0059874

SAF-B03-015
Remaining Sites Confirmation Sampling-Soil
FINAL VALIDATION PACKAGE

MAIL COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan KB 6·12·03
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE COVER SHEET)

SDG H2187 SAF-B03-015

Sample Location/Waste Site: 128-F-1

RECEIVED
JUL 28 2003
EDMC

Date: 27 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Waste Sites Confirmation Sampling - Soil - Waste Site 128-F-1
Subject: Semivolatile - Data Package No. H2187-LLI (SDG No. H2187)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2187-LLI prepared by Lionville Laboratory Incorporated (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	Analysis
J00MJ8	4/28/03	Soil	C	See note 1
J00MJ9	4/28/03	Soil	C	See note 1
J00MK0	4/28/03	Soil	C	See note 1
J00MK1	4/28/03	Soil	C	See note 1
J00MK2	4/28/03	Soil	C	See note 1
J00MK3	4/28/03	Soil	C	See note 1

1-Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

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: Water samples must be extracted within 7 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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

All holding times were met.

- **Method Blanks**

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

All method blank results were acceptable.

<u>Field Blanks</u>

One equipment blank (J00MK3) was submitted for analysis. Di-n-butylphthalate was detected in the equipment blank. Under the BHI statement of work, no qualification is required. All other field blank results were acceptable.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate 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 outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate 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 MS/MSD RPD results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J00MK1/J00MK2) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Eight analytes exceeded the RQL in all other samples (2-nitroanaline, 2,4-dinitrophenol, 3-nitroanaline, 4-nitrophenol, 4-nitroanaline, 4,6-dinitro-2-methylphenol, pentachlorophenol and 2,4,5-trichlorophenol). Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2187-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Eight analytes exceeded the RQL in all other samples (2-nitroanaline, 2,4-dinitrophenol, 3-nitroanaline, 4-nitrophenol, 4-nitroanaline, 4,6-dinitro-2-methylphenol, pentachlorophenol and 2,4,5-trichlorophenol). Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

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

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

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2187	REVIEWER: TLI	DATE: 5/27/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE/PAH ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2187														
Sample Number		J00MJ8		J00MJ9		J00MK0		J00MK1		J00MK2		J00MK3			
Remarks		E. Blank								Duplicate		E. Blank			
Sample Date		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03			
Extraction Date		5/1/03		5/1/03		5/1/03		5/1/03		5/1/03		5/1/03			
Analysis Date		5/2/03		5/2/03		5/2/03		5/2/03		5/2/03		5/2/03			
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
bis(2-Chloroethyl)ether	660	350	U	340	U	340	U	340	U	340	U	330	U		
2-Chlorophenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
1,3-Dichlorobenzene	660	350	U	340	U	340	U	340	U	340	U	330	U		
1,4-Dichlorobenzene	660	350	U	340	U	340	U	340	U	340	U	330	U		
1,2-Dichlorobenzene	660	350	U	340	U	340	U	340	U	340	U	330	U		
2-Methylphenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,2'-oxybis(1-chloropropane)	660	350	U	340	U	340	U	340	U	340	U	330	U		
3 and/or 4-Methylphenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
N-Nitroso-di-n-propylamine	660	350	U	340	U	340	U	340	U	340	U	330	U		
Hexachloroethane	660	350	U	340	U	340	U	340	U	340	U	330	U		
Nitrobenzene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Isophorone	660	350	U	340	U	340	U	340	U	340	U	330	U		
2-Nitrophenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,4-Dimethylphenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
bis(2-Chloroethoxy)methane	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,4-Dichlorophenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
1,2,4-Trichlorobenzene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Naphthalene	660	350	U	340	U	340	U	340	U	340	U	330	U		
4-Chloroaniline	660	350	U	340	U	340	U	340	U	340	U	330	U		
Hexachlorobutadiene	660	350	U	340	U	340	U	340	U	340	U	330	U		
4-Chloro-3-methylphenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
2-Methylnaphthalene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Hexachlorocyclopentadiene	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,4,6-Trichlorophenol	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,4,5-Trichlorophenol*	660	860	U	860	U	850	U	860	U	850	U	830	U		
2-Chloronaphthalene	660	350	U	340	U	340	U	340	U	340	U	330	U		
2-Nitroaniline*	660	860	U	860	U	850	U	860	U	850	U	830	U		
Dimethylphthalate	660	350	U	340	U	340	U	340	U	340	U	330	U		
Acenaphthylene	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,6-Dinitrotoluene	660	350	U	340	U	340	U	340	U	340	U	330	U		

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

SEMIVOLATILE/PAH ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2187														
Sample Number		J00MJ8		J00MJ9		J00MK0		J00MK1		J00MK2		J00MK3			
Remarks		E. Blank								Duplicate		E. Blank			
Sample Date		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03			
Extraction Date		5/1/03		5/1/03		5/1/03		5/1/03		5/1/03		5/1/03			
Analysis Date		5/2/03		5/2/03		5/2/03		5/2/03		5/2/03		5/2/03			
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	860	U	860	U	850	U	860	U	850	U	830	U		
Acenaphthene	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,4-Dinitrophenol*	660	860	U	860	U	850	U	860	U	850	U	830	U		
4-Nitrophenol*	660	860	U	860	U	850	U	860	U	850	U	830	U		
Dibenzofuran	660	350	U	340	U	340	U	340	U	340	U	330	U		
2,4-Dinitrotoluene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Diethylphthalate	660	350	U	340	U	340	U	340	U	340	U	330	U		
4-Chlorophenyl-phenyl ether	660	350	U	340	U	340	U	340	U	340	U	330	U		
Fluorene	660	350	U	340	U	340	U	340	U	340	U	330	U		
4-Nitroaniline*	660	860	U	860	U	850	U	860	U	850	U	830	U		
4,6-Dinitro-2-methylphenol*	660	860	U	860	U	850	U	860	U	850	U	830	U		
N-Nitrosodiphenylamine	660	350	U	340	U	340	U	340	U	340	U	330	U		
4-Bromophenyl-phenyl ether	660	350	U	340	U	340	U	340	U	340	U	330	U		
Hexachlorobenzene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Pentachlorophenol*	660	860	U	860	U	850	U	860	U	850	U	830	U		
Phenanthrene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Anthracene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Carbazole	660	350	U	340	U	340	U	340	U	340	U	330	U		
Di-n-butylphthalate	660	350	U	340	U	340	U	340	U	340	U	200			
Fluoranthene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Pyrene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Butylbenzylphthalate	660	350	U	340	U	340	U	340	U	340	U	330	U		
3,3'-Dichlorobenzidine	660	350	U	340	U	340	U	340	U	340	U	330	U		
Benzo(a)anthracene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Chrysene	660	350	U	340	U	340	U	340	U	340	U	330	U		
bis(2-Ethylhexyl)phthalate	660	350	U	21		340	U	340	U	340	U	330	U		
Di-n-octylphthalate	660	350	U	340	U	340	U	340	U	340	U	330	U		
Benzo(b)fluoranthene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Benzo(k)fluoranthene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Benzo(a)pyrene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Indeno(1,2,3-cd)pyrene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Dibenz(a,h)anthracene	660	350	U	340	U	340	U	340	U	340	U	330	U		
Benzo(g,h,i)perylene	660	350	U	340	U	340	U	340	U	340	U	330	U		

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

* - TDL exceeded

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

Report Date: 05/06/03 14:33

RFW Batch Number: 0304L300 Client: TNUHANFORD B03-015 H2187 Work Order: 11343606001 Page: 1a

