0059799

SAF-B00-030
100 F Area - Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jill Thomson — BJ 5/20
INITIAL/DATE

Jeanette Duncan — BJ 5/20
INITIAL/DATE

SDG H2171 SAF-B00-030

Waste Site: 100-F-24

RECEIVED
JUL 14 2003
EDMC

Date: 12 May 2003
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100F Area - Full Protocol - Waste Site 100-F-24
Subject: Radiochemistry - Data Package No. H2171-EB (SDG No. H2171)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2171-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
J00LY9	4/16/03	Soil	C	See note 1
J00M00	4/16/03	Soil	C	See note 1
J00M01	4/16/03	Soil	C	See note 1
J00M02	4/16/03	Soil	C	See note 1
J00M03	4/16/03	Soil	C	See note 1
J00M04	4/16/03	Soil	C	See note 1

1- Gamma spectroscopy, carbon-14 and 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 (J00M04) was submitted for analysis. Potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

  Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is either 70-130% or ±3 sigma (gamma spectroscopy). 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.

All duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples (JOOLY9/J00M03) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All 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. Fifteen 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. H2171 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

Fifteen 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 Incorporated, 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: H2171	REVIEWER: TLI	DATE: 5/12/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																	
Laboratory: EB																	
Case	SDG: H2171																
Sample Number		J00LY9		J00M00		J00M01		J00M02		J00M03		J00M04					
Remarks										Duplicate		E. Blank					
Location		100-F-24		100-F-24		100-F-24		100-F-24		100-F-24		100-F-24					
Sample Date		4/16/03		4/16/03		4/16/03		4/16/03		4/16/03		4/16/03					
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Carbon-14	1	0.943	U*	-0.391	U*	-0.348	U*	0.587	U*	0.425	U*	-1.00	U*				
Total Strontium	1	0.036	U	0.086	U	0.043	U	-0.083	U	0.040	U	0.042	U				
Potassium-40		13.8		12.6		13.7		13.1		13.9		4.16					
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U				
Cesium 137	0.05	0.053		U	U	U	U	U	U	U	U	U	U				
Radium-226		0.492		0.514		0.484		0.407		0.479		0.159					
Radium-228		0.817		0.792		0.755		0.688		0.719		0.196					
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		0.674		0.578		0.770		0.569		0.642		0.135					
Thorium-232		0.817	U	0.792		0.755		0.688		0.719		0.196					
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				

000010

* - 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.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-001 J00LY9

DATA SHEET

SDG	7492	Client/Case no	Hanford	SDG H2171	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304126-01	Client sample id	J00LY9		
Dept sample id	7492-001	Location/Matrix	100-F-24	SOLID	
Received	04/21/03	Collected/Weight	04/16/03 10:15	1360 g	
% solids	94.9	Custody/SAF No	B00-030-98	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.943	2.1	3.4	50	U	C
Total Strontium	SR-RAD	0.036	0.12	0.24	1.0	U	SR
Potassium 40	13966-00-2	13.8	0.60	0.24			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	0.053	0.022	0.027	0.10		GAM
Radium 226	13982-63-3	0.492	0.057	0.052			GAM
Radium 228	15262-20-1	0.817	0.13	0.12			GAM
Europium 152	14683-23-9	U		0.061	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.068	0.10	U	GAM
Thorium 228	14274-82-9	0.674	0.034	0.030			GAM
Thorium 232	TH-232	0.817	0.13	0.12			GAM
Uranium 235	15117-96-1	U		0.094		U	GAM
Uranium 238	U-238	U		3.3		U	GAM
Americium 241	14596-10-2	U		0.098		U	GAM

