H1624

0057394

Date: 10 March 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105D & H Rx - Interim Closure - Shallow Zone Concrete
Subject: PCB - Data Package No. H1624-LVI (SDG No. H1624)

RECEIVED
JUN 10 2002
EDMC

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H1624-LVI prepared by Lionville Laboratory Incorporated (LVI). 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
B13CJ1	11/29/01	Concrete	C	PCBs by 8082
B12CH2	11/29/01	Concrete	C	PCBs by 8082
B12CH3	11/29/01	Concrete	C	PCBs by 8082
B13CH6	11/29/01	Concrete	C	PCBs by 8082
B13CH7	11/29/01	Concrete	C	PCBs by 8082
B13CJ0	11/27/01	Concrete	C	PCBs by 8082
B13CF9	11/27/01	Concrete	C	PCBs by 8082
B13CH8	11/27/01	Concrete	C	PCBs by 8082
B13CF8	11/27/01	Concrete	C	PCBs by 8082
B13CJ2	11/28/01	Concrete	C	PCBs by 8082
B13CH1	11/28/01	Concrete	C	PCBs by 8082
B14CH4	11/28/01	Concrete	C	PCBs by 8082
B13CH0	11/28/01	Concrete	C	PCBs by 8082
B13CH5	11/28/01	Concrete	C	PCBs by 8082
B13CJ3	11/28/01	Concrete	C	PCBs by 8082
B13CH9	11/28/01	Concrete	C	PCBs by 8082

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and "Sample and Analysis Plan for 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils" (DOE/RL-2001-18, Rev. 0). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than practical quantitaion 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.

<u>Field Blanks</u>

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **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.

Due to the spike being diluted out of the matrix spike and matrix spike duplicate, all PCB results were qualified as estimates and flagged "J".

All other 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.

Due to the surrogates being diluted out, all samples were qualified as estimates and flagged "J".

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike

concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the spike being diluted out of the matrix spike and matrix spike duplicate, all PCB results were qualified as estimates and flagged "J".

Field Duplicate Samples

One pair of field duplicate samples (samples B13CH2/B13CH3) were submitted to LVI for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 105-D & H PQLs, to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels exceeded the analyte specific PQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data Package No. H1624-LVI 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 the surrogates being diluted out, all samples were qualified as estimates and flagged "J". Due to the spike being diluted out of the matrix spike and matrix spike duplicate, all PCB results were qualified as estimates 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 laboratory detection levels exceeded the analyte specific PQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2001-18, Rev. 0, *Sample and Analysis Plan for 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils*, July 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1624	REVIEWER: TLI	DATE: 3/10/02	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	Spike diluted out of MS/MSD
All	J	All	Surrogate diluted out

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																					
Laboratory: LVI																					
Case	SDG: H1624																				
Sample Number		B13CF8		B13CF9		B13CH0		B13CH1		B13CH2		B13CH3		B13CH4		B13CH5		B13CH6		B13CH7	
Remarks												Duplicate									
Sample Date		11/27/01		11/27/01		11/28/01		11/28/01		11/29/01		11/29/01		11/28/01		11/28/01		11/29/01		11/29/01	
PCBs	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	17	690	UJ	690	UJ	680	UJ	680	UJ	690	UJ	690	UJ	690	UJ	690	UJ	690	UJ	800	UJ
Aroclor-1221	17	1400	UJ	1400	UJ	1400	UJ	1400	UJ	1400	UJ	1400	UJ	1400	UJ	1400	UJ	1400	UJ	1600	UJ
Aroclor-1232	17	690	UJ	690	UJ	680	UJ	680	UJ	690	UJ	690	UJ	690	UJ	690	UJ	690	UJ	800	UJ
Aroclor-1242	17	690	UJ	690	UJ	680	UJ	680	UJ	690	UJ	690	UJ	690	UJ	690	UJ	690	UJ	800	UJ
Aroclor-1248	17	690	UJ	690	UJ	680	UJ	680	UJ	690	UJ	690	UJ	690	UJ	690	UJ	690	UJ	800	UJ
Aroclor-1254	17	3200	J	2300	J	1600	J	1700	J	1600	J	2000	J	3100	J	1700	J	4900	J	2700	J
Aroclor-1260	17	690	UJ	690	UJ	680	UJ	680	UJ	690	UJ	690	UJ	690	UJ	690	UJ	690	UJ	800	UJ
Sample Number		B13CH8		B13CH9		B13CJ0		B13CJ1		B13CJ2		B13CJ3									
Remarks																					
Sample Date		11/27/01		11/28/01		11/27/01		11/29/01		11/28/02		11/28/01									
PCBs	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Aroclor-1016	17	690	UJ	730	UJ	700	UJ	690	UJ	690	UJ	730	UJ								
Aroclor-1221	17	1400	UJ	1500	UJ	1400	UJ	1400	UJ	1400	UJ	1500	UJ								
Aroclor-1232	17	690	UJ	730	UJ	700	UJ	690	UJ	690	UJ	730	UJ								
Aroclor-1242	17	690	UJ	730	UJ	700	UJ	690	UJ	690	UJ	730	UJ								
Aroclor-1248	17	690	UJ	730	UJ	700	UJ	690	UJ	690	UJ	730	UJ								
Aroclor-1254	17	3100	J	830	J	2200	J	2200	J	710	J	1900	J								
Aroclor-1260	17	690	UJ	730	UJ	700	UJ	690	UJ	690	UJ	730	UJ								

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.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 12/19/01 07:44

RFW Batch Number: 0112L479 Client: TNUHANFORD B01-078 H1624 Work Order: 11343606001 Page: 1

	Cust ID:	B13CJ1	B13CJ1	B13CJ1	B13CH2	B13CH3	B13CH6
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	20.0	20.0	20.0	20.0	20.0	20.0
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	D %	D %	D %	D %	D %	D %
	Decachlorobiphenyl	D %	D %	D %	D %	D %	D %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		690 U J	1400 U	1400 U	690 U J	690 U J	690 U J
Aroclor-1221		1400 U	2800 U	2700 U	1400 U	1400 U	1400 U
Aroclor-1232		690 U	1400 U	1400 U	690 U	690 U	690 U
Aroclor-1242		690 U	1400 U	1400 U	690 U	690 U	690 U
Aroclor-1248		690 U	1400 U	1400 U	690 U	690 U	690 U
Aroclor-1254		2200	D %	D %	1600	2000	4900
Aroclor-1260		690 U	1400 U	1400 U	690 U	690 U	690 U

	Cust ID:	B13CH7	B13CJ0	B13CF9	B13CH8	B13CF8	B13CJ2
Sample Information	RFW#:	005	006	007	008	009	010
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	20.0	20.0	20.0	20.0	20.0	20.0
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	D %	D %	D %	D %	D %	D %
	Decachlorobiphenyl	D %	D %	D %	D %	D %	D %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		800 U J	700 U J	690 U J	690 U J	690 U J	690 U J
Aroclor-1221		1600 U	1400 U	1400 U	1400 U	1400 U	1400 U
Aroclor-1232		800 U	700 U	690 U	690 U	690 U	690 U
Aroclor-1242		800 U	700 U	690 U	690 U	690 U	690 U
Aroclor-1248		800 U	700 U	690 U	690 U	690 U	690 U
Aroclor-1254		2700	2200	2300	3100	3200	710
Aroclor-1260		800 U	700 U	690 U	690 U	690 U	690 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

12/19/01

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 12/19/01 07:44

RFW Batch Number: 0112L479 Client: TNUHANFORD B01-078 H1624 Work Order: 11343606001 Page: 2

	Cust ID:	B13CH1	B13CH4	B13CH0	B13CH5	B13CJ3	B13CH9
Sample Information	RFW#:	011	012	013	014	015	016
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	20.0	20.0	20.0	20.0	20.0	20.0
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	D %	D %	D %	D %	D %	D %
	Decachlorobiphenyl	D %	D %	D %	D %	D %	D %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		680 U J	690 U J	680 U J	690 U J	730 U J	730 U J
Aroclor-1221		1400 U	1400 U	1400 U	1400 U	1500 U	1500 U
Aroclor-1232		680 U	690 U	680 U	690 U	730 U	730 U
Aroclor-1242		680 U	690 U	680 U	690 U	730 U	730 U
Aroclor-1248		680 U	690 U	680 U	690 U	730 U	730 U
Aroclor-1254		1700	3100	1600	1700	1900	830
Aroclor-1260		680 U	690 U	680 U	690 U	730 U	730 U

	Cust ID:	PBLKZR	PBLKZR BS
Sample Information	RFW#:	01LE1452-MB1	01LE1452-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	98 %	102 %
	Decachlorobiphenyl	107 %	112 %
		fl	fl
Aroclor-1016		33 U	33 U
Aroclor-1221		67 U	67 U
Aroclor-1232		33 U	33 U
Aroclor-1242		33 U	33 U
Aroclor-1248		33 U	33 U
Aroclor-1254		33 U	116 %
Aroclor-1260		33 U	33 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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

~~Analytical Report~~

Client: TNU HANFORD B01-078
LVL#: 0112L479
SDG/SAF#: H1624/B01-078

W.O.#: 11343-606-001-9999-00
Date Received: 11-30-01

PCB

The set of samples consisted of sixteen (16) solid samples collected on 11-27,28,29-01.