	Cust ID:	J00MJ8	J00MJ8	J00MJ8	J00MJ9	J00MK0	J00MK1
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	59 %	62 %	73 %	73 %	70 %	58 %
	2-Fluorobiphenyl	60 %	68 %	74 %	71 %	76 %	63 %
	Terphenyl-d14	82 %	87 %	93 %	85 %	93 %	79 %
	Phenol-d5	61 %	64 %	66 %	72 %	65 %	61 %
	2-Fluorophenol	61 %	59 %	65 %	71 %	69 %	59 %
	2,4,6-Tribromophenol	59 %	74 %	77 %	64 %	66 %	62 %
		fl	fl	fl	fl	fl	fl
Phenol		350 U	63 %	63 %	340 U	340 U	340 U
bis(2-Chloroethyl)ether		350 U	350 U	350 U	340 U	340 U	340 U
2-Chlorophenol		350 U	65 %	65 %	340 U	340 U	340 U
1,3-Dichlorobenzene		350 U	350 U	350 U	340 U	340 U	340 U
1,4-Dichlorobenzene		350 U	58 %	67 %	340 U	340 U	340 U
1,2-Dichlorobenzene		350 U	350 U	350 U	340 U	340 U	340 U
2-Methylphenol		350 U	350 U	350 U	340 U	340 U	340 U
2,2'-oxybis(1-Chloropropane)		350 U	350 U	350 U	340 U	340 U	340 U
3- and/or 4-Methylphenol		350 U	350 U	350 U	340 U	340 U	340 U
N-Nitroso-di-n-propylamine		350 U	62 %	66 %	340 U	340 U	340 U
Hexachloroethane		350 U	350 U	350 U	340 U	340 U	340 U
Nitrobenzene		350 U	350 U	350 U	340 U	340 U	340 U
Isophorone		350 U	350 U	350 U	340 U	340 U	340 U
2-Nitrophenol		350 U	350 U	350 U	340 U	340 U	340 U
2,4-Dimethylphenol		350 U	350 U	350 U	340 U	340 U	340 U
bis(2-Chloroethoxy)methane		350 U	350 U	350 U	340 U	340 U	340 U
2,4-Dichlorophenol		350 U	350 U	350 U	340 U	340 U	340 U
1,2,4-Trichlorobenzene		350 U	59 %	67 %	340 U	340 U	340 U
Naphthalene		350 U	350 U	350 U	340 U	340 U	340 U
4-Chloroaniline		350 U	350 U	350 U	340 U	340 U	340 U
Hexachlorobutadiene		350 U	350 U	350 U	340 U	340 U	340 U
4-Chloro-3-methylphenol		350 U	66 %	66 %	340 U	340 U	340 U
2-Methylnaphthalene		350 U	350 U	350 U	340 U	340 U	340 U
Hexachlorocyclopentadiene		350 U	350 U	350 U	340 U	340 U	340 U
2,4,6-Trichlorophenol		350 U	350 U	350 U	340 U	340 U	340 U
2,4,5-Trichlorophenol		860 U	860 U	860 U	860 U	850 U	860 U

*= Outside of EPA CLP QC limits.

000013

Pr 5/27/03

RFW Batch Number: 0304L300 Client: [illegible]

Cust ID:	J00MJ8	J00MJ8	J00MJ8	J00MJ9	J00MK0	J00MK1
RFW#:	001	001 MS	001 MSD	002	003	004
2-Chloronaphthalene	350 U	350 U	350 U	340 U	340 U	340 U
2-Nitroaniline	860 U	860 U	860 U	860 U	850 U	860 U
Dimethylphthalate	350 U	350 U	350 U	340 U	340 U	340 U
Acenaphthylene	350 U	350 U	350 U	340 U	340 U	340 U
2,6-Dinitrotoluene	350 U	350 U	350 U	340 U	340 U	340 U
3-Nitroaniline	860 U	860 U	860 U	860 U	850 U	860 U
Acenaphthene	350 U	63 %	68 %	340 U	340 U	340 U
2,4-Dinitrophenol	860 U	860 U	860 U	860 U	850 U	860 U
4-Nitrophenol	860 U	58 %	68 %	860 U	850 U	860 U
Dibenzofuran	350 U	350 U	350 U	340 U	340 U	340 U
2,4-Dinitrotoluene	350 U	65 %	73 %	340 U	340 U	340 U
Diethylphthalate	350 U	350 U	350 U	340 U	340 U	340 U
4-Chlorophenyl-phenylether	350 U	350 U	350 U	340 U	340 U	340 U
Fluorene	350 U	350 U	350 U	340 U	340 U	340 U
4-Nitroaniline	860 U	860 U	860 U	860 U	850 U	860 U
4,6-Dinitro-2-methylphenol	860 U	860 U	860 U	860 U	850 U	860 U
N-Nitrosodiphenylamine (1)	350 U	350 U	350 U	340 U	340 U	340 U
4-Bromophenyl-phenylether	350 U	350 U	350 U	340 U	340 U	340 U
Hexachlorobenzene	350 U	350 U	350 U	340 U	340 U	340 U
Pentachlorophenol	860 U	66 %	72 %	860 U	850 U	860 U
Phenanthrene	350 U	350 U	350 U	340 U	340 U	340 U
Anthracene	350 U	350 U	350 U	340 U	340 U	340 U
Carbazole	350 U	350 U	350 U	340 U	340 U	340 U
Di-n-butylphthalate	350 U	350 U	350 U	340 U	340 U	340 U
Fluoranthene	350 U	350 U	350 U	340 U	340 U	340 U
Pyrene	350 U	79 %	84 %	340 U	340 U	340 U
Butylbenzylphthalate	350 U	350 U	350 U	340 U	340 U	340 U
3,3'-Dichlorobenzidine	350 U	350 U	350 U	340 U	340 U	340 U
Benzo(a)anthracene	350 U	350 U	350 U	340 U	340 U	340 U
Chrysene	350 U	350 U	350 U	340 U	340 U	340 U
bis(2-Ethylhexyl)phthalate	350 U	350 U	350 U	21 J	340 U	340 U
Di-n-octyl phthalate	350 U	350 U	350 U	340 U	340 U	340 U
Benzo(b)fluoranthene	350 U	350 U	350 U	340 U	340 U	340 U
Benzo(k)fluoranthene	350 U	350 U	350 U	340 U	340 U	340 U
Benzo(a)pyrene	350 U	350 U	350 U	340 U	340 U	340 U
Indeno(1,2,3-cd)pyrene	350 U	350 U	350 U	340 U	340 U	340 U
Dibenz(a,h)anthracene	350 U	350 U	350 U	340 U	340 U	340 U
Benzo(g,h,i)perylene	350 U	350 U	350 U	340 U	340 U	340 U

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

5/27/05

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

Report Date: 05/06/03 14:33
Page: 2a

RFW Batch Number: 0304L300 Client: TNUHANFORD B03-015 B2187 Work Order: 11343606001

	Cust ID:	J00MK2	J00MK3	SBLKSI	SBLKSI BS
Sample Information	RFW#:	005	006	03LE0515-MB1	03LE0515-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	67 %	81 %	65 %	78 %
	2-Fluorobiphenyl	71 %	86 %	69 %	81 %
	Terphenyl-d14	91 %	104 %	81 %	85 %
	Phenol-d5	67 %	80 %	59 %	76 %
	2-Fluorophenol	68 %	83 %	60 %	74 %
	2,4,6-Tribromophenol	68 %	71 %	62 %	77 %
Phenol		340 U	330 U	330 U	74 %
bis(2-Chloroethyl)ether		340 U	330 U	330 U	330 U
2-Chlorophenol		340 U	330 U	330 U	73 %
1,3-Dichlorobenzene		340 U	330 U	330 U	330 U
1,4-Dichlorobenzene		340 U	330 U	330 U	66 %
1,2-Dichlorobenzene		340 U	330 U	330 U	330 U
2-Methylphenol		340 U	330 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		340 U	330 U	330 U	330 U
3- and/or 4-Methylphenol		340 U	330 U	330 U	330 U
N-Nitroso-di-n-propylamine		340 U	330 U	330 U	73 %
Hexachloroethane		340 U	330 U	330 U	330 U
Nitrobenzene		340 U	330 U	330 U	330 U
Isophorone		340 U	330 U	330 U	330 U
2-Nitrophenol		340 U	330 U	330 U	330 U
2,4-Dimethylphenol		340 U	330 U	330 U	330 U
bis(2-Chloroethoxy)methane		340 U	330 U	330 U	330 U
2,4-Dichlorophenol		340 U	330 U	330 U	330 U
1,2,4-Trichlorobenzene		340 U	330 U	330 U	69 %
Naphthalene		340 U	330 U	330 U	330 U
4-Chloroaniline		340 U	330 U	330 U	330 U
Hexachlorobutadiene		340 U	330 U	330 U	330 U
4-Chloro-3-methylphenol		340 U	330 U	330 U	70 %
2-Methylnaphthalene		340 U	330 U	330 U	330 U
Hexachlorocyclopentadiene		340 U	330 U	330 U	330 U
2,4,6-Trichlorophenol		340 U	330 U	330 U	330 U
2,4,5-Trichlorophenol		850 U	830 U	830 U	830 U

*= Outside of EPA CLP QC limits.