100 F Area - Full Protocol

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-002 J00M00

DATA SHEET

SDG	7492	Client/Case no	Hanford SDG H2171
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304126-02	Client sample id	J00M00
Dept sample id	7492-002	Location/Matrix	100-F-24 SOLID
Received	04/21/03	Collected/Weight	04/16/03 10:30 1361 g
% solids	93.8	Custody/SAF No	B00-030-98 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-0.391	2.0	3.3	50	U	C
Total Strontium	SR-RAD	0.086	0.17	0.32	1.0	U	SR
Potassium 40	13966-00-2	12.6	0.72	0.29			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.036	0.10	U	GAM
Radium 226	13982-63-3	0.514	0.072	0.064			GAM
Radium 228	15262-20-1	0.792	0.17	0.14			GAM
Europium 152	14683-23-9	U		0.079	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.587	0.041	0.040			GAM
Thorium 232	TH-232	0.792	0.17	0.14			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		4.0		U	GAM
Americium 241	14596-10-2	U		0.30		U	GAM

100 F Area - Full Protocol

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-003 J00M01

DATA SHEET

SDG	7492	Client/Case no	Hanford SDG H2171
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304126-03	Client sample id	J00M01
Dept sample id	7492-003	Location/Matrix	100-F-24 SOLID
Received	04/21/03	Collected/Weight	04/16/03 10:25 1338 g
% solids	95.3	Custody/SAF No	B00-030-98 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-0.384	1.8	3.1	50	U	C
Total Strontium	SR-RAD	0.043	0.12	0.25	1.0	U	SR
Potassium 40	13966-00-2	13.7	0.95	0.28			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.028	0.10	U	GAM
Radium 226	13982-63-3	0.484	0.061	0.053			GAM
Radium 228	15262-20-1	0.755	0.13	0.13			GAM
Europium 152	14683-23-9	U		0.062	0.10	U	GAM
Europium 154	15585-10-1	U		0.082	0.10	U	GAM
Europium 155	14391-16-3	U		0.087	0.10	U	GAM
Thorium 228	14274-82-9	0.770	0.048	0.049			GAM
Thorium 232	TH-232	0.755	0.13	0.13			GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		3.5		U	GAM
Americium 241	14596-10-2	U		0.037		U	GAM

100 F Area - Full Protocol

5/7/03

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Form	DVD-DS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-004 J00M02

DATA SHEET

SDG	7492	Client/Case no	Hanford SDG H2171
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304126-04	Client sample id	J00M02
Dept sample id	7492-004	Location/Matrix	100-F-24 SOLID
Received	04/21/03	Collected/Weight	04/16/03 10:45 1278 g
% solids	93.3	Custody/SAF No	B00-030-98 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.587	2.1	3.6	50	U	C
Total Strontium	SR-RAD	-0.083	0.14	0.31	1.0	U	SR
Potassium 40	13966-00-2	13.1	0.65	0.16			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.023	0.10	U	GAM
Radium 226	13982-63-3	0.407	0.052	0.039			GAM
Radium 228	15262-20-1	0.688	0.094	0.089			GAM
Europium 152	14683-23-9	U		0.055	0.10	U	GAM
Europium 154	15585-10-1	U		0.067	0.10	U	GAM
Europium 155	14391-16-3	U		0.074	0.10	U	GAM
Thorium 228	14274-82-9	0.569	0.029	0.025			GAM
Thorium 232	TH-232	0.688	0.094	0.089			GAM
Uranium 235	15117-96-1	U		0.096		U	GAM
Uranium 238	U-238	U		2.5		U	GAM
Americium 241	14596-10-2	U		0.14		U	GAM

