0059854

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

MAIL COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) BJ 8/3/03
INITIAL/DATE

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

SDG H2180 SAF-B03-015

Sample Location/Waste Site: 100-K-30 and 100-K-31

RECEIVED
JUL 28 2003
EDMC

Date: 14 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Waste Sites 100-K-30 & 100-K-33
Subject: Wet Chemistry - Data Package No. H2180-LLI (SDG No. H2180)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2180-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	Waste Site	Validation	Analysis
J00M27	4/18/03	Soil	100-K-30	C	See note 2
J00M29	4/18/03	Soil	100-K-30	C	See note 1 & 2
J00M30	4/18/03	Soil	100-K-30	C	See note 1 & 2
J00M31	4/18/03	Soil	100-K-30	C	See note 1 & 2
J00M32	4/18/03	Soil	100-K-30	C	See note 1 & 2
J00M33	4/18/03	Soil	100-K-30	C	See note 1 & 2
J00M41	4/18/03	Soil	100-K-33	C	See note 2
J00M44	4/18/03	Soil	100-K-33	C	See note 1 & 2
J00M45	4/18/03	Soil	100-K-33	C	See note 1 & 2
J00M46	4/18/03	Soil	100-K-33	C	See note 1 & 2
J00M47	4/18/03	Soil	100-K-33	C	See note 1 & 2
J00M48	4/18/03	Soil	100-K-33	C	See note 1 & 2

1 - Chromium VI by 7196A; pH by 9045.
2 - Sulfate by 300.0.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work 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, 28 days for sulfate and immediate for pH.

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".

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

Two equipment blanks (J00M27(100-K-30) & J00M41(100-K-33)) were 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

Two sets of field duplicate samples (J00M32/J00M33(100-K-30) & J00M44/J00M48(100-K-33)) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All other duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. H2180-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 the holding time being exceeded by greater than twice the limit, all pH 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.

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

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2180	REVIEWER: TLI	DATE: 5/14/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	All	Holding time

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD																	
Laboratory: LLI																	
Case	SDG: H2180																
Sample Number		J00M27		J00M29		J00M30		J00M31		J00M32		J00M33		J00M41		J00M44	
Remarks		E. Blank										Duplicate		E. Blank			
Location		100-K-30		100-K-30		100-K-30		100-K-30		100-K-30		100-K-30		100-K-30		100-K-33	
Sample Date		4/18/03		4/18/03		4/18/03		4/18/03		4/18/03		4/18/03		4/18/03		4/18/03	
Wet Chemistry	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.1	NA		0.43	U	0.42	U	0.70		0.43	U	0.65		NA		0.44	U
Sulfate		1.2	U	822		2630		5.0		1440		1580		1.2	U	220	
pH*		NA		6.8	J	7.2	J	8.4	J	6.7	J	6.7	J	NA		6.2	J

Sample Number		J00M45		J00M46		J00M47		J00M48	
Remarks								Duplicate	
Location		100-K-33		100-K-33		100-K-33		100-K-33	
Sample Date		4/18/03		4/18/03		4/18/03		4/18/03	
Wet Chemistry	RDL	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.1	0.44	U	0.44	U	0.44	U	19.2	
Sulfate		2670		191		3490		206	
pH*		6.2	J	6.9	J	7.2	J	6.2	J

* - pH units

NA = Not analyzed

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

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/29/03

CLIENT: TNUHANFORD B03-015 H2180
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L249

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00M27	% Solids	100	%	0.01	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
-002	J00M29	% Solids	93.0	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	822	MG/KG	134	100
		pH	6.8 J	PH UNIT	0.01	1.0
-003	J00M30	% Solids	94.2	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	2630	MG/KG	133	100
		pH	7.2 J	PH UNIT	0.01	1.0
-004	J00M31	% Solids	95.1	%	0.01	1.0
		Chromium VI	0.70	MG/KG	0.42	1.0
		Sulfate by IC	5.0	MG/KG	1.3	1.0
		pH	8.4 J	PH UNIT	0.01	1.0
-005	J00M32	% Solids	92.9	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	1440	MG/KG	67.3	50.0
		pH	6.7 J	PH UNIT	0.01	1.0
-006	J00M33	% Solids	94.3	%	0.01	1.0
		Chromium VI	0.65	MG/KG	0.42	1.0
		Sulfate by IC	1580	MG/KG	66.3	50.0
		pH	6.7 J	PH UNIT	0.01	1.0

5/10/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180 LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J00M41	% Solids	100	%	0.01	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
-008	J00M44	% Solids	91.4	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	220	MG/KG	13.7	10.0
		pH	6.2 J	PH UNIT	0.01	1.0
-009	J00M45	% Solids	90.7	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	2670	MG/KG	138	100
		pH	6.2 J	PH UNIT	0.01	1.0
-010	J00M46	% Solids	90.2	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	191	MG/KG	13.9	10.0
		pH	6.9 J	PH UNIT	0.01	1.0
-011	J00M47	% Solids	91.4	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	3490	MG/KG	137	100
		pH	7.2 J	PH UNIT	0.01	1.0
-012	J00M48	% Solids	93.1	%	0.01	1.0
		Chromium VI	19.2	MG/KG	0.86	2.0
		Sulfate by IC	206	MG/KG	13.4	10.0
		pH	6.2 J	PH UNIT	0.01	1.0

5/10/02

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015 H2180
LVL#: 0304L249

W.O.#: 11343-606-001-9999-00
Date Received: 04-22-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 12 soil samples.

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

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

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

5. The method blanks were within the method criteria.

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

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

8. The replicate analyses for Sulfate, pH, 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

5/1/03
Date

njp\i04-249

000014

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 ~~17~~ 18 pages. 5/5/03

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

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: Sulfate **Method:** EPA 300.0 (mod.)