000015

5/21/03

RFW Batch Number: [illegible]

Cust ID:	J00MK2		J00MK3		SBLKSI		SBLKSI BS	
RFW#:	005		006		03LE0515-MB1		03LE0515-MB1	
2-Chloronaphthalene	340	U	330	U	330	U	330	U
2-Nitroaniline	850	U	830	U	830	U	830	U
Dimethylphthalate	340	U	330	U	330	U	330	U
Acenaphthylene	340	U	330	U	330	U	330	U
2,6-Dinitrotoluene	340	U	330	U	330	U	330	U
3-Nitroaniline	850	U	830	U	830	U	830	U
Acenaphthene	340	U	330	U	330	U	70	%
2,4-Dinitrophenol	850	U	830	U	830	U	830	U
4-Nitrophenol	850	U	830	U	830	U	64	%
Dibenzofuran	340	U	330	U	330	U	330	U
2,4-Dinitrotoluene	340	U	330	U	330	U	73	%
Diethylphthalate	340	U	330	U	330	U	330	U
4-Chlorophenyl-phenylether	340	U	330	U	330	U	330	U
Fluorene	340	U	330	U	330	U	330	U
4-Nitroaniline	850	U	830	U	830	U	830	U
4,6-Dinitro-2-methylphenol	850	U	830	U	830	U	830	U
N-Nitrosodiphenylamine (1)	340	U	330	U	330	U	330	U
4-Bromophenyl-phenylether	340	U	330	U	330	U	330	U
Hexachlorobenzene	340	U	330	U	330	U	330	U
Pentachlorophenol	850	U	830	U	830	U	72	%
Phenanthrene	340	U	330	U	330	U	330	U
Anthracene	340	U	330	U	330	U	330	U
Carbazole	340	U	330	U	330	U	330	U
Di-n-butylphthalate	340	U	200	J	330	U	330	U
Fluoranthene	340	U	330	U	330	U	330	U
Pyrene	340	U	330	U	330	U	77	%
Butylbenzylphthalate	340	U	330	U	330	U	330	U
3,3'-Dichlorobenzidine	340	U	330	U	330	U	330	U
Benzo(a)anthracene	340	U	330	U	330	U	330	U
Chrysene	340	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	340	U	330	U	330	U	330	U
Di-n-octyl phthalate	340	U	330	U	330	U	330	U
Benzo(b)fluoranthene	340	U	330	U	330	U	330	U
Benzo(k)fluoranthene	340	U	330	U	330	U	330	U
Benzo(a)pyrene	340	U	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	340	U	330	U	330	U	330	U
Dibenz(a,h)anthracene	340	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	340	U	330	U	330	U	330	U

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

5/27/03

000016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC

Client: TNU-HANFORD B03-015
LVL #: 0304L300
SDG/SAF # H2187/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-30-2003

SEMIVOLATILE

Six (6) soil samples were collected on 04-28-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 05-01-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 05-02-2003.

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

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

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

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

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. Internal standard area and retention time criteria were met.

8. Manual integrations are performed according to OP 21-06A-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").

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

J. Michael Taylor
President
Lionville Laboratory Incorporated

05-06-03
Date

som\gorup\data\bna\tnu-hanford-0304-300.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 2 0 pages.

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B03-015-77 | Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit	SAF No.: B03-015	
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030218		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000019

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	D 1	E 1	B 1	A 1	A 1	E 1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
Sample No. / Matrix * / Sample Date / Sample Time										
J00MJ8 / SOIL / 4-28-03 / 1350	X	X	X	X	X		X			
J00MJ9 / SOIL / 4-28-03 / 1335	X	X	X	X	X		X			
J00MK0 / SOIL / 4-28-03 / 1320	X	X	X	X	X		X			
J00MK1 / SOIL / 4-28-03 / 0950	X	X	X	X	X		X			
J00MK2 / SOIL / 4-28-03 / 0950	X	X	X	X	X		X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers / Doug Bowers	4-28-03 / 1530	Ref 3C 3728	4-28-03 / 1530
Ref 3C 3728	42903 1000	SJOALE	42903 1000
SJOALE	42903 1000	FED EX	
FED EX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

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

B03-015-78

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit		SAF No.: B03-015
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030218		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

020000

Preservation	None	None	Cool 4C	Cool 4C
Type of Container	aG	aG	aG	aG
No. of Container(s)	1	D 1	1	1
Volume	1000mL	60mL	A 120mL	60mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See Item (1) in Special Instructions	See Item (2) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)
J00MK3	SOIL	4-28-03	0945	X	X	X	

CHAIN OF POSSESSION

Relinquished By/Removed From (Sign/Print Names)	Date/Time	Received By/Stored In (Sign/Print Names)	Date/Time
Doug Bowers	4-28-03/1730	Ref 3C 3728	4-28-03/1530
REF 3C 3728	42903 1000	SJGALE	42903 1000
SJGALE	42903 1000	FED EX	
FEDEX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

Matrix *
S=Soil
SS=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

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RSCS 128-F-1			DATA PACKAGE: H2187		
VALIDATOR: TLI		LAB: LLI		DATE: 5/27/03	
CASE:			SDG: H2187		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00MJ7 J00MJ9 J00MK0 J00MK1					
J00MK2 J00MK3					
					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: di-n-butyl phthalate in eb.

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
Internal standard areas acceptable? ..... Yes No N/A
Internal standard retention times acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A
Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A
Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: 8 over in all

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries aceptable? ..... 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: 27 May 2003
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 128-F-1
Subject: Radiochemistry - Data Package No. H2187-EB (SDG No. H2187)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2187-EB which was prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00MJ8	4/28/03	Soil	C	See note 1 & 2
J00MJ9	4/28/03	Soil	C	See note 1 & 2
J00MK0	4/28/03	Soil	C	See note 1 & 2
J00MK1	4/28/03	Soil	C	See note 1 & 2
J00MK2	4/28/03	Soil	C	See note 1 & 2
J00MK3	4/28/03	Soil	C	See note 1

1- Gamma spectroscopy.
2 -Gross alpha, gross beta.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

  One equipment blank (J00MK3) was submitted for analysis. Potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **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 70-130%. 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.

All 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 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 duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J00MK1/J00MK2) were submitted for analysis. Duplicates are evaluated based on the same criteria as laboratory duplicates. All field duplicate results were acceptable.

- **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. Nine analytes were reported above their RQL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific RQL.

- **Completeness**

Data package No. H2187 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

Nine analytes were reported above their RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI 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

DATA QUALIFICATION SUMMARY

SDG: H2187	REVIEWER: TLI	DATE: 5/27/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																					
Laboratory: EB																					
Case	SDG: H2187																				
Sample Number		J00MJ8		J00MJ9		J00MK0		J00MK1		J00MK2		J00MK3									
Remarks										Duplicate		E. Blank									
Sample Date		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03									
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha		3.95		4.59		3.57	U	5.37		4.90		NA									
Gross Beta		19.3		12.2		16.7		17.6		15.5		NA									
Potassium-40		15.0		17.6		15.1		15.4		16.3		3.66									
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U								
Cesium 137	0.05	U	U	U	U	U	U	U	U	U	U*	U	U								
Radium-226		0.446		0.458		0.462		0.479		0.544		0.127									
Radium-228		0.597		0.731		0.582		0.665		0.604		0.122									
Europium 152	0.1	U	U	U	U	U	U	U	U	U	U	U	U								
Europium 154	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U								
Europium 155	0.1	U	U*	U	U	U	U*	U	U	U	U*	U	U								
Thorium-228		0.552		0.653		0.584		0.640		0.565		0.167									
Thorium-232		0.597		0.731		0.582		0.665		0.604		0.122									
Uranium-235(gea)		U	U	U	U	U	U	U	U	U	U	U	U								
Uranium-238(gea)		U	U	U	U	U	U	U	U	U	U	U	U								
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U	U	U								

