0059797

SAF-B01-054

100 B/C Area Effluent Pipeline & Proximity Site Remediation Activities - Full Protocol

FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jill Thomson	H9-01	BL 5/19/03 INITIAL/DATE
Jeanette Duncan	H9-02	BL 5/19/03 INITIAL/DATE

SDG: H2132 **SAF-B01-054**

Waste Site/Sample Location: 100-C-3

RECEIVED
JUL 14 2003
EDMC

Date: 29 April 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities - Full Protocol - Waste Site 100-C-3
Subject: Inorganics - Data Package No. H2132-LLI (SDG No. H2132)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2132-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00KB9	3/27/03	Soil	C	See note 1
J00KC0	3/27/03	Soil	C	See note 1
J00KC1	3/27/03	Soil	C	See note 1
J00KC2	3/27/03	Soil	C	See note 1
J00KC3	3/27/03	Soil	C	See note 1
J00KC4	3/27/03	Soil	C	See note 1

1 - Chromium VI by 7196A; ICP metals by 6010B; mercury by 7471A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI, 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

Due to laboratory blank contamination, all detected silver results were qualified as undetected and flagged "U".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00KC4) was submitted for analysis. Barium and chromium (total) were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike

Matrix spike (MS) analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples (J00KC1/J00KC3) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. All chromium VI results exceeded the TDL. Under the BHI statement of work, no

qualification is required. All other reported results met the analyte specific TDL.

- **Completeness**

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

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to laboratory blank contamination, all detected silver results were qualified as undetected and flagged "U".

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

REFERENCES

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

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

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with 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: H2132	REVIEWER: TLI	DATE: 4/29/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silver	U	J00KB9, J00KC1 J00KC2, J00KC3	Blank contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																					
Laboratory: LLI																					
Case	SDG: H2132																				
Sample Number		J00KB9		J00KC0		J00KC1		J00KC2		J00KC3		J00KC4									
Remarks										Duplicate		E. Blank									
Location		100-C-3		100-C-3		100-C-3		100-C-3		100-C-3		100-C-3									
Sample Date		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03									
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.09	U	0.08	U	0.08	U	0.09	U	0.11	U	0.08	U								
Arsenic	1	2.2		2.5		2.2		2.5		2.4		0.33	U								
Barium	20	51.2		49.4		53.6		52.9		62.5		1.2									
Cadmium	0.2	0.22		0.28		0.24		0.14		0.22		0.04	U								
Chromium(total)	1	10.0		10.5		9.9		8.6		9.3		0.26									
Mercury	0.2	0.02	U	0.02	U	0.01	U	0.01	U	0.02	U	0.02	U								
Lead	5	10.0		8.7		9.8		5.5		9.8		0.25	U								
Selenium	1	0.34	U	0.37	U	0.36	U	0.49		0.37	U	0.34	U								
Chromium VI	0.1	0.42	U	0.41	U	0.42	U	0.42	U	0.42	U	0.40	U								

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J00KC4	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	1.2	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.26	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	0.25 u	MG/KG	0.25	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0
-003	J00KB9	Silver, Total	0.09 U	MG/KG	0.08	1.0
		Arsenic, Total	2.2	MG/KG	0.33	1.0
		Barium, Total	51.2	MG/KG	0.009	1.0
		Cadmium, Total	0.22	MG/KG	0.04	1.0
		Chromium, Total	10.0	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	10.0	MG/KG	0.24	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0
-004	J00KC0	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.5	MG/KG	0.35	1.0
		Barium, Total	49.4	MG/KG	0.01	1.0
		Cadmium, Total	0.28	MG/KG	0.04	1.0
		Chromium, Total	10.5	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	8.7	MG/KG	0.26	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0

RBR
4/24/03

08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J00KC1	Silver, Total	0.08 U	MG/KG	0.08	1.0
		Arsenic, Total	2.2	MG/KG	0.35	1.0
		Barium, Total	53.6	MG/KG	0.01	1.0
		Cadmium, Total	0.24	MG/KG	0.04	1.0
		Chromium, Total	9.9	MG/KG	0.06	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Lead, Total	9.8	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
-006	J00KC2	Silver, Total	0.09 U	MG/KG	0.08	1.0
		Arsenic, Total	2.5	MG/KG	0.35	1.0
		Barium, Total	52.9	MG/KG	0.01	1.0
		Cadmium, Total	0.14	MG/KG	0.04	1.0
		Chromium, Total	8.6	MG/KG	0.06	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Lead, Total	5.5	MG/KG	0.26	1.0
		Selenium, Total	0.49	MG/KG	0.36	1.0
-007	J00KC3	Silver, Total	0.11 U	MG/KG	0.08	1.0
		Arsenic, Total	2.4	MG/KG	0.36	1.0
		Barium, Total	62.5	MG/KG	0.01	1.0
		Cadmium, Total	0.22	MG/KG	0.04	1.0
		Chromium, Total	9.3	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	9.8	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0

RW 4/24/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/14/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00KC6	% Solids	100	%	0.01	1.0
-002	J00KC4	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-003	J00KB9	% Solids	95.7	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-004	J00KC0	% Solids	96.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-005	J00KC1	% Solids	96.2	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-006	J00KC2	% Solids	95.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-007	J00KC3	% Solids	95.1	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0

RK 4/29/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LvLI
LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-054
LVL#: 0304L084
SDG/SAF#: H2132/B01-054

W.O.#: 11343-606-001-9999-00
Date Received: 04-01-03

METALS CASE NARRATIVE

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

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

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

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

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

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

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

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

9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of the soil LCS for Mercury (126.3%) which was within manufacturer's performance acceptance limits. Refer to the Inorganics Laboratory Control Standards Report.

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

11. The duplicate analysis for 1 analyte 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 25 pages.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

04-11-03
Date

gmb/m04-084

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-054 H2132
LVL#: 0304L084

W.O.#: 11343-606-001-9999-00
Date Received: 04-01-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

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

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

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

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

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

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

8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

04-15-03
Date

pefvi04-084

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

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Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-054-013
Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L — Data Turnaround: DWS 3/27/03 7 ~~21~~ Days 14 — Air Quality ☐ ~~DWS 3/26/03~~
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC french drain 100-C-3	SAF No.: B01-054	
Ice Chest No.: ERC 96001	Field Logbook No.: EL-~~1548-2~~ 1573 DWS 3/26/03 — COA: R100C32F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030174	Bill of Lading/Air Bill No.: SSE 85PL	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

000018

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	aG	G	G/P	G/P	G	G/P
No. of Container(s)	1	~~1~~ 0 DWS	1	1	1	1	1	1
Volume	60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14

Sample No.	Matrix *	Sample Date	Sample Time									
J00KB9	SOIL	3/27/03	0853	✓	✓	✓	✓					
J00KC0	SOIL	↓	0912	✓	✓	✓	✓					
J00KC1	SOIL	↓	0939	✓	✓	✓	✓					
J00KC2	SOIL	↓	1034	✓	✓	✓	✓					
J00KC3	SOIL	↓	0939	✓	✓	✓	✓					

DWS 3/27/03

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: DWShea DWShea	Date/Time: 3/27/03 1809	Received By/Stored In: Fridge 3A	Date/Time: 3/27/03 1809
Relinquished By/Removed From: ROF 3A	Date/Time: 33/03 1300	Received By/Stored In: [signature]	Date/Time: 33/03 1300
Relinquished By/Removed From: [signature]	Date/Time: 33/03 1300	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time: 4.1.03 / 10:00	Received By/Stored In: [signature]	Date/Time: 4.1.03 / 10:00
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, ~~Silver-108 metastable~~, Uranium-238)
(3) ~~Isotopic Plutonium~~; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 3/27/03

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

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-013	Page 2 of 2

Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L — Data Turnaround: 7 ~~21~~ Days DWS 3/27/03 ~~DWS 3/26/03~~
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC french drain 100-C-3	SAF No.: B01-054	Air Quality ☐
Ice Chest No.: ERC 96001	Field Logbook No.: EL-~~1548~~ 1573 DWS 3/26/03 — COA: R100C32F00		Method of Shipment: FED EX
Shipped To: TMA/RECRA	Offsite Property No.: A030174		Bill of Lading/Air Bill No.: 9025 0SPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

G00019

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None		
Type of Container	G/P	G/P	aG	G	G/P	G/P	G	G/P		
No. of Container(s)	1	1 DWS	1	1	1	1	1	1		
Volume	60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14		
Sample No.	Matrix *	Sample Date	Sample Time								
J00KC4	SOIL	3/27/03	0810	✓	✓	✓	✓				

DWS 3/27/03

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWShea DWShea	3/27/03 1809	Friday 3A	3/27/03 1809
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Friday 3A	3/31/03 1300	SGAZLOFFE	3/31/03 1300
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
SGAZLOFFE	3/31/03 1300	FED-EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED-EX	4-1-03 / 10:00	D. Smith	4-1-03 / 10:00
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Selenium, Silver}
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, ~~Silver-108 metastable~~, Uranium-238}
(3) ~~Isotopic Plutonium~~; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728
Ref # 90 on 3/31/03

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

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

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

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 100-C-3			DATA PACKAGE: H2132		
VALIDATOR: TLI		LAB: LLI		DATE: 4/29/03	
CASE:			SDG: H2132		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	CRVI	
SAMPLES/MATRIX					
J00KB9 J00KC0 J00KC1 J00KC2					
J00KC3 J00KC4					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: Silver – U all detects
Barium + Chromium (total) in FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

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

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

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

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

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments:

8. HOLDING TIMES (all levels)

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: all CRQL com

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/08/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0180-MB1	Silver, Total	0.16	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.03	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.16	MG/KG	0.06	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
BLANK1	03C0068-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J00KC4	Silver, Total	4.5	0.08u	4.7	95.7	1.0
		Arsenic, Total	170	0.33u	187	90.7	1.0
		Barium, Total	171	1.2	187	90.7	1.0
		Cadmium, Total	4.3	0.04u	4.7	91.5	1.0
		Chromium, Total	17.8	0.26	18.7	93.8	1.0
		Mercury, Total	0.15	0.02u	0.15	98.7	1.0
		Lead, Total	43.6	0.25u	46.8	93.2	1.0
		Selenium, Total	168	0.34u	187	89.5	1.0

11

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD		DILUTION FACTOR(REP)
-002REP	J00KC4	Silver, Total	0.09u	0.09	NC	20	1.0
		Arsenic, Total	0.33u	0.32u	NC		1.0
		Barium, Total	1.2	1.4	15.4		1.0
		Cadmium, Total	0.04u	0.04u	NC	4/9/03	1.0
		Chromium, Total	0.26	0.22	16.6		1.0
		Mercury, Total	0.02u	0.01u	NC		1.0
		Lead, Total	0.25u	0.23u	NC		1.0
		Selenium, Total	0.34u	0.32u	NC		1.0

14

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/14/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI022-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/14/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-007	J00KC3	Soluble Chromium VI	4.4	0.42 U	4.2	102.9	1.0
		Insoluble Chromium VI	1270	0.42 U	1240	102.6	100
BLANK10	03LVI022-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.6	1.0
		Insoluble Chromium VI	1170	0.40u	1180	99.5	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/14/03

CLIENT: TNUHANFORD B01-054 H2132 LVL LOT #: 0304L084

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-007REP	J00KC3	Chromium VI	0.42u	0.42u	NC	1.0

Date: 29 April 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities - Full Protocol - Waste Site 100-C-3
Subject: Volatiles - Data Package No. H2132-LLI (SDG No. H2132)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2132-LLI prepared by Lionville Laboratory Inc. (LLI). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00KB9	3/27/03	Soil	C	See note 1
J00KC0	3/27/03	Soil	C	See note 1
J00KC1	3/27/03	Soil	C	See note 1
J00KC2	3/27/03	Soil	C	See note 1
J00KC3	3/27/03	Soil	C	See note 1
J00KC4	3/27/03	Soil	C	See note 1
J00KC6	3/27/03	Soil	C	See note 1

1 - Volatiles by EPA 8260B.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL December 2001). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within: 14 days of the date of sample collection for VOAs. If holding times are exceeded, but not by greater than twice 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 twice 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 met.