The samples and their associated QC samples were extracted on 12-04-01 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 12-16,17,18-01. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid and a sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. Matrix spike recoveries were unobtainable due to the high concentration of target analytes.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria, with the exception of target compound Aroclor 1260 analyzed on 12-16-01 at 17:34 on the primary column. The data reflected an increase in instrument response, so the ability to identify Arolcor 1254 was not impaired. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

12/20/01
Date

pef\r:\group\data\pest\12L-479.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 15 pages.

000055

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Sample Discrepancy Report (SDR) SDR #: 01CL543

Initiator: M. Kobel Batch: 0112L449 Parameter: OPCB
Date: 12/19/01 Samples: BS 1→8 Matrix: Solid
Client: TNJ Method: SW846/MCAWW/CLP/ Prep Batch: 01LE1452

1. Reason for SDR

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

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

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

c. Problem (Include all relevant specific results; attach data if necessary)
AR1260 increased on primary column in CCV before samples 1 thru 8, and the B + BS. All samples contain AR1254 and were reported from the confirmation column, which was in calibration

2. Known or Probable Causes(s)

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

4. Project Manager Instructions...signature/date: [signature] 12/20/01
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: [signature] 12/19/01 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
llector Fahlberg /BOWERS	Company Contact J Adler	Telephone No. 372-2178	Project Coordinator TRENT, SJ	Price Code 9N
oject Designation 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location 105 D		SAF No. B01-078	Air Quality ☐
e Chest No. ERC-02-001	Field Logbook No. ~~EL-1519-2~~ EFL 1133-10	COA R105DX200C	Method of Shipment Fed EX	Data Turnaround 45 Days
ipped To TMA/RECRA	Offsite Property No. RSR# 107051		Bill of Lading/Air Bill No. NA	

OSSIBLE SAMPLE HAZARDS/REMARKS
RADIOACTIVE - TIETO B13CJ4

Special Handling and/or Storage

Preservation	None	Cool 4C	None							
Type of Container	aG	aG	aG							
No. of Container(s)	1	1	1							
Volume	60mL	60mL	120mL							
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.							

Sample No.	Matrix *	Sample Date	Sample Time									
B13CJ1	OTHER SOLID	11-29-01	0820	X	X	X	11-29-01		<0.5 mr/hr			
B13CH2	OTHER SOLID	11-29-01	0835	X	X	X						
B13CH3	OTHER SOLID	11-29-01	0835	X	X	X						
B13CH6	other solid	11-29-01	0850	X	X							
B13CH7	other solid	11-29-01	0905	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	1365 11-29-01	Ref 1A 3728	11-29-01 1305
Ref 1A 3728	0800 11-30-01	R Thoren	0800 11-30-01
R Thoren ERC	0800 11-30-01	FED EX	
Fed Ex	12-1-01 1045	[signature]	12-1-01 1045

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium; Americium-241, Nickel-63, Neptunium-237, Strontium-89,90 - Total Sr.~~

RT 11-30-01

SAMPLES STORED IN REF.# 117 AT THE 3728 SHIPPING FACILITY ON 11/24/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 11/30/01 FOR SHIPMENT.
RT 11-30-01

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

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

3HI-EE-011 (10/99)

3.4

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
Collector: Fahlberg / Bowers DL	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ	Price Code: 9N; Air Quality ☐; Data Turnaround: 45 Days
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D		SAF No.: B01-078	
Ice Chest No.: ERC-02-001	Field Logbook No.: ~~EL 1517-2~~ EFL1133-10	COA: R105DX200C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA	Offsite Property No.: RSR# 107051		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS
RADIOACTIVE
TIE TO B13CJ4
Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	aG	aG	2 G 11-28-01
No. of Container(s)	1	1	1
Volume	60mL	60mL	120mL
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time				
B13CJ0	OTHER SOLID	11-27-01	0935	X	X		<0.5 mR/hR
B13CF9	OTHER SOLID	11-27-01	0952	X	X	X	
B13CH8	OTHER SOLID	11-27-01	1093	X	X		
B13CF8	Other Solid	11-27-01	1012	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Doug Bowers	Date/Time: 11-27-01 / 1400	Received By/Stored In: Bof 1A 3728	Date/Time: 11-27-01 / 1400
Relinquished By/Removed From: Bof 1A 3728	Date/Time: 0800 11-30-01	Received By/Stored In: R Thorer	Date/Time: 0800 11-30-01
Relinquished By/Removed From: R Thorer ERC	Date/Time: 0800 11-30-01	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 12-1-01 - 1045	Received By/Stored In: V. Hennessy	Date/Time: 12-1-01 1045
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-65; Neptunium-237; Strontium-89,90 - Total Sr~~ RT 11-28-01

Samples stored in Ref.#1A at the 3728 Shipping Facility on 11/27/01. Collector not available to relinquish samples on 11/29/01 for shipment.
RT 11-29-01

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

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

HI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
Collector: Fahlberg / Bowers DI	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ	Price Code: 9N
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D		SAF No.: B01-078	Air Quality ☐
Ice Chest No.: ERC-02-001	Field Logbook No.: DJD 11-28-01 ~~EL 1517-9~~ EFL 1133-10	COA: R105DX200C	Method of Shipment: Fed EX	Data Turnaround: 45 Days
Shipped To: TMA/RECRA	Offsite Property No.: RSR# 107051		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS: RADIOACTIVE - TIE TO B13CJ4

Special Handling and/or Storage

Preservation	None	Cool 4C	None									
Type of Container	aG	aG	aG									
No. of Container(s)	1	1	1									
Volume	60mL	60mL	120mL									
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.									

RT 11-29-01

Sample No.	Matrix *	Sample Date	Sample Time									
B13CJ2	OTHER SOLID	11-28-01	0959	X	X			<0.5 mR/hr				
B13CH1	OTHER SOLID	11-28-01	1010	X	X	X		↓	↓			
B13CH4	OTHER SOLID	11-28-01	1020	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Dowers	11-28-01/1400	R+F 1A 3728	11-28-01/1400
R.F. 1A 3728	11-30-01 0800	R.T. Thorne	11-30-01 0800
R.T. Thorne ERC	11-30-01 0800	FED EX	
Fed Ex	12/1/01 1045	[illegible]	12-1-01 1045

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Barium-133); Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium; Americium-241, Nickel-63, Neptunium-237, Strontium-89,90 - Total Sr~~ RT 11-29-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 11/28/01. Collector not available to relinquish samples on 11/30/01 for shipment.

RT 11-30-01

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
Collector: Fahlberg / Bowers DL	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ	Price Code: 9N; Air Quality ☐; Data Turnaround: 45 Days
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D		SAF No.: B01-078	
Ice Chest No.: ERC-02-001	Field Logbook No.: ~~EL-1517-2~~ EFL 113346	COA: R105DX200C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA	Offsite Property No.: RSR # 107051		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE - TIE TO B13CJ4

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	aG	aG	aG
No. of Container(s)	1	1	1
Volume	60mL	60mL	120mL
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B13CH0	OTHER SOLID	11-28-01	0850	X	X	X		<0.5 mR/hr					
B13CH5	OTHER SOLID	11-28-01	0915	X	X								
B13CJ3	OTHER SOLID	11-28-01	0930	X	X	X							
B13CH9	other solid	11-28-01	0945	X	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Doug Bowers	Date/Time: 11-28-01 / 1400	Received By/Stored In: Ref 1A 3728	Date/Time: 11-28-01 / 1400
Relinquished By/Removed From: Ref 1A 3728	Date/Time: 11-30-01 0800	Received By/Stored In: R Thorn	Date/Time: 11-30-01 0800
Relinquished By/Removed From: R Thorn ERC	Date/Time: 11-30-01 0800	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 12-1-01 1045	Received By/Stored In: [signature]	Date/Time: 12-1-01 1045
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 - Total Sr~~ RT 11-29-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 11/28/01. Collector not available to relinquish samples on 11/30/01 for shipment.

RT 11-30-01

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

BHLEF 011 (10/99)

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 105D+H RX			DATA PACKAGE: H1624		
VALIDATOR: JLI		LAB: LVI		DATE: 3/10/00	
CASE:			SDG: H1624		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX Concrete					
B13CJ1, B13CH2, B13CH3, B13CH6, B13CH7, B13CJ0					
B13CF9, B13CH8, B13CF8, B13CJ2, B13CH1 B13CH4					
B13CH0, B13CH5, B13CJ3 B13CH9					

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:

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: MS & Surrogate diluted out – J all

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: No MS/MSD dilut. out of all

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

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: _____

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: 10 March 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105D & H Rx - Interim Closure - Shallow Zone Concrete
Subject: Inorganics - Data Package No. H1624-LVI (SDG No. H1624)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1624-LVI prepared by Lionville Laboratory Incorporated (LVI). 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
B13CJ1	11/29/01	Concrete	C	See note 1
B12CH2	11/29/01	Concrete	C	See note 1
B12CH3	11/29/01	Concrete	C	See note 1
B13CH6	11/29/01	Concrete	C	See note 1
B13CH7	11/29/01	Concrete	C	See note 1
B13CJ0	11/27/01	Concrete	C	See note 1
B13CF9	11/27/01	Concrete	C	See note 1
B13CH8	11/27/01	Concrete	C	See note 1
B13CF8	11/27/01	Concrete	C	See note 1
B13CJ2	11/28/01	Concrete	C	See note 1
B13CH1	11/28/01	Concrete	C	See note 1
B13CH4	11/28/01	Concrete	C	See note 1
B13CH0	11/28/01	Concrete	C	See note 1
B13CH5	11/28/01	Concrete	C	See note 1
B13CJ3	11/28/01	Concrete	C	See note 1
B13CH9	11/28/01	Concrete	C	See note 1

1- ICP metals - 6010B (lead); mercury by 7471A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and "Sample and Analysis Plan for 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils" (DOE/RL-2001-18, Rev. 0). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

- **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 six (6) months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Blanks**

Preparation (Method) 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 practical quantitation limit (PQL), 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 PQL, 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 Blanks

No field blanks were submitted for analysis, therefore, no field blank results were available for review.