NA = Not analyzed

* - 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 H2187

7500-001 J00MJ8

DATA SHEET

SDG	7500	Client/Case no	Hanford	SDG H2187
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R305001-01	Client sample id	J00MJ8	
Dept sample id	7500-001	Location/Matrix	128-F-1 Burn Pit	SOLID
Received	05/01/03	Collected/Weight	04/28/03 13:50	1058 g
% solids	96.9	Custody/SAF No	B03-015-77	B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	3.95	3.0	3.5	10		93A
Gross Beta	12587-47-2	19.3	4.8	6.5	15		93B
Potassium 40	13966-00-2	15.0	1.0	0.45			GAM
Cobalt 60	10198-40-0	U		0.047	0.050	U	GAM
Cesium 137	10045-97-3	U		0.047	0.10	U	GAM
Radium 226	13982-63-3	0.446	0.088	0.081			GAM
Radium 228	15262-20-1	0.597	0.19	0.19			GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.14	0.10	U	GAM
Thorium 228	14274-82-9	0.552	0.048	0.048			GAM
Thorium 232	TH-232	0.597	0.19	0.19			GAM
Uranium 235	15117-96-1	U		0.19		U	GAM
Uranium 238	U-238	U		5.6		U	GAM
Americium 241	14596-10-2	U		0.39		U	GAM

Remaining Sites Confirmation Smpl.

R 5/27/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-002

J00MJ9

DATA SHEET

SDG	7500	Client/Case no	Hanford	SDG H2187
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R305001-02	Client sample id	J00MJ9	
Dept sample id	7500-002	Location/Matrix	128-F-1 Burn Pit	SOLID
Received	05/01/03	Collected/Weight	04/28/03 13:35	1135 g
% solids	97.4	Custody/SAF No	B03-015-77	B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.59	3.2	4.1	10		93A
Gross Beta	12587-47-2	12.2	5.2	7.8	15		93B
Potassium 40	13966-00-2	17.6	1.2	0.32			GAM
Cobalt 60	10198-40-0	U		0.037	0.050	U	GAM
Cesium 137	10045-97-3	U		0.037	0.10	U	GAM
Radium 226	13982-63-3	0.458	0.071	0.064			GAM
Radium 228	15262-20-1	0.731	0.19	0.18			GAM
Europium 152	14683-23-9	U		0.088	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.074	0.10	U	GAM
Thorium 228	14274-82-9	0.653	0.044	0.040			GAM
Thorium 232	TH-232	0.731	0.19	0.18			GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Americium 241	14596-10-2	U		0.048		U	GAM

Remaining Sites Confirmation Smpl.

RW 5/27/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-003

J00MK0

DATA SHEET

SDG	7500	Client/Case no	Hanford	SDG H2187	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R305001-03	Client sample id	J00MK0		
Dept sample id	7500-003	Location/Matrix	128-F-1 Burn Pit	SOLID	
Received	05/01/03	Collected/Weight	04/28/03 13:20	1002 g	
% solids	97.8	Custody/SAF No	B03-015-77	B03-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	3.57	3.1	4.3	10	U	93A
Gross Beta	12587-47-2	16.7	4.6	6.4	15		93B
Potassium 40	13966-00-2	15.1	0.86	0.36			GAM
Cobalt 60	10198-40-0	U		0.043	0.050	U	GAM
Cesium 137	10045-97-3	U		0.037	0.10	U	GAM
Radium 226	13982-63-3	0.462	0.077	0.079			GAM
Radium 228	15262-20-1	0.582	0.18	0.19			GAM
Europium 152	14683-23-9	U		0.083	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.584	0.044	0.043			GAM
Thorium 232	TH-232	0.582	0.18	0.19			GAM
Uranium 235	15117-96-1	U		0.16		U	GAM
Uranium 238	U-238	U		4.6		U	GAM
Americium 241	14596-10-2	U		0.32		U	GAM

Remaining Sites Confirmation Smpl.

3/21/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-004

J00MK1

DATA SHEET

SDG	7500	Client/Case no	Hanford	SDG H2187
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R305001-04	Client sample id	J00MK1	
Dept sample id	7500-004	Location/Matrix	128-F-1 Burn Pit	SOLID
Received	05/01/03	Collected/Weight	04/28/03 09:50	938.2 g
% solids	97.7	Custody/SAF No	B03-015-77	B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	5.37	3.5	3.8	10		93A
Gross Beta	12587-47-2	17.6	4.8	6.5	15		93B
Potassium 40	13966-00-2	15.4	0.70	0.31			GAM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 137	10045-97-3	U		0.032	0.10	U	GAM
Radium 226	13982-63-3	0.479	0.055	0.052			GAM
Radium 228	15262-20-1	0.665	0.15	0.16			GAM
Europium 152	14683-23-9	U		0.070	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.073	0.10	U	GAM
Thorium 228	14274-82-9	0.640	0.038	0.035			GAM
Thorium 232	TH-232	0.665	0.15	0.16			GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		3.6		U	GAM
Americium 241	14596-10-2	U		0.11		U	GAM

Remaining Sites Confirmation Smpl.

5/27/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-005 J00MK2

DATA SHEET

SDG	7500	Client/Case no	Hanford	SDG H2187	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R305001-05	Client sample id	J00MK2		
Dept sample id	7500-005	Location/Matrix	128-F-1 Burn Pit	SOLID	
Received	05/01/03	Collected/Weight	04/28/03 09:50	990.5 g	
% solids	97.5	Custody/SAF No	B03-015-77	B03-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.90	3.0	3.6	10		93A
Gross Beta	12587-47-2	15.5	5.2	7.7	15		93B
Potassium 40	13966-00-2	16.3	1.1	0.47			GAM
Cobalt 60	10198-40-0	U		0.048	0.050	U	GAM
Cesium 137	10045-97-3	U		0.051	0.10	U	GAM
Radium 226	13982-63-3	0.544	0.089	0.088			GAM
Radium 228	15262-20-1	0.604	0.22	0.24			GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	0.565	0.053	0.051			GAM
Thorium 232	TH-232	0.604	0.22	0.24			GAM
Uranium 235	15117-96-1	U		0.20		U	GAM
Uranium 238	U-238	U		5.7		U	GAM
Americium 241	14596-10-2	U		0.42		U	GAM

Remaining Sites Confirmation Smpl.

5/27/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-006

J00MK3

DATA SHEET

SDG	7500	Client/Case no	Hanford SDG H2187
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R305001-06	Client sample id	J00MK3
Dept sample id	7500-006	Location/Matrix	128-F-1 Burn Pit SOLID
Received	05/01/03	Collected/Weight	04/28/03 09:45 961.4 g
% solids	100.0	Custody/SAF No	B03-015-78 B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	3.66	0.62	0.22			GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	U		0.018	0.10	U	GAM
Radium 226	13982-63-3	0.127	0.036	0.036			GAM
Radium 228	15262-20-1	0.122	0.072	0.084			GAM
Europium 152	14683-23-9	U		0.041	0.10	U	GAM
Europium 154	15585-10-1	U		0.064	0.10	U	GAM
Europium 155	14391-16-3	U		0.040	0.10	U	GAM
Thorium 228	14274-82-9	0.167	0.020	0.021			GAM
Thorium 232	TH-232	0.122	0.072	0.084			GAM
Uranium 235	15117-96-1	U		0.063		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Americium 241	14596-10-2	U		0.024		U	GAM

Remaining Sites Confirmation Smpl.

5/27/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/08/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2187 was composed of six solid (soil) samples designated under SAF No. B03-015 with a Project Designation of: Remaining Sites Confirmation Sampling – Soil, 128-F-1 Burn Pit.

The 1000 mL glass bottle-containing sample J00MK3 on CoC B03-015-78 was received broken at Eberline Services on May 1, 2003. The sample container was received completely contained and sealed in a plastic bag (secondary container). Even though the glass container was broken almost all the sample material was still in the container. There was no possibility of cross contamination because all the sample material was contained within the plastic bag.

