Date: 6 January 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-DR FSB - Concrete
Subject: Inorganics - Data Package No. H0483-RLN (SDG No. H0483)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0483-RLN prepared by RECRA LabNet (RLN). 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
B0W3Y6	8/4/99	Solid	C	See note 1
B0W3Y7	8/4/99	Solid	C	See note 1

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

Data validation was conducted in accordance with the BHI validation statement of work and "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). 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

RECEIVED
MAR 20 2000
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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 lead and 28 days for mercury.

All holding times were acceptable.

- **Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

- **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 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.

Due to a matrix spike recovery of 208%, all mercury results were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 60.7%, all lead results were qualified as estimates and flagged "J".

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 105DR PQLs ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package No. H0483-RLN (SDG No. H0483) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a matrix spike recovery of 208%, all mercury results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 60.7%, all lead 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-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*.

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 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 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 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 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: H0483	REVIEWER: TLI	DATE: 1/6/00	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Lead	J	All	MS percent recovery
Mercury	J	All	MS percent recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOLID MATRIX, MG/KG

Project: BECHTEL-HANFORD																					
Laboratory: RECRA LabNet																					
Case	SDG: H0483																				
Sample Number		B0WY36		B0WY37																	
Location		B		D																	
Remarks																					
Sample Date		8/4/99		8/4/99																	
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Mercury	0.08	1.0	J	0.35	J																
Lead	20	51.7	J	33.3	J																

000040

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/12/99

CLIENT: TNU-HANFORD B99-076

WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9908L636

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W3Y6	Mercury, Total	1.0 J	MG/KG	0.03	1.0
		Lead, Total	51.7 J	MG/KG	1.4	5.0
-002	B0W3Y7	Mercury, Total	0.35 J	MG/KG	0.02	1.0
		Lead, Total	33.3 J	MG/KG	1.1	5.0

RW
10/19/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

SEP 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-076
RFW# : 9908L636
SDG/SAF# : H0483/B99-076

W.O.# : 10985-001-001-9999-00
Date Received: 08-06-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 solid samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Five fold dilutions were performed for Lead due to the sample matrix.

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) 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 laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for both analytes were 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. A PDS was prepared at the following concentration:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B0W3Y6	Lead	200	105.2

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

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

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

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

for Pat E.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

8-12-99
Date

mld/m08-636

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-076-04	Page 1 of 1

Collector: Fahlberg/Nielson	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-DR FSB - Concrete	Sampling Location: 105 DR		SAF No.: B99-076
Ice Chest No.: ERC 99-005	Field Logbook No.: EL 1281		Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA Ref 8.2.99	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA
			COA: R105D42870

Price Code: 9K (636)

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

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

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	PCBs - 8080	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)							
B0W3Y6	Other Solid	8-4-99	0945	X	X						B0W0Y4	
B0W3Y7	Other Solid	8-4-99	0955	X	X						B0W0Y5	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1400 8-4-99	Ref 1-C	1400 8-4-99
R. Fahlberg / Ref 1-C	0800 8-5-99	R. Fahlberg / R. Fahlberg	0800 8-5-99
R. Fahlberg / R. Fahlberg	1400 8-5-99	Fed Ex	
Delivered		Johnson	9/6/99 0930

SPECIAL INSTRUCTIONS

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION — Received By — Title — Date/Time

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

0000-03

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 105 DR FSB Concrete			DATA PACKAGE: H0483		
VALIDATOR:		LAB: Reckt		DATE: 10/8/99	
CASE:			SDG: H0483		
ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☐ SW-846/GFAA	☒ SW-846/Hg	☐ SW-846 Cyanide	☐	☐
SAMPLES/MATRIX	B0W346	B0W347			
					solid

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments:

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: Hg 208 ↓J pb 60.7 ↑J

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A

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

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

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

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

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . Yes No N/A

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

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

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

Are all results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 08/12/99

CLIENT: TNU-HANFORD B99-076

RECRA LOT #: 9908L636

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	BOW3Y6	Mercury, Total	1.5	1.0	0.26	208.1	1.0
		Lead, Total	94.1	51.7	69.8	60.7	5.0

