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SAF-RC-020
100-BC Burial Grounds – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 DE 08/31/06
INITIAL/DATE

COMMENTS:

SDG K0438 SAF-RC-020

Waste Site: 120-B-1 Acid Sump

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SEP 25 2006
EDMC

Date: 23 August 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100BC Burial Grounds – Soil Full Protocol - Waste Sites 120-B-1 Acid Sump
Subject: Inorganics - Data Package No. K0438-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0438 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	Date
J12N48	6/13/06	Soil	C	See note 1
J12N49	6/13/06	Soil	C	See note 1
J12N50	6/13/06	Soil	C	See note 1
J12N51	6/13/06	Soil	C	See note 1
J12N52	6/13/06	Soil	C	See note 1
J12N53	6/13/06	Soil	C	See note 1
J12N54	6/13/06	Soil	C	See note 1
J12N55	6/13/06	Soil	C	See note 1
J12NC1	6/13/06	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). 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 28 days for mercury and 6 months for ICP metals.

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 "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

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

Due to method blank contamination, the boron result in samples J12N49, J12N51, J12N52 and J12N54 were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank was submitted for analysis (J12N55). Aluminum, barium, calcium, chromium, copper, iron, potassium, magnesium, sodium, silicon & zinc were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations.

Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a 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 recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (188.2%), all calcium results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (52.5%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (43.6%), all silicon results were qualified as estimates and flagged "J".

All other accuracy 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 duplicates (J12N49/J12N50) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The following RPDs were outside QC limits: Boron (159%), barium (91%), calcium (34%), chromium (57%), iron (32%) and magnesium (34%). Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. Seven silver, seven cadmium and eight selenium results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data package No. K0438 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

The following minor deficiencies were noted:

- Due to method blank contamination, the boron result in samples J12N49, J12N51, J12N52 and J12N54 were qualified as estimates and flagged "UJ".

- Due to a matrix spike recovery outside QC limits (188.2%), all calcium results were qualified as estimates and flagged "J".

- Due to a matrix spike recovery outside QC limits (52.5%), all antimony results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits (43.6%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH 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.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH 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

METALS DATA QUALIFICATION SUMMARY*

SDG: K0438	REVIEWER: TLI	Project: 120-B-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Boron	UJ	J12LN9, J12N51, J12N52 J12N54	Method blank contamination
Calcium	J	All	MS recovery
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0438																		
Sample Numbe		J12N48		J12N49		J12N50		J12N51		J12N52		J12N53		J12N54		J12N55		J12NC1	
Remarks						Duplicate										E. Blank			
Sample Date		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.22	U	0.25	U	0.23	U	0.23	U	0.22	U	0.24	U	0.23		0.07	U	3.8	
Aluminum		5120		4430		4550		6250		6570		6700		4830		30.0		11700	
Arsenic	10	3.6		2.2	U	2.0	U	5.0		3.3		3.6		2.0	U	0.58	U	11.0	
Boron		1.6		0.92	UJ	8.1		1.3	UJ	1.1	UJ	1.8		1.1	UJ	0.23	U	4.2	
Barium	2	63.4		50.0		135		89.7		75.6		102		52.5		1.1		126	
Beryllium		0.18		0.07	U	0.07		0.11		0.31		0.12		0.06	U	0.02	U	0.22	
Calcium		8150	J	3230	J	4570	J	5570	J	3890	J	6260	J	2250	J	18.6	J	17300	J
Cadmium	0.2	0.22	U	0.25	U	0.23	U	0.23	U	0.22	U	0.24	U	0.23	U	0.07	U	1.4	
Cobalt		7.8		4.7		3.6		5.5		9.1		7.6		5.7		0.13	U	8.1	
Chromium	1	18.6		151		273		200		61.6		52.6		142		0.15		109	
Copper		17.9		13.1		11.8		18.4		16.7		19.8		12.7		0.25		130	
Iron		20300		16100		11600		19300		16800		23200		21100		108		12300	
Mercury	0.2	0.02	U	0.04		0.04		0.02	U	0.02	U	0.09		0.03		0.02	U	6.5	
Potassium		882		772		622		1110		880		1140		736		14.9		548	
Magnesium		3810		2920		2060		3680		3760		3740		2840		5.6		6040	
Manganese		295		157		147		230		336		319		185		3.6		361	
Molybdenum		0.92	U	2.3		1.7		1.0		0.93	U	2.1		2.1		0.28	U	8.2	
Sodium		228		230		198		158		134		373		140		6.5		5200	
Nickel		9.0		7.7		6.6		12.3		13.8		12.9		7.5		0.23	U	25.7	
Lead	5	5.0		15.1		11.9		6.1		4.6		15.4		10.0		0.30	U	4550	
Antimony		1.4	UJ	1.6	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.5	UJ	1.4	UJ	0.42	UJ	17.0	J
Selenium	1	1.5	U	1.7	U	1.5	U	1.6	U	1.5	U	1.6	U	1.5	U	0.45	U	3.3	U
Silicon		1050	J	524	J	631	J	755	J	688	J	564	J	541	J	35.3	J	266	J
Vanadium		43.0		40.9		28.7		41.6		32.2		46.1		55.9		0.09	U	27.9	
Zinc	1	43.7		59.5		50.6		38.8		45.5		46.2		72.2		0.42		241	

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J12N48	Silver, Total	0.22 u	MG/KG	0.22	3.0
		Aluminum, Total	5120	MG/KG	9.2	3.0
		Arsenic, Total	3.6	MG/KG	1.9	3.0
		Boron, Total	1.6	MG/KG	0.76	3.0
		Barium, Total	63.4	MG/KG	0.06	3.0
		Beryllium, Total	0.18	MG/KG	0.06	3.0
		Calcium, Total	8150 J	MG/KG	5.2	3.0
		Cadmium, Total	0.22 u	MG/KG	0.22	3.0
		Cobalt, Total	7.8	MG/KG	0.45	3.0
		Chromium, Total	18.6	MG/KG	0.41	3.0
		Copper, Total	17.9	MG/KG	0.38	3.0
		Iron, Total	20300	MG/KG	11.1	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	882	MG/KG	7.2	3.0
		Magnesium, Total	3810	MG/KG	3.1	3.0
		Manganese, Total	295	MG/KG	0.1	3.0
		Molybdenum, Total	0.92 u	MG/KG	0.92	3.0
		Sodium, Total	228	MG/KG	2.4	3.0
		Nickel, Total	9.0	MG/KG	0.76	3.0
		Lead, Total	5.0	MG/KG	0.99	3.0
		Antimony, Total	1.4 u J	MG/KG	1.4	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	1050 J	MG/KG	7.2	3.0
		Vanadium, Total	43.0	MG/KG	0.29	3.0
		Zinc, Total	43.7	MG/KG	0.51	3.0

8/23/06

Lionville Laboratory, Inc.

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CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J12N49	Silver, Total	0.25 u	MG/KG	0.25	3.0
		Aluminum, Total	4430	MG/KG	10.2	3.0
		Arsenic, Total	2.2 u	MG/KG	2.2	3.0
		Boron, Total	0.92 UJ	MG/KG	0.85	3.0
		Barium, Total	50.0	MG/KG	0.07	3.0
		Beryllium, Total	0.07 u	MG/KG	0.07	3.0
		Calcium, Total	3230 J	MG/KG	5.8	3.0
		Cadmium, Total	0.25 u	MG/KG	0.25	3.0
		Cobalt, Total	4.7	MG/KG	0.49	3.0
		Chromium, Total	151	MG/KG	0.46	3.0
		Copper, Total	13.1	MG/KG	0.42	3.0
		Iron, Total	16100	MG/KG	12.3	3.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Potassium, Total	772	MG/KG	8.0	3.0
		Magnesium, Total	2920	MG/KG	3.4	3.0
		Manganese, Total	157	MG/KG	0.11	3.0
		Molybdenum, Total	2.3	MG/KG	1.0	3.0
		Sodium, Total	230	MG/KG	2.7	3.0
		Nickel, Total	7.7	MG/KG	0.85	3.0
		Lead, Total	15.1	MG/KG	1.1	3.0
		Antimony, Total	1.6 u J	MG/KG	1.6	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	524 J	MG/KG	8.0	3.0
		Vanadium, Total	40.9	MG/KG	0.32	3.0
		Zinc, Total	59.5	MG/KG	0.56	3.0

8/23/06

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INORGANICS DATA SUMMARY REPORT 06/29/06