Other: **Method**

000014A

L-WI-034/B-01/01

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Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-62	Page 1 of 1

Collector Doug Bowers	Company Contact Renee Nielson	Telephone No. 521-2090	Project Coordinator KESSNER, JH
Project Designation Remaining Sites Confirmation Sampling-Soil	Sampling Location 100-K-30, KE (west tank)		SAF No. B03-015
Ice Chest No. ERC 02 104	Field Logbook No. EL 1578	COA C17HXK671C	Method of Shipment Federal Express
Shipped To TMA/RECRA	Offsite Property No. A030213		Bill of Lading/Air Bill No. SEE OSPC

Price Code 8B

Data Turnaround 7 Days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	60mL	120mL										
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	IC Anions - 300.0 (Sulfate)										

000015

Sample No.	Matrix *	Sample Date	Sample Time										
J00M27	SOIL	4-18-03	0810	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers DOW	4-18-03	REF 3C 3728	4-18-03/1600
REF 3C 3728	42103 1000	SJOHNSON	42103 1000
SJOHNSON	42103 1000	FED EX	
FED EX	4-22-03 0935		4-22-03 09.25

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for Q.A., Q.C.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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

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

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

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B03-015-04

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 521-2090	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-K-30, KE (west tank)	SAF No.: B03-015	
Ice Chest No.: GRC 02 104	Field Logbook No.: EL 1578	COA: C17HXK671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030213	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

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

000016

Preservation	None	Cool 4C	Cool 4C	None							
Type of Container	aG	~~G/P~~ aG PAS	aG	G/P							
No. of Container(s)	1	1	1	1							
Volume	60mL	~~125~~ 120 ml DAS 4/16/03	120mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0 (Sulfate)	pH (Soil) - 9045							
Sample No.	Matrix *	Sample Date	Sample Time								
J00M29	SOIL		0815	X	X	X	X				
J00M30	SOIL		0820	X	X	X	X				
J00M31	SOIL		0830	X	X	X	X				
J00M32	SOIL		0840	X	X	X	X				
J00M33	SOIL		0840	X	X	X	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	4-18-03/1600	RJF 3C 3728	4-18-03/1600
RJF 3C 3728	42103 1000	SJGOLE	42103 1000
SJGOLE	42103 1000	FED EX	
FED EX	4.22.03 0925	D. Mu	4.22.03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

Matrix *

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

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

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B03-015-66

Collector Doug Bowers	**Company Contact** Renee Nielson **Telephone No.** 521-2090	**Project Coordinator** KESSNER, JH
Project Designation Remaining Sites Confirmation Sampling-Soil	**Sampling Location** 100-K-33, KW (west tank)	**SAF No.** B03-015
Ice Chest No. ERC 96 009	**Field Logbook No.** EL 1578 / **COA** C17HXK671C	**Method of Shipment** Federal Express
Shipped To TMA/RECRA	**Offsite Property No.** A030213	**Bill of Lading/Air Bill No.** SEE OSPC

Price Code 8B **Data Turnaround** 7 Days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C									
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	60mL	120mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0 (Sulfate)									

Sample No.	Matrix *	Sample Date	Sample Time										
J00M41	SOIL	4-18-03	1339	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	748-03/1600	R.A. TC 3728	4-18-03/1600
REF 3C 3728	42103 1000	S.J. GALE	42103 1000
S.J. GALE	42103 1000	FED EX	
Fed Ex	4-22-03 0925	D. Mell	4-22-03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Do not use for Q.A./Q.C.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-67	Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 521-2090	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-K-33, KW (west tank)	SAF No.: B03-015	
Ice Chest No.: ERC 96 009	Field Logbook No.: EL 1578	COA: C17HXK671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030213	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C	Cool 4C	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	120mL	120mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0 (Sulfate)	pH (Soil) - 9045							
Sample No. / Matrix * / Sample Date / Sample Time											
J00M44 / SOIL / 4-18-03 / 1340	X	X	X	X							
J00M45 / SOIL / 4-18-03 / 1345	X	X	X	X							
J00M46 / SOIL / 4-18-03 / 1355	X	X	X	X							
J00M47 / SOIL / 4-18-03 / 1405	X	X	X	X							
J00M48 / SOIL / 4-18-03 / 1340	X	X	X	X							

0000018

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers / Bowers	4-18-03 / 1600	REF 3C 3728	4-18-03 / 1600
REF 3C 3728	42103 / 1000	SIGALE	42103 / 1000
SIGALE	42103 / 1000	FED EX	
FED EX	4.22.03 0925		4.22.03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

Matrix *

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

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

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

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C'	D	E

PROJECT:	100-K-30 100-K-33	DATA PACKAGE:	H2180
VALIDATOR:	TCI	LAB: LLI	DATE: 5/10/00
CASE:		SDG:	H2180

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		

SAMPLES/MATRIX
J00M27 J00M29 J00M30 J00M31 J00M32
J00M33 J00M41 J00M44 J00M45 J00M46
J00M47 J00M48

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

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

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

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

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

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

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

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

Comments:

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

Spike samples analyzed? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

Comments: NO PAS

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: all undetects CRII ann

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/30/03

CLIENT: TNUHANFORD B03-015 H2180 LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LIC025-MB1	Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	03LVI027-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180 LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J00M29	Sulfate by IC	3670	822	2690	105.8	100
-010	J00M46	Soluble Chromium VI	4.4	-0.02	4.4	99.8	1.0
		Insoluble Chromium VI	1400	-0.02	1300	107.4	100
BLANK10	03LIC025-MB1	Sulfate by IC	24.6	1.2 u	25.0	98.2	1.0
BLANK10	03LVI027-MB1	Soluble Chromium VI	3.9	0.40u	4.0	98.2	1.0
		Insoluble Chromium VI	1580	0.40u	1510	104.6	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J00M29	Sulfate by IC	822	751	9.0	100
		pH	6.8	6.9	0.4	1.0
-010REP	J00M46	% Solids	90.2	90.2	0.078	1.0
		Chromium VI	0.44u	0.44u	NC	1.0

Validation Tracking Sheet

SDG: H2180	SAF Title: Remaining Sites Confirmation Sampling
SAF# 603-015	Waste Site: 100-K-30 + 100-K-33

1. Date Initiated: 05-08-03
2. Date Started: 05-09-03
3. Date Due: 05-16-03 Rcvd 05-13-03
4. Date to Reviewers: 05-14-03
5. Date Review Comments Back to Validator: 5-19-03
6. Date Validator Dispositioned Comments are Transmitted Back to Reviewers: 5-22-03
7. Review Complete? Yes No
8. If no, continue to follow steps 5 and 6 above until it is.