BHI was notified of the breakage and it was agreed to by Eberline Services and BHI to empty the sample into another container, remove any broken glass and use the material for the gamma spec. analysis.

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 BHI via e-Fax on May 8, 2003. The electronic data deliverable (EDD) was transmitted to BHI via e-mail on May 8, 2003.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

5/12/3

Date

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

B03-015-77

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit SDG H2187 (7500)	SAF No.: B03-015	
Ice Chest No.: ERC 99 071	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA RECRA	Offsite Property No.: A030246		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000019

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082 Pesticides - 8081	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time									
J00MJ8	SOIL	4-28-03	1350	X	X	X	X	X		X		
J00MJ9	SOIL	4-28-03	1335	X	X	X	X	X		X		
J00MK0	SOIL	4-28-03	1320	X	X	X	X	X		X		
J00MK1	SOIL	4-28-03	0950	X	X	X	X	X		X		
J00MK2	SOIL	4-28-03	0950	X	X	X	X	X		X		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Doug Bowers	4-28-03/1530	Ref 3C 3728	4-28-03/1530
Ref 3C 3728	42903 1000	SJOALE	42903 1000
SJOALE	42903 1000	FED EX	
FED EX			5/1/03 1515

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B03-015-78 | Page 1 of 1

Bechtel Hanford Inc.

Collector: Doug Bowers

Company Contact: Renee Nielson | Telephone No.: 372-9658

Project Coordinator: KESSNER, JH

Price Code: 8B | Data Turnaround: 7 Days

Air Quality ☐

Project Designation: Remaining Sites Confirmation Sampling-Soil

Sampling Location: 128-F-1 burn pit SDGH2187 (7500)

SAF No.: B03-015

Ice Chest No.: GRC 99 071

Field Logbook No.: EL-1578 | COA: C17HXF671C

Method of Shipment: Fed Ex

Shipped To: TMA/RECRA

Offsite Property No.: A030246

Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

020000

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time										
Preservation				None	None	Cool 4C	Cool 4C						
Type of Container				aG	aG	aG	aG						
No. of Container(s)				1	1	1	1						
Volume				1000mL	60mL	120mL	60mL						
				See item (1) in Special Instructions.	See item (2) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)						
J00MK3	SOIL	4-28-03	0945	X	X	X					Broken Container		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	4-28-03/1530	Ref 3C 3728	4-28-03/1530
Ref 3C 3728	42903 1000	SJGALE	42903 1000
SJGALE	42903 1000	FED EX	
FED EX	5/1/03		5/1/03 11:15AM

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); ~~Gross Alpha & Gross Beta~~ per client J. Kessner MM 5/1/03
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

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

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RSCS 128-F-1			DATA PACKAGE: H2187		
VALIDATOR: TLI		LAB: EB		DATE: 5/27/03	
CASE:			SDG: H2187		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J00MJ8 J00MJ9 J00MK0 J00MK1					
J00MK2 J00MK3					
					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: _____

Appendix A – Radiochemical Data Validation Checklist

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: EB – K-40 Ra 226/228 Th 228/232

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: _____

Appendix A – Radiochemical Data Validation Checklist

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 FS or PAS

12. Holding Times (All levels)

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

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

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: 9 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-008

Method Blank

METHOD BLANK

SDG	7500	Client/Case no	Hanford	SDG H2187	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R305001-08	Client sample id	Method Blank		
Dept sample id	7500-008	Material/Matrix		SOLID	
		SAF No	B03-015		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.837	1.2	3.0	10	U	93A
Gross Beta	12587-47-2	0.579	3.8	6.4	15	U	93B
Potassium 40	13966-00-2	U		0.45		U	GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.10	U	GAM
Radium 226	13982-63-3	U		0.037		U	GAM
Radium 228	15262-20-1	U		0.073		U	GAM
Europium 152	14683-23-9	U		0.046	0.10	U	GAM
Europium 154	15585-10-1	U		0.043	0.10	U	GAM
Europium 155	14391-16-3	U		0.051	0.10	U	GAM
Thorium 228	14274-82-9	U		0.024		U	GAM
Thorium 232	TH-232	U		0.073		U	GAM
Uranium 235	15117-96-1	U		0.067		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Americium 241	14596-10-2	U		0.098		U	GAM

Remaining Sites Confirmation Smpl.

QC-BLANK #44570

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-007

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7500
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2187
Contract No. 630

Lab sample id R305001-07
Dept sample id 7500-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B03-015

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
Gross Alpha	211	15	3.0	10		93A	200	8.0	106	66-134	70-130
Gross Beta	207	11	7.6	15		93B	211	8.4	98	76-124	70-130
Cobalt 60	1.82	0.080	0.031	0.050		GAM	1.80	0.072	101	76-124	80-120
Cesium 137	1.71	0.064	0.040	0.10		GAM	1.74	0.070	98	76-124	80-120

Remaining Sites Confirmation Smpl.

QC-LCS #44569

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2187

7500-009

J00MK1

DUPLICATE

SDG	7500			Client/Case no	Hanford SDG H2187
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R305001-09	Lab sample id	R305001-04	Client sample id	J00MK1
Dept sample id	7500-009	Dept sample id	7500-004	Location/Matrix	128-F-1 Burn Pit SOLID
		Received	05/01/03	Collected/Weight	04/28/03 09:50 938.2 g
% solids	97.7	% solids	97.7	Custody/SAF No	B03-015-77 B03-015

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	4.60	3.1	3.9	10		93A	5.37	3.5	3.8		15	147
Gross Beta	17.0	5.3	7.7	15		93B	17.6	4.8	6.5		3	70
Potassium 40	15.0	1.2	0.70			GAM	15.4	0.70	0.31		3	35
Cobalt 60	U		0.060	0.050	U	GAM	U		0.034	U	-	
Cesium 137	U		0.054	0.10	U	GAM	U		0.032	U	-	
Radium 226	0.556	0.10	0.098			GAM	0.479	0.055	0.052		15	46
Radium 228	0.472	0.25	0.28			GAM	0.665	0.15	0.16		34	83
Europium 152	U		0.13	0.10	U	GAM	U		0.070	U	-	
Europium 154	U		0.23	0.10	U	GAM	U		0.11	U	-	
Europium 155	U		0.21	0.10	U	GAM	U		0.073	U	-	
Thorium 228	0.609	0.061	0.062			GAM	0.640	0.038	0.035		5	36
Thorium 232	0.472	0.25	0.28			GAM	0.665	0.15	0.16		34	83
Uranium 235	U		0.21		U	GAM	U		0.10	U	-	
Uranium 238	U		7.4		U	GAM	U		3.6	U	-	
Americium 241	U		0.19		U	GAM	U		0.11	U	-	

Remaining Sites Confirmation Smpl.

QC-DUP#4 44571

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	05/08/03

Rush

EBERLINE SERVICES

ANALYTICAL SERVICES GROUP
Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

Client: Bechtel Hanford Date/Time received 5/1/03 11:15 AM

CoC No. B-03-015-77, 78

Container I.D. No. ERC99071 Requested TAT (Days) 7 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 6
7. Number of containers per sample: 1 (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [ ] Leaking [ ] Broken Container [X] Missing [ ]
11. *Samples are: Preserved [ ] Not preserved [ ] Preservative* _____
12. Describe any anomalies: J00MK3 - Broken Container
13. Was P.M. notified of any anomalies? Yes [X] MM No [ ] Date 5/01/03
14. Received by [signature] Date: 5/1/03 Time: 11:15.

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. _____ Calibration date _____

Date: 27 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 128-F-1
Subject: Wet Chemistry - Data Package No. H2187-LLI (SDG No. H2187)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2187-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00MJ8	4/28/03	Soil	C	See note 1
J00MJ9	4/28/03	Soil	C	See note 1
J00MK0	4/28/03	Soil	C	See note 1
J00MK1	4/28/03	Soil	C	See note 1
J00MK2	4/28/03	Soil	C	See note 1
J00MK3	4/28/03	Soil	C	See note 2

1 - Chromium VI by 7196A; petroleum hydrocarbons by 9071.
2 - No validated analytes requested.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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 and 28 days for petroleum hydrocarbons.