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J12N50	Silver, Total	0.23 u	MG/KG	0.23	3.0
		Aluminum, Total	4550	MG/KG	9.4	3.0
		Arsenic, Total	2.0 u	MG/KG	2.0	3.0
		Boron, Total	8.1	MG/KG	0.79	3.0
		Barium, Total	135	MG/KG	0.07	3.0
		Beryllium, Total	0.07	MG/KG	0.07	3.0
		Calcium, Total	4570 J	MG/KG	5.4	3.0
		Cadmium, Total	0.23 u	MG/KG	0.23	3.0
		Cobalt, Total	3.6	MG/KG	0.46	3.0
		Chromium, Total	273	MG/KG	0.43	3.0
		Copper, Total	11.8	MG/KG	0.39	3.0
		Iron, Total	11600	MG/KG	11.4	3.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Potassium, Total	622	MG/KG	7.4	3.0
		Magnesium, Total	2060	MG/KG	3.2	3.0
		Manganese, Total	147	MG/KG	0.1	3.0
		Molybdenum, Total	1.7	MG/KG	0.95	3.0
		Sodium, Total	198	MG/KG	2.5	3.0
		Nickel, Total	6.6	MG/KG	0.79	3.0
		Lead, Total	11.9	MG/KG	1.0	3.0
		Antimony, Total	1.4 u J	MG/KG	1.4	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	631 J	MG/KG	7.4	3.0
		Vanadium, Total	28.7	MG/KG	0.29	3.0
		Zinc, Total	50.6	MG/KG	0.52	3.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438

LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J12N51	Silver, Total	0.23 u	MG/KG	0.23	3.0
		Aluminum, Total	6250	MG/KG	9.6	3.0
		Arsenic, Total	5.0	MG/KG	2.0	3.0
		Boron, Total	1.3 vJ	MG/KG	0.80	3.0
		Barium, Total	89.7	MG/KG	0.07	3.0
		Beryllium, Total	0.11	MG/KG	0.07	3.0
		Calcium, Total	5570 J	MG/KG	5.4	3.0
		Cadmium, Total	0.23 u	MG/KG	0.23	3.0
		Cobalt, Total	5.5	MG/KG	0.46	3.0
		Chromium, Total	200	MG/KG	0.43	3.0
		Copper, Total	18.4	MG/KG	0.40	3.0
		Iron, Total	19300	MG/KG	11.6	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1110	MG/KG	7.5	3.0
		Magnesium, Total	3680	MG/KG	3.2	3.0
		Manganese, Total	230	MG/KG	0.1	3.0
		Molybdenum, Total	1.0	MG/KG	0.96	3.0
		Sodium, Total	158	MG/KG	2.5	3.0
		Nickel, Total	12.3	MG/KG	0.80	3.0
		Lead, Total	6.1	MG/KG	1.0	3.0
		Antimony, Total	1.5 u J	MG/KG	1.5	3.0
		Selenium, Total	1.6 u	MG/KG	1.6	3.0
		Silicon, Total	755 J	MG/KG	7.5	3.0
		Vanadium, Total	41.6	MG/KG	0.30	3.0
		Zinc, Total	38.8	MG/KG	0.53	3.0

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INORGANICS DATA SUMMARY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J12N52	Silver, Total	0.22 u	MG/KG	0.22	3.0
		Aluminum, Total	6570	MG/KG	9.2	3.0
		Arsenic, Total	3.3	MG/KG	1.9	3.0
		Boron, Total	1.1 U J	MG/KG	0.77	3.0
		Barium, Total	75.6	MG/KG	0.06	3.0
		Beryllium, Total	0.31	MG/KG	0.06	3.0
		Calcium, Total	3890	MG/KG	5.2	3.0
		Cadmium, Total	0.22 u	MG/KG	0.22	3.0
		Cobalt, Total	9.1	MG/KG	0.45	3.0
		Chromium, Total	61.6	MG/KG	0.41	3.0
		Copper, Total	16.7	MG/KG	0.38	3.0
		Iron, Total	16800	MG/KG	11.1	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	880	MG/KG	7.2	3.0
		Magnesium, Total	3760	MG/KG	3.1	3.0
		Manganese, Total	336	MG/KG	0.1	3.0
		Molybdenum, Total	0.93 u	MG/KG	0.93	3.0
		Sodium, Total	134	MG/KG	2.4	3.0
		Nickel, Total	13.8	MG/KG	0.77	3.0
		Lead, Total	4.6	MG/KG	0.99	3.0
		Antimony, Total	1.4 u J	MG/KG	1.4	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	688 J	MG/KG	7.2	3.0
		Vanadium, Total	32.2	MG/KG	0.29	3.0
		Zinc, Total	45.5	MG/KG	0.51	3.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J12N53	Silver, Total	0.24 u	MG/KG	0.24	3.0
		Aluminum, Total	6700	MG/KG	10.0	3.0
		Arsenic, Total	3.6	MG/KG	2.1	3.0
		Boron, Total	1.8	MG/KG	0.84	3.0
		Barium, Total	102	MG/KG	0.07	3.0
		Beryllium, Total	0.12	MG/KG	0.07	3.0
		Calcium, Total	6260 J	MG/KG	5.7	3.0
		Cadmium, Total	0.24 u	MG/KG	0.24	3.0
		Cobalt, Total	7.6	MG/KG	0.49	3.0
		Chromium, Total	52.6	MG/KG	0.45	3.0
		Copper, Total	19.8	MG/KG	0.42	3.0
		Iron, Total	23200	MG/KG	12.2	3.0
		Mercury, Total	0.09	MG/KG	0.02	1.0
		Potassium, Total	1140	MG/KG	7.9	3.0
		Magnesium, Total	3740	MG/KG	3.4	3.0
		Manganese, Total	319	MG/KG	0.10	3.0
		Molybdenum, Total	2.1	MG/KG	1.0	3.0
		Sodium, Total	373	MG/KG	2.7	3.0
		Nickel, Total	12.9	MG/KG	0.84	3.0
		Lead, Total	15.4	MG/KG	1.1	3.0
		Antimony, Total	1.5 u J	MG/KG	1.5	3.0
		Selenium, Total	1.6 u	MG/KG	1.6	3.0
		Silicon, Total	564 J	MG/KG	7.9	3.0
		Vanadium, Total	46.1	MG/KG	0.31	3.0
		Zinc, Total	46.2	MG/KG	0.56	3.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J12N54	Silver, Total	0.23	MG/KG	0.23	3.0
		Aluminum, Total	4830	MG/KG	9.3	3.0
		Arsenic, Total	2.0 u	MG/KG	2.0	3.0
		Boron, Total	1.1 UJ	MG/KG	0.77	3.0
		Barium, Total	52.5	MG/KG	0.06	3.0
		Beryllium, Total	0.06 u	MG/KG	0.06	3.0
		Calcium, Total	2250 J	MG/KG	5.3	3.0
		Cadmium, Total	0.23 u	MG/KG	0.23	3.0
		Cobalt, Total	5.7	MG/KG	0.45	3.0
		Chromium, Total	142	MG/KG	0.42	3.0
		Copper, Total	12.7	MG/KG	0.39	3.0
		Iron, Total	21100	MG/KG	11.2	3.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Potassium, Total	736	MG/KG	7.3	3.0
		Magnesium, Total	2840	MG/KG	3.1	3.0
		Manganese, Total	185	MG/KG	0.1	3.0
		Molybdenum, Total	2.1	MG/KG	0.93	3.0
		Sodium, Total	140	MG/KG	2.4	3.0
		Nickel, Total	7.5	MG/KG	0.77	3.0
		Lead, Total	10.0	MG/KG	1.0	3.0
		Antimony, Total	1.4 u J	MG/KG	1.4	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	541 J	MG/KG	7.3	3.0
		Vanadium, Total	55.9	MG/KG	0.29	3.0
		Zinc, Total	72.2	MG/KG	0.51	3.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	J12N55	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	30.0	MG/KG	2.7	1.0
		Arsenic, Total	0.58 u	MG/KG	0.58	1.0
		Boron, Total	0.23 u	MG/KG	0.23	1.0
		Barium, Total	1.1	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	18.6 J	MG/KG	1.6	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.13 u	MG/KG	0.13	1.0
		Chromium, Total	0.15	MG/KG	0.12	1.0
		Copper, Total	0.25	MG/KG	0.11	1.0
		Iron, Total	108	MG/KG	3.3	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	14.9	MG/KG	2.2	1.0
		Magnesium, Total	5.6	MG/KG	0.92	1.0
		Manganese, Total	3.6	MG/KG	0.03	1.0
		Molybdenum, Total	0.28 u	MG/KG	0.28	1.0
		Sodium, Total	6.5	MG/KG	0.72	1.0
		Nickel, Total	0.23 u	MG/KG	0.23	1.0
		Lead, Total	0.30 u	MG/KG	0.30	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	35.3 J	MG/KG	2.2	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.42	MG/KG	0.15	1.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J12NC1	Silver, Total	3.8	MG/KG	0.49	3.0
		Aluminum, Total	11700	MG/KG	20.1	3.0
		Arsenic, Total	11.0	MG/KG	4.3	3.0
		Boron, Total	4.2	MG/KG	1.7	3.0
		Barium, Total	126	MG/KG	0.14	3.0
		Beryllium, Total	0.22	MG/KG	0.14	3.0
		Calcium, Total	17300 J	MG/KG	11.5	3.0
		Cadmium, Total	1.4	MG/KG	0.49	3.0
		Cobalt, Total	8.1	MG/KG	0.98	3.0
		Chromium, Total	109	MG/KG	0.91	3.0
		Copper, Total	130	MG/KG	0.84	3.0
		Iron, Total	12300	MG/KG	24.4	3.0
		Mercury, Total	6.5	MG/KG	0.17	5.0
		Potassium, Total	548	MG/KG	15.9	3.0
		Magnesium, Total	6040	MG/KG	6.8	3.0
		Manganese, Total	361	MG/KG	0.21	3.0
		Molybdenum, Total	8.2	MG/KG	2.0	3.0
		Sodium, Total	5200	MG/KG	5.3	3.0
		Nickel, Total	25.7	MG/KG	1.7	3.0
		Lead, Total	4550	MG/KG	2.2	3.0
		Antimony, Total	17.0 J	MG/KG	3.1	3.0
		Selenium, Total	3.3 u	MG/KG	3.3	3.0
		Silicon, Total	266 J	MG/KG	15.9	3.0
		Vanadium, Total	27.9	MG/KG	0.63	3.0
		Zinc, Total	241	MG/KG	1.1	3.0