Date: 6 January 2000
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-DR FSB - Concrete
Subject: Radiochemistry - Data Package No. H0483-TNU (SDG No. H0483)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0483-TNU which was prepared by Thermo NUtech (TNU). 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
B0W3Y9	8/4/99	Solid	C	See note 1
B0W400	8/4/99	Solid	C	See note1
B0W401	8/4/99	Solid	C	See note 1

1 - Gamma spectroscopy; alpha spectroscopy (isotopic uranium, isotopic plutonium and americium-241); total strontium; nickel-63; tritium; carbon-14; technetium-99.

Data validation was conducted in accordance with the BHI validation statement of work and the "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). 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**

  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 with liquid scintillation requiring analysis within 7 days of distillation.

  All holding times were acceptable.

- **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 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 laboratory blank results were acceptable although the laboratory reported detection limit exceeded the PQL for cobalt-60, cesium-137, europium-152, europium-154 and europium-155.

- **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% (gamma spectroscopy is 80-120%). 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 the lack of a matrix spike analysis, all carbon-14 and tritium results were qualified as estimates and flagged "J".

Due to a radiochemical yield of 10%, the americium-241(aspec) results in sample BOW401 was qualified as an estimate and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than

30 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. 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 47%, all carbon-14 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the 105DR PQLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory MDAs were at or below the analyte-specific PQL.

- **Completeness**

Data Package No. H0483 (SDG No. H0483) was submitted for validation and verified for completeness. The completion rate 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 a radiochemical yield of 10%, the americium-241(aspec) results in sample B0W401 was qualified as an estimate and flagged "J". Due to an RPD of 47%, all carbon-14 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-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils.*

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 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 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 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 QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0483	REVIEWER: TLI	DATE: 1/6/00	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Americium-241	J	B0W401	Radiochemical yield
Carbon-14	J	All	RPD
Carbon-14, tritium	J	All	No MS analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																					
Laboratory: TNU																					
Case	SDG: H0483																				
Sample Number		B0W3Y9		B0W400		B0W401															
Location		A		C-1		C-2															
Remarks																					
Sample Date		08/04/99		08/04/99		08/04/99															
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	4.56	J	5.97	J	5.97	J														
Carbon-14	50	259	J	174	J	174	J														
Technetium-99	15	0.620		1.06		1.06															
Uranium-233/234	1	1.34		2.24		2.24															
Uranium-235	1	0.077		0.207		0.207															
Uranium-238	1	1.20		1.86		1.86															
Plutonium-238	1	4.99		2.58		2.58															
Plutonium-239/40	1	232		163		163															
Nickel-63	30	7580		4680		4680															
Americium-241	1	75.5		50.7		50.7	J														
Strontium (total)	1	2710		4700		4700															
Potassium-40		U	U	U	U	U	U														
Barium-133		U	U	U	U	U	U														
Cobalt 60	0.1	281		193		193															
Cesium 137	0.1	7790		11000		11000															
Europium 152	0.2	987		548		548															
Europium 154	0.2	226		113		113															
Europium 155	0.1	13.4		9.43		9.43															
Radium-226		U	U	U	U	U	U														
Radium-228		U	U	U	U	U	U														
Thorium-228		U	U	U	U	U	U														
Thorium-232		U	U	U	U	U	U														
Americium-241 (GEA)		108		100		100															
Uranium-238 (GEA)		U	U	U	U	U	U														
Uranium-235 (GEA)		U	U	U	U	U	U														