100 F Area - Full Protocol

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-005 J00M03

DATA SHEET

SDG	7492	Client/Case no	Hanford	SDG H2171	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304126-05	Client sample id	J00M03		
Dept sample id	7492-005	Location/Matrix	100-F-24	SOLID	
Received	04/21/03	Collected/Weight	04/16/03 10:15	1402 g	
% solids	94.8	Custody/SAF No	B00-030-98	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.425	1.8	3.1	50	U	C
Total Strontium	SR-RAD	0.040	0.14	0.29	1.0	U	SR
Potassium 40	13966-00-2	13.9	0.84	0.39			GAM
Cobalt 60	10198-40-0	U		0.039	0.050	U	GAM
Cesium 137	10045-97-3	U		0.037	0.10	U	GAM
Radium 226	13982-63-3	0.479	0.076	0.073			GAM
Radium 228	15262-20-1	0.719	0.17	0.17			GAM
Europium 152	14683-23-9	U		0.089	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.642	0.047	0.045			GAM
Thorium 232	TH-232	0.719	0.17	0.17			GAM
Uranium 235	15117-96-1	U		0.16		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Americium 241	14596-10-2	U		0.34		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-006 J00M04

DATA SHEET

SDG	7492	Client/Case no	Hanford SDG H2171
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304126-06	Client sample id	J00M04
Dept sample id	7492-006	Location/Matrix	100-F-24 SOLID
Received	04/21/03	Collected/Weight	04/16/03 10:10 1323 g
% solids	100.0	Custody/SAF No	B00-030-99 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-1.00	1.6	2.8	50	U	C
Total Strontium	SR-RAD	0.042	0.15	0.29	1.0	U	SR
Potassium 40	13966-00-2	4.16	0.44	0.21			GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Cesium 137	10045-97-3	U		0.020	0.10	U	GAM
Radium 226	13982-63-3	0.159	0.042	0.043			GAM
Radium 228	15262-20-1	0.196	0.092	0.085			GAM
Europium 152	14683-23-9	U		0.044	0.10	U	GAM
Europium 154	15585-10-1	U		0.071	0.10	U	GAM
Europium 155	14391-16-3	U		0.068	0.10	U	GAM
Thorium 228	14274-82-9	0.135	0.031	0.040			GAM
Thorium 232	TH-232	0.196	0.092	0.085			GAM
Uranium 235	15117-96-1	U		0.092		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2171 was composed of six solid (soil) samples designated under SAF No. B00-030 with a Project Designation of: 100 F Area – Full Protocol.

The samples were 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 28, 2003. The electronic data deliverable (EDD) was transmitted to BHI via e-mail on April 28, 2003.

2.0 ANALYSIS NOTES

2.1 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

5/1/3

Date

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-030-98	Page 1 of 1

Collector: FAHLBERG/NIELSON	Company Contact: M Stankovich — Telephone No.: 531-7620	Project Coordinator: KESSNER, JH	Price Code: ~~8E~~ 8B — Data Turnaround: ~~21~~ 7 Days
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-24 SOG H2171 (7492)	SAF No.: B00-030	Air Quality ☐
Ice Chest No.: ERC 02 402	Field Logbook No.: EL-1572 — COA: R10F242000	Method of Shipment: Fed EX	MM 4/21/3
Shipped To: TMA/RECRA	Offsite Property No.: A030199	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive, Tie To

Special Handling and/or Storage

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

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Chromium Hex - 7196	Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152)	Strontium-89,90 -- Total Sr; Carbon-14							
J00LY9	SOIL	4-16-03	1015	X	X	X							
J00M00	SOIL	4-16-03	1030	X	X	X							
J00M01	SOIL	4-16-03	1025	X	X	X							
J00M02	SOIL	4-16-03	1045	X	X	X							
J00M03	SOIL	4-16-03	1015	X	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature] JR Nielson	4/16/03 1430	REF # 1A	4/16/03 1430
REF 1A	41703 0900	SJGALE [signature]	41703 0900
SJGALE [signature]	41703 0900	FED EX	
FED EX		[signature]	4-18-03 1000

SPECIAL INSTRUCTIONS

Personnel not available to relinquish samples from the 3728 Ref # 14 on 4/17/03

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solid, DL=Drum Liq, T=Tissue, Wt=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)