- **Blanks**

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

All method blank results were acceptable.

Field Blanks

One trip blank (J00KC6) and one equipment blank (J00KC4) were submitted for analysis. Toluene and acetone were detected in both blanks. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 70-130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All MS/MSD results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All 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 by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 30% for solid

samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples J00KC1/J00KC3) were submitted to LLI 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 for undetected analytes are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. Twenty-nine analytes were reported above their TDL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific TDL.

- **Completeness**

Data package No. H2132-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Twenty-nine analytes were reported above their TDL. 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-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

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

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for 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: H2132	REVIEWER: TLI	DATE: 4/29/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

VOLATILE ORGANIC, ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																		
Laboratory: LLI																		
Case:	SDG: H2132																	
Sample Number		J00KC6		J00KC4		J00KB9		J00KC0		J00KC1		J00KC2		J00KC3				
Remarks		T. Blank		E. Blank										Duplicate				
Sample Date		03/27/03		03/27/03		03/27/03		3/27/03		3/27/03		3/27/03		3/27/03				
Analysis Date		04/04/03		04/04/03		04/07/03		04/04/03		04/04/03		04/04/03		04/04/03				
VOA/Alcohols/Formaldehyde	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Chloromethane	10	11	U*	9	U	10	U	11	U*	10	U	11	U*	11	U*			
Bromomethane	10	11	U*	9	U	10	U	11	U*	10	U	11	U*	11	U*			
Vinyl Chloride	10	11	U*	9	U	10	U	11	U*	10	U	11	U*	11	U*			
Chloroethane	10	11	U*	9	U	10	U	11	U*	10	U	11	U*	11	U*			
Methylene Chloride	10	6	U	5	U	5	U	7		6		16		11				
Acetone	10	5		4		10	U	11	U*	10	U	3		6	U			
Carbon Disulfide	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
1,1-Dichloroethene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
1,1-Dichloroethane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
1,2-Dichloroethene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Chloroform	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
1,2-Dichloroethane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
2-Butanone	10	11	U*	9	U	10	U	11	U*	10	U	11	U*	11	U*			
1,1,1-Trichloroethane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Carbon Tetrachloride	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Bromodichloromethane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
1,2-Dichloropropane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
cis-1,3-Dichloropropene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Trichloroethene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Dibromochloromethane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
1,1,2-Trichloroethane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Benzene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
trans-1,3-Dichloropropene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Bromoform	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
4-Methyl-2-pentanone	10	11	U*	9	U	10	U	11	U*	10	U	11	U*	11	U*			
2-Hexanone	10	11	U*	9	U	10	U	11	U*	10	U	11	U*	11	U*			
Tetrachloroethene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
1,1,2,2-Tetrachloroethane	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Toluene	10	1		4		5		6		7		6	U	9				
Chlorobenzene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Ethylbenzene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Styrene	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
Xylenes (total)	10	6	U	5	U	5	U	6	U	5	U	6	U	6	U			
* - TDL exceeded																		

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

000074

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

RFW Batch Number: **0304L084** Client: **TNUHANFORD B01-054 H2132** Work Order: 11343606001 Page: 1a

Report Date: 04/08/03 12:39

	Cust ID:	J00KC6		J00KC4		J00KB9		J00KC0		J00KC1		J00KC2	
Sample Information	RFW#:	001		002		003		004		005		006	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.06		0.943		0.962		1.04		0.980		1.02	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
	Toluene-d8	103	%	99	%	110	%	104	%	105	%	104	%
Surrogate	Bromofluorobenzene	84	%	82	%	86	%	78	%	76	%	80	%
Recovery	1,2-Dichloroethane-d4	81	%	78	%	89	%	85	%	86	%	86	%
			fl		fl		fl		fl		fl		fl
Chloromethane		11	U	9	U	10	U	11	U	10	U	11	U
Bromomethane		11	U	9	U	10	U	11	U	10	U	11	U
Vinyl Chloride		11	U	9	U	10	U	11	U	10	U	11	U
Chloroethane		11	U	9	U	10	U	11	U	10	U	11	U
Methylene Chloride		6	U	5	U	5	U	7		6		16	
Acetone		5	J	4	J	10	U	11	U	10	U	3	J
Carbon Disulfide		6	U	5	U	5	U	6	U	5	U	6	U
1,1-Dichloroethene		6	U	5	U	5	U	6	U	5	U	6	U
1,1-Dichloroethane		6	U	5	U	5	U	6	U	5	U	6	U
1,2-Dichloroethene (total)		6	U	5	U	5	U	6	U	5	U	6	U
Chloroform		6	U	5	U	5	U	6	U	5	U	6	U
1,2-Dichloroethane		6	U	5	U	5	U	6	U	5	U	6	U
2-Butanone		11	U	9	U	10	U	11	U	10	U	11	U
1,1,1-Trichloroethane		6	U	5	U	5	U	6	U	5	U	6	U
Carbon Tetrachloride		6	U	5	U	5	U	6	U	5	U	6	U
Bromodichloromethane		6	U	5	U	5	U	6	U	5	U	6	U
1,2-Dichloropropane		6	U	5	U	5	U	6	U	5	U	6	U
cis-1,3-Dichloropropene		6	U	5	U	5	U	6	U	5	U	6	U
Trichloroethene		6	U	5	U	5	U	6	U	5	U	6	U
Dibromochloromethane		6	U	5	U	5	U	6	U	5	U	6	U
1,1,2-Trichloroethane		6	U	5	U	5	U	6	U	5	U	6	U
Benzene		6	U	5	U	5	U	6	U	5	U	6	U
Trans-1,3-Dichloropropene		6	U	5	U	5	U	6	U	5	U	6	U
Bromoform		6	U	5	U	5	U	6	U	5	U	6	U
4-Methyl-2-pentanone		11	U	9	U	10	U	11	U	10	U	11	U
2-Hexanone		11	U	9	U	10	U	11	U	10	U	11	U
Tetrachloroethene		6	U	5	U	5	U	6	U	5	U	6	U
1,1,2,2-Tetrachloroethane		6	U	5	U	5	U	6	U	5	U	6	U
Toluene		1	J	4	J	5	J	6		7		6	U

*= Outside of EPA CLP QC limits.

000012

Cust ID:	J00KC6	J00KC4	J00KB9	J00KC0	J00KC1	J00KC2
RFW#:	001	002	003	004	005	006
Chlorobenzene	6 U	5 U	5 U	6 U	5 U	6 U
Ethylbenzene	6 U	5 U	5 U	6 U	5 U	6 U
Styrene	6 U	5 U	5 U	6 U	5 U	6 U
Xylene (total)	6 U	5 U	5 U	6 U	5 U	6 U

*= Outside of EPA CLP QC limits.

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

RFW Batch Number: 0304L084 Client: TNUHANFORD B01-054 H2132 Work Order: 11343606001 Page: 2a Report Date: 04/08/03 12:39

00

	Cust ID:	J00KC3	J00KC3	J00KC3	VBLKNU	VBLKNU BS	VBLKNV
Sample Information	RFW#:	007	007 MS	007 MSD	03LVH069-MB1	03LVH069-MB1	03LVH073-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.09	1.02	1.06	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	103 %	107 %	104 %	102 %	100 %	102 %
	Bromofluorobenzene	70 %	74 %	78 %	84 %	82 %	84 %
	1,2-Dichloroethane-d4	91 %	96 %	92 %	80 %	84 %	82 %
		fl	fl	fl	fl	fl	fl
Chloromethane		11 U	11 U	11 U	10 U	10 U	10 U
Bromomethane		11 U	11 U	11 U	10 U	10 U	10 U
Vinyl Chloride		11 U	11 U	11 U	10 U	10 U	10 U
Chloroethane		11 U	11 U	11 U	10 U	10 U	10 U
Methylene Chloride		11	9	6 U	5 U	5 U	5 U
Acetone		11 U	11 U	11 U	10 U	10 U	10 U
Carbon Disulfide		6 U	6 U	6 U	5 U	5 U	5 U
1,1-Dichloroethene		6 U	94 %	93 %	5 U	91 %	5 U
1,1-Dichloroethane		6 U	6 U	6 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		6 U	6 U	6 U	5 U	5 U	5 U
Chloroform		6 U	6 U	6 U	5 U	5 U	5 U
1,2-Dichloroethane		6 U	6 U	6 U	5 U	5 U	5 U
2-Butanone		11 U	11 U	11 U	10 U	10 U	10 U
1,1,1-Trichloroethane		6 U	6 U	6 U	5 U	5 U	5 U
Carbon Tetrachloride		6 U	6 U	6 U	5 U	5 U	5 U
Bromodichloromethane		6 U	6 U	6 U	5 U	5 U	5 U
1,2-Dichloropropane		6 U	6 U	6 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	6 U	6 U	5 U	5 U	5 U
Trichloroethene		6 U	98 %	96 %	5 U	87 %	5 U
Dibromochloromethane		6 U	6 U	6 U	5 U	5 U	5 U
1,1,2-Trichloroethane		6 U	6 U	6 U	5 U	5 U	5 U
Benzene		6 U	103 %	100 %	5 U	89 %	5 U
Trans-1,3-Dichloropropene		6 U	6 U	6 U	5 U	5 U	5 U
Bromoform		6 U	6 U	6 U	5 U	5 U	5 U
4-Methyl-2-pentanone		11 U	11 U	11 U	10 U	10 U	10 U
2-Hexanone		11 U	11 U	11 U	10 U	10 U	10 U
Tetrachloroethene		6 U	6 U	6 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	6 U	6 U	5 U	5 U	5 U
Toluene		9	109 %	102 %	5 U	95 %	5 U

*= Outside of EPA CLP QC limits.