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-01 B0W3Y9

DATA SHEET

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Contract TRB-SBB-207925

Lab sample id N908036-01 Client sample id B0W3Y9
Dept sample id 7170-001 Location/Matrix 105 DR SOLID
Received 08/06/99 Collected 08/04/99 09:35
Custody/SAP No B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	4.56	0.19	0.15	400	~~J~~ J	H
Carbon 14	14762-75-5	259	6.4	4.6	50	J	C
Technetium 99	14133-76-7	0.620	0.19	0.39	15	~~J~~	TC
Uranium 233/234	U-233/234	1.34	0.22	0.068	1.0		U
Uranium 235	15117-96-1	0.077	0.052	0.066	1.0	~~J~~	U
Uranium 238	U-238	1.20	0.21	0.054	1.0		U
Plutonium 238	13981-16-3	4.99	1.3	0.32	1.0		PU
Plutonium 239/240	PU-239/240	232	47	0.45	1.0		PU
Nickel 63	13981-37-8	7580	76	6.3	30		NI_L
Americium 241	14596-10-2	75.5	5.4	0.042	1.0		AM
Total Strontium	SR-RAD	2710	100	7.6	1.0		SR
Potassium 40	13966-00-2	U		6.4		U	GAM
Barium 133	13981-41-4	U		2.6		UX	GAM
Cobalt 60	10198-40-0	281	2.0	0.99	0.050		GAM
Cesium 137	10045-97-3	7790	7.0	2.5	0.10		GAM
Europium 152	14683-23-9	987	7.3	8.0	0.10		GAM
Europium 154	15585-10-1	226	4.1	3.3	0.10		GAM
Europium 155	14391-16-3	13.4	2.6	3.8	0.10		GAM
Radium 226	13982-63-3	U		3.1	0.10	U	GAM
Radium 228	15262-20-1	U		6.1	0.20	U	GAM
Thorium 228	14274-82-9	U		2.9		U	GAM
Thorium 232	TH-232	U		6.1		U	GAM
Americium 241	14596-10-2	108	1.8	2.3			GAM
Uranium 238	U-238	U		260		U	GAM
Uranium 235	15117-96-1	U		6.0		U	GAM

PRIORITY

105-DR FSB - Concrete

1/6/00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 10/07/99

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 15

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-02 B0W400

DATA SHEET

SDG	7170	Client/Case no	Hanford SDG-H0483
Contact	L.A. Johnson	Contract	TRB-SBB-207925
Lab sample id	N908036-02	Client sample id	B0W400
Dept sample id	7170-002	Location/Matrix	105 DR SOLID
Received	08/06/99	Collected	08/04/99 09:25
		Custody/SAF No	B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	5.97	0.14	0.072	400	~~U~~ J	H
Carbon 14	14762-75-5	174	5.5	4.6	50	J	C
Technetium 99	14133-76-7	1.06	0.30	0.39	15	~~U~~	TC
Uranium 233/234	U-233/234	2.24	0.32	0.074	1.0		U
Uranium 235	15117-96-1	0.207	0.096	0.072	1.0	~~U~~	U
Uranium 238	U-238	1.86	0.29	0.074	1.0		U
Plutonium 238	13981-16-3	2.58	0.26	0.031	1.0		PU
Plutonium 239/240	PU-239/240	163	11	0.049	1.0		PU
Nickel 63	13981-37-8	4680	47	5.4	30		NI_L
Americium 241	14596-10-2	50.7	3.4	0.044	1.0		AM
Total Strontium	SR-RAD	4700	130	8.6	1.0		SR
Potassium 40	13966-00-2	U		5.7		U	GAM
Barium 133	13981-41-4	U		3.5		UX	GAM
Cobalt 60	10198-40-0	193	1.8	0.93	0.050		GAM
Cesium 137	10045-97-3	11000	10	3.5	0.10		GAM
Europium 152	14683-23-9	540	8.5	10	0.10		GAM
Europium 154	15585-10-1	113	3.4	3.1	0.10		GAM
Europium 155	14391-16-3	9.43	3.6	5.6	0.10		GAM
Radium 226	13982-63-3	U		4.1	0.10	U	GAM
Radium 228	15262-20-1	U		5.2	0.20	U	GAM
Thorium 228	14274-82-9	U		3.7		U	GAM
Thorium 232	TH-232	U		5.2		U	GAM
Americium 241	14596-10-2	100	5.3	7.6			GAM
Uranium 238	U-238	U		150		U	GAM
Uranium 235	15117-96-1	U		7.6		U	GAM

