KG	97.6
		Calcium, LCS	2480	2500	MG/KG	99.0
		Cadmium, LCS	24.2	25.0	MG/KG	96.8
		Cobalt, LCS	245	250	MG/KG	98.2
		Chromium, LCS	49.6	50.0	MG/KG	99.2
		Copper, LCS	120	125	MG/KG	96.3
		Iron, LCS	497	500	MG/KG	99.4
		Potassium, LCS	2270	2500	MG/KG	90.8
		Magnesium, LCS	2430	2500	MG/KG	97.1
		Manganese, LCS	74.7	75.0	MG/KG	99.6
		Molybdenum, LCS	490	500	MG/KG	98.1
		Sodium, LCS	2350	2500	MG/KG	93.8
		Nickel, LCS	195	200	MG/KG	97.6
		Lead, LCS	243	250	MG/KG	97.2
		Antimony, LCS	283	300	MG/KG	94.3
		Selenium, LCS	897	1000	MG/KG	89.7
		Silicon, LCS	165	500	MG/KG	33.0
		Vanadium, LCS	248	250	MG/KG	99.2
		Zinc, LCS	95.0	100	MG/KG	95.0
LCS1	06C0151-LC1	Mercury, LCS	3.0	2.8	MG/KG	106.6