4/24/03

000011

Cust ID:	J00KC3	J00KC3	J00KC3	VBLKNU	VBLKNU BS	VBLKNV
RFW#:	007	007 MS	007 MSD	03LVH069-MB1	03LVH069-MB1	03LVH073-MB1
Chlorobenzene	6 U	106 %	103 %	5 U	96 %	5 U
Ethylbenzene	6 U	6 U	6 U	5 U	5 U	5 U
Styrene	6 U	6 U	6 U	5 U	5 U	5 U
Xylene (total)	6 U	6 U	6 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

000015

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

RFW Batch Number: 0304L084 Client: TNUHANFORD B01-054 H2132 Work Order: 11343606001 Page: 3a Report Date: 04/08/03 12:39

Cust ID: VBLKNV BS

Sample Information		
RFW#:	03LVH073-MB1	
Matrix:	SOIL	
D.F.:	1.00	
Units:	ug/Kg	

Surrogate Recovery			
	Toluene-d8	97	%
	Bromofluorobenzene	84	%
	1,2-Dichloroethane-d4	85	%

Chloromethane	10	U
Bromomethane	10	U
Vinyl Chloride	10	U
Chloroethane	10	U
Methylene Chloride	5	U
Acetone	10	U
Carbon Disulfide	5	U
1,1-Dichloroethene	93	%
1,1-Dichloroethane	5	U
1,2-Dichloroethene (total)	5	U
Chloroform	5	U
1,2-Dichloroethane	5	U
2-Butanone	10	U
1,1,1-Trichloroethane	5	U
Carbon Tetrachloride	5	U
Bromodichloromethane	5	U
1,2-Dichloropropane	5	U
cis-1,3-Dichloropropene	5	U
Trichloroethene	95	%
Dibromochloromethane	5	U
1,1,2-Trichloroethane	5	U
Benzene	94	%
Trans-1,3-Dichloropropene	5	U
Bromoform	5	U
4-Methyl-2-pentanone	10	U
2-Hexanone	10	U
Tetrachloroethene	5	U
1,1,2,2-Tetrachloroethane	5	U
Toluene	98	%

*= Outside of EPA CLP QC limits.

000046

4/29/03

Cust ID: **VBLKNV BS**

RFW#: **03LVH073-MB1**

Chlorobenzene	101	%
Ethylbenzene	5	U
Styrene	5	U
Xylene (total)	5	U

*= Outside of EPA CLP QC limits.

4/29/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LVLI
LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-054
LVL #: 0304L084
SDG/SAF # H2132/B01-054

W.O. #: 11343-606-001-9999-00
Date Received: 04-01-2003

GC/MS VOLATILE

Seven (7) soil samples were collected on 03-27-2003.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL volatile target compounds on 04-04,07-2003.

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

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

2. Samples were analyzed within holding time.

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

4. All surrogate recoveries were within EPA QC limits.

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

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

7. Internal standard area criteria were not met for sample J00KC3. The analysis of associated matrix spike sample fulfills the reanalysis requirement.

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

for J. Michael Taylor
President
Lionville Laboratory Incorporated

04-11-03
Date

som\group\data\vos\tnu-hanford\0304-084.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 3 0 pages.

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-054-013	Page 1 of 2
Collector: D.Shea	Company Contact: D.Shea	Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L; Data Turnaround: DWS 3/27/03 7 ~~21~~ Days 23 ~~DWS 3/26/03~~
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC french drain 100-C-3		SAF No.: B01-054	Air Quality ☐
Ice Chest No.: ERC 96001	Field Logbook No.: EL-~~1548-2~~ 1573 DWS 3/26/03	COA: R100C32F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030174		Bill of Lading/Air Bill No.: 5525 8SPL	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	
Type of Container	G/P	G/P	aG	G	G/P	G/P	G	G/P	
No. of Container(s)	1	DWS 1 0	1	1	1	1	1	1	
Volume	60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14	

Sample No.	Matrix *	Sample Date	Sample Time									
J00KB9	SOIL	3/27/03	0853	✓	✓	✓	✓					
J00KC0	SOIL		0912	✓	✓	✓	✓					
J00KC1	SOIL		0939	✓	✓	✓	✓					
J00KC2	SOIL		1034	✓	✓	✓	✓					
J00KC3	SOIL		0939	✓	✓	✓	✓					

DWS 3/27/03

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWShea DWShea	3/27/03 1809	Fridge 3A	3/27/03 1809
KOF 3A	3/3/03 1300	[signature]	3/3/03 1300
[signature]	3/3/03 1300	FED EX	
Fed Ex	4.1.03 / 10:00	[signature]	4.1.03 / 10:00

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, ~~Silver-108-metastable~~, Uranium-238)
(3) ~~Isotopic Plutonium~~; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728 Ref # [illegible] on 2/3/03

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

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-054-013	Page 2 of 2
Collector: D.Shea	Company Contact: D.Shea	Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L 7 DWS 3/27/03 Data Turnaround
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC french drain 100-C-3		SAF No.: B01-054	Air Quality [ ] ~~11~~ ~~21~~ Days ~~DWS 3/26/03~~
Ice Chest No.: ERC 96001	Field Logbook No.: EL-~~1548-2~~ 1573 DWS 3/26/03	COA: R100C32F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030174		Bill of Lading/Air Bill No.: 9UE0SPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

Preservation				Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container				G/P	G/P	aG	G	G/P	G/P	G	G/P
No. of Container(s)				1	1 DWS 0	1	1	1	1	1	1
Volume				60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL
SAMPLE ANALYSIS				See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14
Sample No.	Matrix *	Sample Date	Sample Time								
J00KC4	SOIL	3/27/03	0810	✓	✓	✓	✓				

DWS 3/27/03

000021

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: DWShea DWShea	Date/Time: 3/27/03 1809	Received By/Stored In: Friday 3A	Date/Time: 3/27/03 1809
Relinquished By/Removed From: ROF 3A	Date/Time: 3/31/03 1300	Received By/Stored In: SJGALE	Date/Time: 3/31/03 1300
Relinquished By/Removed From: SJGALE	Date/Time: 3/31/03 1300	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time: 4-1-03 / 10:00	Received By/Stored In: D. Smith	Date/Time: 4-1-03 / 10:00
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, ~~Silver-108 metastable~~, Uranium-238)
(3) ~~Isotopic Plutonium~~; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728
Ref # 3A on 3/15/03

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

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

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

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code 8L	Data Turnaround
D.Shea	D.Shea	521-6014	KESSNER, JH		DWS 3/27/03 7 + 21 Days
Project Designation	**Sampling Location**		**SAF No.**	**Air Quality** ☐	
100 B/C Area Effluent Pipeline & Proximity Site Remediatio	100 BC french drain 100-C-3		B01-054		

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC 96007	EL-~~1548-3~~ 1573 DWS 3/26/03	R100C32F00	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
TMA/RECRA	A030171	SEE DSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

Preservation	Cool 4C										
Type of Container	G										
No. of Container(s)	1										
Volume	250mL										
SAMPLE ANALYSIS	VOA - 8260A (TCL)										

220000

Sample No.	Matrix *	Sample Date	Sample Time									
J00KC6	SOIL	3/27/03	0756	✓								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWSheu DWSheu	3/27/03 1809	Fridge 3A	3/27/03 1809
Ref 3A	3/31/03 1300	DSCHEF	3/31/03 1300
SSCHEF	3/31/03 1300	FED EX	
FED EX	4-1-03 10:00	D. Smith	4-1-03 10:00
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

Personnel not available to relinquish samples from the 3728 Ref # 30 on 2/31/03

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

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

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

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 BC 100-C-3			DATA PACKAGE: H2132		
VALIDATOR: TLI		LAB: LLI		DATE: 4/29/03	
CASE:			SDG: H2132		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00KB9 J00KC0 J00KC1 J00KC2					
J00KC3 J00KC4 J00KC6					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: ~~[illegible]~~ toluene in both blanks (FD+EB)
4/[illegible] acetone " " " "

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

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

Comments: NO PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A
Internal standard areas acceptable? ..... Yes No N/A
Internal standard retention times acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: 29 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries 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: 29 April 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities - Full Protocol - Waste Site 100-C-3
Subject: Semivolatile - Data Package No. H2132-LLI (SDG No. H2132)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2132-LLI prepared by Lionville Laboratory Incorporated (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00KB9	3/27/03	Soil	C	See note 1
J00KC0	3/27/03	Soil	C	See note 1
J00KC1	3/27/03	Soil	C	See note 1
J00KC2	3/27/03	Soil	C	See note 1
J00KC3	3/27/03	Soil	C	See note 1
J00KC4	3/27/03	Soil	C	See note 1

1-Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Water samples must be extracted within 7 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the bis(2-ethylhexyl)phthlate results in samples J00KB9, J00KC4 and J00KC2 were raised to the TDL and flagged "U".

All other method blank results were acceptable.

<u>Field Blanks</u>

One equipment blank (J00KC4) was submitted for analysis. Bis(2-ethylhexyl)phthalate was detected in the field blank. Under the BHI statement

of work, no qualification is required. All other field blank results were acceptable.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample.

Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J00KC1/J00KC3) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target detection limits (TDL's) to ensure that laboratory detection levels meet the required criteria. All undetected sample results (except 57 analytes in sample J00KC4) exceeded the TDL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2132-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to method blank contamination, the bis(2-ethylhexyl)phthlate results in samples J00KB9, J00KC4 and J00KC2 were raised to the TDL and flagged "U".