- **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 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 PQL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the PQL, the RPD control limit is less than or equal to two times the PQL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD of 38.5%, all mercury results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicates

One pair of field duplicate samples (B13CH2/B13CH3) were submitted for analysis. The samples were compared using the same criteria as laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the PQLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package No. H1624-LVI was submitted for validation and verified for completeness. Completion 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 an RPD of 38.5%, all mercury results were qualified as estimates 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.

REFERENCES

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

DOE/RL-2001-18, Rev. 0, *Sample and Analysis Plan for 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils*, July 2001.

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: H1624	REVIEWER: TLI	DATE: 3/10/02	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, (MG/KG)

Project: BECHTEL-HANFORD																				
Laboratory: LVI																				
Case	SDG: H1624																			
Sample Number		B13CF8		B13CF9		B13CH0		B13CH1		B13CH2		B13CH3		B13CH4		B13CH5		B13CH6		B13CH7
Remarks												Duplicate								
Sample Date		11/27/01		11/27/01		11/28/01		11/28/01		11/29/01		11/29/01		11/28/01		11/28/01		11/29/01		11/29/01
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result
Mercury	0.2	13.9	J	4.6	J	4.3	J	8.1	J	2.5	J	1.9	J	8.7	J	3.6	J	16.1	J	5.0
Lead	10	71.9		50.0		39.2		89.7		29.3		31.3		71.3		47.0		91.8		81.7

Sample Number		B13CH8		B13CH9		B13CJ0		B13CJ1		B13CJ2		B13CJ3								
Remarks																				
Sample Date		11/27/01		11/28/01		11/27/01		11/29/01		11/28/02		11/28/01								
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Mercury	0.2	4.6	J	1.8	J	2.7	J	7.7	J	0.58	J	14.0	J							
Lead	10	51.5		24.2		19.5		72.4		34.5		36.6								

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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/14/01

CLIENT: TNUHANFORD B01-078 H1624

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

LVL LOT #: 0112L479

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13CJ1	Mercury, Total	7.7 J	MG/KG	0.16	10.0
		Lead, Total	72.4	MG/KG	2.9	1.0
-002	B13CH2	Mercury, Total	2.5 J	MG/KG	0.09	5.0
		Lead, Total	29.3	MG/KG	2.8	1.0
-003	B13CH3	Mercury, Total	1.9 J	MG/KG	0.03	2.0
		Lead, Total	31.3	MG/KG	2.8	1.0
-004	B13CH6	Mercury, Total	16.1 J	MG/KG	0.41	25.0
		Lead, Total	91.8	MG/KG	2.8	1.0
-005	B13CH7	Mercury, Total	5.0 J	MG/KG	0.1	5.0
		Lead, Total	81.7	MG/KG	3.3	1.0
-006	B13CJ0	Mercury, Total	2.7 J	MG/KG	0.09	5.0
		Lead, Total	19.5	MG/KG	2.9	1.0
-007	B13CF9	Mercury, Total	4.6 J	MG/KG	0.08	5.0
		Lead, Total	50.0	MG/KG	2.9	1.0
-008	B13CH8	Mercury, Total	4.6 J	MG/KG	0.09	5.0
		Lead, Total	51.5	MG/KG	2.9	1.0

PW 3/10/02

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/14/01

CLIENT: TNUHANFORD B01-078 H1624 LVL LOT #: 0112L479

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	B13CF8	Mercury, Total	13.9 J	MG/KG	0.42	25.0
		Lead, Total	71.9	MG/KG	2.8	1.0
-010	B13CJ2	Mercury, Total	0.58 J	MG/KG	0.02	1.0
		Lead, Total	34.5	MG/KG	2.9	1.0
-011	B13CH1	Mercury, Total	8.1 J	MG/KG	0.32	25.0
		Lead, Total	89.7	MG/KG	2.8	1.0
-012	B13CH4	Mercury, Total	8.7 J	MG/KG	0.43	25.0
		Lead, Total	71.3	MG/KG	2.9	1.0
-013	B13CH0	Mercury, Total	4.3 J	MG/KG	0.09	5.0
		Lead, Total	39.2	MG/KG	2.8	1.0
-014	B13CH5	Mercury, Total	3.6 J	MG/KG	0.08	5.0
		Lead, Total	47.0	MG/KG	2.9	1.0
-015	B13CJ3	Mercury, Total	14.0 J	MG/KG	0.44	25.0
		Lead, Total	36.6	MG/KG	2.9	1.0
-016	B13CH9	Mercury, Total	1.8 J	MG/KG	0.02	1.0
		Lead, Total	24.2	MG/KG	2.9	1.0

Rr
3/10/02

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-078
LVL#: 0112L479
SDG/SAF#: H1624/B01-078

W.O.#: 11343-606-001-9999-00
Date Received: 12-01-01

METALS CASE NARRATIVE

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

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were reported with various dilutions for Mercury due to high concentrations of this analyte.

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

4. The cooler temperature has been recorded on the Chain of Custody.

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

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury.

12. The duplicate analysis for Mercury was 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 19 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

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

14. 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
Deputy Laboratory Manager
Lionville Laboratory Incorporated

12-14-01
Date

gmb/m12-479

LVLI
LIONVILLE LABORATORY INC

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-078-01 Page 1 of 1

Bechtel Hanford Inc.

lector ahlberg /BOWERS	Company Contact J Adler	Telephone No. 372-2178	Project Coordinator TRENT, SJ
ject Designation 05D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location 105 D		SAF No. B01-078
Chest No. ERC-02-001	Field Logbook No. ~~EL 1517-2~~ EFL 1133-10	COA R105DX200C	Method of Shipment Fed EX
ipped To TMA/RECRA	Offsite Property No. RSR# 107051		Bill of Lading/Air Bill No. NA

Price Code 9N

Air Quality ☐

Data Turnaround 45 Days

OSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE - TIETO B13CJ4

Special Handling and/or Storage

Preservation	None	Cool 4C	None									
Type of Container	aG	aG	aG									
No. of Container(s)	1	1	1									
Volume	60mL	60mL	120mL									
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time									
B13CJ1	OTHER SOLID	11-29-01	0820	X	X	X	11-29-01		<0.5 mr/hr			
B13CH2	OTHER SOLID	11-29-01	0835	X	X	X						
B13CH3	OTHER SOLID	11-29-01	0835	X	X	X						
B13CH6	other solid	11-29-01	0850	X	X							
B13CH7	other solid	11-29-01	0905	X	X							

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Sign/Print Names	Received By/Stored In	Date/Time
Doug Bowers	1365 11-29-01	Doug Bowers	Ref 1A 3728	11-29-01 1305
Ref 1A 3728	0800 11-30-01	R Thoren	R Thoren	0800 11-30-01
R Thoren ERC	0800 11-30-01	FED EX		
Fed Ex	12-1-01 1045	[illegible]	12-1-01	1045

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium; Americium-241, Nickel-63, Neptunium-237, Strontium-89,90 - Total Sr.~~

RT 11-30-01

SAMPLES STORED IN REF.# 1A AT THE 3728 SHIPPING FACILITY ON 11/29/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 11/30/01 FOR SHIPMENT.

RT 11-30-01

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

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

3.4

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
Collector: Fahlberg / Bowers, AL	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ	Price Code: 9N
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D		SAF No.: B01-078	Air Quality ☐
Data Turnaround: 45 Days				
Ice Chest No.: ERC-02-001	Field Logbook No.: ~~EL1517-2~~ EFL1133-10	COA: R105DX200C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA	Offsite Property No.: RSR# 107051		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS
RADIOACTIVE
TIE TO B13CJ4
Special Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	aG	aG	aG								
No. of Container(s)	1	1	1								
Volume	60mL	60mL	120mL								
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.								
Sample No. / Matrix * / Sample Date / Sample Time											
B13CJ0 / OTHER SOLID / 11-27-01 / 0935	X	X		<0.5 mR/hR							
B13CF9 / OTHER SOLID / 11-27-01 / 0952	X	X	X								
B13CH8 / OTHER SOLID / 11-27-01 / 1003	X	X									
B13CF8 / other solid / 11-27-01 / 1012	X	X	X								

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Bowers	11-27-01 1400	IA 3728	11-27-01 1400
Relinquished By/Removed From	IA 3728	11-30-01 0800	R Thorne	11-30-01 0800
Relinquished By/Removed From	R Thorne	11-30-01 0800	FEDEX	
Relinquished By/Removed From	FedEx	12-1-01 1045	V. Hennessy	12-1-01 1045
Relinquished By/Removed From				
Relinquished By/Removed From				

SPECIAL INSTRUCTIONS
~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 - Total Sr~~ RT 11-28-01

Samples stored in Ref.# IA at the 3728 Shipping Facility on 11/27/01.
Collector not available to relinquish samples on 11/29/01 for shipment.
RT 11-29-01