8/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020
LVL#: 0606L291
SDG/SAF#: K0438/RC-020

W.O.#: 11343-606-001-9999-00
Date Received: 06-15-06

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 9 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All samples except for sample J12N55 were reported with a 3-fold dilution for ICP metals due to high concentrations and sample matrix.

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

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

6. 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.

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

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 43.6%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

9. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 33 pages.

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

10. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J12N46	Aluminum	66,000	96.7
	Calcium	60,000	97.0
	Iron	66,000	102.8
	Antimony	300	96.6
	Silicon	6,300	100.9

11. The duplicate analyses for 4 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 a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/5/06
Date

jjw/m06-291

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-016	Page 1 of 2

Collector: C. Martinez/D Bowers	Company Contact: Doug Bowers	Telephone No.: 509-531-0701	Project Coordinator: KESSNER, JH
Price Code: Air Quality	Data Turnaround: 14 days		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100 BC - 120-B-1 acid sump		SAF No.: RC-020
Ice Chest No.: TNU-052	Field Logbook No.: EFL 1173-8	CQA: R120B12000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060507		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

low pH

Special Handling and/or Storage

~~None~~ TRE 6-14-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	120mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	IC Anions - 300.0; pH (Soil) - 9045							

	Sample No.	Matrix *	Sample Date	Sample Time										
1	J12N48	SOIL	06/13/06	1205	✓	✓	✓	✓						
2	J12N49	SOIL		1235	✓	✓	✓	✓						
3	J12N50	SOIL		1240	✓	✓	✓	✓						
4	J12N51	SOIL		1250	✓	✓	✓	✓						
5	J12N52	SOIL	06/13/06	1255	✓	✓	✓	✓						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: C Martinez / C Martinez	1830 06/13/06	Received By/Stored In: 2B 3725 Ref	1830 06/13/06
Relinquished By/Removed From: 3708 #2B	6-14-06 1100	Received By/Stored In: TR Edmundson	6-14-06 1100
Relinquished By/Removed From: TR Edmundson	6-14-06 1500	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	6-15-06 0940	Received By/Stored In: [illegible]	6-15-06 0940
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Run Sulfate analysis on available material. EPA method 300.0

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #2B on 6/14/06

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
Ve=Vegetation
X=Other

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-016	Page 2 of 2

Collector C. Martinez/D Bowers	Company Contact Doug Bowers	Telephone No. 509-531-0701	Project Coordinator KESSNER, JH
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 100 BC - 120-B-1 acid sump		SAF No. RC-020
Ice Chest No. TNU-052	Field Logbook No. EFL 1173-8	COA R120B12000	Method of Shipment FED EX
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060507		Bill of Lading/Air Bill No. See OSPC

Price Code: Air Quality

Data Turnaround: 14 days

000000032

POSSIBLE SAMPLE HAZARDS/REMARKS

low pH

Special Handling and/or Storage

~~None~~ TRE 6-14-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	120mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	IC Anions - 300.0; pH (Soil) - 9045							

000025

	Sample No.	Matrix *	Sample Date	Sample Time										
6	J12N53	SOIL	06/13/06	1302	✓	✓	✓	✓						
7	J12N54	SOIL		1315	✓	✓	✓	✓						
8	J12N55	SOIL		1215	✓	TRE 6-14-06	✓	TRE 6-14-06						
9	J12NC1	SOIL	06/13/06	1420	✓	✓	✓	✓						

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: C. Martinez/C. Martinez, Date/Time 06/13/06 1830	Received By/Stored In: 3728 JB, Date/Time 06/13/06 1830
Relinquished By/Removed From: 3728 #2B 6-14-06 1100	Received By/Stored In: TR Edmundson 6-14-06 1100
Relinquished By/Removed From: TR Edmundson 6-14-06 1500	Received By/Stored In: Fed Ex, Date/Time
Relinquished By/Removed From: Fed Ex 6-15-06 0940	Received By/Stored In: 6-15-06 0940
Relinquished By/Removed From, Date/Time	Received By/Stored In, Date/Time
Relinquished By/Removed From, Date/Time	Received By/Stored In, Date/Time

SPECIAL INSTRUCTIONS

Run Sulfate analysis on available material. EPA method 300.0

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]: Mercury - 7470 - (CV)

Personnel not available to Relinquish samples from 3728 Ref #2B on 6/14/06

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

RHI-FF-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 120-B-1			DATA PACKAGE: K0438		
VALIDATOR: TLI		LAB: LLI		DATE: 8/19/00	
			SDG: K0438		

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

SAMPLES/MATRIX				
J12N48	J12N49	J12N50	J12N51	J12N52
J12N53	J12N54	J12N55	J12N61	
				Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: boron - UJ 49, 52, 54, 51

~~beryllium - UJ - 50, 51, 53~~ 8/20/01 ~~no Pts~~

EB - SS. al, Ba, Calcium, chromium, Cu, Fe, K, potassium, magnesium, sodium, silicon + zinc

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: MS calcium - 188% - J all no Pts

Antimony - 52.5 - J all

LCS Silicon 43.6 % - J all

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: FD Boron - 155% magnesium - 34%
Barium - 91%
Calcium - 34%
FD - chromium - 57%
Iron - 32