All undetected sample results (except 55 analytes in sample J00KC4) exceeded the TDL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

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

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2132	REVIEWER: TLI	DATE: 4/29/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
bis(2-ethylhexyl)phthalate	U	J00KB9, J00KC2 J00KC4	Blank contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2132														
Sample Number		J00KB9		J00KC0		J00KC1		J00KC2		J00KC3		J00KC4			
Remarks										Duplicate		E. Blank			
Sample Date		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03			
Extraction Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03			
Analysis Date		4/8/03		4/8/03		4/8/03		4/8/03		4/8/03		4/8/03			
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
bis(2-Chloroethyl)ether	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2-Chlorophenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
1,3-Dichlorobenzene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
1,4-Dichlorobenzene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
1,2-Dichlorobenzene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2-Methylphenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,2'-oxybis(1-chloropropane)	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
3 and/or 4-Methylphenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
N-Nitroso-di-n-propylamine	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Hexachloroethane	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Nitrobenzene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Isophorone	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2-Nitrophenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,4-Dimethylphenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
bis(2-Chloroethoxy)methane	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,4-Dichlorophenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
1,2,4-Trichlorobenzene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Naphthalene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
4-Chloroaniline	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Hexachlorobutadiene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
4-Chloro-3-methylphenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2-Methylnaphthalene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Hexachlorocyclopentadiene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,4,6-Trichlorophenol	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,4,5-Trichlorophenol	660	4400	U	4300	U	8600	U	1700	U	8800	U	840	U		
2-Chloronaphthalene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2-Nitroaniline	660	4400	U	4300	U	8600	U	1700	U	8800	U	840	U		
Dimethylphthalate	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Acenaphthylene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,6-Dinitrotoluene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		

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

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2132														
Sample Number		J00KB9		J00KC0		J00KC1		J00KC2		J00KC3		J00KC4			
Remarks										Duplicate		E. Blank			
Sample Date		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03			
Extraction Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03			
Analysis Date		4/8/03		4/8/03		4/8/03		4/8/03		4/8/03		4/8/03			
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	660	4400	U	4300	U	8600	U	1700	U	8800	U	840	U		
Acenaphthene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,4-Dinitrophenol	660	4400	U	4300	U	8600	U	1700	U	8800	U	840	U		
4-Nitrophenol	660	4400	U	4300	U	8600	U	1700	U	8800	U	840	U		
Dibenzofuran	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
2,4-Dinitrotoluene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Diethylphthalate	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
4-Chlorophenyl-phenyl ether	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Fluorene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
4-Nitroaniline	660	4400	U	4300	U	8600	U	1700	UJ	8800	U	840	UJ		
4,6-Dinitro-2-methylphenol	660	4400	U	4300	U	8600	U	1700	U	8800	U	840	U		
N-Nitrosodiphenylamine	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
4-Bromophenyl-phenyl ether	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Hexachlorobenzene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Pentachlorophenol	660	4400	U	4300	U	8600	U	1700	U	8800	U	840	U		
Phenanthrene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Anthracene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Carbazole	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Di-n-butylphthalate	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Fluoranthene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Pyrene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Butylbenzylphthalate	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
3,3'-Dichlorobenzidine	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Benzo(a)anthracene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Chrysene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
bis(2-Ethylhexyl)phthalate	660	660	U	1700	U	3500	U	660	U	3500	U	660	U		
Di-n-octylphthalate	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Benzo(b)fluoranthene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Benzo(k)fluoranthene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Benzo(a)pyrene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Indeno(1,2,3-cd)pyrene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Dibenz(a,h)anthracene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		
Benzo(g,h,i)perylene	660	1700	U	1700	U	3500	U	700	U	3500	U	330	U		

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

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/10/03 14:00

RFW Batch Number: 0304L084 Client: TMUHANFORD B01-054 H2132 Work Order: 11343606001 Page: 1a

	Cust ID:	J00KC4		J00KC4		J00KC4		J00KB9		J00KC0		J00KC1	
Sample Information	RFW#:	002		002 MS		002 MSD		003		004		005	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		5.00		5.00		10.0	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	68	%	75	%	72	%	56	%	64	%	52	%
	2-Fluorobiphenyl	74	%	85	%	79	%	61	%	69	%	64	%
	Terphenyl-d14	102	%	120	%	106	%	62	%	70	%	55	%
	Phenol-d5	75	%	85	%	78	%	60	%	75	%	59	%
	2-Fluorophenol	80	%	85	%	80	%	60	%	77	%	63	%
	2,4,6-Tribromophenol	85	%	103	%	95	%	53	%	67	%	55	%
			fl		fl		fl		fl		fl		fl
Phenol		330	U	77	%	72	%	1700	U	1700	U	3500	U
bis(2-Chloroethyl)ether		330	U	330	U	330	U	1700	U	1700	U	3500	U
2-Chlorophenol		330	U	86	%	83	%	1700	U	1700	U	3500	U
1,3-Dichlorobenzene		330	U	330	U	330	U	1700	U	1700	U	3500	U
1,4-Dichlorobenzene		330	U	76	%	74	%	1700	U	1700	U	3500	U
1,2-Dichlorobenzene		330	U	330	U	330	U	1700	U	1700	U	3500	U
2-Methylphenol		330	U	330	U	330	U	1700	U	1700	U	3500	U
2,2'-oxybis(1-Chloropropane)		330	U	330	U	330	U	1700	U	1700	U	3500	U
3- and/or 4-Methylphenol		330	U	330	U	330	U	1700	U	1700	U	3500	U
N-Nitroso-di-n-propylamine		330	U	70	%	66	%	1700	U	1700	U	3500	U
Hexachloroethane		330	U	330	U	330	U	1700	U	1700	U	3500	U
Nitrobenzene		330	U	330	U	330	U	1700	U	1700	U	3500	U
Isophorone		330	U	330	U	330	U	1700	U	1700	U	3500	U
2-Nitrophenol		330	U	330	U	330	U	1700	U	1700	U	3500	U
2,4-Dimethylphenol		330	U	330	U	330	U	1700	U	1700	U	3500	U
bis(2-Chloroethoxy)methane		330	U	330	U	330	U	1700	U	1700	U	3500	U
2,4-Dichlorophenol		330	U	330	U	330	U	1700	U	1700	U	3500	U
1,2,4-Trichlorobenzene		330	U	74	%	71	%	1700	U	1700	U	3500	U
Naphthalene		330	U	330	U	330	U	1700	U	1700	U	3500	U
4-Chloroaniline		330	U	330	U	330	U	1700	U	1700	U	3500	U
Hexachlorobutadiene		330	U	330	U	330	U	1700	U	1700	U	3500	U
4-Chloro-3-methylphenol		330	U	88	%	85	%	1700	U	1700	U	3500	U
2-Methylnaphthalene		330	U	330	U	330	U	1700	U	1700	U	3500	U
Hexachlorocyclopentadiene		330	U	330	U	330	U	1700	U	1700	U	3500	U
2,4,6-Trichlorophenol		330	U	330	U	330	U	1700	U	1700	U	3500	U
2,4,5-Trichlorophenol		840	U	840	U	840	U	4400	U	4300	U	8600	U

*= Outside of EPA CLP QC limits.

QKC 4/24/03

000043

RFW Batch Number: 0304L084 Client: TNUHANFORD B01-054 H2132 Work Order: 11343606001 Page: 1b

Cust ID:	J00KC4		J00KC4		J00KC4		J00KB9		J00KC0		J00KC1	
RFW#:	002		002 MS		002 MSD		003		004		005	
2-Chloronaphthalene	330	U	330	U	330	U	1700	U	1700	U	3500	U
2-Nitroaniline	840	U	840	U	840	U	4400	U	4300	U	8600	U
Dimethylphthalate	330	U	330	U	330	U	1700	U	1700	U	3500	U
Acenaphthylene	330	U	330	U	330	U	1700	U	1700	U	3500	U
2,6-Dinitrotoluene	330	U	330	U	330	U	1700	U	1700	U	3500	U
3-Nitroaniline	840	U	840	U	840	U	4400	U	4300	U	8600	U
Acenaphthene	330	U	81	%	78	%	1700	U	1700	U	3500	U
2,4-Dinitrophenol	840	U	840	U	840	U	4400	U	4300	U	8600	U
4-Nitrophenol	840	U	114	%	109	%	4400	U	4300	U	8600	U
Dibenzofuran	330	U	330	U	330	U	1700	U	1700	U	3500	U
2,4-Dinitrotoluene	330	U	92 *	%	90 *	%	1700	U	1700	U	3500	U
Diethylphthalate	330	U	330	U	330	U	1700	U	1700	U	3500	U
4-Chlorophenyl-phenylether	330	U	330	U	330	U	1700	U	1700	U	3500	U
Fluorene	330	U	330	U	330	U	1700	U	1700	U	3500	U
4-Nitroaniline	840	U	840	U	840	U	4400	U	4300	U	8600	U
4,6-Dinitro-2-methylphenol	840	U	840	U	840	U	4400	U	4300	U	8600	U
N-Nitrosodiphenylamine (1)	330	U	330	U	330	U	1700	U	1700	U	3500	U
4-Bromophenyl-phenylether	330	U	330	U	330	U	1700	U	1700	U	3500	U
Hexachlorobenzene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Pentachlorophenol	840	U	94	%	86	%	4400	U	4300	U	8600	U
Phenanthrene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Anthracene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Carbazole	330	U	330	U	330	U	1700	U	1700	U	3500	U
Di-n-butylphthalate	330	U	330	U	330	U	1700	U	1700	U	3500	U
Fluoranthene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Pyrene	330	U	103	%	93	%	1700	U	1700	U	3500	U
Butylbenzylphthalate	330	U	330	U	330	U	1700	U	1700	U	3500	U
3,3'-Dichlorobenzidine	330	U	330	U	330	U	1700	U	1700	U	3500	U
Benzo(a)anthracene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Chrysene	330	U	330	U	330	U	1700	U	1700	U	3500	U
bis(2-Ethylhexyl)phthalate	660 ~~185 JB~~	U	68	JB	330	U	660 ~~270 JB~~	U	1700	U	3500	U
Di-n-octyl phthalate	330	U	330	U	330	U	1700	U	1700	U	3500	U
Benzo(b)fluoranthene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Benzo(k)fluoranthene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Benzo(a)pyrene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Indeno(1,2,3-cd)pyrene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Dibenz(a,h)anthracene	330	U	330	U	330	U	1700	U	1700	U	3500	U
Benzo(g,h,i)perylene	330	U	330	U	330	U	1700	U	1700	U	3500	U

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

000014

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0304L084 Client: TNUHANFORD B01-054 H2132 Work Order: 11343606001 Report Date: 04/10/03 14:00 Page: 2a