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

One equipment blank (J00MK3) was submitted for analysis. No analytes requiring validation were requested.

- **Accuracy**

Matrix Spike

Matrix spike (MS) 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 recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified

"UJ". Samples with a spike 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 spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples (J00MK1/J00MK2) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All other duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All undetected chromium VI results exceeded the RQL. Under the BHI statement of work, no qualification is required. All other results met the analyte specific RQL.

- **Completeness**

Data package No. H2187-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All undetected chromium VI results exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

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

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

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

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

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2187	REVIEWER: TLI	DATE: 5/27/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD																	
Laboratory: LLI																	
Case	SDG: H2187																
Sample Number		J00MJ8		J00MJ9		J00MK0		J00MK1		J00MK2		J00MK3					
Remarks										Duplicate		E. Blank					
Sample Date		04/28/03		04/28/03		04/28/03		04/28/03		04/28/03		04/28/03					
Wet Chemistry	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.1	0.42	U	0.41	U	0.41	U	0.41	U	0.41	U	NA					
Petroleum Hydrocarbons	5	3.4	U	4.0		3.4	U	3.7		4.4		NA					
* - pH units																	
NA = Not analyzed																	

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

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00MJ8	% Solids	96.4		%	0.01	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	3.4	u	MG/KG	3.4	1.0
-002	J00MJ9	% Solids	97.1		%	0.01	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Petroleum Hydrocarbons	4.0		MG/KG	3.4	1.0
-003	J00MK0	% Solids	97.7		%	0.01	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Petroleum Hydrocarbons	3.4	u	MG/KG	3.4	1.0
-004	J00MK1	% Solids	96.8		%	0.01	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Petroleum Hydrocarbons	3.7		MG/KG	3.4	1.0
-005	J00MK2	% Solids	97.5		%	0.01	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Petroleum Hydrocarbons	4.4		MG/KG	3.4	1.0
-006	J00MK3	% Solids	100		%	0.01	1.0

5/27/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015 H2187
LVL#: 0304L300

W.O.#: 11343-606-001-9999-00
Date Received: 04-30-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 6 soil samples.

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

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

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

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries for Petroleum Hydrocarbon (PHC) and Chromium VI were within the 75-125% control limits. The matrix spike duplicate was within the 20% Relative Percent Difference (RPD) control limit.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

05-08-03
Date

njp\i04-300

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 14 pages.

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B03-015-77	Page 1 of 1
Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit		SAF No.: B03-015	Air Quality ☐
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex	Data Turnaround: 7 Days
Shipped To: TMA/RECRA	Offsite Property No.: A030218		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000014

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	D 1	E 1	B 1	A 1	A 1	E 1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
J00MJ8	SOIL	4-28-03	1350	X	X	X	X	X		X			
J00MJ9	SOIL	4-28-03	1335	X	X	X	X	X		X			
J00MK0	SOIL	4-28-03	1320	X	X	X	X	X		X			
J00MK1	SOIL	4-28-03	0950	X	X	X	X	X		X			
J00MK2	SOIL	4-28-03	0950	X	X	X	X	X		X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	4-28-03/1530	Ref 3C 3728	4-28-03/1530
Ref 3C 3728	42903 1000	SJOALE	42903 1000
SJOALE	42903 1000	FED EX	
FED EX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

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

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B03-015-78

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit	SAF No.: B03-015	
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030218	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Preservation	None		None	Cool 4C	Cool 4C							
Type of Container	sG		sG	sG	sG							
No. of Container(s)	1		D 1	1	1							
Volume	1000mL		60mL	A 120mL	60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions		See item (2) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)							
Sample No.	Matrix *	Sample Date	Sample Time									
J00MK3	SOIL	4-28-03	0945	X	X	X						

000015

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	4-28-03/1530	Ref 3C 3728	4-28-03/1530
Ref 3C 3728	42903 1000	SJGALE	42903 1000
SJGALE	42903 1000	FED EX	
FED EX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

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

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RSCS 128-F-1			DATA PACKAGE: H2187		
VALIDATOR: TLT		LAB: LLI		DATE: 5/27/03	
CASE:			SDG: H2187		
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	TPH	
SAMPLES/MATRIX					
J00MJ8	J00MJ9	J00MK0	J00MK1	J00MK2	J00MK3
					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 DATA VALIDATION CHECKLISTS

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:

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 DATA VALIDATION CHECKLISTS

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 DATA VALIDATION CHECKLISTS

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: all Chromium ~~UA~~ over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/07/03

CLIENT: TNUHANFORD B03-015 H2187

LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI040-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	03LHC023-MB1	Petroleum Hydrocarbons	3.3 u	MG/KG	3.3	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J00MJ8	Petroleum Hydrocarbons	137	3.0	145	92.8	1.0
		Petroleum Hydrocarbons	131	3.0	145	88.5	1.0
-005	J00MK2	Soluble Chromium VI	4.4	0.41u	4.1	103.2	1.0
		Insoluble Chromium VI	1220	0.41u	1140	106.5	100
BLANK10	03LVI040-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.8	1.0
		Insoluble Chromium VI	1210	0.40u	1080	112.2	100
LCS10	03LHC023-LC1	Petroleum Hydrocarbons	121	3.3 u	140	86.4	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-001	J00MJ8	Petroleum Hydrocarbons	92.8	88.5	4.8

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-003REP	J00MK0	% Solids	97.7	97.7	0.031	1.0
-005REP	J00MK2	Chromium VI	0.41u	0.41u	NC	1.0

Date: 27 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 128-F-1
Subject: PCB - Data Package No. H2187-LLI (SDG No. H2187)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2187-LLI prepared by Lionville Laboratory Incorporated (LLI). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00MJ8	4/28/03	Soil	C	See note 1
J00MJ9	4/28/03	Soil	C	See note 1
J00MK0	4/28/03	Soil	C	See note 1
J00MK1	4/28/03	Soil	C	See note 1
J00MK2	4/28/03	Soil	C	See note 1

1 - Pesticides by 8081A and PCBs by 8082.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

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 practical quantitation limit (PQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than PQL, the result is qualified as undetected and elevated to the PQL.

All method blank target compound results were acceptable.

Field Blanks

No blank equipment blank was submitted for analysis.

- **Accuracy**

Matrix Spike

Matrix spike 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 analyses are performed in duplicate and must be within control limits of 70% to 130%. If spike recoveries are outside control

limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J00MK1/J00MK2) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

  Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All reported PCB, methoxychlor and toxaphene results exceeded the analyte specific RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

  Data Package No. H2187-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to laboratory reported interference, the beta-BHC result in samples J00MK0, J00MK1 and J00MK2 were qualified as an estimate and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All reported PCB, methoxychlor and toxaphene results exceeded the analyte specific RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

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

DATA QUALIFICATION SUMMARY

SDG: H2187	REVIEWER: TLI	DATE: 5/27/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
beta-BHC	J	J00MK0, J00MK1, J00MK2	Laboratory reported interference

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD														
Laboratory: Lionville Laboratory Inc.														
Case:	SDG: H2187													
Sample Number		J00MJ8		J00MJ9		J00MK0		J00MK1		J00MK2				
Remarks										Duplicate				
Sample Date		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03				
Extraction Date		5/1/03		5/1/03		5/1/03		5/1/03		5/1/03				
Analysis Date		5/6/03		5/6/03		5/6/03		5/6/03		5/6/03				
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	35	U	34	U	34	U	34	U	34	U				
Aroclor-1221	20	69	U	69	U	68	U	69	U	68	U				
Aroclor-1232	20	35	U	34	U	34	U	34	U	34	U				
Aroclor-1242	20	35	U	34	U	34	U	34	U	34	U				
Aroclor-1248	20	35	U	34	U	34	U	34	U	34	U				
Aroclor-1254	20	35	U	34	U	34	U	34	U	34	U				
Aroclor-1260	20	35	U	34	U	34	U	34	U	34	U				
Sample Number		J00MJ8		J00MJ9		J00MK0		J00MK1		J00MK2				
Remarks										Duplicate				
Sample Date		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03				
Extraction Date		5/1/03		5/1/03		5/1/03		5/1/03		5/1/03				
Analysis Date		5/5/03		5/5/03		5/5/03		5/5/03		5/5/03				
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Beta-BHC	5	1.7	U	1.7	U	3.8	J	2.1	J	2.4	J				
Delta-BHC	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Gamma-BHC (Lindane)	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Heptachlor	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Aldrin	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Heptachlor Epoxide	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Endosulfan I	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Dieldrin	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
4,4'-DDE	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
Endrin	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
Endosulfan II	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
4,4'-DDD	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
Endosulfan Sulfate	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
4,4'-DDT	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
Methoxychlor	5	17	U	17	U	17	U	17	U	17	U				
Endrin Ketone	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
Endrin Aldehyde	5	3.5	U	3.4	U	3.4	U	3.4	U	3.4	U				
alpha-Chlordane	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
gamma-Chlordane	5	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U				
Toxaphene	5	170	U	170	U	170	U	170	U	170	U				