010019

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-030-99	Page 1 of 1

Collector: FAHLBERG/NIELSON	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: ~~8L~~ 8B	Data Turnaround: ~~21~~ 7 Days	Air Quality ☐	
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-24 SOA 42171 (7492)	SAF No.: B00-030	
Ice Chest No.: ERC 02 402	Field Logbook No.: EL-1572	COA: R10F242000	Method of Shipment: Fed EX mm 4/21/03
Shipped To: TMA/RECRA	Offsite Property No.: A030199	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive, Tie To

Special Handling and/or Storage

Preservation	Cool 4C	None	None								
Type of Container	sG	sG	sG								
No. of Container(s)	1	1	1								
Volume	120mL	1000mL	60mL								
SAMPLE ANALYSIS	Chromium Per 7196 4/17/03	Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152)	Strontium-89,90 – Total Sr; Carbon-14								
Sample No.	Matrix *	Sample Date	Sample Time								
J00M04	SOIL	4-16-03	1010	X	X	X					

020000

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson R. Nielson	4/16/03 1430	REF# 1A	4/16/03 1430
REF 1A 41703	0900	SIGALE	41703 0900
SIGALE	41703 0900	FED EX	
FED EX			4/21/03 1000

SPECIAL INSTRUCTIONS

Do not run lab QC on this Sample

Personnel not available to relinquish samples from the 3728 Ref # 1A on 4/17/03

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

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

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

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-24		DATA PACKAGE:	H2171	
VALIDATOR:	TCI	LAB:	EB	DATE:	5/7/03
CASE:			SDG:	H2171	
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	C14		
SAMPLES/MATRIX					
J00LY9	J00M00	J00M01	J00M02		
J00M03	J00M04				
					Soil

1. Completeness ..... ☒ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

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

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

Comments: K-40, Ra 226/228 + th 228/232 in ob

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

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

Comments:

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

10. Duplicates (Levels C, D, E) ☐ N/A

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

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

Comments:

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

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

Field duplicate RPD values acceptable? Yes No N/A

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

Field split RPD values acceptable? Yes No N/A

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

Performance audit sample results acceptable? Yes No N/A

Comments: NO FS/PAS

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments:

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

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

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

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

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

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

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

Comments: 15 Kg over 5114

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-008 Method Blank

METHOD BLANK

SDG	7492	Client/Case no	Hanford SDG H2171
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304126-08	Client sample id	Method Blank
Dept sample id	7492-008	Material/Matrix	SOLID
		SAF No	B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.885	2.1	3.5	50	U	C
Total Strontium	SR-RAD	-0.043	0.13	0.28	1.0	U	SR
Potassium 40	13966-00-2	U		0.14		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.010	0.10	U	GAM
Radium 226	13982-63-3	U		0.017		U	GAM
Radium 228	15262-20-1	U		0.042		U	GAM
Europium 152	14683-23-9	U		0.023	0.10	U	GAM
Europium 154	15585-10-1	U		0.029	0.10	U	GAM
Europium 155	14391-16-3	U		0.020	0.10	U	GAM
Thorium 228	14274-82-9	U		0.012		U	GAM
Thorium 232	TH-232	U		0.042		U	GAM
Uranium 235	15117-96-1	U		0.034		U	GAM
Uranium 238	U-238	U		1.2		U	GAM
Americium 241	14596-10-2	U		0.031		U	GAM

100 F Area - Full Protocol

QC-BLANK #44494

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/28/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-007

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7492

Contact Melissa C. Mannion

Client/Case no Hanford SDG H2171

Contract No. 630

Lab sample id R304126-07

Dept sample id 7492-007

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B00-030

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	1980	40	11	50		C	2160	86	92	85-115	80-120
Total Strontium	23.5	0.95	0.30	1.0		SR	22.1	0.88	106	82-118	80-120
Cobalt 60	1.58	0.069	0.030	0.050		GAM	1.66	0.066	95	77-123	80-120
Cesium 137	1.67	0.059	0.036	0.10		GAM	1.59	0.064	105	75-125	80-120