Comments Rcvd from Rich 5-15-03
Comments Rcvd from Cheryl 5-19-03

Back to Bruce 5-19-03

Chain + RCR (Cheryl's given to Rich 5-20 to generate SDR for dates missing from COC (Cheryl's comment on RCR).

✓ with Rich on SDR

Give to Rich 5-22-03 to see if Bruce dispositioned his comments correctly.

Validation Review Form

Date: 5-14-03	COA: C17HXK671C
SDG Number: H2180	Validation Report Title: Remaining Sites Confirmation Sampling - Waste Sites 100-K-30 + 100-K-33
Remaining Sites Expedited Validation Review? Yes X No ____	Comment Due Date: 5-16-03
Reviewers: R. L. Weiss C. L. Volkman Project	
Additional Comments:	

REVIEW COMMENT RECORD (RCR)

1. Date 05/15/03	2. Review No.		
3. Project No. CVP/Remaining Sites	4. Page 1 of 1		
5. Document Number(s)/Title(s) 2180 RLW 5-16-03 Validation Packages for SDG ~~2172~~	6. Program/Project/Building Number 100-K-30 & 100-K-33	7. Reviewer RL Weiss	8. Organization/Group S&DM
9. Location/Phone Sigma 1 372-9631			

17. Comment Submittal Approval: Organization Manager (Optional)	10. Agreement with indicated comment disposition(s) Reviewer/Point of Contract; Date; Author/Originator	11. 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	Inorganics; pg. 10; Sample numbers J00M41 through J00M48 are shown as J00K41 through J00K48 in table.	ok RLW	carried	
2	Wet Chem; pg. 10; Sample numbers J00M41 through J00M48 are shown as J00K41 through J00K48 in table.	5-22-03	carried	

MAY 19 '03 09:03AM BHI S&D MANAGEMENT 509 372 9487 P.4/4

Review Comment Record (RCR)

1. Date	2. Review No.
	ARQP-03-28
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 -2180	Remaining Sites confirmation Sampling – Waste Sites 100-K-30 & 100-K-33	Cheryl Volkman	ARQP – Quality Assurance	3350 GWW 509-372-9208

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

5/19/03
Date

C.L. Volkman
Reviewer/Point of Contact

C.L. Volkman
Author/Originator

11. CLOSED

5/27/03
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	Wet Chemistry – a) Introduction, Last paragraph does not identify the Sampling and Analysis Plan. Is there one? b) Inorganic Narrative – Page 14, 2. References an attached glossary. Please provide c) Chain of Custody – Page 16 – does not contain the Sample Date.		BHI 01249 Rev 3 attached sample dates included in field notes	Closed
2	Inorganics - a) Introduction, Last paragraph does not identify the Sampling and Analysis Plan. Is there one? b) Metals Case Narrative, 2. References a glossary – None is provided. c) Metals Case Narrative, 9. Refers to the Inorganics Laboratory Control Standards Report – None is provided d) Chain of Custody – Page 18 – does not contain the Sample Date e) Inorganic Analysis Data Validation Checklist – Section 3, comments section references samples 24 and 41. Sample 24 should be 27		BHI 01249 Rev 3 attached LCS is not validated under level C validation sample dates found in the field notes corrected	Closed

SDR-B603-041

MAY 19 '03 09:02AM BHI S&D MANAGEMENT 509 372 9487 P.3/4

SDR #: BS03-041
Revision#: 0
Date Initiated: 4/23/2003

SAMPLE DISPOSITION RECORD

SAF: B03-015

OU: SEE SAF COMMENT

Project ID: 100/600 Areas

Task ID: 1

Sampling Event: Remaining Sites Confirmation Sampling-Soil

Laboratory: TMA/RECRA

Task Manager: CARLSON, RA

Sampling Information:

Number of Samples: 10

ID Numbers: J00LX8,J00LX9,J00LY0,J00LY1,J00LY2,J00M29,J00M30,J00M31,J00M32,J00M33 (H2181)

Matrix: SOIL

Collection Date: 04/16/03-04/18/03

Issue Background:

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

Type: 2) Chain of Custody Problem

Description: Sample Date Not Indicated on Chain of Custody.

Disposition:

Description: Sample Date Not Indicated on Chain of Custody.

Justification: No sample date was indicated for the listed samples on the associated chain of custody. The sampling date was retrieved from the sampler's log book. Sample date and time are required to be entered on the chain of custody form.

Approval Signatures:

KESSNER, JH

Project Coordinator (Print/Sign) Date

CARLSON, RA

Task Manager (Print/Sign) Date

LIONVILLE LABORATORY INC.

5 May 2003

Joan Kessner
Bechtel-Hanford, Inc.
3190 Washington Way
MSIN H9-03
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0304L249
SDG #	H2180
SAF #	B03-015
Date Received	4-22-03
# Samples	12
Matrix	Soil
Volatiles	
Semivolatiles	
Pest/PCB	
DRO/KRO/GRO	
GC Alcohols	
Metals	X
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

RECEIVED MAY 2003

r:\group\pm\orlette\tmu-hanford\data\b_ltrs.doc

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

RECEIVED
MAY 2003

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03 LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00M27						
% SOLIDS	001	S	03L%S057	04/18/03	04/23/03	04/24/03
SULFATE BY IC	001	S	03LIC025	04/18/03	04/28/03	04/28/03
J00M29						
% SOLIDS	002	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	002	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	002	S	03LIC025	04/18/03	04/28/03	04/28/03
SULFATE BY IC	002 REP	S	03LIC025	04/18/03	04/28/03	04/28/03
SULFATE BY IC	002 MS	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	002	S	03LPH032	04/18/03	04/28/03	04/28/03
PH	002 REP	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M30						
% SOLIDS	003	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	003	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	003	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	003	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M31						
% SOLIDS	004	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	004	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	004	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	004	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M32						
% SOLIDS	005	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	005	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	005	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	005	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M33						
% SOLIDS	006	S	03L%S057	04/18/03	04/23/03	04/24/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03 LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	006	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	006	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	006	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M41						
% SOLIDS	007	S	03L%S057	04/18/03	04/23/03	04/24/03
SULFATE BY IC	007	S	03LIC025	04/18/03	04/28/03	04/28/03
J00M44						
% SOLIDS	008	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	008	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	008	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	008	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M45						
% SOLIDS	009	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	009	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	009	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	009	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M46						
% SOLIDS	010	S	03L%S057	04/18/03	04/23/03	04/24/03
% SOLIDS	010 REP	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	010	S	03LVI027	04/18/03	04/25/03	04/25/03
CHROMIUM VI	010 REP	S	03LVI027	04/18/03	04/25/03	04/25/03
CHROMIUM VI	010 MS	S	03LVI027	04/18/03	04/25/03	04/25/03
CHROMIUM VI	010 MSD	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	010	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	010	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M47						
% SOLIDS	011	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	011	S	03LVI027	04/18/03	04/25/03	04/25/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03

LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFATE BY IC	011	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	011	S	03LPH032	04/18/03	04/28/03	04/28/03
J00M48						
% SOLIDS	012	S	03L%S057	04/18/03	04/23/03	04/24/03
CHROMIUM VI	012	S	03LVI027	04/18/03	04/25/03	04/25/03
SULFATE BY IC	012	S	03LIC025	04/18/03	04/28/03	04/28/03
PH	012	S	03LPH032	04/18/03	04/28/03	04/28/03
LAB QC:						
SULFATE BY IC	MB1	S	03LIC025	N/A	04/28/03	04/28/03
SULFATE BY IC	MB1 BS	S	03LIC025	N/A	04/28/03	04/28/03
CHROMIUM VI	MB1	S	03LVI027	N/A	04/25/03	04/25/03
CHROMIUM VI	MB1 BS	S	03LVI027	N/A	04/25/03	04/25/03
CHROMIUM VI	MB1 BSD	S	03LVI027	N/A	04/25/03	04/25/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015 H2180
LVL#: 0304L249

W.O.#: 11343-606-001-9999-00
Date Received: 04-22-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 12 soil samples.

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

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

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

5. The method blanks were within the method criteria.

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

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

8. The replicate analyses for Sulfate, pH, 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

5/1/03
Date

njp\i04-249

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 ~~17~~ 18 pages. 5/5/03

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3047

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		✓ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: Sulfate **Method:** EPA 300.0 (mod.)

Other: **Method**

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/29/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00M27	% Solids	100	%	0.01	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
-002	J00M29	% Solids	93.0	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	822	MG/KG	134	100
		pH	6.8	PH UNIT	0.01	1.0
-003	J00M30	% Solids	94.2	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	2630	MG/KG	133	100
		pH	7.2	PH UNIT	0.01	1.0
-004	J00M31	% Solids	95.1	%	0.01	1.0
		Chromium VI	0.70	MG/KG	0.42	1.0
		Sulfate by IC	5.0	MG/KG	1.3	1.0
		pH	8.4	PH UNIT	0.01	1.0
-005	J00M32	% Solids	92.9	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	1440	MG/KG	67.3	50.0
		pH	6.7	PH UNIT	0.01	1.0
-006	J00M33	% Solids	94.3	%	0.01	1.0
		Chromium VI	0.65	MG/KG	0.42	1.0
		Sulfate by IC	1580	MG/KG	66.3	50.0
		pH	6.7	PH UNIT	0.01	1.0

6A

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J00M41	% Solids	100	%	0.01	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
-008	J00M44	% Solids	91.4	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	220	MG/KG	13.7	10.0
		pH	6.2	PH UNIT	0.01	1.0
-009	J00M45	% Solids	90.7	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	2670	MG/KG	138	100
		pH	6.2	PH UNIT	0.01	1.0
-010	J00M46	% Solids	90.2	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	191	MG/KG	13.9	10.0
		pH	6.9	PH UNIT	0.01	1.0
-011	J00M47	% Solids	91.4	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	3490	MG/KG	137	100
		pH	7.2	PH UNIT	0.01	1.0
-012	J00M48	% Solids	93.1	%	0.01	1.0
		Chromium VI	19.2	MG/KG	0.86	2.0
		Sulfate by IC	206	MG/KG	13.4	10.0
		pH	6.2	PH UNIT	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LIC025-MB1	Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	03LVI027-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J00M29	Sulfate by IC	3670	822	2690	105.8	100
-010	J00M46	Soluble Chromium VI	4.4	-0.02	4.4	99.8	1.0
		Insoluble Chromium VI	1400	-0.02	1300	107.4	100
BLANK10	03LIC025-MB1	Sulfate by IC	24.6	1.2 u	25.0	98.2	1.0
BLANK10	03LVI027-MB1	Soluble Chromium VI	3.9	0.40u	4.0	98.2	1.0
		Insoluble Chromium VI	1580	0.40u	1510	104.6	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J00M29	Sulfate by IC	822	751	9.0	100
		pH	6.8	6.9	0.4	1.0
-010REP	J00M46	% Solids	90.2	90.2	0.078	1.0
		Chromium VI	0.44u	0.44u	NC	1.0

Lionville Laboratory Use Only

03041249

Custody Transfer Record/Lab Work Request

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B03-015

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: spec Del: STD TAT: 7 days

Date Rec'd: 4-22-03 Date Due: 4-29-03

		A	B	C	D
Refrigerator #		6	6	→	
#/Type Container	Liquid				
	Solid	1aq	1aq	1aq	1aq
Volume	Liquid				
	Solid	60	120	120	250
Preservatives		—	—	—	—
ANALYSES REQUESTED →	ORGANIC: VOA				
	BNA				
	Pest/PCB				
	Herb				
	INORG: Metal				
	CN				
	Anions				
	Hex Chrom				
	TPH				

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only: MRCRA70	ICS04	ICR6	TPH
001	J00M27			S	4-18-03	0810	X	X		
002	J00M29					0815	X	X	X	X
003	J00M30					0820	X	X	X	X
004	J00M31					0830	X	X	X	X
005	J00M32					0840	X	X	X	X
006	J00M33					0840	X	X	X	X
007	J00M41					1339	X	X		
008	J00M44					1340	X	X	X	X
009	J00M45					1345	X	X	X	X
010	J00M46					1355	X	X	X	X

Special Instructions: SAF # B03-015

Run Matrix QC (do not use samples -001 or -007)

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # See below
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 2.0 °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

7902 6627 5088 / 1.3°C 7902 6627 4997

7902 6627 5733 / 3.1°C

Relinquished by	Received by	Date	Time
Leo Ex	D. Smith	4-22-03	0925

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Lionville Laboratory Use Only