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

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 05/07/03 09:36

RFW Batch Number: 0304L300 Client: TNUHANFORD B03-015 H2187 Work Order: 11343606001 Page: 1

	Cust ID:	J00MJ8	J00MJ9	J00MJ9	J00MJ9	J00MK0	J00MK1
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	100 %	105 %	95 %	115 %	105 %	95 %
	Decachlorobiphenyl	110 %	115 %	105 %	130 * %	120 %	110 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		35 U	34 U	99 %	117 %	34 U	34 U
Aroclor-1221		69 U	69 U	69 U	69 U	68 U	69 U
Aroclor-1232		35 U	34 U	34 U	34 U	34 U	34 U
Aroclor-1242		35 U	34 U	34 U	34 U	34 U	34 U
Aroclor-1248		35 U	34 U	34 U	34 U	34 U	34 U
Aroclor-1254		35 U	34 U	34 U	34 U	34 U	34 U
Aroclor-1260		35 U	34 U	97 %	116 %	34 U	34 U

	Cust ID:	J00MK2	PBLKSN	PBLKSN BS
Sample Information	RFW#:	005	03LE0514-MB1	03LE0514-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	90 %	95 %	100 %
	Decachlorobiphenyl	115 %	115 %	120 %
		fl	fl	fl
Aroclor-1016		34 U	33 U	105 %
Aroclor-1221		68 U	67 U	67 U
Aroclor-1232		34 U	33 U	33 U
Aroclor-1242		34 U	33 U	33 U
Aroclor-1248		34 U	33 U	33 U
Aroclor-1254		34 U	33 U	33 U
Aroclor-1260		34 U	33 U	107 %

000011

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

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 05/08/03 12:09

RFW Batch Number: 0304L300 Client: TNUHANFORD B03-015 H2187 Work Order: 11343606001 Page: 1

	Cust ID:	J00MJ8	J00MJ8	J00MJ8	J00MJ9	J00MK0	J00MK1
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	90 %	95 %	95 %	100 %	95 %	95 %
	Decachlorobiphenyl	125 * %	120 %	125 * %	125 * %	120 %	120 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Beta-BHC		1.7 U	1.7 U	1.7 U	1.7 U	3.8 J	2.1 J
Delta-BHC		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)		1.7 U	76 %	80 %	1.7 U	1.7 U	1.7 U
Heptachlor		1.7 U	90 %	92 %	1.7 U	1.7 U	1.7 U
Aldrin		1.7 U	84 %	86 %	1.7 U	1.7 U	1.7 U
Heptachlor epoxide		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan I		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dieldrin		3.5 U	97 %	99 %	3.4 U	3.4 U	3.4 U
4,4'-DDE		3.5 U	3.5 U	3.5 U	3.4 U	3.4 U	3.4 U
Endrin		3.5 U	110 %	113 %	3.4 U	3.4 U	3.4 U
Endosulfan II		3.5 U	3.5 U	3.5 U	3.4 U	3.4 U	3.4 U
4,4'-DDD		3.5 U	3.5 U	3.5 U	3.4 U	3.4 U	3.4 U
Endosulfan sulfate		3.5 U	3.5 U	3.5 U	3.4 U	3.4 U	3.4 U
4,4'-DDT		3.5 U	104 %	104 %	3.4 U	3.4 U	3.4 U
Methoxychlor		17 U	17 U	17 U	17 U	17 U	17 U
Endrin ketone		3.5 U	3.5 U	3.5 U	3.4 U	3.4 U	3.4 U
Endrin aldehyde		3.5 U	3.5 U	3.5 U	3.4 U	3.4 U	3.4 U
alpha-Chlordane		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Toxaphene		170 U	170 U	170 U	170 U	170 U	170 U

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

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Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 05/08/03 12:09

RFW Batch Number: 0304L300 Client: TNUHANFORD B03-015 H2187 Work Order: 11343606001 Page: 2

	Cust ID:	J00MK2	PBLKSN	PBLKSN BS
Sample Information	RFW#:	005	03LE0514-MB1	03LE0514-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	90 %	100 %	110 %
	Decachlorobiphenyl	120 %	115 %	145 * %
Alpha-BHC		1.7 U	1.7 U	1.7 U
Beta-BHC		2.4 ~~U~~ J	1.7 U	1.7 U
Delta-BHC		1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)		1.7 U	1.7 U	102 %
Heptachlor		1.7 U	1.7 U	106 %
Aldrin		1.7 U	1.7 U	92 %
Heptachlor epoxide		1.7 U	1.7 U	1.7 U
Endosulfan I		1.7 U	1.7 U	1.7 U
Dieldrin		3.4 U	3.3 U	115 %
4,4'-DDE		3.4 U	3.3 U	3.3 U
Endrin		3.4 U	3.3 U	104 %
Endosulfan II		3.4 U	3.3 U	3.3 U
4,4'-DDD		3.4 U	3.3 U	3.3 U
Endosulfan sulfate		3.4 U	3.3 U	3.3 U
4,4'-DDT		3.4 U	3.3 U	114 %
Methoxychlor		17 U	17 U	17 U
Endrin ketone		3.4 U	3.3 U	3.3 U
Endrin aldehyde		3.4 U	3.3 U	3.3 U
alpha-Chlordane		1.7 U	1.7 U	1.7 U
gamma-Chlordane		1.7 U	1.7 U	1.7 U
Toxaphene		170 U	170 U	170 U

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

000013

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0304L300
SDG/SAF #: H2187/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-30-03

PCB

The set of samples consisted of five (5) soil samples collected on 04-28-03.

The samples and their associated QC samples were extracted on 05-01-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-06-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All samples and their associated QC samples received sulfuric Acid and Sulfur cleanups.
4. The method blank was below the reporting limits for all target compounds.
5. One (1) of eighteen (18) surrogate recoveries was outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/9/03
Date

pef\r:\group\data\pest\tnu hanford\04L-300.pcb

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

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

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0304L300
SDG/SAF #: H2187/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-30-03

PESTICIDE

The set of samples consisted of five (5) soil samples collected on 04-28-03.

The samples and their associated QC samples were extracted on 05-01-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-05,06-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8081A.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All samples and their associated QC samples received a Sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. Four (4) of eighteen (18) surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/9/03
Date

pef\r:\group\data\pest\tnu hanford\04L-301.pes

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

000016

B03-015-77

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit		SAF No.: B03-015
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030218		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000017

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	D 1	E 1	B 1	A 1	A 1	E 1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
Sample No. / Matrix * / Sample Date / Sample Time										
J00MJ8 / SOIL / 4-28-03 / 1350	X	X	X	X	X		X			
J00MJ9 / SOIL / 4-28-03 / 1335	X	X	X	X	X		X			
J00MK0 / SOIL / 4-28-03 / 1320	X	X	X	X	X		X			
J00MK1 / SOIL / 4-28-03 / 0950	X	X	X	X	X		X			
J00MK2 / SOIL / 4-28-03 / 0950	X	X	X	X	X		X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	4-28-03 1530	REF 3C 3728	4-28-03 1530
REF 3C 3728	42903 1000	SJOALE	42903 1000
SJOALE	42903 1000	FED EX	
FED EX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit		SAF No.: B03-015
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030218		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Preservation	None	None	Cool 4C	Cool 4C	
Type of Container	sG	sG	sG	sG	
No. of Container(s)	1	1	1	1	
Volume	1000mL	60mL	120mL	60mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	