100 F Area - Full Protocol

QC-LCS #44493

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 04/28/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2171

7492-009

J00M01

DUPLICATE

SDG	7492			Client/Case no	Hanford — SDG H2171
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R304126-09	Lab sample id	R304126-03	Client sample id	J00M01
Dept sample id	7492-009	Dept sample id	7492-003	Location/Matrix	100-F-24 — SOLID
		Received	04/21/03	Collected/Weight	04/16/03 10:25 — 1338 g
% solids	95.3	% solids	95.3	Custody/SAF No	B00-030-98 — B00-030

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
Carbon 14	0.857	2.0	3.3	50	U	C	-0.384	1.8	3.1	U	-	
Total Strontium	-0.074	0.15	0.33	1.0	U	SR	0.043	0.12	0.25	U	-	
Potassium 40	13.8	0.98	0.48			GAM	13.7	0.95	0.28		1	35
Cobalt 60	U		0.046	0.050	U	GAM	U		0.033	U	-	
Cesium 137	U		0.045	0.10	U	GAM	U		0.028	U	-	
Radium 226	0.497	0.092	0.095			GAM	0.484	0.061	0.053		3	46
Radium 228	0.582	0.19	0.21			GAM	0.755	0.13	0.13		26	61
Europium 152	U		0.10	0.10	U	GAM	U		0.062	U	-	
Europium 154	U		0.17	0.10	U	GAM	U		0.082	U	-	
Europium 155	U		0.11	0.10	U	GAM	U		0.087	U	-	
Thorium 228	0.673	0.050	0.047			GAM	0.770	0.048	0.049		13	35
Thorium 232	0.582	0.19	0.21			GAM	0.755	0.13	0.13		26	61
Uranium 235	U		0.17		U	GAM	U		0.10	U	-	
Uranium 238	U		5.4		U	GAM	U		3.5	U	-	
Americium 241	U		0.15		U	GAM	U		0.037	U	-	

100 F Area - Full Protocol

QC-DUP#3 44495

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/28/03

Date: 12 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Area - Full Protocol - Waste Site 100-F-24
Subject: Inorganics - Data Package No. H2171-LLI (SDG No. H2171)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2171-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
J00LY9	4/16/03	Soil	C	See note 1
J00M00	4/16/03	Soil	C	See note 1
J00M01	4/16/03	Soil	C	See note 1
J00M02	4/16/03	Soil	C	See note 1
J00M03	4/16/03	Soil	C	See note 1
J00M04	4/16/03	Soil	C	See note 1

1 - Chromium VI by 7196A.

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.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

All preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00M04) was submitted for analysis. All equipment blank results were acceptable.

- **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 (J00LY9/J00M03) 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 reported results exceeded the analyte specific TDL. Under the BHI statement

of work, no qualification is required.

- **Completeness**

Data package No. H2171-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All reported results exceeded the analyte specific 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 Incorporated, 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: H2171	REVIEWER: TLI	DATE: 5/12/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD																					
Laboratory: LLI																					
Case	SDG: H2171																				
Sample Number		J00LY9		J00M00		J00M01		J00M02		J00M03		J00M04									
Remarks										Duplicate		E. Blank									
Location		100-F-24		100-F-24		100-F-24		100-F-24		100-F-24		100-F-24									
Sample Date		4/16/03		4/16/03		4/16/03		4/16/03		4/16/03		4/16/03									
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.1	0.44	U	0.44	U	0.43	U	0.44	U	0.44	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.

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/25/03

CLIENT: TNUHANFORD B00-030 H2171 LVL LOT #: 0304L239

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00LY9	% Solids	91.5	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
-002	J00M00	% Solids	91.4	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
-003	J00M01	% Solids	93.5	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
-004	J00M02	% Solids	91.4	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
-005	J00M03	% Solids	90.7	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
-006	J00M04	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0

5/7/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B00-030 H2171
LVL#: 0304L239

W.O.#: 11343-606-001-9999-00
Date Received: 04-18-03

INORGANIC NARRATIVE

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

2. The samples were prepared and analyzed in accordance with the methods 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 analyses for Percent Solids and Chromium VI were 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

04-29-03
Date

njp\04- 239

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 13 pages.

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

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B00-030-96

Collector: FAHLBERG/NIELSON	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8L	Data Turnaround: 21 Days	Air Quality ☐	
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-24	SAF No.: B00-030	
Ice Chest No.: ERC 02 010	Field Logbook No.: EL-1572	COA: R10F242000	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A030212	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive, Tie To

Special Handling and/or Storage

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

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Chromium Hex - 7196	Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152)	Strontium-89,90 -- Total Sr/Carbon-14
J00LY9	SOIL	4-16-03	1015	X	X	X
J00M00	SOIL	4-16-03	1030	X	X	X
J00M01	SOIL	4-16-03	1025	X	X	X
J00M02	SOIL	4-16-03	1045	X	X	X
J00M03	SOIL	4-16-03	1015	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R Nielson	4/16/03 1430	REF # 1A	4/16/03 1430
REF 1A	41703 0900	SJGALE	41703 0900
SJGALE	41703 0900	FED EX	
Fed Ex	4/18/03 0900		4/18/03 0900

SPECIAL INSTRUCTIONS

Personnel not available to relinquish samples from the 3728 Ref # 1A on 4/17/03

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)

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-030-99 | Page 1 of 1

Collector: FAHLBERG/NIELSON	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8L	Data Turnaround: 21 Days	Air Quality ☐	
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-24		SAF No.: B00-030
Ice Chest No.: ERC 02 010	Field Logbook No.: EL-1572	COA: R10F242000	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A030212		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive, Tie To

Special Handling and/or Storage

Preservation				Cool 4C	None	None					
Type of Container				aG	aG	aG					
No. of Container(s)				1	1	1					
Volume				120mL	1000mL	60mL					
SAMPLE ANALYSIS				Chromium Hex - 7196	Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152)	Strontium-89,90 – Total Sr; Carbon-14					
Sample No.	Matrix *	Sample Date	Sample Time								
J00M04	SOIL	4-16-03	1010	X	X	X					

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	4/16/03 1430	REF# 1A	4/16/03 1430
REF 1A	41703 0900	SJGALE	41703 0900
SJGALE	41703 0900	FED EX	
Fed Ex	4.18.03 0900		4.18.03 0900

SPECIAL INSTRUCTIONS

Do not run lab QC on this Sample

Personnel not available to relinquish samples from the 3728 Ref # 1A on 4/17/03

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)

000015

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-24		DATA PACKAGE:	H2171	
VALIDATOR:	TCI	LAB:	LLI	DATE:	5/7/03
CASE:			SDG:	H2171	

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J00LY9 J00M00 J00M01 J00M02 J00M03
J00M04

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

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

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

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

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

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

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

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

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

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

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

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

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

Comments: 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 ova

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/25/03

CLIENT: TNUHANFORD B00-030 H2171 LVL LOT #: 0304L239

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI026-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/25/03

CLIENT: TNUHANFORD B00-030 H2171 LVL LOT #: 0304L239

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-005	J00N03	Soluble Chromium VI	4.9	0.44u	4.4	106.9	1.0
		Insoluble Chromium VI	1340	0.44u	1240	108.2	100
BLANK10	03LVI026-MB1	Soluble Chromium VI	3.9	0.40u	4.0	96.6	1.0
		Insoluble Chromium VI	1320	0.40u	1300	101.2	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/25/03

CLIENT: TNUHANFORD B00-030 H2171 LVL LOT #: 0304L239

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J00LY9	% Solids	91.5	91.8	0.34	1.0
-005REP	J00M03	Chromium VI	0.44u	0.44u	NC	1.0