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~~

Results 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: Silver - 7 over
Cadmium - 7 over
Selenium - 8 over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0394-MB1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	2.9 u	MG/KG	2.9	1.0
		Arsenic, Total	0.61 u	MG/KG	0.61	1.0
		Boron, Total	0.29	MG/KG	0.24	1.0
		Barium, Total	0.03	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	3.0	MG/KG	1.6	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.14 u	MG/KG	0.14	1.0
		Chromium, Total	0.13 u	MG/KG	0.13	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	3.5 u	MG/KG	3.5	1.0
		Potassium, Total	2.3 u	MG/KG	2.3	1.0
		Magnesium, Total	0.97 u	MG/KG	0.97	1.0
		Manganese, Total	0.03 u	MG/KG	0.03	1.0
		Molybdenum, Total	0.29 u	MG/KG	0.29	1.0
		Sodium, Total	0.76	MG/KG	0.76	1.0
		Nickel, Total	0.24 u	MG/KG	0.24	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.44 u	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	2.3 u	MG/KG	2.3	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.16 u	MG/KG	0.16	1.0
BLANK1	06C0123-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J12N48	Silver, Total	4.9	0.22u	5.3	92.5	3.0
		Aluminum, Total	6650	5120	212	720.5*	3.0
		Arsenic, Total	198	3.6	212	91.7	3.0
		Boron, Total	96.9	1.6	106	89.8	3.0
		Barium, Total	269	63.4	212	96.9	3.0
		Beryllium, Total	5.2	0.18	5.3	94.6	3.0
		Calcium, Total	13100	8150	2650	188.2	3.0
		Cadmium, Total	4.7	0.22u	5.3	88.7	3.0
		Cobalt, Total	58.1	7.8	53.1	94.7	3.0
		Chromium, Total	41.3	18.6	21.2	107.1	3.0
		Copper, Total	44.2	17.9	26.5	99.2	3.0
		Iron, Total	21300	20300	106	942.3*	3.0
		Potassium, Total	3400	882	2650	94.9	3.0
		Magnesium, Total	6460	3810	2650	99.6	3.0
		Manganese, Total	356	295	53.1	115.3*	3.0
		Molybdenum, Total	99.5	0.92u	106	93.8	3.0
		Sodium, Total	2740	228	2650	94.7	3.0
		Nickel, Total	59.8	9.0	53.1	95.7	3.0
		Lead, Total	54.4	5.0	53.1	93.0	3.0
		Antimony, Total	27.9	1.4 u	53.1	52.5	3.0
		Selenium, Total	193	1.5 u	212	90.8	3.0
		Silicon, Total	1380	1050	106	312.2*	3.0
		Vanadium, Total	97.0	43.0	53.1	101.7	3.0
		Zinc, Total	100	43.7	53.1	106.6	3.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-005	J12N52	Mercury, Total	0.18	0.02u	0.16	109.4	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J12N48	Silver, Total	0.22u	0.22u	NC	3.0
		Aluminum, Total	5120	5240	2.2	3.0
		Arsenic, Total	3.6	4.5	22.2	3.0
		Boron, Total	1.6	1.8	11.8	3.0
		Barium, Total	63.4	60.3	5.0	3.0
		Beryllium, Total	0.18	0.16	16.8	3.0
		Calcium, Total	8150	10800	28.0	3.0
		Cadmium, Total	0.22u	0.22u	NC	3.0
		Cobalt, Total	7.8	6.7	15.2	3.0
		Chromium, Total	18.6	14.4	25.5	3.0
		Copper, Total	17.9	17.5	2.3	3.0
		Iron, Total	20300	18300	10.4	3.0
		Potassium, Total	882	817	7.6	3.0
		Magnesium, Total	3810	3810	0.084	3.0
		Manganese, Total	295	267	10.2	3.0
		Molybdenum, Total	0.92u	0.92u	NC	3.0
		Sodium, Total	228	246	7.3	3.0
		Nickel, Total	9.0	8.2	9.3	3.0
		Lead, Total	5.0	5.5	9.5	3.0
		Antimony, Total	1.4 u	1.4 u	NC	3.0
		Selenium, Total	1.5 u	1.5 u	NC	3.0
		Silicon, Total	1050	779	29.9	3.0
		Vanadium, Total	43.0	41.8	2.8	3.0
		Zinc, Total	43.7	50.9	15.2	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-005REP	J12N52	Mercury, Total	0.02u	0.02u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/29/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0394-LC1	Silver, LCS	48.8	50.0	MG/KG	97.6
		Aluminum, LCS	489	500	MG/KG	97.8
		Arsenic, LCS	922	1000	MG/KG	92.2
		Boron, LCS	467	500	MG/KG	93.3
		Barium, LCS	491	500	MG/KG	98.2
		Beryllium, LCS	23.8	25.0	MG/KG	95.2
		Calcium, LCS	2370	2500	MG/KG	94.7
		Cadmium, LCS	23.3	25.0	MG/KG	93.2
		Cobalt, LCS	242	250	MG/KG	97.0
		Chromium, LCS	48.5	50.0	MG/KG	97.0
		Copper, LCS	124	125	MG/KG	99.4
		Iron, LCS	489	500	MG/KG	97.7
		Potassium, LCS	2380	2500	MG/KG	95.3
		Magnesium, LCS	2350	2500	MG/KG	94.1
		Manganese, LCS	73.5	75.0	MG/KG	98.0
		Molybdenum, LCS	491	500	MG/KG	98.2
		Sodium, LCS	2420	2500	MG/KG	96.7
		Nickel, LCS	192	200	MG/KG	95.9
		Lead, LCS	238	250	MG/KG	95.4
		Antimony, LCS	283	300	MG/KG	94.3
		Selenium, LCS	890	1000	MG/KG	89.0
		Silicon, LCS	218	500	MG/KG	43.6
		Vanadium, LCS	245	250	MG/KG	97.8
		Zinc, LCS	94.0	100	MG/KG	94.0
LCS1	06C0123-LC1	Mercury, LCS	6.3	6.2	MG/KG	102.0

Date: 23 August 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100BC Burial Grounds – Soil Full Protocol - Waste Site 120-B-1 Acid Sump
Subject: PCB - Data Package No. K0438-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0438 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	Date
J12N48	6/13/06	Soil	C	PCBs by 8082
J12N49	6/13/06	Soil	C	PCBs by 8082
J12N50	6/13/06	Soil	C	PCBs by 8082
J12N51	6/13/06	Soil	C	PCBs by 8082
J12N52	6/13/06	Soil	C	PCBs by 8082
J12N53	6/13/06	Soil	C	PCBs by 8082
J12N54	6/13/06	Soil	C	PCBs by 8082
J12N55	6/13/06	Soil	C	PCBs by 8082
J12NC1	6/13/06	Soil	C	PCBs by 8082

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

One equipment blank was submitted for analysis (J12N55). All equipment blank results were acceptable.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J12N49/J12N50) were submitted for analysis. Field duplicates 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 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All undetected analytes in sample J12NC1 exceeded the RQL. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data Package No. K0438 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 undetected analytes in sample J12NC1 exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: K0438	REVIEWER: TLI	Project: 120-B-1	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0438																		
Sample Number		J12N48		J12N49		J12N50		J12N51		J12N52		J12N53		J12N54		J12N55		J12NC1	
Remarks						Duplicate										E. Blank			
Sample Date		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06	
Extraction Date		6/20/06		6/20/06		6/20/06		6/20/06		6/20/06		6/20/06		6/20/06		6/20/06		6/20/06	
Analysis Date		7/10/06		7/10/06		7/10/06		7/6/06		7/6/06		7/6/06		7/10/06		7/10/06		7/20/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	15	U	16	U	15	U	16	U	15	U	16	U	15	U	13	U	320	U
Aroclor-1221	100	9.8		16	U	15	U	16	U	15	U	16	U	15	U	13	U	320	U
Aroclor-1232	100	15	U	16	U	15	U	16	U	15	U	16	U	15	U	13	U	320	U
Aroclor-1242	100	15	U	16	U	15	U	16	U	15	U	16	U	15	U	13	U	320	U
Aroclor-1248	100	15	U	16	U	15	U	16	U	15	U	16	U	15	U	13	U	320	U
Aroclor-1254	100	15	U	16	U	15	U	16	U	15	U	16	U	15	U	13	U	1900	
Aroclor-1260	100	15	U	170		96		16	U	15	U	70		22		13	U	3600	

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.