Matrix *
SD=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 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
ector Ahlberg / Bowers DL	Company Contact J Adler	Telephone No. 372-2178	Project Coordinator TRENT, SJ	Price Code 9N
ect Designation 05D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location 105 D		SAF No. B01-078	Air Quality ☐
Chest No. ERC-02-001	Field Logbook No. DZB 11-28-01 ~~EL 1517-2~~ EFL 1133-10	COA R105DX200C	Method of Shipment Fed EX	Data Turnaround 45 Days
pped To MA/RECRA	Offsite Property No. RSR# 107051		Bill of Lading/Air Bill No. WA	

SSIBLE SAMPLE HAZARDS/REMARKS
RADIOACTIVE - TIE TO B13CJ4

pecial Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	aG	aG	RT 11-29-01
No. of Container(s)	1	1	
Volume	60mL	60mL	120mL
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B13CJ2	OTHER SOLID	11-28-01	0959	X	X			<0.5 mR/hr					
B13CH1	OTHER SOLID	11-28-01	1010	X	X	X		↓	↓				
B13CH4	OTHER SOLID	11-28-01	1020	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	11-28-01/1400	Rex 1A 3728	11-28-01/1400
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
S. Of 1A 3728	11-30-01 0800	R.T. Thorn	11-30-01 0800
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R.T. Thorn ERC	11-30-01 0800	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex	12/1/01 1045	V. Hernandez	12-1-01 1045
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 - Total Sr~~ RT 11-29-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 11/28/01. Collector not available to relinquish samples on 11/30/01 for shipment.
RT 11-30-01

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

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

HI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
Collector: Fahlberg / Bowers DL	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ	Price Code: 9N; Air Quality ☐
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D		SAF No.: B01-078	Data Turnaround: 45 Days
Ice Chest No.: ERC-02-001	Field Logbook No.: ~~EL-15172~~ EFL 113340	COA: R105DX200C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA	Offsite Property No.: RSR # 107051		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE - TIE TO B13CJ4

Special Handling and/or Storage

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

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.							
B13CH0	OTHER SOLID	11-28-01	0850	X	X	X			<0.5 mR/hr				
B13CH5	OTHER SOLID	11-28-01	0915	X	X								
B13CJ3	OTHER SOLID	11-28-01	0930	X	X	X							
B13CH9	other solid	11-28-01	0945	X	X								

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Doug Bowers Bowers 11-28-01 / 1400	Received By/Stored In: Ref 1A 3728 11-28-01 / 1400	Date/Time
Relinquished By/Removed From: Ref 1A 3728 11-30-01 0800	Received By/Stored In: R F Thorn 11-30-01 0800	Date/Time
Relinquished By/Removed From: R F Thorn ERC 11-30-01 0800	Received By/Stored In: FED EX	Date/Time
Relinquished By/Removed From: Fed Ex 12-1-01 1045	Received By/Stored In: Vicki Hennig 12-1-01 1045	Date/Time
Relinquished By/Removed From	Received By/Stored In	Date/Time
Relinquished By/Removed From	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 - Total Sr~~ RT 11-29-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 11/28/01. Collector not available to relinquish samples on 11/30/01 for shipment.

RT 11-30-01

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

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

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E

PROJECT: 100 D&H Rx		DATA PACKAGE: H1624
VALIDATOR: TLI	LAB: LVI	DATE: 3/10/02
CASE:		SDG: H1624

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

SAMPLES/MATRIX Concrete

B13CJ1, B13CH2, B13CH3, B13CK6, B13CH7, B13CJ0
B13CF9, B13CH8, B13CF8, B13CJ2, B13CH1, B13CH4
B13CH0, B13CH5, B13CJ7, B13CH9

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:

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: Hg over but over 4X spike amount

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: 38.5% Hg 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 12/14/01

CLIENT: TNUHANFORD B01-078 H1624

LVL LOT #: 0112L479

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01C0400-MB1	Mercury, Total	0.02	u	MG/KG	0.02	1.0
BLANK1	01L0803-MB1	Lead, Total	2.8	u	MG/KG	2.8	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/14/01

CLIENT: TNUHANFORD B01-078 H1624

LVL LOT #: 0112L479

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13CJ1	Mercury, Total	5.0	7.7	0.16	-1800. *	10.0
		Lead, Total	123	72.4	51.6	98.6	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/14/01

CLIENT: TNUHANFORD B01-078 H1624

LVL LOT #: 0112L479

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13CJ1	Mercury, Total	7.7	5.2	38.5	10.0
		Lead, Total	72.4	85.4	16.5	1.0

Date: 10 March 2002
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 105D & H Rx - Interim Closure - Shallow Zone Concrete
Subject: Radiochemistry - Data Package No. H1624-ES (SDG No. H1624)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H1624-ES which was prepared by Eberline Services (ES). 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
B13CF8	11/27/01	Concrete	C	See note 1
B13CF9	11/27/01	Concrete	C	See note 1
B13CH0	11/28/01	Concrete	C	See note 1
B13CH1	11/28/01	Concrete	C	See note 1
B13CH2	11/29/01	Concrete	C	See note 1
B13CH3	11/29/01	Concrete	C	See note 1

1 - Gamma spectroscopy; total strontium; alpha spectroscopy; nickel-63; carbon-14; and tritium.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and "Sample and Analysis Plan for 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils" (DOE/RL-2001-18, Rev. 0). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
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 and 7 days for liquid scintillation counting.

  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 Blank

  No field blanks were submitted with the SDG, therefore, no field blank data was present for review.

- **Accuracy**

  Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery 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, rejected, or not qualified, depending on the activity of the individual sample.

Due to a radiochemical yield of 107%, all detected isotopic uranium results in sample B13CF9 were qualified as estimates and flagged "J".

Due to the lack of a matrix spike analysis, all carbon-14 and tritium results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 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 an RPD of 87%, all carbon-14 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate

One set of field duplicates (B13CH2/B13CH3) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for carbon-14 (137%) and strontium (31.7%) were outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the 105-D & H PQLs to ensure that laboratory detection levels meet the required criteria. The PQL was exceeded for the following: Uranium-235(aspec) and europium-155 in all samples; thorium-228 and thorium-232 in samples B13CF8 and B13CF9; uranium-238 in samples B13CF8 and B13CH0; and plutonium-238 in sample B13CH0. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the PQL.

- **Completeness**

  Data package No. H1624-ES 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 the lack of a matrix spike analysis, all carbon-14 and tritium results were qualified as estimates and flagged "J". Due to an RPD of 87%, all carbon-14 results were qualified as estimates and flagged "J". Due to a radiochemical yield of 107%, all detected isotopic uranium results in sample B13CF9 were qualified as estimates 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.

The PQL was exceeded for the following: Uranium-235(aspec) and europium-155 in all samples; thorium-228 and thorium-232 in samples B13CF8 and B13CF9; uranium-238 in samples B13CF8 and B13CH0; and plutonium-238 in sample B13CH0. Under the BHI statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2001-18, Rev. 0, *Sample and Analysis Plan for 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils*, July 2001.

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: H1624	REVIEWER: TLI	DATE: 3/10/02	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Detected isotopic uranium	J	B13CF9	Radiochemical yield
Carbon-14 Tritium	J	All	No matrix spike analysis
Carbon-14	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																					
Laboratory: ES																					
Case	SDG: H1624																				
Sample Number		B13CF8		B13CF9		B13CH0		B13CH1		B13CH2		B13CH3									
Remarks												Duplicate									
Sample Date		11/27/01		11/27/01		11/28/01		11/28/01		11/29/01		11/29/01									
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Tritium	400	677	J	277	J	184	J	703	J	1480	J	768	J								
Carbon-14	50	2010	J	1260	J	826	J	1740	J	2630	J	484	J								
Nickel-63	30	23100		11500		12800		72500		16300		17400									
Strontium (total)	1	3180		2330		1930		2060		2630		3620									
Thorium-228	1	-0.354	U	0.953	U	0.903		0.855		0.407	U	0.666									
Thorium-230		0.706	U	1.90	U	0.601	U	2.25		-0.041	U	0.105	U								
Thorium-232	1	0.706	U	0.190	U	0.515		0.852		0.487		0.210	U								
Uranium-233/234	1	23.2	J	4.42	J	6.04	J	2.57	J	16.4	J	16.3	J								
Uranium-235	1	0.891	U	-0.191	U	0.430	U	0	U	-0.165	U	-0.169	U								
Uranium-238	1	2.58	U	2.06	J	0.355	U	1.36	J	1.64	J	1.12	J								
Neptumium-237	1	0.085	U	0.037	U	0.675	U	0.033	U	0.030	U	0.126	U								
Plutonium-238	1	7.46		3.40		3.01	U	14.9		6.03		6.41									
Plutonium-239/40	1	418		162		130		490		217		250									
Americium-241	1	101		41.2		39.2		140		43.1		51.5									
Potassium-40		U	U	U	U	U	U	U	U	U	U	NA									
Cobalt 60	0.05	673		389		466		2260		816		728									
Barium-133		U	U	U	U	U	U	U	U	U	U	U	U								
Cesium 137	0.1	11300		8210		6750		16700		11100		12700									
Radium-226		U	U	U	U	U	U	U	U	U	U	U	U								
Radium-228		U	U	U	U	U	U	U	U	U	U	U	U								
Europium 152	0.1	2350		1790		1480		2780		1490		1290									
Europium 154	0.1	353		236		204		518		251		215									
Europium 155	0.1	U	U	U	U	U	U	U	U	U	U	U	U								
Thorium-228(GEA)		U	U	U	U	U	U	U	U	U	U	U	U								
Thorium-232(GEA)		U	U	U	U	U	U	U	U	U	U	U	U								
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	102		U	U	U	U	53.5		40.6									