105-DR FSB - Concrete

PRIORITY

1/6/00

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-03 B0W401

DATA SHEET

SDG	7170	Client/Case no	Hanford SDG-H0483
Contact	L.A. Johnson	Contract	TRB-SBB-207925
Lab sample id	N908036-03	Client sample id	B0W401
Dept sample id	7170-003	Location/Matrix	105 DR SOLID
Received	08/06/99	Collected	08/04/99 09:09
		Custody/SAP No	B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	6.46	0.15	0.073	400	~~J~~ J	H
Carbon 14	14762-75-5	3300	67	16	50	J	C
Technetium 99	14133-76-7	1.94	0.28	0.44	15	~~J~~	TC
Uranium 233/234	U-233/234	1.70	0.26	0.079	1.0		U
Uranium 235	15117-96-1	0.139	0.070	0.067	1.0	~~J~~	U
Uranium 238	U-238	2.61	0.34	0.069	1.0		U
Plutonium 238	13981-16-3	6.83	0.58	0.041	1.0		PU
Plutonium 239/240	PU-239/240	187	13	0.047	1.0		PU
Nickel 63	13981-37-8	10000	100	7.2	30		NI_L
Americium 241	14596-10-2	71.8	16	0.40	1.0	J	AM
Total Strontium	SR-RAD	3280	120	11	1.0		SR
Potassium 40	13966-00-2	U		6.5		U	GAM
Barium 133	13981-41-4	U		1.9		UX	GAM
Cobalt 60	10198-40-0	720	2.3	1.1	0.050		GAM
Cesium 137	10045-97-3	7540	5.0	1.9	0.10		GAM
Europium 152	14683-23-9	1280	6.0	5.9	0.10		GAM
Europium 154	15585-10-1	302	3.8	3.3	0.10		GAM
Europium 155	14391-16-3	12.4	1.8	3.0	0.10		GAM
Radium 226	13982-63-3	U		2.5	0.10	U	GAM
Radium 228	15262-20-1	U		5.5	0.20	U	GAM
Thorium 228	14274-82-9	U		1.9		U	GAM
Thorium 232	TH-232	U		5.5		U	GAM
Americium 241	14596-10-2	50.2	2.4	3.6			GAM
Uranium 238	U-238	U		200		U	GAM
Uranium 235	15117-96-1	U		4.8		U	GAM

105-DR PSB - Concrete

PRIORITY

1/4/00

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0483 is composed of three solid samples designated under SAF No. B99-076 with a Project Designation of : 105-DR FSB-Concrete.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. The results were transmitted to BHI via facsimile on August 25, 1999.

2.0 ANALYSIS NOTES

2.1 Technetium-99 Analyses

The RPD for the duplicate analysis was 59%, greater than the 3 sigma total of 51%. Positive Tc99 was detected in all the samples.

2.2 Total Strontium Analyses

All sample MDA's were greater than the RDL however all samples contained strontium activity much greater than the RDL and MDA. The blank sample indicated slight cross contamination.

2.3 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.4 Tritium Analyses

No problems were encountered during the course of the analyses.

2.5 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

SEP 1999
RECEIVED
Data
Log In

2.6 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses. Some Pu-239 activity was being counted in the ROI for the tracer Pu242 resulting in a apparently high tracer yield. The integration bounds for Pu239 were changed slightly in order to remove the Pu239 counts from the Pu242 ROI and the data recalculated. All data, except for the LCS and blank, was recalculated.

2.7 Americium-241 Analyses

No problems were encountered during the course of the analyses. Due to an unclear definition between the Am243 tracer peak and the Am241 peak in the alpha spectra of the samples the integration limits for Am241 were changed slightly to remove some of the Am243 counts and the data recalculated. All data, except for the LCS and blank, was recalculated.