	Cust ID:	J00KC2		J00KC3		SBLKQQ		SBLKQQ BS	
Sample Information	RFW#:	006		007		03LE0388-MB1		03LE0388-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	D.F.:	2.00		10.0		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	63	%	57	%	75	%	59	%
	2-Fluorobiphenyl	66	%	71	%	83	%	67	%
	Terphenyl-d14	78	%	60	%	113	%	97	%
	Phenol-d5	68	%	66	%	84	%	67	%
	2-Fluorophenol	72	%	68	%	88	%	68	%
	2,4,6-Tribromophenol	80	%	63	%	94	%	90	%
Phenol		700	U	3500	U	330	U	63	%
bis(2-Chloroethyl)ether		700	U	3500	U	330	U	330	U
2-Chlorophenol		700	U	3500	U	330	U	69	%
1,3-Dichlorobenzene		700	U	3500	U	330	U	330	U
1,4-Dichlorobenzene		700	U	3500	U	330	U	60	%
1,2-Dichlorobenzene		700	U	3500	U	330	U	330	U
2-Methylphenol		700	U	3500	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		700	U	3500	U	330	U	330	U
3- and/or 4-Methylphenol		700	U	3500	U	330	U	330	U
N-Nitroso-di-n-propylamine		700	U	3500	U	330	U	55	%
Hexachloroethane		700	U	3500	U	330	U	330	U
Nitrobenzene		700	U	3500	U	330	U	330	U
Isophorone		700	U	3500	U	330	U	330	U
2-Nitrophenol		700	U	3500	U	330	U	330	U
2,4-Dimethylphenol		700	U	3500	U	330	U	330	U
bis(2-Chloroethoxy)methane		700	U	3500	U	330	U	330	U
2,4-Dichlorophenol		700	U	3500	U	330	U	330	U
1,2,4-Trichlorobenzene		700	U	3500	U	330	U	59	%
Naphthalene		700	U	3500	U	330	U	330	U
4-Chloroaniline		700	U	3500	U	330	U	330	U
Hexachlorobutadiene		700	U	3500	U	330	U	330	U
4-Chloro-3-methylphenol		700	U	3500	U	330	U	75	%
2-Methylnaphthalene		700	U	3500	U	330	U	330	U
Hexachlorocyclopentadiene		700	U	3500	U	330	U	330	U
2,4,6-Trichlorophenol		700	U	3500	U	330	U	330	U
2,4,5-Trichlorophenol		1700	U	8800	U	840	U	840	U

*= Outside of EPA CLP QC limits.

4/24/03

000013

6

Cust ID:	J00KC2		J00KC3		SBLKQQ		SBLKQQ BS	
RFW#:	006		007		03LE0388-MB1		03LE0388-MB1	
2-Chloronaphthalene	700	U	3500	U	330	U	330	U
2-Nitroaniline	1700	U	8800	U	840	U	840	U
Dimethylphthalate	700	U	3500	U	330	U	330	U
Acenaphthylene	700	U	3500	U	330	U	330	U
2,6-Dinitrotoluene	700	U	3500	U	330	U	330	U
3-Nitroaniline	1700	U	8800	U	840	U	840	U
Acenaphthene	700	U	3500	U	330	U	68	%
2,4-Dinitrophenol	1700	U	8800	U	840	U	840	U
4-Nitrophenol	1700	U	8800	U	840	U	101	%
Dibenzofuran	700	U	3500	U	330	U	330	U
2,4-Dinitrotoluene	700	U	3500	U	330	U	79	%
Diethylphthalate	700	U	3500	U	330	U	330	U
4-Chlorophenyl-phenylether	700	U	3500	U	330	U	330	U
Fluorene	700	U	3500	U	330	U	330	U
4-Nitroaniline	1700	U	8800	U	840	U	840	U
4,6-Dinitro-2-methylphenol	1700	U	8800	U	840	U	840	U
N-Nitrosodiphenylamine (1)	700	U	3500	U	330	U	330	U
4-Bromophenyl-phenylether	700	U	3500	U	330	U	330	U
Hexachlorobenzene	700	U	3500	U	330	U	330	U
Pentachlorophenol	1700	U	8800	U	840	U	86	%
Phenanthrene	700	U	3500	U	330	U	330	U
Anthracene	700	U	3500	U	330	U	330	U
Carbazole	700	U	3500	U	330	U	330	U
Di-n-butylphthalate	700	U	3500	U	330	U	330	U
Fluoranthene	700	U	3500	U	330	U	330	U
Pyrene	700	U	3500	U	330	U	87	%
Butylbenzylphthalate	700	U	3500	U	330	U	330	U
3,3'-Dichlorobenzidine	700	U	3500	U	330	U	330	U
Benzo(a)anthracene	700	U	3500	U	330	U	330	U
Chrysene	700	U	3500	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	660 ~~330~~ ~~100~~	~~JB~~ U	3500	U	350		220	JB
Di-n-octyl phthalate	700	U	3500	U	330	U	330	U
Benzo(b)fluoranthene	700	U	3500	U	330	U	330	U
Benzo(k)fluoranthene	700	U	3500	U	330	U	330	U
Benzo(a)pyrene	700	U	3500	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	700	U	3500	U	330	U	330	U
Dibenz(a,h)anthracene	700	U	3500	U	330	U	330	U
Benzo(g,h,i)perylene	700	U	3500	U	330	U	330	U

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

4/24/03

000016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-054
LVL #: 0304L084
SDG/SAF # H2132/B01-054

W.O. #: 11343-606-001-9999-00
Date Received: 04-01-2003

SEMIVOLATILE

Six (6) soil samples were collected on 03-27-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 04-02-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-08-2003.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. Several samples required 2 to 10-fold dilution due to the nature of the sample matrix.
5. All surrogate recoveries were within EPA QC limits.
6. Two (2) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
7. All blank spike recoveries were within EPA QC limits.
8. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than 2x the CRQL.
9. Internal standard area and retention time criteria were met.
10. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
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.

for J. Michael Taylor
President
Lionville Laboratory Incorporated

04-11-03
Date

som\gorup\data\bna\tnu-hanford-0304-084.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 2 6 pages.

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-054-013	Page 1 of 2
Collector: D.Shea	Company Contact: D.Shea	Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L; Data Turnaround: DWS 3/27/03 7 ~~21~~ Days ~~DWS 3/26/03~~
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC french drain 100-C-3		SAF No.: B01-054	Air Quality ☐
Ice Chest No.: ERC 96001	Field Logbook No.: EL-~~1548-2~~ 1573 DWS 3/26/03	COA: R100C32F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030174		Bill of Lading/Air Bill No.: SSE 8SPL	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None		
Type of Container	G/P	G/P	aG	G	G/P	G/P	G	G/P		
No. of Container(s)	1	DWS 1/0	1	1	1	1	1	1		
Volume	60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14		

000019

Sample No.	Matrix *	Sample Date	Sample Time										
J00KB9	SOIL	3/27/03	0853	✓	✓	✓	✓						
J00KC0	SOIL	↓	0912	✓	✓	✓	✓						
J00KC1	SOIL		0939	✓	✓	✓	✓						
J00KC2	SOIL		1034	✓	✓	✓	✓						
J00KC3	SOIL		0939	✓	✓	✓	✓						

DWS 3/27/03

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWShea DWShea	3/27/03 1809	Fridge 3A	3/27/03 1809
KOF 3A	33/03 1300	SGALEX	33/03 1300
SGALEX	33/03 1300	FED EX	
FED EX	4.1.03 / 10:00	[signature]	4.1.03 / 10:00

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Selenium, Silver}
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, ~~Silver-108 metastable~~, Uranium-238}
(3) ~~Isotopic Plutonium;~~ Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 3/27/03

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

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-013	Page 2 of 2

Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L 7 DWS 3/27/03 Data Turnaround
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC french drain 100-C-3	SAF No.: B01-054	Air Quality [ ] ~~11~~ ~~21~~ Days ~~DWS 3/26/03~~
Ice Chest No.: ERC 96001	Field Logbook No.: EL-~~1548-3~~ 1573 DWS 3/26/03 — COA: R100C32F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030174	Bill of Lading/Air Bill No.: 9025 0SPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None		
Type of Container	G/P	G/P	aG	G	G/P	G/P	G	G/P		
No. of Container(s)	1	DWS 0	1	1	1	1	1	1		
Volume	60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14		

000020

Sample No.	Matrix *	Sample Date	Sample Time										
J00KC4	SOIL	3/27/03	0810	✓	✓	✓	✓						

DWS 3/27/03

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWShea DWShea	3/27/03 1809	Friday 3A	3/27/03 1809
REF 3A	3/31/03 1300	SJGALE	3/31/03 1300
SJGALE	3/31/03 1300	FED EX	
Fed Ex	4.1.03 / 10:00	D. Smith	4.1.03/10:00

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, ~~Silver-108 metastable~~, Uranium-238)
(3) ~~Isotopic Plutonium~~; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728
Ref # 3A on 3/15/03

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

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

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

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 100-C-3			DATA PACKAGE: H2132		
VALIDATOR: TLI		LAB: LLI		DATE: 4/29/03	
CASE:			SDG: H2132		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00KB9 J00KC0 J00KC1 J00KC2					
J00KC3 J00KC4					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: bis (2-ethylhexyl) phthalate in MB B9 + C2 – C4 at CRQL
bis (2-ethyl hexyl) phthalate in FB

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

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

Comments: No PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A
Iinternal standard areas acceptable? ..... Yes No N/A
Internal standard retention times acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

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

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

Comments: all detects but ~~55~~ 57 in C4

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 29 April 2003
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities - Full Protocol - Waste Site 100-C-3
Subject: Radiochemistry - Data Package No. H2132-EB (SDG No. H2132)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2132-EB which was prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00KB9	3/27/03	Soil	C	See note 1
J00KC0	3/27/03	Soil	C	See note 1
J00KC1	3/27/03	Soil	C	See note 1
J00KC2	3/27/03	Soil	C	See note 1
J00KC3	3/27/03	Soil	C	See note 1
J00KC4	3/27/03	Soil	C	See note 1

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

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00KC4) was submitted for analysis. Uranium-233/234, potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is either 70-130% or ±3 sigma. 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. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% or ±3 sigma.

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

Due to an RPD outside QC limits (>2x CRDL), all radium-228 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples (J00KC1/J00KC3) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. The RPD for radium-228 was outside QC limits (>2x the CRDL). Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. Thirty-one analytes were reported above their TDL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific TDL.