Sample No.	Matrix *	Sample Date	Sample Time				
J00MK3	SOIL	4-28-03	0945	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	4-28-03/1530	Ref 3C 3728	4-28-03/1530
Ref 3C 3728	42903 1000	SJGALE	42903 1000
SJGALE	42903 1000	FED EX	
FEDEX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

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

000018

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RSCS 128-F-1			DATA PACKAGE: H2187		
VALIDATOR: TLI		LAB: LLI		DATE: 5/22/03	
CASE:			SDG: H2187		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J00MJ8	J00MJ9	J00MK0	J00MK1	J00MK2	J00MK3
					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:

PESTICIDE/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 eb

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

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

Comments: NO PAS

PESTICIDE/PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PESTICIDE/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

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

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

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

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

Comments: all PCB, toxaphene + methoxychlor ok

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

GPC check recoveries aceptable? ..... 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: 27 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil-Waste Site 128-F-1
Subject: Inorganics - Data Package No. H2187-LLI (SDG No. H2187)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2187-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00MJ8	4/28/03	Soil	C	See note 1
J00MJ9	4/28/03	Soil	C	See note 1
J00MK0	4/28/03	Soil	C	See note 1
J00MK1	4/28/03	Soil	C	See note 1
J00MK2	4/28/03	Soil	C	See note 1
J00MK3	4/28/03	Soil	C	See note 1

1 - ICP metals; mercury.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

One equipment blank (J00MK3) was submitted for analysis. Barium, mercury, chromium and lead were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike

Matrix spike (MS) 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 recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike

recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike 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 spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery 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.

Due to a RPD of 45.5%, all barium results were qualified as estimates and flagged "J".

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J00MK1/J00MK2) were submitted for analysis. Duplicates are evaluated based on the same criteria as laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. H2187-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be

valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a RPD of 45.5%, all barium results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

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

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

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

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

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2187	REVIEWER: TLI	DATE: 5/27/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Barium	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																					
Laboratory: LLI																					
Case	SDG: H2187																				
Sample Number		J00MJ8		J00MJ9		J00MK0		J00MK1		J00MK2		J00MK3									
Remarks										Duplicate		E. Blank									
Sample Date		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03		4/28/03									
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.08	U	0.07	U	0.08	U	0.08	U	0.08	U	0.07	U								
Arsenic		1.8		2.1		1.7		1.6		1.8		0.29	U								
Barium	20	67.4	J	30.6	J	37.3	J	47.6	J	49.2	J	1.0	J								
Cadmium	0.2	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.03	U								
Chromium (total)	1	12.1		10.6		9.9		11.6		11.6		0.06									
Mercury	0.2	0.02	U	0.02	U	0.02		0.02		0.02		0.02									
Lead	5	3.1		2.9		2.5		2.9		3.0		0.22									
Selenium	1	0.36	U	0.33	U	0.34	U	0.34	U	0.36	U	0.30	U								

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00MJ8	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.8	MG/KG	0.35	1.0
		Barium, Total	67.4 J	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	12.1	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.1	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
-002	J00MJ9	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.1	MG/KG	0.32	1.0
		Barium, Total	30.6 J	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.6	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	2.9	MG/KG	0.24	1.0
		Selenium, Total	0.33 u	MG/KG	0.33	1.0
-003	J00MK0	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.7	MG/KG	0.33	1.0
		Barium, Total	37.3 J	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	9.9	MG/KG	0.06	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Lead, Total	2.5	MG/KG	0.24	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0
-004	J00MK1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.6	MG/KG	0.33	1.0
		Barium, Total	47.6 J	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	11.6	MG/KG	0.06	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Lead, Total	2.9	MG/KG	0.25	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0

5/27/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J00MK2	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.8	MG/KG	0.35	1.0
		Barium, Total	49.2 J	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	11.6	MG/KG	0.06	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Lead, Total	3.0	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
-006	J00MK3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	0.29 u	MG/KG	0.29	1.0
		Barium, Total	1.0 J	MG/KG	0.008	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.06	MG/KG	0.05	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Lead, Total	0.22	MG/KG	0.21	1.0
		Selenium, Total	0.30 u	MG/KG	0.30	1.0

JR 5/27/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL#: 0304L300
SDG/SAF#: H2187/B03-015

W.O.#: 11343-606-001-9999-00
Date Received: 04-30-03

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.

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

   All samples were rerun in file TA0505B as the Torch turned off in the middle of the original run, TA0502C.

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

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

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

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

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

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision 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 17 pages.

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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. 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

05-07-03
Date

gmb/m04-300

0304L300

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-77	Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit	SAF No.: B03-015	
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030218	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	D 1	E 1	B 1	A 1	A VOA 2	E 1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			

970000

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1
J00MJ8	SOIL	4-28-03	1350	X	X	X	X	X		X
J00MJ9	SOIL	4-28-03	1335	X	X	X	X	X		X
J00MK0	SOIL	4-28-03	1320	X	X	X	X	X		X
J00MK1	SOIL	4-28-03	0950	X	X	X	X	X		X
J00MK2	SOIL	4-28-03	0950	X	X	X	X	X		X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	4-28-03/1530	Ref 3C 3728	4-28-03/1530
Ref 3C 3728	42903 1000	SJOALE	42903 1000
SJOALE	42903 1000	FED EX	
FED EX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Sol
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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-78	Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 128-F-1 burn pit	SAF No.: B03-015	
Ice Chest No.: ERC 02 007	Field Logbook No.: EL-1578	COA: C17HXF671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030218		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Preservation	None		None	Cool 4C	Cool 4C							
Type of Container	sG		sG	sG	sG							
No. of Container(s)	1		D 1	1	1							
Volume	1000mL		60mL	A 120mL	60mL							
SAMPLE ANALYSIS	See Item (1) in Special Instructions		See Item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)							
Sample No.	Matrix *	Sample Date	Sample Time									
J00MK3	SOIL	4-28-03	0941	X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers (Bowers)	4-28-03/1530	Ref 3C 3728	4-28-03/1530
Ref 3C 3728	42903 1000	SJ GALE	42903 1000
SJ GALE	42903 1000	FED EX	
FED EX	4/30/03 0930		4-30-03 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/29/03

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

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

270000

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: RSCS 128-F-1			DATA PACKAGE: H2187		
VALIDATOR: TLI		LAB: LLI		DATE: 5/27/03	
CASE:			SDG: H2187		

ANALYSES PERFORMED

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

SAMPLES/MATRIX

JOOMJ8	JOOMJ9	JOOMK0	JOOMK1	JOOMK2	JOOMK3
					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: Barium chromium mercury + lead in eb

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: No PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: Barium – 415.5 – J all

6. ICP QUALITY CONTROL (Levels D and E)

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments:

8. HOLDING TIMES (all levels)

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0241-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.04	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.06 u	MG/KG	0.06	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
BLANK1	03C0102-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187

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

LVL LOT #: 0304L300

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J00MJ8	Silver, Total	5.1	0.08u	5.1	100	1.0
		Arsenic, Total	199	1.8	203	97.1	1.0
		Barium, Total	240	67.4	203	84.7	1.0
		Cadmium, Total	4.7	0.04u	5.1	92.2	1.0
		Chromium, Total	30.8	12.1	20.3	92.1	1.0
		Mercury, Total	0.16	0.02u	0.15	105.2	1.0
		Lead, Total	52.8	3.1	50.9	97.6	1.0
		Selenium, Total	194	0.36u	203	95.6	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/07/03

CLIENT: TNUHANFORD B03-015 H2187 LVL LOT #: 0304L300

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J00MJ8	Silver, Total	0.08u	0.08u	NC	1.0
		Arsenic, Total	1.8	1.8	0.00	1.0
		Barium, Total	67.4	42.4	45.5	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	12.1	10.0	19.0	1.0
		Mercury, Total	0.02u	0.02	NC Q11	1.0
		Lead, Total	3.1	3.0	3.3	1.0
		Selenium, Total	0.36u	0.34u	NC	1.0

MJ 5/7/03

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