2.8 Carbon-14 Analyses

The C14 recovery LCS for the initial analysis was unsatisfactory. A reanalysis was performed with an acceptable LCS recovery, however the RPD for duplicate analysis was 47%, greater than the 3 sigma total of 23%. Sample inhomegeneity is most likely the cause of the difference in the results.

2.9 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-076-05	Page 1 of 1

Collector: Fahlberg/Nielson	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-DR FSB - Concrete	Sampling Location: 105 DR		SAF No.: B99-076
Ice Chest No.: ERC 99-002	Field Logbook No.: EL 1281		Method of Shipment: Fed Ex
Shipped To: TMA/~~RECRA~~ R. F. 8.2.99	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA
			COA: R105D4-2870

Price Code: 9K

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None
Type of Container	aG
No. of Container(s)	1
Volume	120mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time											
B0W3Y9	Other Solid	8.4.99	0935	X						M.G.	CPM 1400	B0W0X6		
B0W400	Other Solid	8.4.99	0925	X							CPM 1500	B0W0X7		
B0W401	Other Solid	8.4.99	0909	X							CPM 1700	B0W0X8		
											~~CPM 1700~~			

B6V000

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: R. Fahlberg / R. Fahlberg, Date/Time 1400 8.4.99	Received By: Ref 1-C, Date/Time 1400 8.4.99	
Relinquished By: Ref 1-C, Date/Time 8.5.99 0800	Received By: R. Fahlberg / R. Fahlberg, Date/Time 8.5.99 0800	
Relinquished By: R. Fahlberg / R. Fahlberg, Date/Time 1400 8.5.99	Received By: Fed Ex, Date/Time 8/5-99	
Relinquished By: FedEx, Date/Time 11:30 8-6-99	Received By: TNU M. Goldenberg, Date/Time 11:30 8-6-99	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; Technetium-99; Nickel-63; Carbon-14; Tritium - H3

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 105-DR FSB Concrete		DATA PACKAGE: H0483
VALIDATOR: TLI	LAB: TNU	DATE:
CASE:		SDG: H0483

ANALYSES PERFORMED

☒ ~~Gross Alpha/Beta~~	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☒ Tritium	☒ C14	☒ Ni-63	

SAMPLES/MATRIX BOW349 BOW400 BOW401

Solid

1. Completeness . . . . . ☐ N/A

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

Comments:

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No N/A

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

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

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

Comments:

3. Continuing Calibration . . . . . ☑ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A
Calibration check acceptable? . . . . . Yes No N/A
Calibration check standards NIST traceable? . . . . . Yes No N/A
Calibration check standards expired? . . . . . Yes No N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . 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? . . . . . Yes No N/A

Comments: SR-90 - all >5X ok
Eu - all on +DL

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: NR

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments: Am 241 109% yield – Jall 401

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: ~~Tc-99 – Jall (59%)~~
C-14 – Jall (47%)
gamma - ~~Jall~~ dup count ~~not~~ a fraction of the original - OK

9. Field QC Samples . . . . . ☒ 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: _____

10. Holding Times

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

Comments: _____

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

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

Results supported in raw data? . . . . . Yes No N/A

Results Acceptable? . . . . . Yes No N/A

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

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

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

Comments: _____

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-06

B0W3Y9

DUPLICATE

SDG 7170
Contact L.A. Johnson

Client/Case no Hanford SDG-H0483
Case no TRB-SEB-207925

DUPLICATE
Lab sample id N908036-06
Dept sample id 7170-006

ORIGINAL
Lab sample id N908036-01
Dept sample id 7170-001
Received 08/06/99

Client sample id B0W3Y9
Location/Matrix 105 DR SOLID
Collected 08/04/99 09:35
Custody/SAF No B99-076-05 B99-076

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	4.63	0.19	0.15	400	J	H	4.56	0.19	0.15	J	2	23	
Technetium 99	1.14	0.19	0.29	15	J	TC	0.620	0.19	0.39	J	59	51	
Uranium 233/234	1.24	0.23	0.076	1.0		U	1.34	0.22	0.068		8	38	
Uranium 235	0.086	0.058	0.073	1.0	J	U	0.077	0.052	0.066	J	11	144	
Uranium 238	1.23	0.23	0.061	1.0		U	1.20	0.21	0.054		2	40	
Plutonium 238	5.24	0.49	0.037	1.0		PU	4.99	1.3	0.32		5	42	
Plutonium 239/240	227	16	0.060	1.0		PU	232	47	0.45		2	34	
Nickel 63	7790	78	6.7	30		NI_L	7580	76	6.3		3	21	
Americium 241	76.1	12	0.29	1.0		AM	75.5	5.4	0.042		1	28	
Total Strontium	2720	89	4.3	1.0		SR	2710	100	7.6		0	22	
Potassium 40	U		21		U	GAM	U		6.4	U	-		
Barium 133	U		7.0		UX	GAM	U		2.6	UX	-		
Cobalt 60	284	5.6	3.1	0.050		GAM	281	2.0	0.99		1	32	
Cesium 137	8090	20	6.6	0.10		GAM	7790	7.0	2.5		4	32	
Europium 152	959	20	22	0.10		GAM	987	7.3	8.0		3	32	
Europium 154	242	12	10	0.10		GAM	226	4.1	3.3		7	33	
Europium 155	U		15	0.10	U	GAM	13.4	2.6	3.8		11	164	
Radium 226	U		8.6	0.10	U	GAM	U		3.1	U	-		
Radium 228	U		16	0.20	U	GAM	U		6.1	U	-		
Thorium 228	U		7.3		U	GAM	U		2.9	U	-		
Thorium 232	U		16		U	GAM	U		6.1	U	-		
Americium 241	87.9	12	16			GAM	108	1.8	2.3		21	37	
Uranium 238	U		610		U	GAM	U		260	U	-		
Uranium 235	U		18		U	GAM	U		6.0	U	-		

105-DR FSB - Concrete

QC-DUP#1 31523

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 10/07/99

Date: 6 January 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-DR FSB Concrete
Subject: PCB - Data Package No. H0483-RLN (SDG No. H0483)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0483-RLN prepared by Recra LabNet (RLN). 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
B0V3Y6	08/04/99	Solid	C	EPA 8082*
B0V3Y7	08/04/99	Solid	C	EPA 8082*

*Equivalent to the requested method (EPA 8080).

Data validation was conducted in accordance with the BHI validation statement of work and the "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). 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 nondetects are rejected and flagged "UR".

Holding times were met for all samples.

- **Blanks**

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 CRQL. 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 CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

- **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". Nondetected 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 MS/MSD results of undetected or diluted out, all PCB results were qualified as estimates and flagged "J".

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". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to a surrogate recovery outside QC limits, all PCB results in sample B0W3Y7 were qualfied as estimates and flagged "J".

Due to the surrogate being diluted out, all undetected PCB results in sample B0W3Y6 were rejected and flagged "UR" and all detected PCB results (aroclor-1254) were qualified as estimates and flagged "J".

All other surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to the lack of a MS/MSD analysis, all PCB results were qualified as estimates and flagged "J".

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 105DR to ensure that laboratory detection levels meet the required criteria. All PCB results in sample B0W3Y6 (except aroclor 1254) were reported above the PQL. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL.

- Completeness

  Data Package No. H0483-RLN (SDG No. H0483) was submitted for validation and verified for completeness. The completion percentage was 57%.

MAJOR DEFICIENCIES

Due to the surrogate being diluted out, all undetected PCB results in sample B0W3Y6 were rejected and flagged "UR". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to MS/MSD results of undetected or diluted out, all PCB results were qualified as estimates and flagged "J". Due to a surrogate recovery outside QC limits, all PCB results in sample B0W3Y7 were qualfied as estimates and flagged "J". Due to the lack of a MS/MSD analysis, all PCB results were qualified as estimates and flagged "J". Due to the surrogate being diluted out, the detected PCB result (aroclor-1254) in sample B0W3Y6 was qualified as an estimate and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All PCB results in sample B0W3Y6 (except aroclor 1254) were reported above the 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-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*.

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 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. 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 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 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: H0483	REVIEWER: TLI	DATE: 1/6/00	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	MS/MSD diluted out
All	J	All	No duplicate analysis
All	J	B0W3Y7	Surrogate recovery
All except Aroclor-1254	UR	B0W3Y6	Surrogate diluted out
Aroclor-1254	J	B0W3Y6	Surrogate diluted out

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOLID MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																									
Laboratory: Recra LabNet																									
Case	SDG: H0483																								
Sample Number		B0W3Y6		B0W3Y7																					
Location		B		D																					
Remarks																									
Sample Date		08/04/99		08/04/99																					
PCB	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	510	UR	40	UJ																				
Aroclor-1221	100	1000	UR	79	UJ																				
Aroclor-1232	100	510	UR	40	UJ																				
Aroclor-1242	100	510	UR	40	UJ																				
Aroclor-1248	100	510	UR	40	UJ																				
Aroclor-1254	100	810	J	40	UJ																				
Aroclor-1260	100	510	UR	40	UJ																				

010000

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 08/17/99 11:22

FW Batch Number: 9908L636 Client: TNU-HANFORD B99-076 Work Order: 10985001001 Page: 1

	Cust ID:	BOW3Y6	BOW3Y6	BOW3Y6	B0W3Y7	PBLKQT	PBLKQT BS
ample nformation	RFW#:	001	001 MS	001 MSD	002	99LE0927-MB1	99LE0927-MB1
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOIL	SOIL
	D.F.:	10.0	10.0	10.0	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
urrogate:	Tetrachloro-m-xylene	D %	D %	D %	100 %	108 %	75 %
	Decachlorobiphenyl	D %	D %	D %	137 * %	109 %	80 %
		fl	fl	fl	fl	fl	fl
roclor-1016		510 U R	1000 U	1000 U	40 U J	33 U	33 U
roclor-1221		1000 U R	2000 U	2100 U	79 U	67 U	67 U
roclor-1232		510 U R	1000 U	1000 U	40 U	33 U	33 U
roclor-1242		510 U R	1000 U	1000 U	40 U	33 U	33 U
roclor-1248		510 U R	1000 U	1000 U	40 U	33 U	33 U
roclor-1254		810 J	D %	D %	40 U	33 U	75 %
roclor-1260		510 U R	1000 U	1000 U	40 U	33 U	33 U

004

000021

12/15/99

08-17-99

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

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

SEP 1999 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-076
RFW#: 9908L636
SDG/SAF#: H0483/B99-076

W.O.#: 10985-001-001-9999-00
Date Received: 08-06-99

PCB

The set of samples consisted of two (2) solid samples collected on 08-04-99.

The samples and their associated QC samples were extracted on 08-10-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 08-11,12-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclor 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 sulfur cleanup.

4. The method blank was below the reporting limits for all target compounds.

5. One (1) of six (6) obtainable surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).

6. The blank spike recovery was within acceptance criteria.

7. Matrix spike recoveries were unobtainable due to high concentration of analytes and the dilution required for analysis.

8. Sample BOW3Y6 and its QC samples required ten-fold instrument dilutions due to high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.

9. All initial calibrations associated with this data set were within acceptance criteria.

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

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

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Rs 7 J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

08-18-99
Date

pef\r:\group\data\pest\08L-636.pcb

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-076-04	Page 1 of 1

Collector Fahlberg/Nielson	Company Contact J Adler	Telephone No. 373-4316	Project Coordinator TRENT, SJ	Price Code 9K (636)
Project Designation 105-DR FSB - Concrete	Sampling Location 105 DR		SAF No. B99-076	Data Turnaround 15 Days
Ice Chest No. ERC 99-005	Field Logbook No. EL 1281		Method of Shipment Fed Ex	
Shipped To ~~TMA~~/RECRA Ref 8.2.99	Offsite Property No. NA		Bill of Lading/Air Bill No. NA	
			COA R105D42870	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
Special Handling and/or Storage	No. of Container(s)	1	1									
	Volume	60mL	60mL									
SAMPLE ANALYSIS		PCBs - 8080	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)									