- **Completeness**

Data package No. H2132 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 an RPD outside QC limits (>2x CRDL), all radium-228 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Thirty-one analytes were reported above their TDL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

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

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the 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: H2132	REVIEWER: TLI	DATE: 4/29/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Radium-228	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																			
Laboratory: EB																			
Case	SDG: H2132																		
Sample Number		J00KB9		J00KC0		J00KC1		J00KC2		J00KC3		J00KC4							
Remarks										Duplicate		E. Blank							
Location		100-C-3		100-C-3		100-C-3		100-C-3		100-C-3		100-C-3							
Sample Date		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03		3/27/03							
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Tritium	10	-0.059	U	0.020	U	0.016	U	-0.032	U	0.004	U	-0.039	U						
Carbon-14	1	0.211	U	1.24	U*	0.904	U	1.56	U*	1.26	U*	1.04	U*						
Total Strontium	1	0.046	U	-0.027	U	-0.001	U	-0.024	U	-0.003	U	-0.043	U						
Uranium-233/234	1	0.349		0.420		0.706		0.465		0.433		0.198							
Uranium-235	1	0.028	U	0.057	U	0.061	U	0.059	U	0.028	U	0.027	U						
Uranium-238	1	0.488		0.700		0.580		0.416		0.365		0.154	U						
Americium-241	1	0.036	U	-0.050	U	-0.046	U	0.061	U	0.092	U	0	U						
Potassium-40		7.90		11.7		9.51		10.8		9.42		3.58							
Cobalt 60	0.05	U	U*	U	U*	U	U*	U	U*	U	U	U	U						
Cesium 137	0.05	0.112		U	U*	0.147		U	U*	0.089		U	U						
Radium-226		0.339		0.416		0.343		0.465		0.349		0.166							
Radium-228		0.391	J	0.435	J	0.934	J	0.979	J	0.496	J	0.233	J						
Europium 152	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U						
Europium 154	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U						
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U						
Thorium-228		0.431		0.472		0.401		0.496		0.441		0.131							
Thorium-232		0.391		0.435		0.934		0.979		0.496		0.233							
Uranium-235	1	U	U	U	U	U	U	U	U	U	U	U	U						
Uranium-238	1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*						
Americium-241	1	U	U	U	U	U	U	U	U	U	U	U	U						

* - TDL exceeded

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

000070

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-01 J00KB9

DATA SHEET

SDG	7472	Client/Case no	Hanford SDG H2132
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304009-01	Client sample id	J00KB9
Dept sample id	7472-001	Location/Matrix	100 BC Fr. Drain 100-C-3 SOLID
Received	04/01/03	Collected/Weight	03/27/03 08:53 1046 g
% solids	95.7	Custody/SAF No	B01-054-013 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.059	0.096	0.17	400	U	H
Carbon 14	14762-75-5	0.211	1.7	2.8	50	U	C
Total Strontium	SR-RAD	0.046	0.15	0.30	1.0	U	SR
Uranium 233/234	U-233/234	0.349	0.19	0.18	1.0		U
Uranium 235	15117-96-1	0.028	0.056	0.22	1.0	U	U
Uranium 238	U-238	0.488	0.23	0.18	1.0		U
Americium 241	14596-10-2	0.036	0.15	0.28	1.0	U	AM
Potassium 40	13966-00-2	7.90	2.6	0.58			GAM
Cobalt 60	10198-40-0	U		0.071	0.050	U	GAM
Cesium 137	10045-97-3	0.112	0.054	0.064	0.10		GAM
Radium 226	13982-63-3	0.339	0.14	0.12			GAM
Radium 228	15262-20-1	0.391	0.25	0.25		J	GAM
Europium 152	14683-23-9	U		0.15	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	0.431	0.087	0.098			GAM
Thorium 232	TH-232	0.391	0.25	0.25			GAM
Uranium 235	15117-96-1	U		0.20		U	GAM
Uranium 238	U-238	U		6.7		U	GAM
Americium 241	14596-10-2	U		0.058		U	GAM

100 B/C Area Effluent Pipe. & Prox.

PW 4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-02 J00KC0

DATA SHEET

SDG	7472	Client/Case no	Hanford SDG H2132
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304009-02	Client sample id	J00KC0
Dept sample id	7472-002	Location/Matrix	100 BC Fr. Drain 100-C-3 SOLID
Received	04/01/03	Collected/Weight	03/27/03 09:12 1164 g
% solids	96.8	Custody/SAF No	B01-054-013 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.020	0.10	0.17	400	U	H
Carbon 14	14762-75-5	1.24	2.0	3.3	50	U	C
Total Strontium	SR-RAD	-0.027	0.14	0.30	1.0	U	SR
Uranium 233/234	U-233/234	0.420	0.19	0.18	1.0		U
Uranium 235	15117-96-1	0.057	0.057	0.22	1.0	U	U
Uranium 238	U-238	0.700	0.24	0.18	1.0		U
Americium 241	14596-10-2	-0.050	0.050	0.19	1.0	U	AM
Potassium 40	13966-00-2	11.7	2.6	0.66			GAM
Cobalt 60	10198-40-0	U		0.082	0.050	U	GAM
Cesium 137	10045-97-3	U		0.073	0.10	U	GAM
Radium 226	13982-63-3	0.416	0.15	0.13			GAM
Radium 228	15262-20-1	0.435	0.30	0.32		J	GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.24	0.10	U	GAM
Europium 155	14391-16-3	U		0.14	0.10	U	GAM
Thorium 228	14274-82-9	0.472	0.072	0.079			GAM
Thorium 232	TH-232	0.435	0.30	0.32			GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		8.9		U	GAM
Americium 241	14596-10-2	U		0.070		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RW 4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-03 J00KC1

DATA SHEET

SDG	7472	Client/Case no	Hanford	SDG H2132	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304009-03	Client sample id	J00KC1		
Dept sample id	7472-003	Location/Matrix	100 BC Fr. Drain 100-C-3	SOLID	
Received	04/01/03	Collected/Weight	03/27/03 09:39	1182 g	
% solids	95.9	Custody/SAF No	B01-054-013	B01-054	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.016	0.11	0.18	400	U	H
Carbon 14	14762-75-5	0.904	1.9	3.2	50	U	C
Total Strontium	SR-RAD	-0.001	0.15	0.30	1.0	U	SR
Uranium 233/234	U-233/234	0.706	0.26	0.19	1.0		U
Uranium 235	15117-96-1	0.061	0.061	0.23	1.0	U	U
Uranium 238	U-238	0.580	0.26	0.19	1.0		U
Americium 241	14596-10-2	-0.046	0.092	0.35	1.0	U	AM
Potassium 40	13966-00-2	9.51	1.4	0.82			GAM
Cobalt 60	10198-40-0	U		0.092	0.050	U	GAM
Cesium 137	10045-97-3	0.147	0.096	0.11	0.10		GAM
Radium 226	13982-63-3	0.343	0.16	0.17			GAM
Radium 228	15262-20-1	0.934	0.32	0.31		J	GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.29	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.401	0.076	0.090			GAM
Thorium 232	TH-232	0.934	0.32	0.31			GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

100 B/C Area Effluent Pipe. & Prox.

4/24/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-04 J00KC2

DATA SHEET

SDG	7472	Client/Case no	Hanford SDG H2132
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304009-04	Client sample id	J00KC2
Dept sample id	7472-004	Location/Matrix	100 BC Fr. Drain 100-C-3 SOLID
Received	04/01/03	Collected/Weight	03/27/03 10:34 1087 g
% solids	95.2	Custody/SAF No	B01-054-013 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.032	0.098	0.17	400	U	H
Carbon 14	14762-75-5	1.56	1.7	2.9	50	U	C
Total Strontium	SR-RAD	-0.024	0.13	0.29	1.0	U	SR
Uranium 233/234	U-233/234	0.465	0.20	0.19	1.0		U
Uranium 235	15117-96-1	0.059	0.059	0.23	1.0	U	U
Uranium 238	U-238	0.416	0.20	0.19	1.0		U
Americium 241	14596-10-2	0.061	0.12	0.24	1.0	U	AM
Potassium 40	13966-00-2	10.8	1.2	0.68			GAM
Cobalt 60	10198-40-0	U		0.076	0.050	U	GAM
Cesium 137	10045-97-3	U		0.071	0.10	U	GAM
Radium 226	13982-63-3	0.465	0.13	0.13			GAM
Radium 228	15262-20-1	0.979	0.32	0.30		J	GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.22	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	0.496	0.067	0.071			GAM
Thorium 232	TH-232	0.979	0.32	0.30			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.1		U	GAM
Americium 241	14596-10-2	U		0.16		U	GAM

100 B/C Area Effluent Pipe. & Prox.

4/24/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-05 J00KC3

DATA SHEET

SDG	7472	Client/Case no	Hanford SDG H2132
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304009-05	Client sample id	J00KC3
Dept sample id	7472-005	Location/Matrix	100 BC Fr. Drain 100-C-3 SOLID
Received	04/01/03	Collected/Weight	03/27/03 09:39 1239 g
% solids	96.0	Custody/SAF No	B01-054-013 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.004	0.075	0.13	400	U	H
Carbon 14	14762-75-5	1.26	1.6	2.7	50	U	C
Total Strontium	SR-RAD	-0.003	0.16	0.33	1.0	U	SR
Uranium 233/234	U-233/234	0.433	0.18	0.17	1.0		U
Uranium 235	15117-96-1	0.028	0.055	0.21	1.0	U	U
Uranium 238	U-238	0.365	0.18	0.17	1.0		U
Americium 241	14596-10-2	0.092	0.12	0.23	1.0	U	AM
Potassium 40	13966-00-2	9.42	0.89	0.32			GAM
Cobalt 60	10198-40-0	U		0.050	0.050	U	GAM
Cesium 137	10045-97-3	0.089	0.040	0.040	0.10		GAM
Radium 226	13982-63-3	0.349	0.073	0.070			GAM
Radium 228	15262-20-1	0.496	0.19	0.20		J	GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.17	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	0.441	0.051	0.047			GAM
Thorium 232	TH-232	0.496	0.19	0.20			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		6.1		U	GAM
Americium 241	14596-10-2	U		0.10		U	GAM

100 B/C Area Effluent Pipe. & Prox.

4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-06 J00KC4

DATA SHEET

SDG	7472	Client/Case no	Hanford	SDG H2132
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R304009-06	Client sample id	J00KC4	
Dept sample id	7472-006	Location/Matrix	100 BC Fr. Drain 100-C-3	SOLID
Received	04/01/03	Collected/Weight	03/27/03 08:10	1286 g
% solids	99.9	Custody/SAF No	B01-054-013	B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.039	0.10	0.17	400	U	H
Carbon 14	14762-75-5	1.04	1.5	2.5	50	U	C
Total Strontium	SR-RAD	-0.043	0.18	0.38	1.0	U	SR
Uranium 233/234	U-233/234	0.198	0.13	0.17	1.0		U
Uranium 235	15117-96-1	0.027	0.053	0.20	1.0	U	U
Uranium 238	U-238	0.154	0.13	0.17	1.0	U	U
Americium 241	14596-10-2	0	0.064	0.25	1.0	U	AM
Potassium 40	13966-00-2	3.58	0.46	0.26			GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Cesium 137	10045-97-3	U		0.027	0.10	U	GAM
Radium 226	13982-63-3	0.166	0.052	0.050			GAM
Radium 228	15262-20-1	0.233	0.12	0.11		J	GAM
Europium 152	14683-23-9	U		0.066	0.10	U	GAM
Europium 154	15585-10-1	U		0.092	0.10	U	GAM
Europium 155	14391-16-3	U		0.064	0.10	U	GAM
Thorium 228	14274-82-9	0.131	0.029	0.031			GAM
Thorium 232	TH-232	0.233	0.12	0.11			GAM
Uranium 235	15117-96-1	U		0.087		U	GAM
Uranium 238	U-238	U		3.7		U	GAM
Americium 241	14596-10-2	U		0.062		U	GAM