PCBs by GC

Report Date: 07/20/06 10:19

RFW Batch Number: 0606L291 Client: TNUHANFORD RC-020 K0438 Work Order: 11343606001 Page: 1

	Cust ID:	J12N48	J12N49	J12N50	J12N51	J12N52	J12N52
Sample Information	RFW#:	001	002	003	004	005	005 MS
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		84 %	101 %	93 %	66 %	87 %	93 %
Decachlorobiphenyl		78 %	95 %	94 %	62 %	88 %	91 %
Aroclor-1016		15 U	16 U	15 U	16 U	15 U	85 %
Aroclor-1221		9.8 J	16 U	15 U	16 U	15 U	15 U
Aroclor-1232		15 U	16 U	15 U	16 U	15 U	15 U
Aroclor-1242		15 U	16 U	15 U	16 U	15 U	15 U
Aroclor-1248		15 U	16 U	15 U	16 U	15 U	15 U
Aroclor-1254		15 U	16 U	15 U	16 U	15 U	15 U
Aroclor-1260		15 U	170	96	16 U	15 U	90 %

	Cust ID:	J12N52	J12N53	J12N54	J12N55	J12NC1	PBLKKF
Sample Information	RFW#:	005 MSD	006	007	008	009	06LE0510-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	10.0	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		88 %	105 %	97 %	110 %	96 %	103 %
Decachlorobiphenyl		91 %	103 %	93 %	102 %	111 %	94 %
Aroclor-1016		85 %	16 U	15 U	13 U	320 U	13 U
Aroclor-1221		15 U	16 U	15 U	13 U	320 U	13 U
Aroclor-1232		15 U	16 U	15 U	13 U	320 U	13 U
Aroclor-1242		15 U	16 U	15 U	13 U	320 U	13 U
Aroclor-1248		15 U	16 U	15 U	13 U	320 U	13 U
Aroclor-1254		15 U	16 U	15 U	13 U	1900	13 U
Aroclor-1260		91 %	70	22	13 U	3600	13 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

K 8/23/06

B 7/24/06

000000006

000011

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 07/20/06 10:19

RFW Batch Number: 0606L291 Client: TNUHANFORD RC-020 K0438 Work Order: 11343606001 Page: 2

Cust ID: PBLKKF BS

Sample Information	RFW#:	06LE0510-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG

Surrogate:	Tetrachloro-m-xylene	68	%
	Decachlorobiphenyl	91	%

==========fl==========fl==========fl==========fl==========fl==========fl

Aroclor-1016	100	%
Aroclor-1221	13	U
Aroclor-1232	13	U
Aroclor-1242	13	U
Aroclor-1248	13	U
Aroclor-1254	13	U
Aroclor-1260	106	%

K 8/23/06

0000012

0000000007

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

7/31/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0606L291
SDG/SAF # K0438/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 06-15-2006

PCB

Nine (9) soil samples were collected on 06-15-2006.

The samples and their associated QC samples were extracted on 06-20-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 07-06,10,11,20-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were extracted and analyzed within required holding time.

2. All sample results were reported on a dry-weight basis.

3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.

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

5. All surrogate recoveries were within acceptance criteria.

6. The blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. Sample J12NC1 required a 10-fold dilution due to high concentration of target analytes. The reporting limits were adjusted to reflect the necessary dilution.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 1 pages.

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

LIONVILLE LABORATORY INC.

10. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria with the exception of CCVs analyzed on 07-10,11-2006 at 06:17 P.M and 02:01 A.M on the both columns. The data reflected an increase in instrument response, so the ability to identify the target compounds was not impaired. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

11. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/25/06
Date

som\r:\group\data\pest\tnu hanford\0606-291.pcbs

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 066C 315

Initiator: John Lach
Date: 7/12/06
Client: TAU

Batch: 0606L291
Samples: All
Method: SW846/MCAWW/CLP/

Parameter: PCB
Matrix: Soil
Prep Batch: 06LB0510

1. Reason for SDR

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

b. General Discrepancy

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

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

c. Problem (Include all relevant specific results; attach data if necessary)

Samples 1-3, 6-9 CLU elevated @ 17.5% on RTX-CLP2 column

Blank spike CLU elevated @ 17.6 + 16.4% Limit 15%

~~Samples~~ 1-7/11/06

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:

None. There is minimal impact to the data.

4. Project Manager Instructions...signature/date: _____

✓ __ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: _____

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-016	Page 1 of 2

Collector: C. Martinez/D Bowers	Company Contact: Doug Bowers	Telephone No.: 509-531-0701	Project Coordinator: KESSNER, JH
Price Code: Air Quality	Data Turnaround: 14 days		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100 BC - 120-B-1 acid sump		SAF No.: RC-020
Ice Chest No.: TNU-052	Field Logbook No.: EFL 1173-8	COA: R120B12000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060507		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

low pH

Special Handling and/or Storage

~~None~~ TRE 6-14-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	120mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	IC Anions - 300.0; pH (Soil) - 9045							

000017

	Sample No.	Matrix *	Sample Date	Sample Time										
1	J12N48	SOIL	06/13/06	1205	✓	✓	✓	✓						
2	J12N49	SOIL		1235	✓	✓	✓	✓						
3	J12N50	SOIL		1240	✓	✓	✓	✓						
4	J12N51	SOIL		1250	✓	✓	✓	✓						
5	J12N52	SOIL	06/13/06	1255	✓	✓	✓	✓						

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Edward Martinez / S. Martinez 06/13/06 — Date/Time 1830	Received By/Stored In: 2B 3720-3 Ref. — Date/Time 1830 06/13/06	
Relinquished By/Removed From: 3728 #2B 6-14-06 — Date/Time 1100	Received By/Stored In: T.R. Edmundson 6-14-06 — Date/Time 1100	
Relinquished By/Removed From: WCH T.R. Edmundson 6-14-06 — Date/Time 1500	Received By/Stored In: Fed Ex — Date/Time	
Relinquished By/Removed From: Fed Ex 6-15-06 — Date/Time 0940	Received By/Stored In: 6-15-06 — Date/Time 0940	
Relinquished By/Removed From — Date/Time	Received By/Stored In — Date/Time	
Relinquished By/Removed From — Date/Time	Received By/Stored In — Date/Time	

SPECIAL INSTRUCTIONS

Run Sulfate analysis on available material. EPA method 300.0

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 2B on 6/14/06

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 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-016	Page 2 of 2

Collector: C. Martinez/D Bowers	Company Contact: Doug Bowers	Telephone No.: 509-531-0701	Project Coordinator: KESSNER, JH
Price Code: Air Quality	Data Turnaround: 14 days		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100 BC - 120-B-1 acid sump		SAF No.: RC-020
Ice Chest No.: TNU-052	Field Logbook No.: EFL 1173-8	COA: R120B12000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060507		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

low pH

Special Handling and/or Storage

~~None~~ TRE 6-14-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	120mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	IC Anions - 300.0; pH (Soil) - 9045							

010000018

	Sample No.	Matrix *	Sample Date	Sample Time										
6	J12N53	SOIL	06/13/06	1302	✓	✓	✓	✓						
7	J12N54	SOIL		1315	✓	✓	✓	✓						
8	J12N55	SOIL		1215	✓	TRE 6-14-06	✓	TRE 6-14-06						
9	J12NC1	SOIL	06/13/06	1420	✓	✓	✓	✓						

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: [illegible] Date/Time: 06/13/06 1830	Received By/Stored In: 3728 JB Date/Time: 06/13/06 1830
Relinquished By/Removed From: 3728 #2B 6-14-06 1100	Received By/Stored In: [illegible] 6-14-06 1100
Relinquished By/Removed From: [illegible] 6-14-06 1500	Received By/Stored In: Fed Ex Date/Time:
Relinquished By/Removed From: Fed Ex 6-15-06 0940	Received By/Stored In: [illegible] 6-15-06 0940
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

SPECIAL INSTRUCTIONS

Run Sulfate analysis on available material. EPA method 300.0

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}, Mercury - 7470 - (CV)

Personnel not available to Relinquish samples from 3728 Ref #2B on 6/14/06

Matrix *

S=Soil
SD=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 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	120-B-1		DATA PACKAGE:	K0438	
VALIDATOR:	TLI	LAB: LLI		DATE: 8/20/06	
			SDG: K0438		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J12N48	J12N49	J12N50	J12N51		
J12N52	J12N53	J12N54	J12N55		
J12NC1					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

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

Surrogates analyzed? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: NO PAS

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: ~~FD - 1260 - RPD~~ 09/08/2016

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

Results 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 undects in NCI area

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 23 August 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100BC Burial Grounds – Soil Full Protocol – Waste Site 120-B-1 Acid Sump
Subject: Wet Chemistry - Data Package No. K0438-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0438 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	Date
J12N48	6/13/06	Soil	C	See note 1
J12N49	6/13/06	Soil	C	See note 1
J12N50	6/13/06	Soil	C	See note 1
J12N51	6/13/06	Soil	C	See note 1
J12N52	6/13/06	Soil	C	See note 1
J12N53	6/13/06	Soil	C	See note 1
J12N54	6/13/06	Soil	C	See note 1
J12NC1	6/13/06	Soil	C	See note 1

1 – Anions by 300.0, chromium VI by 7196A & pH by 9045C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). 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 bromide, chloride, fluoride and sulfate; 2 days for nitrate, nitrite and phosphate; 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 undetected nitrate, nitrite and phosphate results were rejected and flagged "UR".