Sample No.	Matrix *	Sample Date	Sample Time										
B0W3Y6	Other Solid	8-4-99	0945	X	X						B0W0Y4		
B0W3Y7	Other Solid	8-4-99	0955	X	X						B0W0Y5		

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS	Matrix *
Relinquished By R. Fahlberg / R. Fahlberg	Date/Time 1400 8-4-99	Received By Ref 1-C	Date/Time 1400 8-4-99	Soil Water Vapor Other Solid Other Liquid
Relinquished By R. Fahlberg / Ref 1-C	Date/Time 0800 8-5-99	Received By R. Fahlberg / R. Fahlberg	Date/Time 0800 8-5-99	
Relinquished By R. Fahlberg / R. Fahlberg	Date/Time 1400 8-5-99	Received By Fed Ex	Date/Time	
Relinquished By Delivered	Date/Time	Received By [illegible] 9/6/99	Date/Time 0830	

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

000025

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 105-DR FSB concrete			DATA PACKAGE: H0483		
VALIDATOR:		LAB: Recra		DATE: 10/8/91	
CASE:			SDG: H0483		
ANALYSES PERFORMED					
☐ CLP3/90	☐ SW-846 8080	☐ SW-846 8081	☒ SW 8082	☐	☐
SAMPLES/MATRIX BOW346 BOW347					
				Solid	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

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

Comments:

14 + 40 4 + 2

8/4/91

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable . . . . . Yes No N/A

Are calibration standard retention times acceptable? . . . . . Yes No N/A

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

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? . . . . . Yes No N/A

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

Comments:

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? . . . . . Yes No N/A

Are quantitation column calibration factor %RSD values acceptable? . . . . . Yes No N/A

Were the analytical sequence requirements met? . . . . . Yes No N/A

Are continuing calibration %D values acceptable? . . . . . Yes No N/A

Comments:

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? . . . . . Yes No N/A

Was the resolution acceptable in the resolution check mix? . . Yes No N/A

Is resolution acceptable in the PEM, INDA and INDB? . . . . . Yes No N/A

Are DDT and Endrin breakdowns acceptable? . . . . . Yes No N/A

Are retention times in PEMs and calibration mixes acceptable? . Yes No N/A

Are RPD values in the PEMs acceptable? . . . . . Yes No N/A

Are %RSD values acceptable? . . . . . Yes No N/A

Comments:

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? . . . . . Yes No N/A

Is resolution acceptable in the PEMs? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs, INDA and INDB mixes?	Yes	No	N/A
Are RPD values in the PEMs acceptable?	Yes	No	N/A
Are the DDT and endrin breakdowns acceptable?	Yes	No	N/A
Was GPC cleanup performed?	Yes	No	N/A
Is the GPC calibration check acceptable?	Yes	No	N/A
Was Florisil cleanup performed?	Yes	No	N/A
Is the Florisil performance check acceptable?	Yes	No	N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed?	Yes	No	N/A
Are laboratory blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments:

5. ACCURACY

Were surrogates analyzed?	Yes	No	N/A
Are surrogate recoveries acceptable?	Yes	No	N/A
Were MS/MSD samples analyzed?	Yes	No	N/A
Are MS/MSD results acceptable?	Yes	No	N/A
Were LCS samples analyzed?	Yes	No	N/A
Are LCS results acceptable?	Yes	No	N/A

Comments:
decachlorobiphenyl out 47 J all 47
MS/MSD — 9 a diluted out

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

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

Are laboratory duplicate results acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: U on diluted out - J

7. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? . . . . . Yes No N/A

Are positive results resolved acceptably? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Comments: BOW346 all but 1254 over

A-8