100 B/C Area Effluent Pipe. & Prox.

PW 4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/08/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2132 was composed of six solid (soil) samples designated under SAF No. B01-054 with a Project Designation of: 100 B/C Area Effluent Pipeline & Proximity Site Remediation, French Drain 100-C-3.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on April 8, 2003. The electronic data deliverable (EDD) was transmitted to BHI via e-Mail on April 8, 2003.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.5 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.6 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 C. Mannion

Melissa C. Mannion
Program Manager

4/14/3

Date

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-013	Page 1 of 2

Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L — Data Turnaround: DWS 3/27/03 7 ~~11~~ ~~21~~ Days ~~DWS 3/26/03~~
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC french drain 100-C-3 H2132 (7472)	SAF No.: B01-054	Air Quality: ☐
Ice Chest No.: ERC 02 404	Field Logbook No.: EL-~~1548-2~~ 1573 DWS 3/26/03 — COA: R100C32F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030189	Bill of Lading/Air Bill No.: SOE 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radiologically contaminated

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None		
Type of Container	G/P	G/P	aG	G	G/P	G/P	G	G/P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14		

Sample No.	Matrix *	Sample Date	Sample Time										
J00KB9	SOIL	3/27/03	0853		DWS 3/27/03			✓	✓	✓	✓		
J00KC0	SOIL	↓	0912					✓	✓	✓	✓		
J00KC1	SOIL		0939					✓	✓	✓	✓		
J00KC2	SOIL		1034					✓	✓	✓	✓		
J00KC3	SOIL		0939					✓	✓	✓	✓		

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: Dwshea Dwshea	Date/Time: 3/27/03 1809	Received By/Stored In: Fridge 3A	Date/Time: 3/27/03 1809
Relinquished By/Removed From: REF 3A 53103	Date/Time: 1300	Received By/Stored In: [signature]	Date/Time: 33103 1300
Relinquished By/Removed From: [signature]	Date/Time: 33103 1300	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In: [signature]	Date/Time: 4-1-03 1000
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, ~~Silver-108 metastable~~, Uranium-238)
(3) ~~Isotopic Plutonium~~; Isotopic Uranium; Americium-241; Strontium-89,90 – Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 3/27/03

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

000019

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-054-013	Page 2 of 2
llector D.Shea	Company Contact D.Shea	Telephone No. 521-6014	Project Coordinator KESSNER, JH	Price Code 8L 7 days DWS 3/27/03 Data Turnaround
oject Designation 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location 100 BC french drain 100-C-3 H2132 (7472)		SAF No. B01-054	Air Quality ☐ ~~11~~ ~~21~~ Days ~~DWS 3/26/03~~
e Chest No. ERC 02 404	Field Logbook No. DWS EL-~~1548-2~~ 1573 3/26/03	COA R100C32F00	Method of Shipment FED EX	
~~ipped~~ To TMA/RECRA	Offsite Property No. A030189		Bill of Lading/Air Bill No. ~~[illegible]~~ 05PC	

OSSIBLE SAMPLE HAZARDS/REMARKS

otentially radiologically contaminated

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None		
Type of Container	G/P	G/P	aG	G	G/P	G/P	G	G/P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	250g	250mL	500mL	60mL	120mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Tritium - H3	Carbon-14		

Sample No.	Matrix *	Sample Date	Sample Time										
100KC4	SOIL	3/27/03	0810		DWS 3/27/03			✓	✓	✓	✓		

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWShea DWShea	3/27/03 1809	Fridge 3A	3/27/03 1809
REF 3A	33103 1300	SJGALO [illegible]	33103 1300
SJGALO [illegible]	33103 1300	FED EX	
FED EX		[illegible]	4-10 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Selenium, Silver}
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, ~~Silver-108 metastable~~, Uranium-238}
(3) ~~Isotopic Plutonium~~; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Nickel-63~~

DWS 3/26/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 7/31/03

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 (03/01/2002)

000020

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 BC 100-C-3			DATA PACKAGE: H2132		
VALIDATOR: TCI		LAB: EB		DATE: 4/29/03	
CASE:			SDG: H2132		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	C-14		
SAMPLES/MATRIX					
J00KB9 J00KC0 J00KC1 J00KC2					
J00KC3 J00KC4					

1. Completeness ..... ☒ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

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

Method blank analyzed within required frequency? ..... Yes No N/A
Method blank results acceptable? ..... Yes No N/A
Analytes detected in method blank? ..... Yes No N/A
Field blank(s) analyzed? ..... Yes No N/A
Field blank results acceptable? ..... Yes No N/A
Analytes detected in field blank(s)? ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:
U 233/234, K40, Ra 226/228 th 228/232 in FB

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

LCS /BSS analyzed within required frequency? ..... Yes No N/A
LCS/BSS recoveries acceptable? ..... Yes No N/A
LCS/BSS traceable? (Levels D,E) ..... Yes No N/A
LCS/BSS expired? (Levels D,E) ..... Yes No N/A
LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

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

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

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: _____

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: _____

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: Ra-228 >2x CRDL – J all

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: Ra 228 >2x CRDL in FB
No FS or PAS

12. Holding Times (All levels)

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

Appendix A – Radiochemical Data Validation Checklist

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

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

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

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

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

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

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

Comments: 31 ~~2~~ 4 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-08 **Method Blank**

METHOD BLANK

SDG	7472	Client/Case no	Hanford	SDG H2132	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304009-08	Client sample id	Method Blank		
Dept sample id	7472-008	Material/Matrix		SOLID	
		SAF No	B01-054		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.031	0.16	0.26	400	U	H
Carbon 14	14762-75-5	1.31	2.1	3.5	50	U	C
Total Strontium	SR-RAD	-0.060	0.18	0.37	1.0	U	SR
Uranium 233/234	U-233/234	-0.025	0.050	0.19	1.0	U	U
Uranium 235	15117-96-1	0	0.061	0.23	1.0	U	U
Uranium 238	U-238	0	0.050	0.19	1.0	U	U
Americium 241	14596-10-2	-0.037	0.074	0.28	1.0	U	AM
Potassium 40	13966-00-2	U		0.37		U	GAM
Cobalt 60	10198-40-0	U		0.035	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.10	U	GAM
Radium 226	13982-63-3	U		0.052		U	GAM
Radium 228	15262-20-1	U		0.14		U	GAM
Europium 152	14683-23-9	U		0.068	0.10	U	GAM
Europium 154	15585-10-1	U		0.081	0.10	U	GAM
Europium 155	14391-16-3	U		0.052	0.10	U	GAM
Thorium 228	14274-82-9	U		0.076		U	GAM
Thorium 232	TH-232	U		0.14		U	GAM
Uranium 235	15117-96-1	U		0.087		U	GAM
Uranium 238	U-238	U		3.8		U	GAM
Americium 241	14596-10-2	U		0.054		U	GAM

100 B/C Area Effluent Pipe. & Prox.

QC-BLANK 44247

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7472
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2132
Contract No. 630

Lab sample id R304009-07
Dept sample id 7472-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-054

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	13.1	0.39	0.25	400		H	14.0	0.56	94	84-116	80-120
Carbon 14	2030	41	10	50		C	2140	86	95	84-116	80-120
Total Strontium	22.6	1.0	0.34	1.0		SR	22.2	0.89	102	82-118	80-120
Uranium 233/234	19.3	1.8	0.87	1.0		U	19.3	0.77	100	83-117	80-120
Uranium 235	14.7	1.6	0.21	1.0		U	15.7	0.63	94	82-118	80-120
Uranium 238	20.2	1.9	0.83	1.0		U	21.0	0.84	96	84-116	80-120
Americium 241	21.0	2.5	0.30	1.0		AM	21.0	0.84	100	80-120	80-120
Cobalt 60	4.92	0.22	0.097	0.050		GAM	5.10	0.20	96	77-123	80-120
Cesium 137	4.83	0.19	0.12	0.10		GAM	4.86	0.19	99	76-124	80-120

100 B/C Area Effluent Pipe. & Prox.

QC-LCS 44246

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-09 J00KC3

DUPLICATE

SDG	7472			Client/Case no	Hanford SDG H2132
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R304009-09	Lab sample id	R304009-05	Client sample id	J00KC3
Dept sample id	7472-009	Dept sample id	7472-005	Location/Matrix	100 BC Fr. Drain 100-C-3 SOLID
		Received	04/01/03	Collected/Weight	03/27/03 09:39 1239 g
% solids	96.0	% solids	96.0	Custody/SAF No	B01-054-013 B01-054

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
Tritium	-0.076	0.10	0.18	400	U	H	0.004	0.075	0.13	U	-	
Carbon 14	1.17	1.6	2.7	50	U	C	1.26	1.6	2.7	U	-	
Total Strontium	0.047	0.15	0.31	1.0	U	SR	-0.003	0.16	0.33	U	-	
Uranium 233/234	0.341	0.20	0.19	1.0		U	0.433	0.18	0.17		24	105
Uranium 235	0.030	0.059	0.23	1.0	U	U	0.028	0.055	0.21	U	-	
Uranium 238	0.634	0.25	0.19	1.0		U	0.365	0.18	0.17		54	93
Americium 241	-0.036	0.071	0.27	1.0	U	AM	0.092	0.12	0.23	U	-	
Potassium 40	7.45	1.6	1.4			GAM	9.42	0.89	0.32		23	46
Cobalt 60	U		0.12	0.050	U	GAM	U		0.050	U	-	
Cesium 137	0.120	0.085	0.089	0.10		GAM	0.089	0.040	0.040		30	139
Radium 226	0.364	0.17	0.18			GAM	0.349	0.073	0.070		4	84
Radium 228	0.928	0.41	0.31			GAM	0.496	0.19	0.20		61	101
Europium 152	U		0.23	0.10	U	GAM	U		0.11	U	-	
Europium 154	U		0.36	0.10	U	GAM	U		0.17	U	-	
Europium 155	U		0.21	0.10	U	GAM	U		0.11	U	-	
Thorium 228	0.524	0.13	0.15			GAM	0.441	0.051	0.047		17	54
Thorium 232	0.928	0.41	0.31			GAM	0.496	0.19	0.20		61	101
Uranium 235	U		0.34		U	GAM	U		0.14	U	-	
Uranium 238	U		10		U	GAM	U		6.1	U	-	
Americium 241	U		0.23		U	GAM	U		0.10	U	-	

100 B/C Area Effluent Pipe. & Prox.

QC-DUP#5 44248

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2132

R304009-10 JOOKC3

MATRIX SPIKE

SDG	7472			Client/Case no	Hanford SDG H2132
Contact	Melissa C. Mannion			Contract	No. 630
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R304009-10	Lab sample id	R304009-05	Client sample id	JOOKC3
Dept sample id	7472-010	Dept sample id	7472-005	Location/Matrix	100 BC Fr. Drain 100-C-3 SOLID
		Received	04/01/03	Collected/Weight	03/27/03 09:39 1239 g
% solids	96.0	% solids	96.0	Custody/SAF No	B01-054-013 B01-054

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	47.7	0.55	0.16	400	X	H	53.0	2.1	0.004	0.075	90	85-115	60-140

100 B/C Area Effluent Pipe. & Prox.

QC-MS#5 44249

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	04/08/03

Duncan, Jeanette M

From: Christian, Bruce [BChristian@TechLawInc.com]
Sent: Wednesday, May 14, 2003 4:52 PM
To: Duncan, Jeanette M
Subject: RE: Validation Coming You Way Today

I had to leave Cheryl Volkman's Inorganic comment for H2132 blank. Please show it to Rich and see what he thinks.