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

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

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are

qualified "UJ". Samples with a 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 recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy 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 duplicates (J12N49/J12N50) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for nitrite was outside QC limits (97%). Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package K0438 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 79%.

MAJOR DEFICIENCIES

Due to the holding time being exceeded by greater than twice the limit, undetected nitrate, nitrite and phosphate results were rejected and flagged "UR". Rejected data is us unusable and should not be recorded.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

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

- 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 WCH 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.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH 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

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0438	REVIEWER: TLI	Project: 120-B-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate Nitrite Phosphate	UR	All undetected samples	Holding time
Nitrate Nitrite Phosphate	J	All detected samples	Holding time
pH	J	All	Holding time

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																	
Lab: LLI	SDG: K0438																
Sample Number		J12N48		J12N49		J12N50		J12N51		J12N52		J12N53		J12N54		J12NC1	
Remarks						Duplicate											
Sample Date		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06		6/15/06	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Bromide		2.5	U	2.5	U	3.0	U	2.9	U	2.4	U	3.2	U	2.8	U	127	U
Chloride		4.1		2.5	U	3.0	U	2.9	U	2.4	U	3.2	U	2.8	U	260	
Fluoride		2.5	U	2.5	U	3.0	U	2.9	U	3.8		6.4	U	2.8	U	127	U
Nitrate		2.54	UR	2.55	UR	3.03	UR	2.86	UR	2.40	UR	3.22	UR	2.84	UR	127	UR
Nitrite		2.54	UR	12.7	J	4.37	J	2.86	UR	3.10	J	18.9	J	3.16	J	141	J
Phosphate		2.5	UR	7.6	J	11.1	J	7.1	J	2.4	UR	3.2	UR	2.8	UR	127	UR
Chromium VI	0.5	0.36		0.24	U	0.34		0.27		0.36		0.30		0.38		0.61	
Sulfate	5	293		122		143		1890		126		5960		77.5		177000	
pH		10	J	8.5	J	9.2	J	8.1	J	7.8	J	6.6	J	6.2	J	2.5	J

000010

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/14/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J12N48	% Solids	89.8		%	0.01	1.0
		Bromide by IC	2.5	u	MG/KG	2.5	1.0
		Chloride by IC	4.1		MG/KG	2.5	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	2.54	uR	MG/KG	2.54	1.0
		Nitrate by IC	2.54	uR	MG/KG	2.54	1.0
		Phosphate by IC	2.5	uR	MG/KG	2.5	1.0
		Chromium VI	0.36		MG/KG	0.22	1.0
		Sulfate by IC	293		MG/KG	12.7	5.0
		pH	10	J	SOIL PH	0.01	1.0
-002	J12N49	% Solids	81.8		%	0.01	1.0
		Bromide by IC	2.5	u	MG/KG	2.5	1.0
		Chloride by IC	2.5	u	MG/KG	2.5	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	2.55	uR	MG/KG	2.55	1.0
		Nitrate by IC	12.7	J	MG/KG	2.55	1.0
		Phosphate by IC	7.6	J	MG/KG	2.5	1.0
		Chromium VI	0.24	u	MG/KG	0.24	1.0
		Sulfate by IC	122		MG/KG	5.1	2.0
		pH	8.5	J	SOIL PH	0.01	1.0
-003	J12N50	% Solids	87.2		%	0.01	1.0
		Bromide by IC	3.0	u	MG/KG	3.0	1.0
		Chloride by IC	3.0	u	MG/KG	3.0	1.0
		Fluoride by IC	3.0	u	MG/KG	3.0	1.0
		Nitrite by IC	3.03	uR	MG/KG	3.03	1.0
		Nitrate by IC	4.37	J	MG/KG	3.03	1.0
		Phosphate by IC	11.1	J	MG/KG	3.0	1.0
		Chromium VI	0.34		MG/KG	0.23	1.0
		Sulfate by IC	143		MG/KG	6.1	2.0
		pH	9.2	J	SOIL PH	0.01	1.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/14/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J12N51	% Solids	85.3		%	0.01	1.0
		Bromide by IC	2.9	u	MG/KG	2.9	1.0
		Chloride by IC	2.9	u	MG/KG	2.9	1.0
		Fluoride by IC	2.9	u	MG/KG	2.9	1.0
		Nitrite by IC	2.86	uR	MG/KG	2.86	1.0
		Nitrate by IC	2.86	uR	MG/KG	2.86	1.0
		Phosphate by IC	7.1	J	MG/KG	2.9	1.0
		Chromium VI	0.27		MG/KG	0.23	1.0
		Sulfate by IC	1890		MG/KG	143	50.0
		pH	8.1	J	SOIL PH	0.01	1.0
-005	J12N52	% Solids	89.5		%	0.01	1.0
		Bromide by IC	2.4	u	MG/KG	2.4	1.0
		Chloride by IC	2.4	u	MG/KG	2.4	1.0
		Fluoride by IC	3.8		MG/KG	2.4	1.0
		Nitrite by IC	2.40	uR	MG/KG	2.40	1.0
		Nitrate by IC	3.10	J	MG/KG	2.40	1.0
		Phosphate by IC	2.4	uR	MG/KG	2.4	1.0
		Chromium VI	0.36		MG/KG	0.22	1.0
		Sulfate by IC	126		MG/KG	12.0	5.0
		pH	7.8	J	SOIL PH	0.01	1.0
-006	J12N53	% Solids	81.9		%	0.01	1.0
		Bromide by IC	3.2	u	MG/KG	3.2	1.0
		Chloride by IC	3.2	u	MG/KG	3.2	1.0
		Fluoride by IC	6.4	u	MG/KG	6.4	2.0
		Nitrite by IC	3.22	uR	MG/KG	3.22	1.0
		Nitrate by IC	18.9	J	MG/KG	3.22	1.0
		Phosphate by IC	3.2	uR	MG/KG	3.2	1.0
		Chromium VI	0.30		MG/KG	0.24	1.0
		Sulfate by IC	5960		MG/KG	159	50.0
		pH	6.6	J	SOIL PH	0.01	1.0

8/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/14/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J12N54	% Solids	88.8		%	0.01	1.0
		Bromide by IC	2.8	u	MG/KG	2.8	1.0
		Chloride by IC	2.8	u	MG/KG	2.8	1.0
		Fluoride by IC	2.8	u	MG/KG	2.8	1.0
		Nitrite by IC	2.84	uR	MG/KG	2.84	1.0
		Nitrate by IC	3.16	J	MG/KG	2.84	1.0
		Phosphate by IC	2.8	uR	MG/KG	2.8	1.0
		Chromium VI	0.38		MG/KG	0.22	1.0
		Sulfate by IC	77.5		MG/KG	2.8	1.0
		pH	6.2	J	SOIL PH	0.01	1.0
-008	J12N55	% Solids	100		%	0.01	1.0
-009	J12NC1	% Solids	41.3		%	0.01	1.0
		Bromide by IC	127	u	MG/KG	127	20.0
		Chloride by IC	260		MG/KG	127	20.0
		Fluoride by IC	127	u	MG/KG	127	20.0
		Nitrite by IC	127	uR	MG/KG	127	20.0
		Nitrate by IC	141	J	MG/KG	127	20.0
		Phosphate by IC	127	uR	MG/KG	127	20.0
		Chromium VI	0.61		MG/KG	0.48	1.0
		Sulfate by IC	177000		MG/KG	6360	1000
		pH	2.5	J	SOIL PH	0.01	1.0

R 8/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020 K0438
LVL#: 0606L291

W.O.#: 11343-606-001-9999-00
Date Received: 06-15-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 9 soil samples.

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

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvLI certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

   Elevated reporting limits for Bromide, Fluoride, Nitrate and Phosphate are the result of the necessity to dilute the samples to diminish co-elution effects as well as matrix interferences.

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 Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Chromium VI and Sulfate were within the 75-125% control limits.

8. The replicate analyses for Bromide, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate and pH were within the 20% Relative Percent Difference (RPD) control limit however replicate analyses for Chloride and Chromium VI were outside the control limit that may be attributed to sample inhomogeneity.

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

7/17/06
Date

njp\06-291

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 18 pages.

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

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-020 K0438

RECEIVED
JUL 2006

DATE RECEIVED: 06/15/06 LVL LOT # 0606L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J12N48						
% SOLIDS	001	S	06L%S068	06/15/06	06/19/06	06/20/06
BROMIDE BY IC	001	S	06LICE62	06/15/06	06/28/06	06/28/06
BROMIDE BY IC	001 REP	S	06LICE62	06/15/06	06/28/06	06/28/06
BROMIDE BY IC	001 MS	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	001	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	001 REP	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	001 MS	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	001	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	001 REP	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	001 MS	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	001	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	001 REP	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	001 MS	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	001	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	001 REP	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	001 MS	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	001	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	001 REP	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	001 MS	S	06LICE62	06/15/06	06/28/06	06/28/06
CHROMIUM VI	001	S	06LVI062	06/15/06	06/29/06	06/29/06
CHROMIUM VI	001 REP	S	06LVI062	06/15/06	06/29/06	06/29/06
CHROMIUM VI	001 MS	S	06LVI062	06/15/06	06/29/06	06/29/06
CHROMIUM VI	001 MSD	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	001	S	06LICE62	06/15/06	06/28/06	06/28/06
SULFATE BY IC	001 REP	S	06LICE62	06/15/06	06/28/06	06/28/06
SULFATE BY IC	001 MS	S	06LICE62	06/15/06	06/28/06	06/28/06
PH	001	S	06LPH036	06/15/06	06/16/06	06/16/06
J12N49						
% SOLIDS	002	S	06L%S068	06/15/06	06/19/06	06/20/06
BROMIDE BY IC	002	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	002	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	002	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	002	S	06LICE62	06/15/06	06/28/06	06/28/06

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-020 K0438

DATE RECEIVED: 06/15/06 LVL LOT # :0606L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRATE BY IC	002	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	002	S	06LICE62	06/15/06	06/28/06	06/28/06
CHROMIUM VI	002	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	002	S	06LICE62	06/15/06	06/28/06	06/28/06
PH	002	S	06LPH036	06/15/06	06/16/06	06/16/06
J12N50						
% SOLIDS	003	S	06L%S068	06/15/06	06/19/06	06/20/06
BROMIDE BY IC	003	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	003	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	003	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	003	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	003	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	003	S	06LICE62	06/15/06	06/28/06	06/28/06
CHROMIUM VI	003	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	003	S	06LICE62	06/15/06	06/28/06	06/28/06
PH	003	S	06LPH036	06/15/06	06/16/06	06/16/06
J12N51						
% SOLIDS	004	S	06L%S068	06/15/06	06/19/06	06/20/06
BROMIDE BY IC	004	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	004	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	004	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	004	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	004	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	004	S	06LICE62	06/15/06	06/28/06	06/28/06
CHROMIUM VI	004	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	004	S	06LICE62	06/15/06	06/28/06	06/28/06
PH	004	S	06LPH036	06/15/06	06/16/06	06/16/06
J12N52						
% SOLIDS	005	S	06L%S068	06/15/06	06/19/06	06/20/06
BROMIDE BY IC	005	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	005	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	005	S	06LICE62	06/15/06	06/28/06	06/28/06

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-020 K0438

DATE RECEIVED: 06/15/06 LVL LOT # :0606L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRITE BY IC	005	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	005	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	005	S	06LICE62	06/15/06	06/28/06	06/28/06
CHROMIUM VI	005	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	005	S	06LICE62	06/15/06	06/28/06	06/28/06
PH	005	S	06LPH036	06/15/06	06/16/06	06/16/06
J12N53						
% SOLIDS	006	S	06L%S068	06/15/06	06/19/06	06/20/06
BROMIDE BY IC	006	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	006	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	006	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	006	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	006	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	006	S	06LICE62	06/15/06	06/28/06	06/28/06
CHROMIUM VI	006	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	006	S	06LIC063	06/15/06	07/03/06	07/03/06
PH	006	S	06LPH036	06/15/06	06/16/06	06/16/06
J12N54						
% SOLIDS	007	S	06L%S068	06/15/06	06/19/06	06/20/06
BROMIDE BY IC	007	S	06LICE62	06/15/06	06/28/06	06/28/06
CHLORIDE BY IC	007	S	06LICE62	06/15/06	06/28/06	06/28/06
FLUORIDE BY IC	007	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRITE BY IC	007	S	06LICE62	06/15/06	06/28/06	06/28/06
NITRATE BY IC	007	S	06LICE62	06/15/06	06/28/06	06/28/06
PHOSPHATE BY IC	007	S	06LICE62	06/15/06	06/28/06	06/28/06
CHROMIUM VI	007	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	007	S	06LICE62	06/15/06	06/28/06	06/28/06
PH	007	S	06LPH036	06/15/06	06/16/06	06/16/06
J12N55						
% SOLIDS	008	S	06L%S068	06/15/06	06/19/06	06/20/06
J12NC1						
% SOLIDS	009	S	06L%S068	06/15/06	06/19/06	06/20/06

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-020 K0438

DATE RECEIVED: 06/15/06 LVL LOT # :0606L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BROMIDE BY IC	009	S	06LIC063	06/15/06	07/03/06	07/03/06
CHLORIDE BY IC	009	S	06LIC063	06/15/06	07/03/06	07/03/06
FLUORIDE BY IC	009	S	06LIC063	06/15/06	07/03/06	07/03/06
NITRITE BY IC	009	S	06LIC063	06/15/06	07/03/06	07/03/06
NITRATE BY IC	009	S	06LIC063	06/15/06	07/03/06	07/03/06
PHOSPHATE BY IC	009	S	06LIC063	06/15/06	07/03/06	07/03/06
CHROMIUM VI	009	S	06LVI062	06/15/06	06/29/06	06/29/06
SULFATE BY IC	009	S	06LIC063	06/15/06	07/03/06	07/03/06
PH	009	S	06LPH036	06/15/06	06/16/06	06/16/06
PH	009 REP	S	06LPH036	06/15/06	06/16/06	06/16/06

LAB QC:

BROMIDE BY IC	MB1	S	06LICE62	N/A	06/27/06	06/27/06
BROMIDE BY IC	MB1 BS	S	06LICE62	N/A	06/27/06	06/27/06
CHLORIDE BY IC	MB1	S	06LICE62	N/A	06/27/06	06/27/06
CHLORIDE BY IC	MB1 BS	S	06LICE62	N/A	06/27/06	06/27/06
FLUORIDE BY IC	MB1	S	06LICE62	N/A	06/27/06	06/27/06
FLUORIDE BY IC	MB1 BS	S	06LICE62	N/A	06/27/06	06/27/06
NITRITE BY IC	MB1	S	06LICE62	N/A	06/27/06	06/27/06
NITRITE BY IC	MB1 BS	S	06LICE62	N/A	06/27/06	06/27/06
NITRATE BY IC	MB1	S	06LICE62	N/A	06/27/06	06/27/06
NITRATE BY IC	MB1 BS	S	06LICE62	N/A	06/27/06	06/27/06
PHOSPHATE BY IC	MB1	S	06LICE62	N/A	06/27/06	06/27/06
PHOSPHATE BY IC	MB1 BS	S	06LICE62	N/A	06/27/06	06/27/06
CHROMIUM VI	MB1	S	06LVI062	N/A	06/29/06	06/29/06
CHROMIUM VI	MB1 BS	S	06LVI062	N/A	06/29/06	06/29/06
CHROMIUM VI	MB1 BSD	S	06LVI062	N/A	06/29/06	06/29/06
SULFATE BY IC	MB1	S	06LICE62	N/A	06/27/06	06/27/06
SULFATE BY IC	MB1 BS	S	06LICE62	N/A	06/27/06	06/27/06
SULFATE BY IC	MB1	S	06LIC063	N/A	07/03/06	07/03/06
SULFATE BY IC	MB1 BS	S	06LIC063	N/A	07/03/06	07/03/06
BROMIDE BY IC	MB1	S	06LIC063	N/A	07/03/06	07/03/06
BROMIDE BY IC	MB1 BS	S	06LIC063	N/A	07/03/06	07/03/06
CHLORIDE BY IC	MB1	S	06LIC063	N/A	07/03/06	07/03/06
CHLORIDE BY IC	MB1 BS	S	06LIC063	N/A	07/03/06	07/03/06
FLUORIDE BY IC	MB1	S	06LIC063	N/A	07/03/06	07/03/06
FLUORIDE BY IC	MB1 BS	S	06LIC063	N/A	07/03/06	07/03/06

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-020 K0438

DATE RECEIVED: 06/15/06 LVL LOT # :0606L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRITE BY IC	MB1	S	06LIC063	N/A	07/03/06	07/03/06
NITRITE BY IC	MB1 BS	S	06LIC063	N/A	07/03/06	07/03/06
NITRATE BY IC	MB1	S	06LIC063	N/A	07/03/06	07/03/06
NITRATE BY IC	MB1 BS	S	06LIC063	N/A	07/03/06	07/03/06
PHOSPHATE BY IC	MB1	S	06LIC063	N/A	07/03/06	07/03/06
PHOSPHATE BY IC	MB1 BS	S	06LIC063	N/A	07/03/06	07/03/06

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-016	Page 1 of 1

Collector C. Martinez/D Bowers	Company Contact Doug Bowers	Telephone No. 509-531-0701	Project Coordinator KESSNER, JH
Price Code Air Quality	Data Turnaround 14 days		
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 100 BC - 120-B-1 acid sump		SAF No. RC-020
Ice Chest No. TNU-052	Field Logbook No. EFL 1173-8	CQA R120B12000	Method of Shipment FED EX
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060507		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

low pH

Special Handling and/or Storage

~~Non~~ TRR 6-14-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	120mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	IC Anions - 300.0; pH (Soil) - 9045							

1200021

	Sample No.	Matrix *	Sample Date	Sample Time										
1	J12N48	SOIL	06/13/06	1205	✓	✓	✓	✓						
2	J12N49	SOIL		1235	✓	✓	✓	✓						
3	J12N50	SOIL		1240	✓	✓	✓	✓						
4	J12N51	SOIL		1250	✓	✓	✓	✓						
5	J12N52	SOIL	06/13/06	1255	✓	✓	✓	✓						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From C. Martinez/C. Martinez	Date/Time 1830 06/13/06	Received By/Stored In 28 3728 Ref.	Date/Time 1830 06/13/06
Relinquished By/Removed From 3728 #28 6-14-06	Date/Time 1100	Received By/Stored In JR Edmundson 6-14-06	Date/Time 1100
Relinquished By/Removed From JR Edmundson 6-14-06	Date/Time 1500	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex 6-15-06	Date/Time 0940	Received By/Stored In 6-15-06	Date/Time 0940
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

Run Sulfate analysis on available material. EPA method 300.0

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #28 on 6/14/06

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 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-020-016	Page 2 of 2

Collector: C. Martinez/D Bowers	Company Contact: Doug Bowers	Telephone No.: 509-531-0701	Project Coordinator: KESSNER. JH
Price Code: Air Quality	Data Turnaround: 14 days		
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100 BC - 120-B-1 acid sump		SAF No.: RC-020
Ice Chest No.: TNU-052	Field Logbook No.: EFL 1173-8	COA: R120B12000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / JONVILLE	Offsite Property No.: A060507		Bill of Lading/Air Bill No.: See OSPC

000000017

POSSIBLE SAMPLE HAZARDS/REMARKS

low pH

Special Handling and/or Storage

~~None~~ TRE 6-14-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	120mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	IC Anions - 300.0; pH (Soil) - 9045							

000022

	Sample No.	Matrix *	Sample Date	Sample Time										
6	J12N53	SOIL	06/13/06	1302	✓	✓	✓	✓						
7	J12N54	SOIL		1315	✓	✓	✓	✓						
8	J12N55	SOIL		1215	✓	TRE 6-14-06	✓	TRE 6-14-06						
9	J12NC1	SOIL	06/13/06	1420	✓	✓	✓	✓						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: C. Martinez/C. Martinez	06/13/06 1830	Received By/Stored In: 3728 JB	06/13/06 1830
Relinquished By/Removed From: 3728 #2B	6-14-06 1100	Received By/Stored In: TR Edmundson	6-14-06 1100
Relinquished By/Removed From: TR Edmundson	6-14-06 1500	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	6-15-06 0940	Received By/Stored In: [illegible]	6-15-06 0941
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Run Sulfate analysis on available material. EPA method 300.0

(1) ICP Metals - 6010 (Client List) [Aluminum. Antimony. Arsenic. Barium. Beryllium. Boron. Cadmium. Calcium. Chromium. Cobalt. Copper. Iron. Lead. Magnesium. Manganese. Molybdenum. Nickel. Potassium. Selenium. Silicon. Silver. Sodium. Vanadium. Zinc]: Mercury - 7470 - (CV)

Personnel not available to Relinquish samples from 3728 Ref #2B on 6/14/06

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 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 120-B-1			DATA PACKAGE: K0438		
VALIDATOR: TLI		LAB: LLI		DATE: 8/20/00	
			SDG: K0438		

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			
J12N48	J12N49	J12N50	J12N51
J12N52	J12N53	J12N54	J12N61
			Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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 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: no FB

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 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:

FD 97.5% - nitrite

6. HOLDING TIMES (all levels)

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

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

Comments: nitrate, nitrite phosphate >2x UR/J all
plt >2x - J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/14/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LICE62-MB1	Bromide by IC	2.5	u	MG/KG	2.5	1.0
		Chloride by IC	2.5	u	MG/KG	2.5	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	2.50	u	MG/KG	2.50	1.0
		Nitrate by IC	2.50	u	MG/KG	2.50	1.0
		Phosphate by IC	2.5	u	MG/KG	2.5	1.0
		Sulfate by IC	2.5	u	MG/KG	2.5	1.0
BLANK10	06LVI062-MB1	Chromium VI	0.20	u	MG/KG	0.20	1.0
BLANK10	06LIC063-MB1	Bromide by IC	2.5	u	MG/KG	2.5	1.0
		Chloride by IC	2.5	u	MG/KG	2.5	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	2.50	u	MG/KG	2.50	1.0
		Nitrate by IC	2.50	u	MG/KG	2.50	1.0
		Phosphate by IC	2.5	u	MG/KG	2.5	1.0
		Sulfate by IC	2.5	u	MG/KG	2.5	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/14/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J12N48	Bromide by IC	55.8	0.0	54.0	103.4	1.0
		Chloride by IC	55.3	4.1	54.0	94.9	1.0
		Fluoride by IC	55.9	2.5 u	54.0	102.8	1.0
		Nitrite by IC	55.0	2.54u	54.0	101.9	1.0
		Nitrate by IC	67.5	2.54u	54.0	124.9	1.0
		Phosphate by IC	59.0	2.5 u	54.0	109.3	1.0
		Soluble Chromium VI	4.5	0.36	4.5	92.5	1.0
		Insoluble Chromium VI	1520	0.36	1560	97.4	100
		Sulfate by IC	895	293	543	110.9	10.0
BLANK10	06LICE62-MB1	Bromide by IC	47.6	2.5 u	50.0	95.1	1.0
		Chloride by IC	46.4	2.5 u	50.0	92.7	1.0
		Fluoride by IC	48.4	2.5 u	50.0	96.9	1.0
		Nitrite by IC	47.4	2.50u	50.0	94.8	1.0
		Nitrate by IC	48.0	2.50u	50.0	96.0	1.0
		Phosphate by IC	50.5	2.5 u	50.0	101.1	1.0
		Sulfate by IC	47.1	2.5 u	50.0	94.2	1.0
BLANK10	06LVI062-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100	1.0
		Insoluble Chromium VI	1250	0.20u	1200	104.1	100
BLANK10	06LIC063-MB1	Bromide by IC	49.2	2.5 u	50.0	98.4	1.0
		Chloride by IC	47.3	2.5 u	50.0	94.5	1.0
		Fluoride by IC	48.2	2.5 u	50.0	96.4	1.0
		Nitrite by IC	48.4	2.50u	50.0	96.9	1.0
		Nitrate by IC	48.8	2.50u	50.0	97.7	1.0
		Phosphate by IC	51.8	2.5 u	50.0	103.5	1.0
		Sulfate by IC	47.4	2.5 u	50.0	94.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/14/06

CLIENT: TNUHANFORD RC-020 K0438 LVL LOT #: 0606L291

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J12N48	Bromide by IC	2.5 u	2.5 u	NC	1.0
		Chloride by IC	4.1	2.5 u	90.0	1.0
		Fluoride by IC	2.5 u	2.5 u	NC	1.0
		Nitrite by IC	2.54u	2.53u	NC	1.0
		Nitrate by IC	2.54u	2.53u	NC	1.0
		Phosphate by IC	2.5 u	2.5 u	NC	1.0
		Chromium VI	0.36	0.22u	90.6	1.0
		Sulfate by IC	293	255	13.9	5.0
-009REP	J12NC1	pH	2.5	2.4	4.0	1.0