0304L249

Custody Transfer Record/Lab Work Request

Page ___ of ___

LVLI — LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford B03.015

Est. Final Proj. Sampling Date:

Project #: See page 1

Project Contact/Phone #:

Lionville Laboratory Project Manager: Orlette Johnson

QC: ___ Del: ___ TAT: 7 Days

Date Rec'd: 4.22.03 Date Due:

		A	B	C	D
Refrigerator #		6			
#/Type Container	Liquid				
	Solid	1qg	1qg	1qg	1qg
Volume	Liquid				
	Solid	60	120	120	250
Preservatives		—	—	—	—
ANALYSES REQUESTED	ORGANIC: VOA				
	ORGANIC: BNA				
	ORGANIC: Pest/PCB				
	ORGANIC: Herb				
	INORG: Metal				
	INORG: CN				
	INORG: IC Anions				
	INORG: Hex Chrome				
	INORG: PH				

MATRIX CODES:
- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- L - EP/TCLP Leachate
- WI - Wipe
- X - Other
- F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only: MACRATO	ICSOY	ICR6	IPH
011	J00M47			S	4.18.03	1405	X	X	X	X
012	J00M48			L	L	1340	X	X	X	X

Special Instructions:

DATE/REVISIONS:
1. ___
2. ___
3. ___
4. ___
5. ___
6. ___

Lionville Laboratory Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. ___ °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

Relinquished by	Received by	Date	Time
Neal S.	D. Smith	4.22.03	0925

Relinquished by	Received by	Date	Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

B03-015-62

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 521-2090	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-K-30, KE (west tank)		SAF No.: B03-015
Ice Chest No.: ERC 02 104	Field Logbook No.: EL 1578	COA: C17HXK671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030213		Bill of Lading/Air Bill No.: SEE OPC

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	60mL	120mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0 (Sulfate)										
Sample No. / Matrix * / Sample Date / Sample Time												
J00M27 / SOIL / 4-18-03 / 0810	X	X										

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: D049	Doug Bowers DOUG BOWERS	4/18-03/1600
Received By/Stored In: REF 3C 3728		4-18-03/1600
Relinquished By/Removed From: REF 3C 3728		42103 1000
Received By/Stored In: SJOHNSON		42103 1000
Relinquished By/Removed From: SJOHNSON		42103 1000
Received By/Stored In: FED EX		
Relinquished By/Removed From: FED EX		4-22-03 0925
Received By/Stored In:		4-22-03 09:25
Relinquished By/Removed From:		
Received By/Stored In:		
Relinquished By/Removed From:		
Received By/Stored In:		

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Do not use for Q.A., Q.C.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-64	Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 521-2090	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-K-30, KE (west tank)	SAF No.: B03-015	
Ice Chest No.: GRC 02 104	Field Logbook No.: EL 1578	COA: C17HXK671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030213	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C	Cool 4C	None							
Type of Container	aG	~~G/P~~ aG DAS	aG	G/P							
No. of Container(s)	1	1	1	1							
Volume	60mL	~~125~~ 120 ml DAS 4/16/03	120mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0 (Sulfate)	pH (Soil) - 9045							
Sample No. / Matrix * / Sample Date / Sample Time											
J00M29 / SOIL / / 0815	X	X	X	X							
J00M30 / SOIL / / 0820	X	X	X	X							
J00M31 / SOIL / / 0830	X	X	X	X							
J00M32 / SOIL / / 0840	X	X	X	X							
J00M33 / SOIL / / 0840	X	X	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D Bowers	4-18-03/1600	RJF 3C 3728	4-18-03/1600
RJF 3C 3728	42103 1000	SJGOLES/Sole	42103 1000
SJGOLES/Sole	42103 1000	FED EX	
Fed Ex	4-22-03 0925	D. Mann	4-22-03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-66	Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson — Telephone No.: 521-2090	Project Coordinator: KESSNER, JH	Price Code: 8B — Data Turnaround: 7 Days
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-K-33, KW (west tank)	SAF No.: B03-015	Air Quality ☐
Ice Chest No.: ERC 96 009	Field Logbook No.: EL 1578 — COA: C17HXK671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A030213	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	60mL	120mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0 (Sulfate)										

Sample No.	Matrix *	Sample Date	Sample Time										
J00M41	SOIL	4-18-03	1339	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	Bowers 4-18-03 1600	RAF 3C 3728	4-18-03 1600
REF 3C 3728	4 21 03 1000	SJ GALE	4 21 03 1000
SJ GALE	4 21 03 1000	FED EX	
Fed Ex	4-22-03 0925	D Mel	4-22-03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Do not use for Q.A./Q.C.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-67	Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 521-2090	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-K-33, KW (west tank)	SAF No.: B03-015	
Ice Chest No.: ERC 96 009	Field Logbook No.: EL 1578	COA: C17HXK671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030213	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C	Cool 4C	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	120mL	120mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0 (Sulfate)	pH (Soil) - 9045							
Sample No.	Matrix *	Sample Date	Sample Time								
J00M44	SOIL	4-18-03	1340	X	X	X	X				
J00M45	SOIL	4-18-03	1345	X	X	X	X				
J00M46	SOIL	4-18-03	1355	X	X	X	X				
J00M47	SOIL	4-18-03	1405	X	X	X	X				
J00M48	SOIL	4-18-03	1340	X	X	X	X				

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	Bowers 4-18-03 1600	RCF 3C 3728	4-18-03 1600
RCF 3C 3728	42103 1000	S J Gale	42103 1000
S J Gale	42103 1000	FED EX	
FED EX	4.22.03 0925	D Bowers	4.22.03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wl=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)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

:LIENT: TNU Hanford

urchase Order/Project:

DATE: 4-22-03

.AF# / SOW# / Release #: B03-015

.aboratory SDG #: 0304L249

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☒ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☐ Yes	☐ No	☒ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☒ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☒ N/A	☐ see Comment #
12. coc signed and dated?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 02-104 / 1.3°C

ERC 96-050 / 2.0°C

ERC 96-009 / 3.1°C

Laboratory Sample Custodian:

Laboratory Project Manager: D. Smith

RECEIVED MAY 2003

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03 LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00M27						
SILVER, TOTAL	001	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	001	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	001	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	001	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	001	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	001	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	001	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	001	S	03L0220	04/18/03	04/23/03	04/25/03
J00M29						
SILVER, TOTAL	002	S	03L0220	04/18/03	04/23/03	04/25/03
SILVER, TOTAL	002 REP	S	03L0220	04/18/03	04/23/03	04/25/03
SILVER, TOTAL	002 MS	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	002	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	002 REP	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	002 MS	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	002	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	002 REP	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	002 MS	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	002	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	002 REP	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	002 MS	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	002	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	002 REP	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	002 MS	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	002	S	03C0096	04/18/03	04/24/03	04/29/03
MERCURY, TOTAL	002 REP	S	03C0096	04/18/03	04/24/03	04/29/03
MERCURY, TOTAL	002 MS	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	002	S	03L0220	04/18/03	04/23/03	04/25/03
LEAD, TOTAL	002 REP	S	03L0220	04/18/03	04/23/03	04/25/03
LEAD, TOTAL	002 MS	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	002	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	002 REP	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	002 MS	S	03L0220	04/18/03	04/23/03	04/25/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03 LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00M30						
SILVER, TOTAL	003	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	003	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	003	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	003	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	003	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	003	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	003	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	003	S	03L0220	04/18/03	04/23/03	04/25/03
J00M31						
SILVER, TOTAL	004	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	004	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	004	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	004	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	004	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	004	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	004	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	004	S	03L0220	04/18/03	04/23/03	04/25/03
J00M32						
SILVER, TOTAL	005	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	005	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	005	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	005	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	005	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	005	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	005	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	005	S	03L0220	04/18/03	04/23/03	04/25/03
J00M33						
SILVER, TOTAL	006	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	006	S	03L0220	04/18/03	04/23/03	04/25/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03 LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BARIUM, TOTAL	006	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	006	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	006	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	006	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	006	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	006	S	03L0220	04/18/03	04/23/03	04/25/03
J00M41						
SILVER, TOTAL	007	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	007	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	007	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	007	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	007	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	007	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	007	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	007	S	03L0220	04/18/03	04/23/03	04/25/03
J00M44						
SILVER, TOTAL	008	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	008	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	008	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	008	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	008	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	008	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	008	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	008	S	03L0220	04/18/03	04/23/03	04/25/03
J00M45						
SILVER, TOTAL	009	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	009	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	009	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	009	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	009	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	009	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	009	S	03L0220	04/18/03	04/23/03	04/25/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03 LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	009	S	03L0220	04/18/03	04/23/03	04/25/03
J00M46						
SILVER, TOTAL	010	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	010	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	010	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	010	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	010	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	010	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	010	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	010	S	03L0220	04/18/03	04/23/03	04/25/03
J00M47						
SILVER, TOTAL	011	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	011	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	011	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	011	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	011	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	011	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	011	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	011	S	03L0220	04/18/03	04/23/03	04/25/03
J00M48						
SILVER, TOTAL	012	S	03L0220	04/18/03	04/23/03	04/25/03
ARSENIC, TOTAL	012	S	03L0220	04/18/03	04/23/03	04/25/03
BARIUM, TOTAL	012	S	03L0220	04/18/03	04/23/03	04/25/03
CADMIUM, TOTAL	012	S	03L0220	04/18/03	04/23/03	04/25/03
CHROMIUM, TOTAL	012	S	03L0220	04/18/03	04/23/03	04/25/03
MERCURY, TOTAL	012	S	03C0096	04/18/03	04/24/03	04/29/03
LEAD, TOTAL	012	S	03L0220	04/18/03	04/23/03	04/25/03
SELENIUM, TOTAL	012	S	03L0220	04/18/03	04/23/03	04/25/03

LAB QC:

SILVER LABORATORY	LC1 BS	S	03L0220	N/A	04/23/03	04/25/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2180

DATE RECEIVED: 04/22/03 LVL LOT # :0304L249

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1	S	03L0220	N/A	04/23/03	04/25/03
ARSENIC LABORATORY	LC1 BS	S	03L0220	N/A	04/23/03	04/25/03
ARSENIC, TOTAL	MB1	S	03L0220	N/A	04/23/03	04/25/03
BARIUM LABORATORY	LC1 BS	S	03L0220	N/A	04/23/03	04/25/03
BARIUM, TOTAL	MB1	S	03L0220	N/A	04/23/03	04/25/03
CADMIUM LABORATORY	LC1 BS	S	03L0220	N/A	04/23/03	04/25/03
CADMIUM, TOTAL	MB1	S	03L0220	N/A	04/23/03	04/25/03
CHROMIUM LABORATORY	LC1 BS	S	03L0220	N/A	04/23/03	04/25/03
CHROMIUM, TOTAL	MB1	S	03L0220	N/A	04/23/03	04/25/03
MERCURY LABORATORY	LC1 BS	S	03C0096	N/A	04/24/03	04/29/03
MERCURY, TOTAL	MB1	S	03C0096	N/A	04/24/03	04/29/03
LEAD LABORATORY	LC1 BS	S	03L0220	N/A	04/23/03	04/25/03
LEAD, TOTAL	MB1	S	03L0220	N/A	04/23/03	04/25/03
SELENIUM LABORATORY	LC1 BS	S	03L0220	N/A	04/23/03	04/25/03
SELENIUM, TOTAL	MB1	S	03L0220	N/A	04/23/03	04/25/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL#: 0304L249
SDG/SAF#: H2180/B03-015

W.O.#: 11343-606-001-9999-00
Date Received: 04-22-03

METALS CASE NARRATIVE

1. This narrative covers the analyses of 12 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 (80-120% for Mercury).

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

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

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

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

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. A serial dilution was performed for Mercury. Refer to the Inorganics Accuracy Report.

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

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

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 23 pages.

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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.