-----Original Message-----
From: Duncan, Jeanette M [mailto:JMDuncan@mail.bhi-erc.com]
Sent: Tue 5/13/2003 11:27 AM
To: Christian, Bruce
Cc:
Subject: RE: Validation Coming You Way Today

Bruce,

H2131 and H2135 complete.

Jeanette

-----Original Message-----
From: Christian, Bruce [mailto:BChristian@TechLawInc.com
<mailto:BChristian@TechLawInc.com>]
Sent: Monday, May 12, 2003 9:49 PM
To: Duncan, Jeanette M
Subject: RE: Validation Coming You Way Today

This is 2131 inorganics. I'ts in wordperfect.

-----Original Message-----
From: Duncan, Jeanette M [mailto:JMDuncan@mail.bhi-erc.com
<mailto:JMDuncan@mail.bhi-erc.com>]
Sent: Fri 5/9/2003 7:53 AM
To: Christian, Bruce
Cc:
Subject: Validation Coming You Way Today

T Bruce,
Two more 7 day TAT validations. One of them is one of the four I had forecasted that you would be receiving this week (H2172) and the other one (H2180) is a remaining sites validation for which i don't know validation is going to happen until I am told to set it up. Anyway, yesterday, when i shipped off these two validation request packages, Rich wasn't here so I couldn't get the validation references on the VSR. So, here they are:

H2172 Validation References: BHI-01249, Rev. 3, DQO Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort & DOE/RL-96-22, 100 Area Remedial Action Sampling and Analysis Plan

H2180 Validation Reference: BHI-01249, Rev. 3, DQO Summary Report

for 100/300 Area Remaining Sites Analytical Sampling Effort

Hopefully this is the information you need and you won't have to fire off an IR immediately upon receipt of the VSR.

Jeanette

FAX

TECHLAW, INC.
3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 27 April 2003

Information Request #1

H2132-Rad

There is no CR VI chain of custody for sample J00KC4.

See attached SDR. Should have attached SDR to VSR when I set validation. Many apologies.

Jeanette

SDR #: BS03-037
Revision#: 0
Date Initiated: 4/10/2013

SAMPLE DISPOSITION RECORD

SAF: B01-054

OU: 100-BC-1

Project ID: 100-BC-1 RA/WD

Task ID: 1

Sampling Event: 100 B/C Effluent Pipeline

Laboratory: TMA/RECRA

Task Manager: STROM, DN

Sampling Information:

Number of Samples: 7

ID Numbers: J00KB9,J00KC0,J00KC1,J00KC2,J00KC3,J00KC4,J00KC6 (H2132)

Matrix: SOIL

Collection Date: 03/27/03

Issue Background:

Class:
- [ ] General Project Use
- [X] General Laboratory Direction
- [ ] Validation Direction
- [ ] Sample Management Direction

Type: 1) Addition of Analyses

Description: Addition of CrVI analysis.

Disposition:

Description: Addition of CrVI analysis.

Justification: After review of the priority data for site 100-C-3 it was noted that CrVI had not been requested. The analysis has been requested and will be run within hold time for CrVI.

Approval Signatures:

KESSNER, JH / (signature) 4/14/03
Project Coordinator (Print/Sign) Date

STROM, DN
Task Manager (Print/Sign) Date

TRANSMISSION RESULT REPORT (APR 28 '03 10:46AM)

BHI S&D MANAGEMENT 509 372 9487

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
047	MEMORY TX		12087238944	03/03	OK

ERRORS

1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

Apr-28-03 07:18A RS Christian P.02

FAX

TECHLAW, INC.

3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 27 April 2003

Information Request #1

H2132-Rad

Validation Review Form

Date: 4-30-03	**COA:** R100C32F00
SDG Number: H2132	**Validation Report Title:** 100 BC Effluent Pipeline Proximity Site Remediation Activities Full Protocol – Waste Site 100-C-3
BC ~~Remaining Sites~~ **Expedited Validation Review?** **Yes** X **No** ____	**Comment Due Date:** 5-2
Reviewers: R. L. Weiss C. L. Volkman Project	
Additional Comments:	

Validation Tracking Sheet

SDG: H2132	**SAF Title:** 100EC Effluent Pipeline Proximity Site Remediation Activities – Full Protocol
SAF# B01-054	**Waste Site:** 100-C-3

1. Date Initiated: 4-23-03
2. Date Started: 4-24-03
3. Date Due: 4-29-03
4. Date to Reviewers: 4-30-03
5. Date Review Comments Back to Validator: 5-5-03
6. Date Validator Dispositioned Comments are Transmitted Back to Reviewers: 5-15-03
7. Review Complete? Yes No
8. If no, continue to follow steps 5 and 6 above until it is.

Review Comments Rcvd from Cheryl 5-5-03
from Rich 5-1-03

Richs comments transmitted back to Bruce
Bruce xmited comments back 5-15-03
on 5-16-03
Rich OK comments on 5-19-03

Review Comment Record (RCR)

1. Date	2. Review No.
5/02/03	ARQP-03-22
3. Project	**4. Page**
ERC	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer:	8. Organization/Group	9. Location/Phone
SDG – H-2132	100-BC Area Effluent Pipeline & Proximity Site Remediation Activities – Full Protocol – Waste Site 100-C-3	Cheryl Volkman	ARQP – Quality Assurance	3350 GWW 509-372-9208

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)

5/02/03
Date

C.L. Volkman
Reviewer/Point of Contact

C.L. Volkman
Author/Originator

5/15/03
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	Volatiles – Data Validation checklist (page 24) has incorrect sample/matrix numbers = J00K39? And J00KC6 is missing		correct	CW Closed
2	Inorganics – 1) Inorganic Narrative covers the analyses of 7 soil samples. The package only contains 6, and 2) the package contains the incorrect Chain of Custody (page 18)		#2 corrected	CW Closed
3	Radiochemistry – Page 2 under Field (Equipment) Blank the incorrect sample number is referenced. Should it be J00KC4?		correct	CW Closed
4	Semivolatile – NO COMMENTS			

MAY 05 '03 06:49AM BHI S&D MANAGEMENT 509 372 9487 P.1/4

REVIEW COMMENT RECORD (RCR)

1. Date 05/01/03	2. Review No.
3. Project No. CVP/Remaining Sites	4. Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Validation Packages for SDG 2132	100-C-3	RL Weiss	S&DM	Sigma 1 372-9631

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11.
Organization Manager (Optional)	Reviewer/Point of Contract Date Author/Originator	Reviewer/Point of Contact Date 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. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	All – Packages need to reference BHI-01249 "DQO Summary Report for 100/300 Area Remaining Sites Analytical Sampling Plan" for additional criteria used for validation.		Reference not updated for VOA Correct K	
2	VOA, pg.11: Acetone values for J00KC6 & J00KC4 are incorrectly flagged "U". Table lists analysis for Vinyl Acetate which in not reported in the lab data. Deleting the Vinyl Acetate line will correct.	OK RLW 5-15-03	Correct K	
3	Inorganics, pgs 4, 10 & 25; Detection levels and listed RDLs. Add RDL criteria for Ba and Cd from BHI-01249. Use RDLs criteria for Ag, Pb, and CrVI from BHI-01249. Revise table and discussion on missed RDLs as per these criteria.	OK RLW 5-14-03	TDL section not revised to include 100/300 and CrVI not discussed Correct K	
4	Inorganics, pg. 10; Silver value for J00KC4 should be 0.08 not 0.07.	OK RLW 5-14-03	Correct K	
5	Semivolatiles, pgs 4, 11,12, & 25; Detection levels and listed RDLs. Use RDL criteria for SVOAs from BHI-01249. Revise table and discussion on missed RDLs as per these criteria.	OK RLW 5-15-03	Correct K	—
6	Semivolatiles, pgs 2, 4, 9, 12, 16, & 23; Blank contamination. Evaluate, qualify, and adjust all samples (including field blanks) to lab method blank contamination issues. The bis(2-ethylhexyl0phthalate results for J00KC4 should be raised to CRQL and flagged "U". Revise discussion on Field blanks as needed.	OK RLW 5-15-03	Correct K	—
7	Rad, pgs 3, 10, & 27; Detection levels and listed RDLs. Use RDLs criteria for Cs-137 from BHI-01249. No RDL criteria specified for Alpha or Beta. Revise table and discussion on missed RDLs as per these criteria.	OK RLW 5-15-03	Correct K	—

pg 3-4 "Analytical Detection Levels" section was not ~~[illegible]~~ revised

TRANSMISSION RESULT REPORT (MAY 15 '03 12:37PM)

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(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
093	MEMORY TX		12087238944	07/07	OK

ERRORS

1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

MAY 05 '03 06:49AM BHI S&D MANAGEMENT 509 372 9487 P.4/4

1. Date 05/01/03
2. Review No.
3. Project No. CVP/Remaining Sites
4. Page 1 of 1
7. Reviewer RL Weiss
8. Organization/Group S&DM
9. Location/Phone Sigma 1 372-9631
11.
Reviewer/Point of Contact
Date
Author/Originator

14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
	Reference not updated for VOA	
	Correct	
OK RLW 5-15-03	Correct	
	TDL section not revised to include 10/15/00 and SRVI not discussed	
	Correct	
OK RLW 5-15-03	Correct	
OK RLW 5-15-03	Correct	
OK RLW 5-15-03	Correct	
OK RLW 5-15-03	Correct	

vols " section was not revised

A-6400-090.1 (11/99)