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 H1624

R112003-01 B13CF8

DATA SHEET

SDG	7173	Client/Case no	Hanford	SDG H1624	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R112003-01	Client sample id	B13CF8		
Dept sample id	7173-001	Location/Matrix	105 D	SOLID	
Received	12/03/01	Collected/Weight	11/27/01 10:12	101.5 g	
% solids	100.0	Custody/SAF No	B01-078-01	B01-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	677	15	6.0	400	J	H
Carbon 14	14762-75-5	2010	41	12	50	J	C
Nickel 63	13981-37-8	23100	460	81	30		NI_L
Total Strontium	SR-RAD	3180	51	6.3	1.0		SR
Thorium 228	14274-82-9	-0.354	1.1	2.4		U	TH
Thorium 230	14269-63-7	0.706	1.4	2.2	1.0	U	TH
Thorium 232	TH-232	0.706	0.71	1.4	1.0	U	TH
Uranium 233/234	U-233/234	23.2	6.2	2.8	1.0	J	U
Uranium 235	15117-96-1	0.891	0.89	3.4	1.0	U	U
Uranium 238	U-238	2.58	2.2	2.8	1.0	U	U
Neptunium 237	13994-20-2	0.085	0.17	0.40	1.0	U	NP
Plutonium 238	13981-16-3	7.46	2.8	1.7	1.0		PU
Plutonium 239/240	PU-239/240	418	34	1.7	1.0		PU
Americium 241	14596-10-2	101	11	2.6	1.0		AM
Potassium 40	13966-00-2	U		31		U	GAM
Cobalt 60	10198-40-0	673	9.0	4.2	0.050		GAM
Barium 133	13981-41-4	U		8.3		U	GAM
Cesium 137	10045-97-3	11300	20	9.2	0.10		GAM
Radium 226	13982-63-3	U		11	0.10	U	GAM
Radium 228	15262-20-1	U		28	0.20	U	GAM
Europium 152	14683-23-9	2350	26	27	0.10		GAM
Europium 154	15585-10-1	353	17	14	0.10		GAM
Europium 155	14391-16-3	U		21	0.10	U	GAM
Thorium 228	14274-82-9	U		8.3		U	GAM
Thorium 232	TH-232	U		28		U	GAM
Uranium 235	15117-96-1	U		16		U	GAM
Uranium 238	U-238	U		1000		U	GAM
Americium 241	14596-10-2	U		120		U	GAM

105D & H Rx-Interim Closure-Shallow

JR 3/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-02

B13CF9

DATA SHEET

SDG	7173	Client/Case no	Hanford — SDG H1624
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R112003-02	Client sample id	B13CF9
Dept sample id	7173-002	Location/Matrix	105 D — SOLID
Received	12/03/01	Collected/Weight	11/27/01 09:52 — 85.1 g
% solids	100.0	Custody/SAF No	B01-078-01 — B01-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	277	10	6.0	400	~~U~~ J	H
Carbon 14	14762-75-5	1260	26	9.6	50	J	C
Nickel 63	13981-37-8	11500	230	55	30		NI_L
Total Strontium	SR-RAD	2330	53	6.8	1.0		SR
Thorium 228	14274-82-9	0.953	1.1	1.8		U	TH
Thorium 230	14269-63-7	1.90	1.9	2.3	1.0	U	TH
Thorium 232	TH-232	0.190	0.38	1.5	1.0	U	TH
Uranium 233/234	U-233/234	4.42	1.6	1.2	1.0	J	U
Uranium 235	15117-96-1	-0.191	0.38	1.5	1.0	U	U
Uranium 238	U-238	2.06	1.3	1.2	1.0	J	U
Neptunium 237	13994-20-2	0.037	0.22	0.41	1.0	U	NP
Plutonium 238	13981-16-3	3.40	1.8	1.7	1.0		PU
Plutonium 239/240	PU-239/240	162	16	1.7	1.0		PU
Americium 241	14596-10-2	41.2	6.7	1.7	1.0		AM
Potassium 40	13966-00-2	U		11		U	GAM
Cobalt 60	10198-40-0	389	2.7	1.5	0.050		GAM
Barium 133	13981-41-4	U		2.8		U	GAM
Cesium 137	10045-97-3	8210	8.0	2.6	0.10		GAM
Radium 226	13982-63-3	U		3.6	0.10	U	GAM
Radium 228	15262-20-1	U		7.4	0.20	U	GAM
Europium 152	14683-23-9	1790	8.0	8.1	0.10		GAM
Europium 154	15585-10-1	236	5.3	4.7	0.10		GAM
Europium 155	14391-16-3	U		8.4	0.10	U	GAM
Thorium 228	14274-82-9	U		2.7		U	GAM
Thorium 232	TH-232	U		7.4		U	GAM
Uranium 235	15117-96-1	U		6.8		U	GAM
Uranium 238	U-238	U		300		U	GAM
Americium 241	14596-10-2	102	4.7	6.4			GAM

105D & H Rx-Interim Closure-Shallow

JR 3/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-03 B13CH0

DATA SHEET

SDG	7173	Client/Case no	Hanford	SDG H1624	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R112003-03	Client sample id	B13CH0		
Dept sample id	7173-003	Location/Matrix	105 D	SOLID	
Received	12/03/01	Collected/Weight	11/28/01 08:50	100.7 g	
% solids	100.0	Custody/SAF No	B01-078-01	B01-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	184	8.3	5.8	400	~~U~~ J	H
Carbon 14	14762-75-5	826	17	7.8	50	J	C
Nickel 63	13981-37-8	12800	260	58	30		NI_L
Total Strontium	SR-RAD	1930	46	6.2	1.0		SR
Thorium 228	14274-82-9	0.903	0.43	0.53			TH
Thorium 230	14269-63-7	0.601	0.86	1.5	1.0	U	TH
Thorium 232	TH-232	0.515	0.34	0.33	1.0	~~U~~	TH
Uranium 233/234	U-233/234	6.04	2.9	2.7	1.0	J	U
Uranium 235	15117-96-1	0.430	0.86	3.3	1.0	U	U
Uranium 238	U-238	0.355	0.71	2.7	1.0	U	U
Neptunium 237	13994-20-2	0.675	0.58	0.74	1.0	U	NP
Plutonium 238	13981-16-3	3.01	2.6	3.3	1.0	U	PU
Plutonium 239/240	PU-239/240	130	19	3.3	1.0		PU
Americium 241	14596-10-2	39.2	5.9	1.5	1.0		AM
Potassium 40	13966-00-2	U		14		U	GAM
Cobalt 60	10198-40-0	466	4.3	2.0	0.050		GAM
Barium 133	13981-41-4	U		3.7		U	GAM
Cesium 137	10045-97-3	6750	11	4.0	0.10		GAM
Radium 226	13982-63-3	U		4.8	0.10	U	GAM
Radium 228	15262-20-1	U		13	0.20	U	GAM
Europium 152	14683-23-9	1480	12	12	0.10		GAM
Europium 154	15585-10-1	204	8.7	7.2	0.10		GAM
Europium 155	14391-16-3	U		12	0.10	U	GAM
Thorium 228	14274-82-9	U		3.8		U	GAM
Thorium 232	TH-232	U		13		U	GAM
Uranium 235	15117-96-1	U		7.3		U	GAM
Uranium 238	U-238	U		460		U	GAM
Americium 241	14596-10-2	U		40		U	GAM

105D & H Rx-Interim Closure-Shallow

pz 3/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-04 B13CH1

DATA SHEET

SDG	7173	Client/Case no	Hanford	SDG H1624	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R112003-04	Client sample id	B13CH1		
Dept sample id	7173-004	Location/Matrix	105 D	SOLID	
Received	12/03/01	Collected/Weight	11/28/01 10:10	102.1 g	
% solids	100.0	Custody/SAF No	B01-078-01	B01-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	703	15	5.5	400	J	H
Carbon 14	14762-75-5	1740	35	12	50	J	C
Nickel 63	13981-37-8	72500	1500	150	30		NI_L
Total Strontium	SR-RAD	2060	43	7.1	1.0		SR
Thorium 228	14274-82-9	0.855	0.47	0.63			TH
Thorium 230	14269-63-7	2.25	1.0	1.6	1.0		TH
Thorium 232	TH-232	0.852	0.39	0.30	1.0		TH
Uranium 233/234	U-233/234	2.57	1.2	1.2	1.0	J	U
Uranium 235	15117-96-1	0	0.37	1.4	1.0	U	U
Uranium 238	U-238	1.36	0.91	1.2	1.0	J	U
Neptunium 237	13994-20-2	0.033	0.20	0.36	1.0	U	NP
Plutonium 238	13981-16-3	14.9	4.5	2.8	1.0		PU
Plutonium 239/240	PU-239/240	490	50	2.8	1.0		PU
Americium 241	14596-10-2	140	14	1.6	1.0		AM
Potassium 40	13966-00-2	U		61		U	GAM
Cobalt 60	10198-40-0	2260	27	11	0.050		GAM
Barium 133	13981-41-4	U		17		U	GAM
Cesium 137	10045-97-3	16700	50	15	0.10		GAM
Radium 226	13982-63-3	U		23	0.10	U	GAM
Radium 228	15262-20-1	U		69	0.20	U	GAM
Europium 152	14683-23-9	2780	54	57	0.10		GAM
Europium 154	15585-10-1	518	38	33	0.10		GAM
Europium 155	14391-16-3	U		27	0.10	U	GAM
Thorium 228	14274-82-9	U		17		U	GAM
Thorium 232	TH-232	U		69		U	GAM
Uranium 235	15117-96-1	U		33		U	GAM
Uranium 238	U-238	U		2400		U	GAM
Americium 241	14596-10-2	U		160		U	GAM

105D & H Rx-Interim Closure-Shallow

3/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-05 B13CH2

DATA SHEET

SDG	7173	Client/Case no	Hanford SDG H1624
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R112003-05	Client sample id	B13CH2
Dept sample id	7173-005	Location/Matrix	105 D SOLID
Received	12/03/01	Collected/Weight	11/29/01 08:35 106.0 g
% solids	100.0	Custody/SAF No	B01-078-01 B01-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	1480	22	6.2	400	J	H
Carbon 14	14762-75-5	2630	53	14	50	J	C
Nickel 63	13981-37-8	16300	330	65	30		NI_L
Total Strontium	SR-RAD	2630	48	6.6	1.0		SR
Thorium 228	14274-82-9	0.407	0.33	0.45		U	TH
Thorium 230	14269-63-7	-0.041	0.73	1.4	1.0	U	TH
Thorium 232	TH-232	0.487	0.33	0.31	1.0		TH
Uranium 233/234	U-233/234	16.4	3.1	1.0	1.0	J	U
Uranium 235	15117-96-1	-0.165	0.33	1.3	1.0	U J	U
Uranium 238	U-238	1.64	0.82	1.0	1.0		U
Neptunium 237	13994-20-2	0.030	0.18	0.34	1.0	U	NP
Plutonium 238	13981-16-3	6.03	2.4	1.8	1.0		PU
Plutonium 239/240	PU-239/240	217	21	1.8	1.0		PU
Americium 241	14596-10-2	43.1	6.3	1.5	1.0		AM
Potassium 40	13966-00-2	U		18		U	GAM
Cobalt 60	10198-40-0	816	5.8	2.7	0.050		GAM
Barium 133	13981-41-4	U		5.2		U	GAM
Cesium 137	10045-97-3	11100	10	4.8	0.10		GAM
Radium 226	13982-63-3	U		6.7	0.10	U	GAM
Radium 228	15262-20-1	U		14	0.20	U	GAM
Europium 152	14683-23-9	1490	13	14	0.10		GAM
Europium 154	15585-10-1	251	9.3	8.3	0.10		GAM
Europium 155	14391-16-3	U		13	0.10	U	GAM
Thorium 228	14274-82-9	U		5.1		U	GAM
Thorium 232	TH-232	U		14		U	GAM
Uranium 235	15117-96-1	U		12		U	GAM
Uranium 238	U-238	U		540		U	GAM
Americium 241	14596-10-2	53.5	7.1	10			GAM

105D & H Rx-Interim Closure-Shallow

ps 3/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-06 B13CH3

DATA SHEET

SDG	7173	Client/Case no	Hanford SDG H1624
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R112003-06	Client sample id	B13CH3
Dept sample id	7173-006	Location/Matrix	105 D SOLID
Received	12/03/01	Collected/Weight	11/29/01 08:35 107.1 g
% solids	100.0	Custody/SAF No	B01-078-01 B01-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	768	16	6.0	400	J	H
Carbon 14	14762-75-5	484	10	6.0	50	J	C
Nickel 63	13981-37-8	17400	350	68	30		NI_L
Total Strontium	SR-RAD	3620	56	6.9	1.0		SR
Thorium 228	14274-82-9	0.666	0.42	0.62			TH
Thorium 230	14269-63-7	0.105	0.77	1.4	1.0	U	TH
Thorium 232	TH-232	0.210	0.28	0.34	1.0	U	TH
Uranium 233/234	U-233/234	16.3	3.2	1.1	1.0	J	U
Uranium 235	15117-96-1	-0.169	0.34	1.3	1.0	U J	U
Uranium 238	U-238	1.12	0.84	1.1	1.0		U
Neptunium 237	13994-20-2	0.126	0.25	0.42	1.0	U	NP
Plutonium 238	13981-16-3	6.41	2.4	1.8	1.0		PU
Plutonium 239/240	PU-239/240	250	23	1.8	1.0		PU
Americium 241	14596-10-2	51.5	6.6	1.3	1.0		AM
Cobalt 60	10198-40-0	728	6.6	2.9	0.050		GAM
Barium 133	13981-41-4	U		6.6		U	GAM
Cesium 137	10045-97-3	12700	20	5.8	0.10		GAM
Radium 226	13982-63-3	U		8.2	0.10	U	GAM
Radium 228	15262-20-1	U		16	0.20	U	GAM
Europium 152	14683-23-9	1290	17	19	0.10		GAM
Europium 154	15585-10-1	215	11	9.7	0.10		GAM
Europium 155	14391-16-3	U		17	0.10	U	GAM
Thorium 228	14274-82-9	U		6.4		U	GAM
Thorium 232	TH-232	U		16		U	GAM
Uranium 235	15117-96-1	U		15		U	GAM
Uranium 238	U-238	U		620		U	GAM
Americium 241	14596-10-2	40.6	7.8	12			GAM

105D & H Rx-Interim Closure-Shallow

pr 3/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1624 was composed of six other solid (concrete) samples designated under SAF No. B01-078 with a Project Designation of: 105D & H Rx – Interim Closure – Shallow Zone Concrete.

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 December 21, 2001 and January 22 and 31, 2002.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The RPD between sample B13CH0 and its sample duplicate was 28%, greater than the 3σ limit (23%). No other problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

Due to a LCS (75%) and sample duplicate failure (RPD - 57%) the C-14 samples were reanalyzed with new QC samples. The LCS percent recovery (81%) was below the 3σ limits (86 to 114%), but within the laboratory protocol limits (80 to 120%). The RPD between sample B13CH0 and its sample duplicate was 87%, greater than the 3σ limit of 24%. The sample duplicate failure is probably due to sample in homogeneity because of the small sample aliquots required by the method (C-14 – Oxidation).

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.8 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.9 Neptunium-237 Analyses

There was contamination in the method blank (0.384 pCi/g). The activity was below the RDL (1.0 pCi/g) for Np-237. No other problems were encountered during the course of the analyses.

2.10 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

2/5/02

Date

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-078-01	Page 1 of 1
Collector: Fahlberg / BOWERS	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ	Price Code: ~~9N~~ 9L; Data Turnaround: ~~45~~ 21 Days
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D H1624 (7173)		SAF No.: B01-078	Air Quality ☐
Ice Chest No.: ERC-01-043	Field Logbook No.: ~~EL 1517-2~~ EFL 1133-10	COA: R105DX200C	Method of Shipment: Fed EX	mm 12/5/01
Shipped To: TMA/RECRA	Offsite Property No.: RSR # 107630		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE: TIE TO B13CJ4

Special Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	aG	aG	aG								
No. of Container(s)	1	1	1								
Volume	60mL	60mL	120mL								
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	PCBs - 8082	See item (1) in Special Instructions.								

RT 11-30-01

Sample No.	Matrix *	Sample Date	Sample Time										
~~B13CJ1~~	~~OTHER SOLID~~	~~11-29-01~~	~~0820~~	~~X~~	~~X~~	~~X~~	11-29-01						
B13CH2	OTHER SOLID	11-29-01	0835	RT 11-30-01	X	X			< 0.5 mr/hr				
B13CH3	OTHER SOLID	11-29-01	0835	RT 11-30-01	X	X			↓	↓			
~~B13CH6~~	~~other solid~~	~~11-29-01~~	~~0850~~	~~X~~	~~X~~	RT 11-30-01							
~~B13CH7~~	~~other solid~~	~~11-29-01~~	~~0905~~	~~X~~	~~X~~								

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: Doug Bowers	Date/Time: 1365 11-29-01	Received By/Stored In: Ref 1A 3728	Date/Time: 11-29-01/1305
Relinquished By/Removed From: Ref 1A 3728	Date/Time: 0800 11.30.01	Received By/Stored In: R Thoren	Date/Time: 0800 11-30-01
Relinquished By/Removed From: R Thoren ERC	Date/Time: 0800 11.30.01	Received By/Stored In: FED EX	Date/Time: 11-30-01
Relinquished By/Removed From: Fed Ex	Date/Time: 12-1-01 12:00	Received By/Stored In: [illegible]	Date/Time: 12-3-01 8:27
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 -- Total Sr

SAMPLES STORED IN REF.# 1A AT THE 3728 SHIPPING FACILITY ON 11/29/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 11/30/01 FOR SHIPMENT.

RT 11-30-01

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-078-01 | Page 1 of 1

Contractor: Fahlberg / Bowers DI	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D H1624 (7173)		SAF No.: B01-078
Ice Chest No.: ERC-01-043	Field Logbook No.: ~~EL 1517-2~~ EFL 1133-10	COA: R105DX200C	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: RSR #107030		Bill of Lading/Air Bill No.: NA

Price Code: ~~9N~~ 9L | Data Turnaround: ~~45~~ 21 Days | Air Quality ☐

MM 12/5/01

POSSIBLE SAMPLE HAZARDS/REMARKS: RADIOACTIVE - TIETO B13CJ4

Special Handling and/or Storage

Preservation	None RT 11-29-01	Cool 4G RT 11-29-01	None									
Type of Container	aG	aG	aG									
No. of Container(s)		1	1									
Volume	60mL	60mL	120mL									
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 (CV)	PCBs 8082	See item (1) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
~~B13CJ2~~ RT 11-30-01	~~OTHER SOLID~~	~~11-28-01~~	~~0959~~	X	X		<0.5 mr/hr						
B13CH1	OTHER SOLID	11-28-01	1010	X	X	X							
~~B13CH4~~ RT 11.30.01	~~OTHER SOLID~~	~~11-28-01~~	~~1020~~	X	X								

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: Doug Bowers Bowers	Date/Time: 11-28-01/1400	Received By/Stored In: Ref 1A 3728	Date/Time: 11-28-01/1400
Relinquished By/Removed From: Ref 1A 3728	Date/Time: 0800 11-30-01	Received By/Stored In: R.F. Thorer	Date/Time: 0800 11-30-01
Relinquished By/Removed From: R.F. Thorer ERC	Date/Time: 0800 11-30-01	Received By/Stored In: FED EX	Date/Time: 11-30-01
Relinquished By/Removed From: Fed Ex	Date/Time: 12-1-01 1250	Received By/Stored In: [illegible]	Date/Time: 12-3-01
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 – Total Sr

SAMPLES STORED IN REF.# 1A AT THE 3728 SHIPPING FACILITY ON 11/28/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 11/30/01 FOR SHIPMENT.

RT 11-30-01

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

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

BHI-EE-011 (10/99)

000031

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-078-01 | Page 1 of 1

Collector: Fahlberg / Dowey / DL

Company Contact: J Adler | Telephone No.: 372-2178

Project Coordinator: TRENT, SJ

Price Code: ~~9N~~ 9L | Data Turnaround: ~~45~~ 21 Days

Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete

Sampling Location: 105 D H1624 (7173)

SAF No.: B01-078

Air Quality ☐

Ice Chest No.: ERC-01-043

Field Logbook No.: ~~EL 15172~~ EFL 11337-40 (LD 11-28-01)

COA: R105DX200C

Method of Shipment: Fed EX

mm 12/5/01

Shipped To: TMA/RECRA

Offsite Property No.: RSR# 107030

Bill of Lading/Air Bill No.: WA

POSSIBLE SAMPLE HAZARDS/REMARKS: RADIOACTIVE - TIE TO B13CJ4

Special Handling and/or Storage

Preservation	None (RT 11-29-01)	Cool 4C (RT 11-29-01)	None
Type of Container	aG	aG	aG
No. of Container(s)	1	1	1
Volume	60mL	60mL	120mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471A (CV)	PCBs - 8082	See item (1) in Special Instructions.	
B13CH0	OTHER SOLID	11-28-01	0810	X	X	X	<0.5 mr/hr
~~B13CH5~~	~~OTHER SOLID~~	~~11-28-01~~	~~0915~~	X	X		
~~B13CJ3~~	~~OTHER SOLID~~	~~11-28-01~~	~~0910~~	X	X	~~X~~	RT 11-29-01 NO TMA Sample Taken on This Number
~~B13CH4~~	~~OTHER SOLID~~	~~11-28-01~~	~~0945~~	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Dowey	11-29-01/1400	Ref 1A 3728	11-29-01/1400
Ref 1A 3728	11.30.01 0800	R Thorer	11.30.01 0800
R Thorer ERC	11.30.01 0800	FEDEX	11-30-01
Fed Ex	12-1-01 1210	SRCarr / R Ewing	12-3-01 0100

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 -- Total Sr

SAMPLES STORED IN REF.# 1A AT THE 3728 SHIPPING FACILITY ON 11/28/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 11/29/01 FOR SHIPMENT.

RT 11-29-01

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

IHI-EE-011 (10/99)

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-078-01 | Page 1 of 1

Collector: Fahlberg / Bowers DL	Company Contact: J Adler	Telephone No.: 372-2178	Project Coordinator: TRENT, SJ
Project Designation: 105D & H Rx - Interim Closure - Shallow Zone Concrete	Sampling Location: 105 D H1624 (7173)		SAF No.: B01-078
Ice Chest No.: ERC-01-043	Field Logbook No.: ~~BL 1517-2~~ EFL1133-10	COA: R105DX200C	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: RSR # 107050		Bill of Lading/Air Bill No.: NA

Price Code: 9N 9L | Data Turnaround: ~~45~~ 21 Days | Air Quality ☐ | MM 12/5/01

POSSIBLE SAMPLE HAZARDS/REMARKS: RADIOACTIVE TIE TO B13CJ4

Special Handling and/or Storage

Preservation	~~Chilled~~	Cool 4C	None							
Type of Container	~~1-G~~	~~2-G~~ 1-G	aG							
No. of Container(s)			1							
Volume	60mL	60mL	120mL							
SAMPLE ANALYSIS	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 (CV)	PCBs - 8082	See item (1) in Special Instructions.							
Sample No. / Matrix * / Sample Date / Sample Time										
~~B15E90-9~~ / ~~OTHER SOLID~~ / ~~11-27-01~~ / ~~0935~~	X	X		<0.5 MR/hR						
B13CF9 / OTHER SOLID / 11-27-01 / 0952	X	X	X							
~~B13CF8-01~~ / ~~OTHER SOLID~~ / ~~11-27-01~~ / ~~1013~~	X	X								
B13CF8 / OTHER Solid / 11-27-01 / 1012	X	X	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Bowers	11-27-01 1400	Received By/Stored In: IA 3728	11-27-01 1400
Relinquished By/Removed From: IA 3728	11-30-01 0800	Received By/Stored In: RJ Thorer	11-30-01 0800
Relinquished By/Removed From: RJ Thorer ERC	11-30-01 0800	Received By/Stored In: FED EX	11-30-01
Relinquished By/Removed From: FED EX	12-1-01 1200	Received By/Stored In: Stevens/RCOVS	12-3-01 8:00
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Neptunium-237; Strontium-89,90 -- Total Sr

Samples stored in Ref.# IA at the 3728 Shipping Facility on 11/27/01. Collector not available to relinquish samples on 11/27/01 for shipment. 11-30-01

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

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

3HI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 105D & H Rx			DATA PACKAGE: H1624		
VALIDATOR: TLI		LAB:		DATE: 3/10/02	
CASE:			SDG: H1624		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	C14	Ni-63	
SAMPLES/MATRIX Concrete					
B13CF8 B13CF9 B13CH0 B13CH1 B13CH2					
B13CH3					

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

Appendix A – Radiochemical Data Validation Checklist

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: Up 237 -04

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

Appendix A – Radiochemical Data Validation Checklist

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: Isotopic or – 107% J all

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: C-14 + 3H – No MS J all

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: th 228 ok C14 87% J

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: C14 137%
SR 31,7%

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: U235(aspe) + 155 thall

th228 + 232 in F8 + F9

U234 in F8 + CO

pu238 in CO

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-08

Method Blank

METHOD BLANK

SDG 7173
Contact Melissa C. Mannion

Client/Case no Hanford
Contract No. 630

SDG H1624

Lab sample id R112003-08
Dept sample id 7173-008

Client sample id Method Blank
Material/Matrix
SAF No B01-078

SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	4.48	13	21	30	U	NI_L
Total Strontium	SR-RAD	-1.11	2.0	4.1	1.0	U	SR
Thorium 228	14274-82-9	-0.110	0.073	0.35		U	TH
Thorium 230	14269-63-7	0.659	0.81	1.5	1.0	U	TH
Thorium 232	TH-232	-0.037	0.15	0.28	1.0	U	TH
Uranium 233/234	U-233/234	0.276	0.55	1.1	1.0	U	U
Uranium 235	15117-96-1	-0.167	0.33	1.3	1.0	U	U
Uranium 238	U-238	0.138	0.28	1.1	1.0	U	U
Neptunium 237	13994-20-2	0.384	0.26	0.13	1.0	J	NP
Plutonium 238	13981-16-3	0.040	0.24	0.49	1.0	U	PU
Plutonium 239/240	PU-239/240	0.119	0.24	0.38	1.0	U	PU
Americium 241	14596-10-2	-0.207	0.41	1.6	1.0	U	AM
Potassium 40	13966-00-2	U		7.8		U	GAM
Cobalt 60	10198-40-0	U		0.49	0.050	U	GAM
Barium 133	13981-41-4	U		0.44		U	GAM
Cesium 137	10045-97-3	U		0.45	0.10	U	GAM
Radium 226	13982-63-3	U		0.80	0.10	U	GAM
Radium 228	15262-20-1	U		2.1	0.20	U	GAM
Europium 152	14683-23-9	U		1.0	0.10	U	GAM
Europium 154	15585-10-1	U		1.3	0.10	U	GAM
Europium 155	14391-16-3	U		0.82	0.10	U	GAM
Thorium 228	14274-82-9	U		0.55		U	GAM
Thorium 232	TH-232	U		2.1		U	GAM
Uranium 235	15117-96-1	U		1.3		U	GAM
Uranium 238	U-238	U		59		U	GAM
Americium 241	14596-10-2	U		0.89		U	GAM

105D & H Rx-Interim Closure-Shallow

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-11

Method Blank

METHOD BLANK

SDG	7173	Client/Case no	Hanford SDG H1624
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R112003-11	Client sample id	Method Blank
Dept sample id	7173-011	Material/Matrix	SOLID
		SAF No	B01-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.977	5.4	9.3	400	U	H

105D & H Rx-Interim Closure-Shallow

QC-BLANK 40764

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-14

Method Blank

METHOD BLANK

SDG	7173	Client/Case no	Hanford	SDG H1624	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R112003-14	Client sample id	Method Blank		
Dept sample id	7173-014	Material/Matrix		SOLID	
		SAF No	B01-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-0.277	3.1	5.3	50	U	C

105D & H Rx-Interim Closure-Shallow

QC-BLANK 40992

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/31/02

000021

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7173
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1624
Case no No. 630

Lab sample id R112003-07
Dept sample id 7173-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-078

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
Nickel 63	2220	47	24	30		NI_L	2300	92	97	84-116	80-120
Total Strontium	455	15	4.0	1.0		SR	436	17	104	83-117	80-120
Thorium 230	214	7.9	1.5	1.0		TH	204	8.2	105	89-111	80-120
Uranium 233/234	181	16	7.7	1.0		U	186	7.4	97	84-116	80-120
Uranium 235	152	14	1.6	1.0		U	151	6.0	101	83-117	80-120
Uranium 238	208	17	7.3	1.0		U	202	8.1	103	84-116	80-120
Neptunium 237	189	6.5	0.31	1.0	B	NP	199	8.0	95	89-111	80-120
Plutonium 238	243	9.6	0.47	1.0		PU	246	9.8	99	89-111	80-120
Plutonium 239/240	265	10	0.40	1.0		PU	264	11	100	89-111	80-120
Americium 241	202	17	1.4	1.0		AM	191	7.6	106	83-117	80-120
Cobalt 60	19.3	0.43	0.17	0.050		GAM	18.8	0.75	103	76-124	80-120
Cesium 137	22.9	0.37	0.20	0.10		GAM	22.0	0.88	104	76-124	80-120

105D & H Rx-Interim Closure-Shallow

QC-LCS 40527

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-10

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7173
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1624
Case no No. 630

Lab sample id R112003-10
Dept sample id 7173-010

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-078

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	2730	38	11	400		H	2800	110	98	84-116	80-120

105D & H Rx-Interim Closure-Shallow

QC-LCS 40763

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

Lab Control Sample

R112003-13

LAB CONTROL SAMPLE

SDG 7173
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1624
Case no No. 630

Lab sample id R112003-13
Dept sample id 7173-013

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-078

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
Carbon 14	9200	180	28	50		C	11300	450	81	86-114	80-120

105D & H Rx-Interim Closure-Shallow

QC-LCS 40991

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/31/02

000027

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-09 B13CH0

DUPLICATE

SDG	7173			Client/Case no	Hanford SDG H1624
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R112003-09	Lab sample id	R112003-03	Client sample id	B13CH0
Dept sample id	7173-009	Dept sample id	7173-003	Location/Matrix	105 D SOLID
		Received	12/03/01	Collected/Weight	11/28/01 08:50 100.7 g
% solids	100.0	% solids	100.0	Custody/SAF No	B01-078-01 B01-078

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
Nickel 63	12300	250	60	30		NI_L	12800	260	58		4	22
Total Strontium	1940	28	4.1	1.0		SR	1930	46	6.2		1	22
Thorium 228	0.585	0.34	0.38			TH	0.903	0.43	0.53		43	111
Thorium 230	-0.034	0.69	1.4	1.0	U	TH	0.601	0.86	1.5	U	-	
Thorium 232	0.618	0.34	0.26	1.0	J	TH	0.515	0.34	0.33	J	18	128
Uranium 233/234	5.49	1.8	1.1	1.0		U	6.04	2.9	2.7		10	89
Uranium 235	0	0.36	1.4	1.0	U	U	0.430	0.86	3.3	U	-	
Uranium 238	0.445	0.59	1.1	1.0	U	U	0.355	0.71	2.7	U	-	
Neptunium 237	0.035	0.14	0.27	1.0	U	NP	0.675	0.58	0.74	U	-	
Plutonium 238	3.92	0.82	0.31	1.0		PU	3.01	2.6	3.3	U	26	118
Plutonium 239/240	135	6.1	0.31	1.0		PU	130	19	3.3		4	25
Americium 241	36.1	5.6	1.3	1.0		AM	39.2	5.9	1.5		8	34
Potassium 40	U		26		U	GAM	U		14	U	-	
Cobalt 60	486	6.2	2.7	0.050		GAM	466	4.3	2.0		4	32
Barium 133	U		5.1		U	GAM	U		3.7	U	-	
Cesium 137	6950	17	5.5	0.10		GAM	6750	11	4.0		3	32
Radium 226	U		5.9	0.10	U	GAM	U		4.8	U	-	
Radium 228	U		16	0.20	U	GAM	U		13	U	-	
Europium 152	1470	15	16	0.10		GAM	1480	12	12		1	32
Europium 154	212	10	9.1	0.10		GAM	204	8.7	7.2		4	33
Europium 155	U		11	0.10	U	GAM	U		12	U	-	
Thorium 228	U		4.7		U	GAM	U		3.8	U	-	
Thorium 232	U		16		U	GAM	U		13	U	-	
Uranium 235	U		11		U	GAM	U		7.3	U	-	
Uranium 238	U		560		U	GAM	U		460	U	-	
Americium 241	U		39		U	GAM	U		40	U	-	

105D & H Rx-Interim Closure-Shallow

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-12 B13CH0

DUPLICATE

SDG	7173			Client/Case no	Hanford SDG H1624
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R112003-12	Lab sample id	R112003-03	Client sample id	B13CH0
Dept sample id	7173-012	Dept sample id	7173-003	Location/Matrix	105 D SOLID
		Received	12/03/01	Collected/Weight	11/28/01 08:50 100.7 g
% solids	100.0	% solids	100.0	Custody/SAF No	B01-078-01 B01-078

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 TOT	PROT LIMIT
Tritium	244	9.4	5.9	400	J	H	184	8.3	5.8	J	28	23	

105D & H Rx-Interim Closure-Shallow

QC-DUP#3 40765

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

R112003-15

B13CH0

DUPLICATE

SDG	7173			Client/Case no	Hanford SDG H1624
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R112003-15	Lab sample id	R112003-03	Client sample id	B13CH0
Dept sample id	7173-015	Dept sample id	7173-003	Location/Matrix	105 D SOLID
		Received	12/03/01	Collected/Weight	11/28/01 08:50 100.7 g
% solids	100.0	% solids	100.0	Custody/SAF No	B01-078-01 B01-078

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 TOT	PROT LIMIT
Carbon 14	2100	43	13	50		C	826	17	7.8		87	24	

105D & H Rx-Interim Closure-Shallow

QC-DUP#3A1 40993

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/31/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1624

Test U Matrix SOLID
SDG 7173
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1624

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7018-068											
B13CF8	R112003-01			7173-001	23.2	U	2.58 U				
B13CF9	R112003-02			7173-002	4.42	U	2.06	215	156	-9	19
B13CH0	R112003-03			7173-003	6.04	U	U				
B13CH1	R112003-04			7173-004	2.57	U	1.36	189	154	0	27
B13CH2	R112003-05			7173-005	16.4	U	1.64	1E3	535	-10	21
B13CH3	R112003-06			7173-006	16.3	U	1.12	1E3	1E3	-15	32
BLK (QC ID=40528)	R112003-08			7173-008	U	U	U				
LCS (QC ID=40527)	R112003-07			7173-007	ok	ok	ok				
Duplicate (R112003-03)	R112003-09			7173-009	ok	- U	- U				
Nominal values and limits from method 105D & H Rx-Interim Closure-Shallow				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
								Averages 715		-9	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7018-068	2σ prep error 5.0 %				Reference Lab Notebook 7018 pg. 068											
B13CF8	R112003-01			3.4	0.0500			86		99			17	12/14/01	12/14	SS-019
B13CF9	R112003-02			1.5	0.0500			107		145			21	12/14/01	12/18	SS-031
B13CH0	R112003-03			3.3	0.0500			93		97			16	12/14/01	12/14	SS-022
B13CH1	R112003-04			1.4	0.0500			105		145			20	12/14/01	12/18	SS-043
B13CH2	R112003-05			1.3	0.0500			96		175			16	12/14/01	12/15	SS-047
B13CH3	R112003-06			1.3	0.0500			93		176			16	12/14/01	12/15	SS-048
BLK (QC ID=40528)	R112003-08			1.3	0.0500			94		176				12/14/01	12/15	SS-050
LCS (QC ID=40527)	R112003-07			7.7	0.0500			80		176				12/14/01	12/15	SS-049
Duplicate (R112003-03) (QC ID=40529)	R112003-09			1.4	0.0500			104		151			20	12/14/01	12/18	SS-041
Nominal values and limits from method				1.0	0.0500			20-105		100	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/31/02

Duncan, Jeanette M

From: Weiss, Richard L
Sent: Tuesday, March 12, 2002 12:52 PM
To: Duncan, Jeanette M
Subject: Review of Validation Packages for SDG H1624

Jeanette,

Here are my comments for the validation packages for SDG H1624:

Rad & Inorganics - No Comments

PCBs - Pg11: Value for Aroclor-1254 for sample B13CH9 is incorrect Listed as 1800, should be 830.

Rich

Review Comment Record (RCR)

1. Date	2. Review No.
2/13/02	BHI/QA2005
3. Project	**4. Page**
105D & H Rx	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No.: H1624	105D & H Rx – Interim Closure – Shallow Zone Concrete	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval:

Organization Manager (Optional)

Date

10. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact

Author/Originator

11. CLOSED

03/19/02
Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	PCB – Page 11, the table column for sample date for samples B13CH6 and B13CH7 needs expanded to accommodate the dates.		Correct	
2	Inorganics – Page 10, the units in the page heading shows UG/KG; whereas, the units for the data in the table are MG/KG.		Correct	
3	RadChem – OK No Comment			
4				
5				
6				