Pat G

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

05-02-03
Date

jjw/m04-249

LVLI
LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0304L249

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	__6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	__6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	__6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

L-WI-033/N-04/98

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00M27	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.67	MG/KG	0.35	1.0
		Barium, Total	5.2	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.32	MG/KG	0.06	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Lead, Total	0.71	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
-002	J00M29	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.5	MG/KG	0.36	1.0
		Barium, Total	50.9	MG/KG	0.01	1.0
		Cadmium, Total	0.22	MG/KG	0.04	1.0
		Chromium, Total	15.2	MG/KG	0.06	1.0
		Mercury, Total	15.0	MG/KG	0.41	25.0
		Lead, Total	14.4	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-003	J00M30	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.4	MG/KG	0.37	1.0
		Barium, Total	65.1	MG/KG	0.01	1.0
		Cadmium, Total	0.26	MG/KG	0.04	1.0
		Chromium, Total	13.7	MG/KG	0.06	1.0
		Mercury, Total	17.5	MG/KG	0.33	25.0
		Lead, Total	36.0	MG/KG	0.28	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
-004	J00M31	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.6	MG/KG	0.34	1.0
		Barium, Total	61.8	MG/KG	0.01	1.0
		Cadmium, Total	0.64	MG/KG	0.04	1.0
		Chromium, Total	12.5	MG/KG	0.06	1.0
		Mercury, Total	4.3	MG/KG	0.40	25.0
		Lead, Total	22.2	MG/KG	0.26	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J00M32	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.1	MG/KG	0.35	1.0
		Barium, Total	66.1	MG/KG	0.01	1.0
		Cadmium, Total	0.04	MG/KG	0.04	1.0
		Chromium, Total	14.8	MG/KG	0.06	1.0
		Mercury, Total	12.0	MG/KG	0.41	25.0
		Lead, Total	19.1	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
-006	J00M33	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.8	MG/KG	0.34	1.0
		Barium, Total	69.7	MG/KG	0.01	1.0
		Cadmium, Total	0.05	MG/KG	0.04	1.0
		Chromium, Total	9.1	MG/KG	0.06	1.0
		Mercury, Total	10.6	MG/KG	0.37	25.0
		Lead, Total	19.4	MG/KG	0.26	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
-007	J00M41	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	0.32 u	MG/KG	0.32	1.0
		Barium, Total	0.92	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.06	MG/KG	0.06	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Lead, Total	0.34	MG/KG	0.24	1.0
		Selenium, Total	0.33 u	MG/KG	0.33	1.0
-008	J00M44	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	1.7	MG/KG	0.32	1.0
		Barium, Total	78.8	MG/KG	0.009	1.0
		Cadmium, Total	0.29	MG/KG	0.04	1.0
		Chromium, Total	28.5	MG/KG	0.05	1.0
		Mercury, Total	178	MG/KG	4.4	250
		Lead, Total	32.8	MG/KG	0.24	1.0
		Selenium, Total	0.33 u	MG/KG	0.33	1.0

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J00M45	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	1.6	MG/KG	0.38	1.0
		Barium, Total	77.7	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	7.0	MG/KG	0.07	1.0
		Mercury, Total	24.7	MG/KG	0.43	25.0
		Lead, Total	18.6	MG/KG	0.28	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
-010	J00M46	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	2.2	MG/KG	0.38	1.0
		Barium, Total	78.2	MG/KG	0.01	1.0
		Cadmium, Total	1.0	MG/KG	0.04	1.0
		Chromium, Total	12.1	MG/KG	0.07	1.0
		Mercury, Total	4.8	MG/KG	0.41	25.0
		Lead, Total	27.8	MG/KG	0.29	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
-011	J00M47	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.0	MG/KG	0.36	1.0
		Barium, Total	74.6	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	7.5	MG/KG	0.06	1.0
		Mercury, Total	6.8	MG/KG	0.44	25.0
		Lead, Total	11.4	MG/KG	0.27	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
-012	J00M48	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.2	MG/KG	0.36	1.0
		Barium, Total	74.8	MG/KG	0.01	1.0
		Cadmium, Total	0.18	MG/KG	0.04	1.0
		Chromium, Total	27.7	MG/KG	0.06	1.0
		Mercury, Total	252	MG/KG	4.1	250
		Lead, Total	32.8	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0220-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.03	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.13	MG/KG	0.06	1.0
		Lead, Total	0.35	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
BLANK1	03C0096-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J00M29	Silver, Total	5.0	0.08u	5.3	94.3	1.0
		Arsenic, Total	197	1.5	211	92.9	1.0
		Barium, Total	286	50.9	211	111.3	1.0
		Cadmium, Total	5.1	0.22	5.3	92.1	1.0
		Chromium, Total	37.3	15.2	21.1	104.7	1.0
		Mercury, Total	16.2	15.0	0.16	767.1*	25.0
		Lead, Total	66.8	14.4	52.7	99.4	1.0
		Selenium, Total	196	0.37u	211	92.8	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J00M29	Silver, Total	0.08u	0.08u	NC	1.0
		Arsenic, Total	1.5	1.9	23.5	1.0
		Barium, Total	50.9	60.1	16.6	1.0
		Cadmium, Total	0.22	0.24	11.8	1.0
		Chromium, Total	15.2	17.9	16.3	1.0
		Mercury, Total	15.0	16.3	8.4	25.0
		Lead, Total	14.4	19.3	29.1	1.0
		Selenium, Total	0.37u	0.36u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/30/03

CLIENT: TNUHANFORD B03-015 H2180

LVL LOT #: 0304L249

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	03L0220-LC1	Silver, LCS	50.3	50.0	MG/KG	100.6
		Arsenic, LCS	988	1000	MG/KG	98.8
		Barium, LCS	504	500	MG/KG	100.9
		Cadmium, LCS	25.0	25.0	MG/KG	100
		Chromium, LCS	51.0	50.0	MG/KG	102.0
		Lead, LCS	248	250	MG/KG	99.3
		Selenium, LCS	965	1000	MG/KG	96.5
LCS1	03C0096-LC1	Mercury, LCS	6.4	6.2	MG/KG	102.5

Lionville Laboratory Use Only

0304L249

Custody Transfer Record/Lab Work Request

LVLI Lionville Laboratory Inc.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B03-015

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 7 days

Date Rec'd: 4-22-03 Date Due: 4-29-03

		A	B	C	D
Refrigerator #		6	6	→	
#/Type Container	Liquid				
	Solid	1aq	1aq	1aq	1aq
Volume	Liquid				1
	Solid	60	120	120	250
Preservatives		—	—	—	—

ANALYSES REQUESTED →

ORGANIC				INORG					
VOA	BNA	Pest/PCB	Herb	Metal	CN	TC Anions	Hex Chrome	pH	
				Mercury	ICS04	ICP6	IPH		

Lionville Laboratory Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Mercury	ICS04	ICP6	IPH
001	J00M27			S	4-18-03	0810	X	X		
002	J00M29					0815	X	X	X	X
003	J00M30					0820	X	X	X	X
004	J00M31					0830	X	X	X	X
005	J00M32					0840	X	X	X	X
006	J00M33					0840	X	X	X	X
007	J00M41					1339	X	X		
008	J00M44					1340	X	X	X	X
009	J00M45					1345	X	X	X	X
010	J00M46					1355	X	X	X	X

Special Instructions: SAF # B03-015

Run Matrix QC (do not use samples -001 or -007)

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ___ or
Hand Delivered ___
Airbill # See below
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 2.0 °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 7902 6602 7508 8/1.3°C 7902 6602 4997

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	4-22-03	0921

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-62	Page 1 of 1

Collector Doug Bowers	Company Contact Renee Nielson	Telephone No. 521-2090	Project Coordinator KESSNER, JH	Price Code 8B	Data Turnaround 7 Days
Project Designation Remaining Sites Confirmation Sampling-Soil	Sampling Location 100-K-30, KE (west tank)		SAF No. B03-015	Air Quality ☐	
Ice Chest No. ERC 02 104	Field Logbook No. EL 1578	COA C17HXK671C	Method of Shipment Federal Express		
Shipped To TMA/RECRA	Offsite Property No. A030213		Bill of Lading/Air Bill No. SEE OPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	60mL	120mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0 (Sulfate)										
Sample No.	Matrix *	Sample Date	Sample Time									
J00M27	SOIL	4-18-03	0810	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	4/18-03/1600	REF 3C 3728	4/18-03/1600
REF 3C 3728	42103 1000	[illegible]	42103 1000
[illegible]	42103 1000	FED EX	
Fed Ex	4-22-03 0925	[illegible]	4-22-03 09.25

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for Q.A., Q.C.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-64	Page 1 of 1

Collector: Doug Bowers	Company Contact: Renee Nielson	Telephone No.: 521-2090	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-K-30, KE (west tank)	SAF No.: B03-015	
Ice Chest No.: GRC 02 104	Field Logbook No.: EL 1578	COA: C17HXK671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030213		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C	Cool 4C	None							
Type of Container	aG	~~G/P~~ aG DAS ~~4/16/03~~	aG	G/P							
No. of Container(s)	1	1	1	1							
Volume	60mL	~~125~~ 120 ml DAS 4/16/03	120mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0 (Sulfate)	pH (Soil) - 9045							

Sample No.	Matrix *	Sample Date	Sample Time										
J00M29	SOIL		0815	X	X	X	X						
J00M30	SOIL		0820	X	X	X	X						
J00M31	SOIL		0830	X	X	X	X						
J00M32	SOIL		0840	X	X	X	X						
J00M33	SOIL		0840	X	X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	4-18-03/1600	Ref 3C 3728	4-18-03/1600
Ref 3C 3728	42103 1000	SJGOLE [illegible]	42103 1000
SJGOLE [illegible]	42103 1000	FED EX	
Fed Ex	4-22-03 0925	[illegible]	4-22-03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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)

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Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-66	Page 1 of 1

Collector Doug Bowers	Company Contact Renee Nielson	Telephone No. 521-2090	Project Coordinator KESSNER, JH
Project Designation Remaining Sites Confirmation Sampling-Soil	Sampling Location 100-K-33, KW (west tank)		SAF No. B03-015
Ice Chest No. ERC 96 009	Field Logbook No. EL 1578	COA C17HXK671C	Method of Shipment Federal Express
Shipped To TMA/RECRA	Offsite Property No. A030213		Bill of Lading/Air Bill No. SEE OSPC

Price Code 8B

Air Quality ☐

Data Turnaround 7 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	60mL	120mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0 (Sulfate)										

Sample No.	Matrix *	Sample Date	Sample Time										
J00M41	SOIL	4-18-03	1339	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D Doug Bowers Bowers	4-18-03 1600	R of 3C 3728	4-18-03 1600
REF 3C 3728	42103 1000	SJGALE	42103 1000
SJGALE	42103 1000	FED EX	
Fed Ex	4.22-03 0925	D Mel	4.22-03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Do not use for Q.A./Q.C.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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

21

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-67	Page 1 of 1

Collector Doug Bowers	Company Contact Renee Nielson	Telephone No. 521-2090	Project Coordinator KESSNER, JH	Price Code 8B	Data Turnaround 7 Days
Project Designation Remaining Sites Confirmation Sampling-Soil	Sampling Location 100-K-33, KW (west tank)		SAF No. B03-015	Air Quality ☐	
Ice Chest No. ERC 96 009	Field Logbook No. EL 1578	COA C17HXK671C	Method of Shipment Federal Express		
Shipped To TMA/RECRA	Offsite Property No. A030213		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Preservation	None	Cool 4C	Cool 4C	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	120mL	120mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0 (Sulfate)	pH (Soil) - 9045							

Sample No.	Matrix *	Sample Date	Sample Time											
J00M44	SOIL	4-18-03	1340	X	X	X	X							
J00M45	SOIL	4-18-03	1345	X	X	X	X							
J00M46	SOIL	4-18-03	1355	X	X	X	X							
J00M47	SOIL	4-18-03	1405	X	X	X	X							
J00M48	SOIL	4-18-03	1340	X	X	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D Bowers / Doug Bowers	4-18-03 / 1600	REF 3C 3728	4-18-03 / 1600
REF 3C 3728	42103 1000	S Gale	42103 1000
S Gale	42103 1000	FED EX	
FED EX	4.22.03 0925	D Mullen	4.22.03 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/21/03

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

.IENT: TNU Hanford **DATE:** 4-22-03

rchase Order/Project:

.F# / SOW# / Release #: B03-015

boratory SDG #: 0304L249

OTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☐ Yes	☐ No	☑ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 02-104 / 1.3°C

ERC 96-050 / 2.0°C

ERC 96-009 / 3.1°C

Laboratory Sample Custodian: D. Griffith

Laboratory Project Manager: