0070001

SAF-RC-048
100 Area and 300 Area Component of the RCBRA Water Sampling
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jill Thomson	H0-23	JE / 06/07/06 INITIAL/DATE
Jeanette Duncan (2)	H9-02	JE / 06/07/06 INITIAL/DATE

RECEIVED
JUN 2 2 2006
EDMC

COMMENTS:

SDG K0188 SAF-RC-048

Sample Location/Waste Site: **199-K-132**
399-1-1
199-N-73
399-4-12
399-4-9

Date: 25 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Radiochemistry - Data Package No. K0188-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0188 prepared by Eberline Services (EB). 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
J10M15	1/17/06	Water	C	See note 1
J10M56	1/19/06	Water	C	See note 1
J10M57	1/19/06	Water	C	See note 1
J10M59	1/17/06	Water	C	See note 1
J11162	1/17/06	Water	C	See note 1
J11163	1/19/06	Water	C	See note 1

1 – Tritium, carbon-14, radium-228, radium-226, total strontium, isotopic thorium, isotopic uranium, gamma spectroscopy.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 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 Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate

analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the 100 & 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. Two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0188 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 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.

Two analytes 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-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0188	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228 Thorium-232	J	All	No LCS

* - 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													
Laboratory: EB													
Case	SDG: K0188												
Sample Number		J10M15		J10M56		J10M57		J10M59		J11162		J11163	
Remarks													
Sample Date		1/17/06		1/19/06		1/19/06		1/17/06		1/17/06		1/19/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	1370		5080		239		1580		990		7080	
Carbon-14	50	5540		-20.2	U	8.94	U	5670		20.8	U	-14.3	U
Total Strontium	1	0.095	U	0.043	U	0.023	U	-0.276	U	-0.061	U	-0.035	U
Radium-228	3	1.02	U	0.035	U	0.025	U	0.890	U	-0.078	U	-0.225	U
Thorium-228		0	UJ	0.021	UJ	0.019	UJ	0.043	UJ	0.150	UJ	0.039	UJ
Thorium-230		0	U	-0.063	U	0	U	0	U	-0.100	U	-0.078	U
Thorium-232	1	0.030	UJ	-0.021	UJ	-0.019	UJ	0	UJ	0	UJ	0	UJ
Uranium-233/234	1	1.91		28.8		6.32		1.70		0.26		14.5	
Uranium-235	1	0.075		2.40		0.353		0.073		0.010	U	1.04	
Uranium-238	1	1.42		26.3		6.62		1.39		0.216		13.9	
Radium-226	1	0.270	U	-0.108	U	-0.164	U	0.066	U	0.007	U	0.094	U
Potassium-40		U	U	U	U	U	U	U	U	U	U	U	U
Cobalt 60	25	U	U	U	U*	U	U	U	U	U	U	U	U
Cesium 137	15	U	U	U	U*	U	U	U	U	U	U	U	U
Radium-226		U	U	U	U	U	U	U	U	U	U	U	U
Radium-228		U	U	U	U	U	U	U	U	U	U	U	U
Europium 152		U	U	U	U	U	U	U	U	U	U	U	U
Europium 154		U	U	U	U	U	U	U	U	U	U	U	U
Europium 155		U	U	U	U	U	U	U	U	U	U	U	U
Thorium-228		U	U	U	U	U	U	U	U	U	U	U	U
Thorium-232		U	U	U	U	U	U	U	U	U	U	U	U
Uranium-235(gea)		U	U	U	U	U	U	U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U	U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U	U	U
Ruthenium-106		U	U	U	U	U	U	U	U	U	U	U	U
Antimony-125		U	U	U	U	U	U	U	U	U	U	U	U
Beryllium-7		U	U	U	U	U	U	U	U	U	U	U	U
Cesium-134		U	U	U	U	U	U	U	U	U	U	U	U

* - RQL exceeded

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-01 J10M15

DATA SHEET

SDG	7368	Client/Case no	Hanford	SDG K0188	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R601132-01	Client sample id	J10M15		
Dept sample id	7368-001	Location/Matrix	199-K-132	WATER	
Received	01/20/06	Collected/Volume	01/17/06 09:40	7 L	
		Custody/SAF No	RC-048-51	RC-048	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	1370	140	180	400		H
Carbon 14	14762-75-5	5540	200	120	200		C
Total Strontium	SR-RAD	0.095	0.36	0.70	2.0	U	SR
Radium 228	15262-20-1	1.02	0.97	2.5	3.0	U	AC
Thorium 228	14274-82-9	0	0.061	0.23		U J	TH
Thorium 230	14269-63-7	0	0.12	0.23	1.0	U	TH
Thorium 232	TH-232	0.030	0.061	0.23	1.0	U J	TH
Uranium 233/234	U-233/234	1.91	0.15	0.033	1.0		U
Uranium 235	15117-96-1	0.075	0.033	0.025	1.0		U
Uranium 238	U-238	1.42	0.13	0.026	1.0		U
Radium 226	13982-63-3	0.270	0.40	0.67	2.0	U	RA
Potassium 40	13966-00-2	U		270		U	GAM
Cobalt 60	10198-40-0	U		14	25	U	GAM
Cesium 137	10045-97-3	U		15	15	U	GAM
Radium 226	13982-63-3	U		28		U	GAM
Radium 228	15262-20-1	U		63		U	GAM
Europium 152	14683-23-9	U		40	50	U	GAM
Europium 154	15585-10-1	U		38	50	U	GAM
Europium 155	14391-16-3	U		40	50	U	GAM
Thorium 228	14274-82-9	U		20		U	GAM
Thorium 232	TH-232	U		63		U	GAM
Uranium 235	15117-96-1	U		53		U	GAM
Uranium 238	U-238	U		1700		U	GAM
Americium 241	14596-10-2	U		110		U	GAM
Ruthenium 106	13967-48-1	U		130		U	GAM
Antimony 125	14234-35-6	U		33		U	GAM
Beryllium 7	13966-02-4	U		150		U	GAM
Cesium 134	13967-70-9	U		16		U	GAM

100&300Area Component RCBRA Water Sa

5/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-02 J10M56

DATA SHEET

SDG	7368	Client/Case no	Hanford	SDG K0188	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R601132-02	Client sample id	J10M56		
Dept sample id	7368-002	Location/Matrix	399-4-9	WATER	
Received	01/20/06	Collected/Volume	01/19/06 10:57	7 L	
		Custody/SAF No	RC-048-63	RC-048	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	5080	230	200	400		H
Carbon 14	14762-75-5	-20.2	37	63	200	U	C
Total Strontium	SR-RAD	0.043	0.40	0.83	2.0	U	SR
Radium 228	15262-20-1	0.035	1.6	2.4	3.0	U	AC
Thorium 228	14274-82-9	0.021	0.084	0.16		U J	TH
Thorium 230	14269-63-7	-0.063	0.042	0.16	1.0	U	TH
Thorium 232	TH-232	-0.021	0.042	0.16	1.0	U J	TH
Uranium 233/234	U-233/234	28.8	0.85	0.11	1.0		U
Uranium 235	15117-96-1	2.40	0.17	0.022	1.0		U
Uranium 238	U-238	26.3	0.79	0.11	1.0		U
Radium 226	13982-63-3	-0.108	0.35	0.66	2.0	U	RA
Potassium 40	13966-00-2	U		730		U	GAM
Cobalt 60	10198-40-0	U		26	25	U	GAM
Cesium 137	10045-97-3	U		24	15	U	GAM
Radium 226	13982-63-3	U		58		U	GAM
Radium 228	15262-20-1	U		120		U	GAM
Europium 152	14683-23-9	U		59	50	U	GAM
Europium 154	15585-10-1	U		70	50	U	GAM
Europium 155	14391-16-3	U		81	50	U	GAM
Thorium 228	14274-82-9	U		39		U	GAM
Thorium 232	TH-232	U		120		U	GAM
Uranium 235	15117-96-1	U		97		U	GAM
Uranium 238	U-238	U		2800		U	GAM
Americium 241	14596-10-2	U		200		U	GAM
Ruthenium 106	13967-48-1	U		200		U	GAM
Antimony 125	14234-35-6	U		57		U	GAM
Beryllium 7	13966-02-4	U		260		U	GAM
Cesium 134	13967-70-9	U		26		U	GAM

100&300Area Component RCBRA Water Sa

5/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-03 J10M57

DATA SHEET

SDG	7368	Client/Case no	Hanford	SDG K0188	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R601132-03	Client sample id	J10M57		
Dept sample id	7368-003	Location/Matrix	399-4-12	WATER	
Received	01/20/06	Collected/Volume	01/19/06 11:33	7 L	
		Custody/SAF No	RC-048-66	RC-048	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALIFIERS	TEST
Tritium	10028-17-8	239	130	220	400		H
Carbon 14	14762-75-5	8.94	37	61	200	U	C
Total Strontium	SR-RAD	0.023	0.35	0.70	2.0	U	SR
Radium 228	15262-20-1	0.025	1.2	2.6	3.0	U	AC
Thorium 228	14274-82-9	0.019	0.077	0.15		U J	TH
Thorium 230	14269-63-7	0	0.077	0.15	1.0	U	TH
Thorium 232	TH-232	-0.019	0.038	0.15	1.0	U J	TH
Uranium 233/234	U-233/234	6.32	0.30	0.050	1.0		U
Uranium 235	15117-96-1	0.353	0.068	0.023	1.0		U
Uranium 238	U-238	6.62	0.30	0.050	1.0		U
Radium 226	13982-63-3	-0.164	0.36	0.68	2.0	U	RA
Potassium 40	13966-00-2	U		290		U	GAM
Cobalt 60	10198-40-0	U		14	25	U	GAM
Cesium 137	10045-97-3	U		13	15	U	GAM
Radium 226	13982-63-3	U		27		U	GAM
Radium 228	15262-20-1	U		57		U	GAM
Europium 152	14683-23-9	U		30	50	U	GAM
Europium 154	15585-10-1	U		36	50	U	GAM
Europium 155	14391-16-3	U		34	50	U	GAM
Thorium 228	14274-82-9	U		17		U	GAM
Thorium 232	TH-232	U		57		U	GAM
Uranium 235	15117-96-1	U		41		U	GAM
Uranium 238	U-238	U		1500		U	GAM
Americium 241	14596-10-2	U		58		U	GAM
Ruthenium 106	13967-48-1	U		99		U	GAM
Antimony 125	14234-35-6	U		27		U	GAM
Beryllium 7	13966-02-4	U		110		U	GAM
Cesium 134	13967-70-9	U		15		U	GAM

100&300Area Component RCBRA Water Sa

5/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-04 J10M59

DATA SHEET

SDG	7368	Client/Case no	Hanford	SDG K0188	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R601132-04	Client sample id	J10M59		
Dept sample id	7368-004	Location/Matrix	199-K-132	WATER	
Received	01/20/06	Collected/Volume	01/17/06 09:40	7 L	
		Custody/SAF No	RC-048-68	RC-048	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	1580	170	220	400		H
Carbon 14	14762-75-5	5670	200	120	200		C
Total Strontium	SR-RAD	-0.276	0.29	0.70	2.0	U	SR
Radium 228	15262-20-1	0.890	0.97	2.6	3.0	U	AC
Thorium 228	14274-82-9	0.043	0.17	0.33		U J	TH
Thorium 230	14269-63-7	0	0.086	0.33	1.0	U	TH
Thorium 232	TH-232	0	0.086	0.33	1.0	U J	TH
Uranium 233/234	U-233/234	1.70	0.14	0.030	1.0		U
Uranium 235	15117-96-1	0.073	0.033	0.025	1.0		U
Uranium 238	U-238	1.39	0.13	0.026	1.0		U
Radium 226	13982-63-3	0.066	0.36	0.64	2.0	U	RA
Potassium 40	13966-00-2	U		110		U	GAM
Cobalt 60	10198-40-0	U		11	25	U	GAM
Cesium 137	10045-97-3	U		11	15	U	GAM
Radium 226	13982-63-3	U		21		U	GAM
Radium 228	15262-20-1	U		42		U	GAM
Europium 152	14683-23-9	U		35	50	U	GAM
Europium 154	15585-10-1	U		32	50	U	GAM
Europium 155	14391-16-3	U		38	50	U	GAM
Thorium 228	14274-82-9	U		18		U	GAM
Thorium 232	TH-232	U		42		U	GAM
Uranium 235	15117-96-1	U		50		U	GAM
Uranium 238	U-238	U		1200		U	GAM
Americium 241	14596-10-2	U		55		U	GAM
Ruthenium 106	13967-48-1	U		100		U	GAM
Antimony 125	14234-35-6	U		29		U	GAM
Beryllium 7	13966-02-4	U		120		U	GAM
Cesium 134	13967-70-9	U		15		U	GAM

100&300Area Component RCBRA Water Sa

5/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-05 J11162

DATA SHEET

SDG	7368	Client/Case no	Hanford	SDG K0188	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R601132-05	Client sample id	J11162		
Dept sample id	7368-005	Location/Matrix	199-N-73	WATER	
Received	01/20/06	Collected/Volume	01/17/06 11:50	7 L	
		Custody/SAF No	RC-048-119	RC-048	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	990	160	220	400		H
Carbon 14	14762-75-5	20.8	36	60	200	U	C
Total Strontium	SR-RAD	-0.061	0.37	0.76	2.0	U	SR
Radium 228	15262-20-1	-0.078	0.97	2.6	3.0	U	AC
Thorium 228	14274-82-9	0.150	0.20	0.38		U J	TH
Thorium 230	14269-63-7	-0.100	0.10	0.38	1.0	U	TH
Thorium 232	TH-232	0	0.10	0.38	1.0	U J	TH
Uranium 233/234	U-233/234	0.259	0.070	0.033	1.0		U
Uranium 235	15117-96-1	0.010	0.021	0.040	1.0	U	U
Uranium 238	U-238	0.216	0.061	0.033	1.0		U
Radium 226	13982-63-3	0.007	0.36	0.69	2.0	U	RA
Potassium 40	13966-00-2	U		310		U	GAM
Cobalt 60	10198-40-0	U		14	25	U	GAM
Cesium 137	10045-97-3	U		14	15	U	GAM
Radium 226	13982-63-3	U		26		U	GAM
Radium 228	15262-20-1	U		57		U	GAM
Europium 152	14683-23-9	U		31	50	U	GAM
Europium 154	15585-10-1	U		33	50	U	GAM
Europium 155	14391-16-3	U		35	50	U	GAM
Thorium 228	14274-82-9	U		17		U	GAM
Thorium 232	TH-232	U		57		U	GAM
Uranium 235	15117-96-1	U		42		U	GAM
Uranium 238	U-238	U		1500		U	GAM
Americium 241	14596-10-2	U		58		U	GAM
Ruthenium 106	13967-48-1	U		110		U	GAM
Antimony 125	14234-35-6	U		26		U	GAM
Beryllium 7	13966-02-4	U		120		U	GAM
Cesium 134	13967-70-9	U		15		U	GAM

100&300Area Component RCBRA Water Sa

K 5/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-06 J11163

DATA SHEET

SDG	7368	Client/Case no	Hanford	SDG K0188	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R601132-06	Client sample id	J11163		
Dept sample id	7368-006	Location/Matrix	399-1-1	WATER	
Received	01/20/06	Collected/Volume	01/19/06 09:38	7 L	
		Custody/SAF No	RC-048-120	RC-048	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	7080	290	220	400		H
Carbon 14	14762-75-5	-14.3	35	60	200	U	C
Total Strontium	SR-RAD	-0.035	0.34	0.73	2.0	U	SR
Radium 228	15262-20-1	-0.225	3.5	3.2	3.0	U	AC
Thorium 228	14274-82-9	0.039	0.079	0.30		U J	TH
Thorium 230	14269-63-7	-0.078	0.079	0.30	1.0	U	TH
Thorium 232	TH-232	0	0.078	0.30	1.0	U J	TH
Uranium 233/234	U-233/234	14.5	0.55	0.084	1.0		U
Uranium 235	15117-96-1	1.04	0.12	0.026	1.0		U
Uranium 238	U-238	13.9	0.53	0.082	1.0		U
Radium 226	13982-63-3	0.094	0.34	0.61	2.0	U	RA
Potassium 40	13966-00-2	U		120		U	GAM
Cobalt 60	10198-40-0	U		12	25	U	GAM
Cesium 137	10045-97-3	U		11	15	U	GAM
Radium 226	13982-63-3	U		22		U	GAM
Radium 228	15262-20-1	U		43		U	GAM
Europium 152	14683-23-9	U		34	50	U	GAM
Europium 154	15585-10-1	U		32	50	U	GAM
Europium 155	14391-16-3	U		38	50	U	GAM
Thorium 228	14274-82-9	U		18		U	GAM
Thorium 232	TH-232	U		43		U	GAM
Uranium 235	15117-96-1	U		53		U	GAM
Uranium 238	U-238	U		1300		U	GAM
Americium 241	14596-10-2	U		57		U	GAM
Ruthenium 106	13967-48-1	U		100		U	GAM
Antimony 125	14234-35-6	U		29		U	GAM
Beryllium 7	13966-02-4	U		120		U	GAM
Cesium 134	13967-70-9	U		15		U	GAM

100&300Area Component RCBRA Water Sa

5/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/12/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0188 was composed of six water samples designated under SAF No. RC-048 with a Project Designation of: 100 Area and 300 Area Component of the RCBRA Water Sa.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on March 13, 2006.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.4 Radium-226 Analysis

No problems were encountered during the course of the analyses.

2.5 Radium-228 Analysis

Samples J10M56, J10M57, and J11163 contained a long-lived beta activity; this activity was not removed by the applied chemistry procedures. In order to produce Ra-228 results the raw counts were reduced by a Sr90-Y90 analysis program using a linear regression equation. The QC LCS recovery was 122%, greater than the protocol limit of 120%.

No other problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.8 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

3/13/6

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-51	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688 K0188	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132 (7368)		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-99-046 ~~AFS-04-066~~ RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060200		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

None

020000

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3 CARBON-14	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
Sample No. / Matrix * / Sample Date / Sample Time										
J10M15 / WATER / JAN 17 2006 / 0940	X	X	X	X	X	X				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1215 1-17-06	RZ Steffler R.Z. Steffler	1215 1-17-06
RZ Steffler R.Z. Steffler	1345 1-17-06	3728/2A 1-19-06	1345
3728/2A 1-19-06	0830	RZ Steffler R.Z. Steffler	0830 1-19-06
RZ Steffler R.Z. Steffler	1500 WH 1-19-06	Fed Ex	
FED EX		DFM	01/20/06 9:45

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

groundwater
MLM 1/20/06

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-048-63	Page 1 of 2

Collector ~~DURATEK~~ ~~D.R. BREWINGTON~~	Company Contact JOAN KESSNER	Telephone No. 375-4688 K0188	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-9 (73168)		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-~~020~~ 001 RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060228		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

None

1200021

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time										
J10M56	WATER	JAN 19 2006	1057	X	X	X	X	X	X				

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
~~DURATEK~~ D. R. BREWINGTON Relinquished By/Removed From	1220 1-19-06	RZ Steffler R.Z. Steffler	1220 1-19-06
RZ Steffler R.Z. Steffler	1500 1-19-06	Fed Ex	
~~FED EX~~			01/20/06 9:45

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *

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

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-66	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688 K0188	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-12 (7368)		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-022	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060228		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

None

000022

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
Sample No. / Matrix * / Sample Date / Sample Time										
J10M57 / WATER / JAN 19 2006 / 1133	X	X	X	X	X	X				

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From DURATEK D. R. BREWINGTON	1220 1-19-06	Received By/Stored In R2 Steffler	1220 1-19-06
Relinquished By/Removed From R2 Steffler	1500 1-19-06	Received By/Stored In Fed Ex	
Relinquished By/Removed From Fed Ex		Received By/Stored In MFW	6/20/06 9:45
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *

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

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-68	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688 K0188	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132 (7368)		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-99-046 ~~ERC-04-003~~ RES 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060200		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

None

0000023

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3 CARBON-14	See item (1) in Special Instructions	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
Sample No.	Matrix *	Sample Date	Sample Time							
J10M59	WATER	JAN 17 2006	0940	X	X	X	X	X	X	

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1215 1-17-06	RZ Steffler R.Z. Steffler	1215 1-17-06
RZ Steffler R.Z. Steffler	1345 1-17-06	3728 / 2A 1-17-06	1345
3728 / 2A 1-19-06	0830	RZ Steffler R.Z. Steffler	0830 1-19-06
RZ Steffler R.Z. Steffler WH	1500 1-19-06	Fed Ex	
Fed Ex		MM	01/20/06 9:45

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

groundwater
mm
1/20/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SJ=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-048-119	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688 K0188	Project Coordinator KESSNER, JH
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-N-73 (7368)		SAF No. RC-048
Ice Chest No. ERC-99-046 AFS-04-021 RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060200		Bill of Lading/Air Bill No. SEE OSPC

Price Code 7N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

None

0000024

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226, Ra-228	See item (2) in Special Instructions	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time										
J11162	WATER	JAN 17 2006	1150	X	X	X	X	X	X				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1-17-06 1215	RZ Stoffler R.Z. Stoffler	1215 1-17-06
RZ Stoffler R.Z. Stoffler	1-17-06 1345	3728 / 2A	1-17-06 1345
3728 / 2A 1-19-06	0830	RZ Stoffler R.Z. Stoffler	0830 1-19-06
RZ Stoffler R.Z. Stoffler	1-19-06 1500	Fed Ex	
FED EX		DH MTW	01/20/06 9:45

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

groundwater

MLM 1/24

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-048-120	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688 K0188	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-1-1 (7368)		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-001	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES OLIONVILLE	Offsite Property No. A060228		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

None

000025

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time										
J11163	WATER	JAN 19 2006	0938	X	X	X	X	X	X				

CHAIN OF POSSESSION	Sign/Print Names		
DURATEK D. R. BREWINGTON	Date/Time 1220 1-19-06	Received By/Stored In R2 Steffler	Date/Time 1220 1-19-06
Relinquished By/Removed From R2 Steffler	Date/Time 1500 WCH 1-19-06	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From FED EX	Date/Time	Received By/Stored In	Date/Time 01/20/06 9:45
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *

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

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

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

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	RCBR+		DATA PACKAGE:	K0188	
VALIDATOR:	TCI	LAB: EB		DATE: 5/16/08	
			SDG:	K0188	
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-226	Tritium	C-14		
SAMPLES/MATRIX					
J10M15	J10M56	J10M57	J10M59	J11162	J11163
					Water

1. Completeness ..... ☐ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

_____

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_____

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

Method blank analyzed within required frequency? ..... Yes No N/A

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

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

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

Analytes detected in field blank(s)? ..... Yes No N/A

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

Comments: no FB

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

LCS /BSS analyzed within required frequency? ..... Yes No N/A

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

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

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

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

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

Comments: thorium 228 & 232 - no LCS J all

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

Chemical carrier added? ..... Yes No N/A

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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_____

_____

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

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

Comments: _____

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

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

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

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

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

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

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

Comments: no Field QC

12. Holding Times (All levels)

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

Comments: _____

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

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

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

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

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

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

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

Comments: Zones

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-08 Method Blank

METHOD BLANK

SDG	7368	Client/Case no	Hanford	SDG K0188	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R601132-08	Client sample id	Method Blank		
Dept sample id	7368-008	Material/Matrix		WATER	
		SAF No	RC-048		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	672	1200	2200	400	U	H
Carbon 14	14762-75-5	11.4	37	62	200	U	C
Total Strontium	SR-RAD	0.107	0.34	0.68	2.0	U	SR
Radium 228	15262-20-1	-0.187	0.81	2.3	3.0	U	AC
Thorium 228	14274-82-9	0.084	0.085	0.16		U	TH
Thorium 230	14269-63-7	0	0.084	0.16	1.0	U	TH
Thorium 232	TH-232	-0.021	0.042	0.16	1.0	U	TH
Uranium 233/234	U-233/234	0.008	0.023	0.037	1.0	U	U
Uranium 235	15117-96-1	0	0.019	0.035	1.0	U	U
Uranium 238	U-238	0.008	0.015	0.029	1.0	U	U
Radium 226	13982-63-3	0.097	0.34	0.62	2.0	U	RA
Potassium 40	13966-00-2	U		630		U	GAM
Cobalt 60	10198-40-0	U		23	25	U	GAM
Cesium 137	10045-97-3	U		22	15	U	GAM
Radium 226	13982-63-3	U		53		U	GAM
Radium 228	15262-20-1	U		100		U	GAM
Europium 152	14683-23-9	U		54	50	U	GAM
Europium 154	15585-10-1	U		66	50	U	GAM
Europium 155	14391-16-3	U		74	50	U	GAM
Thorium 228	14274-82-9	U		35		U	GAM
Thorium 232	TH-232	U		100		U	GAM
Uranium 235	15117-96-1	U		86		U	GAM
Uranium 238	U-238	U		2600		U	GAM
Americium 241	14596-10-2	U		180		U	GAM
Ruthenium 106	13967-48-1	U		180		U	GAM
Antimony 125	14234-35-6	U		50		U	GAM
Beryllium 7	13966-02-4	U		160		U	GAM
Cesium 134	13967-70-9	U		23		U	GAM

100&300Area Component RCBRA Water Sa

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7368

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0188

Contract No. 630

Lab sample id R601132-07

Dept sample id 7368-007

Client sample id Lab Control Sample

Material/Matrix WATER

SAF No RC-048

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	20800	1900	2200	400		H	22300	890	93	80-120	80-120
Carbon 14	9310	320	150	200		C	9570	380	97	83-117	80-120
Total Strontium	20.4	1.1	0.53	2.0		SR	19.7	0.79	104	81-119	80-120
Radium 228	22.5	1.8	2.7	3.0		AC	18.4	0.74	122	82-118	80-120
Thorium 230	22.1	2.4	0.16	1.0		TH	22.2	0.89	100	81-119	80-120
Uranium 233/234	18.7	0.62	0.27	1.0		U	18.6	0.74	100	89-111	80-120
Uranium 235	15.4	0.55	0.022	1.0		U	15.1	0.60	102	89-111	80-120
Uranium 238	18.9	0.63	0.26	1.0		U	20.2	0.81	94	90-110	80-120
Radium 226	53.4	2.3	0.55	2.0		RA	55.9	2.2	96	89-111	80-120
Cobalt 60	476	31	19	25		GAM	488	20	98	75-125	80-120
Cesium 137	527	26	19	15		GAM	494	20	107	74-126	80-120

100&300Area Component RCBRA Water Sa

QC-LCS #55999

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-09 J10M15

DUPLICATE

SDG	7368	Client/Case no	Hanford SDG K0188
Contact	Melissa C. Mannion	Contract	No. 630
DUPLICATE		ORIGINAL	
Lab sample id	R601132-09	Lab sample id	R601132-01
Dept sample id	7368-009	Dept sample id	7368-001
		Received	01/20/06
Client sample id	J10M15		
Location/Matrix	199-K-132 WATER		
Collected/Volume	01/17/06 09:40 7 L		
Custody/SAF No	RC-048-51 RC-048		

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	1360	140	180	400		H	1370	140	180		1	30	0.1
Carbon 14	5360	190	110	200		C	5540	200	120		3	23	0.4
Total Strontium	0.010	0.31	0.62	2.0	U	SR	0.095	0.36	0.70	U	-		0.4
Radium 228	0.175	1.0	2.7	3.0	U	AC	1.02	0.97	2.5	U	-		1.2
Thorium 228	0.156	0.16	0.30		U	TH	0	0.061	0.23	U	-		1.8
Thorium 230	-0.039	0.078	0.30	1.0	U	TH	0	0.12	0.23	U	-		0.5
Thorium 232	0	0.078	0.30	1.0	U	TH	0.030	0.061	0.23	U	-		0.6
Uranium 233/234	1.78	0.17	0.041	1.0		U	1.91	0.15	0.033		7	21	1.0
Uranium 235	0.072	0.036	0.034	1.0		U	0.075	0.033	0.025		4	100	0.1
Uranium 238	1.53	0.15	0.035	1.0		U	1.42	0.13	0.026		7	23	1.0
Radium 226	0.017	0.32	0.62	2.0	U	RA	0.270	0.40	0.67	U	-		1.0
Potassium 40	U		220		U	GAM	U		270	U	-		0.3
Cobalt 60	U		22	25	U	GAM	U		14	U	-		0.6
Cesium 137	U		16	15	U	GAM	U		15	U	-		0.1
Radium 226	U		38		U	GAM	U		28	U	-		0.4
Radium 228	U		76		U	GAM	U		63	U	-		0.3
Europium 152	U		44	50	U	GAM	U		40	U	-		0.1
Europium 154	U		46	50	U	GAM	U		38	U	-		0.3
Europium 155	U		39	50	U	GAM	U		40	U	-		0
Thorium 228	U		24		U	GAM	U		20	U	-		0.3
Thorium 232	U		76		U	GAM	U		63	U	-		0.3
Uranium 235	U		60		U	GAM	U		53	U	-		0.2
Uranium 238	U		2200		U	GAM	U		1700	U	-		0.4
Americium 241	U		54		U	GAM	U		110	U	-		0.9
Ruthenium 106	U		150		U	GAM	U		130	U	-		0.2
Antimony 125	U		37		U	GAM	U		33	U	-		0.2
Beryllium 7	U		210		U	GAM	U		150	U	-		0.5
Cesium 134	U		21		U	GAM	U		16	U	-		0.4

100&300Area Component RCBRA Water Sa

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	03/12/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0188

R601132-10 J10M15

MATRIX SPIKE

SDG	7368			Client/Case no	Hanford SDG K0188
Contact	Melissa C. Mannion			Contract	No. 630
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R601132-10	Lab sample id	R601132-01	Client sample id	J10M15
Dept sample id	7368-010	Dept sample id	7368-001	Location/Matrix	199-K-132 WATER
		Received	01/20/06	Collected/Volume	01/17/06 09:40 7 L
				Custody/SAF No	RC-048-51 RC-048

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	30200	640	250	400	X	H	29900	1200	1370	140	96	83-117	60-140
Carbon 14	23000	770	240	200	X	C	19100	760	5540	200	91	80-120	60-140

100&300Area Component RCBRA Water Sa

QC-MS#1 56002

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	03/12/06

Date: 25 May 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Semivolatile - Data Package No. K0188-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0188 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
J10M15	1/17/06	Water	C	See note 1
J10M56	1/19/06	Water	C	See note 1
J10M57	1/19/06	Water	C	See note 1
J10M59	1/17/06	Water	C	See note 1
J11162	1/17/06	Water	C	See note 1
J11163	1/19/06	Water	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 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**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 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, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the di-n-butylphthalate and bis(2-ethylhexyl)phthalate results in all samples were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five

times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and matrix spike duplicate recoveries outside QC limits (83% and 84%), all hexochloroethane results were qualified as estimates and flagged "J".

Due to matrix spike and matrix spike duplicate recoveries outside QC limits (1% and 14%), all 4-chloroanaline results were qualified as estimates and flagged "J".

Due to matrix spike recoveries outside QC limits, all bis(2-chloroethoxy)methane (2%), 2,4-dichlorophenol (55%), 2-nitroanaline (17%), acenaphthylene (20%), 3-nitroanaline (0%), 4-nitroanaline (8%), n-nitrosodiphenylamine (1%) and carbazole (0%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-20%. If RPD values are out of

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

Due to an RPD outside QC limits (20.1%), all phenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (50%), all 2-chlorophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (60%), all 2-nitrophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (191%), all bis(2-chloroethoxy)methane results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (53%), all 2,4-dichlorophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (173%), all 4-chloroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (35%), all 2,4,6-trichlorophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (39%), all 2,4,5-trichlorophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (145%), all 2-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (133%), all acenaphtylene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (200%), all 3-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (28%), all 2,4-dinitrophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (58%), all 4-nitrophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (25%), all dibenzofuran results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (172%), all 4-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (48%), all 4,6-dinitro-2-methylphenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (194%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (62%), all pentachlorophenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (200%), all carbazole results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (24%), all pyrene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (43%), all butylbenzylphthalate results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (200%), all 3,3-dichlorobenzidine results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (24%), all benzo(k)fluoranthene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (28%), all benzo(a)pyrene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (24%), all 4-chloro-3-methylphenol results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (20.1%), all di-n-octylphthalate results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. K0188 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 di-n-butylphthalate and bis(2-ethylhexyl)phthalate results in all samples were qualified as undetected, raised to the RQL and flagged "U".

- Due to matrix spike and matrix spike duplicate recoveries outside QC limits (83% and 84%), all hexochloroethane results were qualified as estimates and flagged "J".

- Due to matrix spike and matrix spike duplicate recoveries outside QC limits (1% and 14%), all 4-chloroanaline results were qualified as estimates and flagged "J".

- Due to matrix spike recoveries outside QC limits, all bis(2-chloroethoxy)methane (2%), 2,4-dichlorophenol (55%), 2-nitroanaline (17%), acenaphthylene (20%), 3-nitroanaline (0%), 4-nitroanaline (8%), n-nitrosodiphenylamine (1%) and carbazole (0%) results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (20.1%), all phenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (50%), all 2-chlorophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (60%), all 2-nitrophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (191%), all bis(2-chloroethoxy)methane results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (53%), all 2,4-dichlorophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (173%), all 4-chloroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (35%), all 2,4,6-trichlorophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (39%), all 2,4,5-trichlorophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (145%), all 2-nitroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (133%), all acenaphtylene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (200%), all 3-nitroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (28%), all 2,4-dinitrophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (58%), all 4-nitrophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (25%), all dibenzofuran results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (172%), all 4-nitroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (48%), all 4,6-dinitro-2-methylphenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (194%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (62%), all pentachlorophenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (200%), all carbazole results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (24%), all pyrene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (43%), all butylbenzylphthalate results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (200%), all 3,3-dichlorobenzidine results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (24%), all benzo(k)fluoranthene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (28%), all benzo(a)pyrene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (24%), all 4-chloro-3-methylphenol results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (20.1%), all di-n-octylphthalate 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-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K0188	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	U at RQL	All	Method blank contamination
Hexochloroethane 4-Chloroanaline	J	All	MS & MSD recovery
Bis(2-chloroethoxy)methane 2,4-Dichlorophenol 2-Nitroanaline Acenaphthylene 3-Nitroanaline 4-Nitroanaline n-Nitrosodiphenylamine Carbazole	J	All	Matrix spike recovery
Phenol 2-Chlorophenol 2-Nitrophenol Bis(2-chloroethoxy)methane 2,4-Dichlorophenol 4-Chloroanaline 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Nitroanaline Acenaphtylene 3-Nitroanaline 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran 4-Nitroanaline 4,6-Dinitro-2-methylphenol n-Nitrosodiphenylamine Pentachlorophenol Carbazole Pyrene Butylbenzylphthalate 3,3-Dichlorobenzidine Benzo(k)fluoranthene Benzo(a)pyrene 4-Chloro-3-methylphenol Di-n-octylphthalate	J	All	RPD

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

* - 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

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: WASHINGTON CLOSURE HANFORD													
Laboratory: LLI	SDG: K0188												
Sample Number		J10M15		J10M56		J10M57		J10M59		J11162		J11163	
Remarks													
Sample Date		1/17/06		1/19/06		1/19/06		1/17/06		1/17/06		1/19/06	
Extraction Date		1/22/06		1/22/06		1/22/06		1/22/06		1/22/06		1/22/06	
Analysis Date		1/25/06		1/25/06		1/25/06		1/24/06		1/24/06		1/24/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
bis(2-Chloroethyl)ether		10	U	10	U	10	U	10	U	10	U	10	U
2-Chlorophenol		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
1,3-Dichlorobenzene		10	U	10	U	10	U	10	U	10	U	10	U
1,4-Dichlorobenzene		10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichlorobenzene	650	10	U	10	U	10	U	10	U	10	U	10	U
2-Methylphenol		10	U	10	U	10	U	10	U	10	U	10	U
2,2'-oxybis(1-chloropropane)		10	U	10	U	10	U	10	U	10	U	10	U
3 and/or 4-Methylphenol		10	U	10	U	10	U	10	U	10	U	10	U
N-Nitroso-di-n-propylamine		10	U	10	U	10	U	10	U	10	U	10	U
Hexachloroethane		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Nitrobenzene		10	U	10	U	10	U	10	U	10	U	10	U
Isophorone		10	U	10	U	10	U	10	U	10	U	10	U
2-Nitrophenol		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
2,4-Dimethylphenol		10	U	10	U	10	U	10	U	10	U	10	U
bis(2-Chloroethoxy)methane		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
2,4-Dichlorophenol		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
1,2,4-Trichlorobenzene	650	10	U	10	U	10	U	10	U	10	U	10	U
Naphthalene		10	U	10	U	10	U	10	U	10	U	10	U
4-Chloroaniline		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Hexachlorobutadiene		10	U	10	U	10	U	10	U	10	U	10	U
4-Chloro-3-methylphenol		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
2-Methylnaphthalene		10	U	10	U	10	U	10	U	10	U	10	U
Hexachlorocyclopentadiene		10	U	10	U	10	U	10	U	10	U	10	U
2,4,6-Trichlorophenol	330	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
2,4,5-Trichlorophenol	330	25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
2-Chloronaphthalene		10	U	10	U	10	U	10	U	10	U	10	U
2-Nitroaniline		25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
Dimethylphthalate		10	U	10	U	10	U	10	U	10	U	10	U
Acenaphthylene		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
2,6-Dinitrotoluene		10	U	10	U	10	U	10	U	10	U	10	U

000014

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.

* - RQL exceeded

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: WASHINGTON CLOSURE HANFORD													
Laboratory: LLI	SDG: K0188												
Sample Number		J10M15		J10M56		J10M57		J10M59		J11162		J11163	
Remarks													
Sample Date		1/17/06		1/19/06		1/19/06		1/17/06		1/17/06		1/19/06	
Extraction Date		11/15/05		11/15/05		11/15/05		11/15/05		11/15/05		1/22/06	
Analysis Date		11/16/05		11/22/05		11/18/05		11/22/05		11/22/05		1/24/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline		25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
Acenaphthene		10	U	10	U	10	U	10	U	10	U	10	U
2,4-Dinitrophenol		25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
4-Nitrophenol		25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
Dibenzofuran	330	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
2,4-Dinitrotoluene		10	U	10	U	10	U	10	U	10	U	10	U
Diethylphthalate		10	U	10	U	10	U	10	U	10	U	10	U
4-Chlorophenyl-phenyl ether		10	U	10	U	10	U	10	U	10	U	10	U
Fluorene		10	U	10	U	10	U	10	U	10	U	10	U
4-Nitroaniline		25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
4,6-Dinitro-2-methylphenol		25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
N-Nitrosodiphenylamine		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
4-Bromophenyl-phenyl ether		10	U	10	U	10	U	10	U	10	U	10	U
Hexachlorobenzene		10	U	10	U	10	U	10	U	10	U	10	U
Pentachlorophenol	330	25	UJ	25	UJ	26	UJ	26	UJ	25	UJ	25	UJ
Phenanthrene		10	U	10	U	10	U	10	U	10	U	10	U
Anthracene		10	U	10	U	10	U	10	U	10	U	10	U
Carbazole		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Di-n-butylphthalate		10	U	10	U	10	U	10	U	10	U	10	U
Fluoranthene		10	U	10	U	10	U	10	U	10	U	10	U
Pyrene		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Butylbenzylphthalate		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
3,3'-Dichlorobenzidine		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Benzo(a)anthracene		10	U	10	U	10	U	10	U	10	U	10	U
Chrysene		10	U	10	U	10	U	10	U	10	U	10	U
bis(2-Ethylhexyl)phthalate		10	U	10	U	10	U	10	U	10	U	10	U
Di-n-octylphthalate		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Benzo(b)fluoranthene		10	U	10	U	10	U	10	U	10	U	10	U
Benzo(k)fluoranthene		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Benzo(a)pyrene		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Indeno(1,2,3-cd)pyrene		10	U	10	U	10	U	10	U	10	U	10	U
Dibenz(a,h)anthracene		10	U	10	U	10	U	10	U	10	U	10	U
Benzo(g,h,i)perylene		10	U	10	U	10	U	10	U	10	U	10	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000015

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0601L122 Client: TNUHANFORD RCG-048 K0188 Work Order: 11343606001 Report Date: 01/31/06 11:01 Page: 1a

	Cust ID:	J10M59	J10M59	J10M59	J11163	J11162	J10M15
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Surrogate Recovery	Nitrobenzene-d5	78 %	79 %	88 %	71 %	66 %	66 %
	2-Fluorobiphenyl	70 %	99 %	93 %	72 %	65 %	67 %
	Terphenyl-d14	128 %	93 %	102 %	104 %	84 %	102 %
	Phenol-d5	80 %	31 %	84 %	74 %	67 %	69 %
	2-Fluorophenol	75 %	44 %	76 %	69 %	65 %	64 %
	2,4,6-Tribromophenol	80 %	65 %	108 %	81 %	68 %	85 %
		fl	fl	fl	fl	fl	fl
Phenol		10 U J	76 %	93 %	10 U J	10 U J	10 U J
bis(2-Chloroethyl)ether		10 U	101 %	98 %	10 U	10 U	10 U
2-Chlorophenol		10 U J	57 %	95 %	10 U J	10 U J	10 U J
1,3-Dichlorobenzene		10 U	78 %	88 %	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	78 %	87 %	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	87 %	93 %	10 U	10 U	10 U
2-Methylphenol		10 U	87 %	98 %	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	103 %	97 %	10 U	10 U	10 U
4-Methylphenol		10 U	90 %	100 %	10 U	10 U	10 U
N-Nitroso-di-n-propylamine		10 U	102 %	101 %	10 U	10 U	10 U
Hexachloroethane		10 U J	83 * %	84 * %	10 U J	10 U J	10 U J
Nitrobenzene		10 U	91 %	95 %	10 U	10 U	10 U
Isophorone		10 U	100 %	107 %	10 U	10 U	10 U
2-Nitrophenol		10 U J	51 %	95 %	10 U J	10 U J	10 U J
2,4-Dimethylphenol		10 U	81 %	89 %	10 U	10 U	10 U
bis(2-Chloroethoxy)methane		10 U J	2 * %	97 %	10 U J	10 U J	10 U J
2,4-Dichlorophenol		10 U J	55 * %	95 %	10 U J	10 U J	10 U J
1,2,4-Trichlorobenzene		10 U	87 %	93 %	10 U	10 U	10 U
Naphthalene		10 U	90 %	94 %	10 U	10 U	10 U
4-Chloroaniline		10 U J	1 * %	14 * %	10 U J	10 U J	10 U J
Hexachlorobutadiene		10 U	96 %	101 * %	10 U J	10 U J	10 U J
4-Chloro-3-methylphenol		10 U J	83 %	106 %	10 U	10 U	10 U
2-Methylnaphthalene		10 U	101 %	101 %	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	99 %	92 %	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U J	71 %	101 %	10 U J	10 U J	10 U J
2,4,5-Trichlorophenol		26 U J	71 %	105 %	25 U J	25 U J	25 U J

*= Outside of EPA CLP QC limits.

5/24/06

0000016

0000000007

Cust ID:	J10M59	J10M59	J10M59	J11163	J11162	J10M15
RFW#:	001	001 MS	001 MSD	002	003	004
2-Chloronaphthalene	10 U	120 * %	102 %	10 U	10 U	10 U
2-Nitroaniline	26 U J	17 * %	108 %	25 U J	25 U J	25 U J
Dimethylphthalate	10 U	126 * %	104 %	10 U	10 U	10 U
Acenaphthylene	10 U J	20 * %	100 %	10 U J	10 U J	10 U J
2,6-Dinitrotoluene	10 U	128 * %	106 %	10 U	10 U	10 U
3-Nitroaniline	26 U J	0 * %	118 %	25 U J	25 U J	25 U J
Acenaphthene	10 U	108 %	101 %	10 U	10 U	10 U
2,4-Dinitrophenol	26 U J	99 %	131 * %	25 U J	25 U J	25 U J
4-Nitrophenol	26 U J	63 %	114 * %	25 U J	25 U J	25 U J
Dibenzofuran	10 U J	137 * %	107 %	10 U J	10 U J	10 U J
2,4-Dinitrotoluene	10 U	146 * %	122 * %	10 U	10 U	10 U
Diethylphthalate	10 U	123 * %	106 %	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	129 %	108 %	10 U	10 U	10 U
Fluorene	10 U	128 * %	106 %	10 U	10 U	10 U
4-Nitroaniline	26 U J	8 * %	107 * %	25 U J	25 U J	25 U J
4,6-Dinitro-2-methylphenol	26 U J	79 %	129 %	25 U J	25 U J	25 U J
N-Nitrosodiphenylamine (1)	10 U J	1 * %	69 %	10 U J	10 U J	10 U J
4-Bromophenyl-phenylether	10 U	101 %	98 %	10 U	10 U	10 U
Hexachlorobenzene	10 U	118 * %	116 * %	10 U	10 U	10 U
Pentachlorophenol	26 U J	76 %	145 * %	25 U J	25 U J	25 U J
Phenanthrene	10 U	107 %	117 %	10 U	10 U	10 U
Anthracene	10 U	100 %	111 %	10 U	10 U	10 U
Carbazole	10 U J	0 * %	105 %	10 U J	10 U J	10 U J
Di-n-butylphthalate	10 ~~JB~~ U	112 %	116 %	10 ~~2 JB~~ U	10 ~~1 JB~~ U	10 ~~3 JB~~ U
Fluoranthene	10 U	116 %	114 %	10 U	10 U	10 U
Pyrene	10 U J	80 %	102 %	10 U J	10 U J	10 U J
Butylbenzylphthalate	10 U J	77 %	119 %	10 U J	10 U J	10 U J
3,3'-Dichlorobenzidine	10 U J	0 %	63 %	10 U J	10 U J	10 U J
Benzo(a)anthracene	10 U	98 %	114 %	10 U	10 U	10 U
Chrysene	10 U	102 %	112 %	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 ~~2 JB~~ U	112 %	129 %	10 ~~2 JB~~ U	10 ~~3 JB~~ U	10 ~~5 JB~~ U
Di-n-octyl phthalate	10 U J	170 * %	139 %	10 U J	10 U J	10 U J
Benzo(b)fluoranthene	10 U	156 * %	129 %	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U J	149 * %	117 %	10 U J	10 U J	10 U J
Benzo(a)pyrene	10 U J	89 %	118 %	10 U J	10 U J	10 U J
Indeno(1,2,3-cd)pyrene	10 U	143 * %	132 %	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	119 %	135 %	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	107 %	125 %	10 U	10 U	10 U

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

K 5/24/06

000017

000000008

Semivolatiles by GC/MS, HSL List

Report Date: 01/31/06 11:01

RFW Batch Number: 0601L122 Client: TNUHANFORD RCG-048 K0188 Work Order: 11343606001 Page: 2a

	Cust ID:	J10M57	J10M56	SBLKSX	SBLKSX BS	SBLKSX BSD
Sample Information	RFW#:	005	006	06LE0052-MB1	06LE0052-MB1	06LE0052-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L
Surrogate Recovery	Nitrobenzene-d5	63 %	64 %	68 %	85 %	78 %
	2-Fluorobiphenyl	63 %	65 %	68 %	90 %	81 %
	Terphenyl-d14	102 %	92 %	99 %	100 %	95 %
	Phenol-d5	65 %	65 %	71 %	85 %	89 %
	2-Fluorophenol	60 %	61 %	59 %	80 %	80 %
	2,4,6-Tribromophenol	84 %	77 %	78 %	95 %	104 %
		fl	fl	fl	fl	fl
Phenol		10 U J	10 U J	10 U	93 %	101 %
bis(2-Chloroethyl)ether		10 U	10 U	10 U	93 %	94 %
2-Chlorophenol		10 U J	10 U J	10 U	95 %	94 %
1,3-Dichlorobenzene		10 U	10 U	10 U	81 %	65 %
1,4-Dichlorobenzene		10 U	10 U	10 U	80 %	64 %
1,2-Dichlorobenzene		10 U	10 U	10 U	87 %	72 %
2-Methylphenol		10 U	10 U	10 U	97 %	99 %
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	95 %	92 %
4-Methylphenol		10 U	10 U	10 U	96 %	105 %
N-Nitroso-di-n-propylamine		10 U	10 U	10 U	94 %	112 %
Hexachloroethane		10 U J	10 U J	10 U	75 %	60 %
Nitrobenzene		10 U	10 U	10 U	91 %	90 %
Isophorone		10 U	10 U	10 U	101 %	112 * %
2-Nitrophenol		10 U J	10 U J	10 U	89 %	96 %
2,4-Dimethylphenol		10 U	10 U	10 U	90 %	102 %
bis(2-Chloroethoxy)methane		10 U J	10 U J	10 U	96 %	100 %
2,4-Dichlorophenol		10 U J	10 U J	10 U	92 %	103 %
1,2,4-Trichlorobenzene		10 U	10 U	10 U	88 %	76 %
Naphthalene		10 U	10 U	10 U	88 %	83 %
4-Chloroaniline		10 U J	10 U J	10 U	44 %	28 %
Hexachlorobutadiene		10 U	10 U	10 U	92 %	73 %
4-Chloro-3-methylphenol		10 U J	10 U J	10 U	100 %	115 * %
2-Methylnaphthalene		10 U	10 U	10 U	94 %	100 %
Hexachlorocyclopentadiene		10 U	10 U	10 U	77 %	67 %
2,4,6-Trichlorophenol		10 U J	10 U J	10 U	98 %	104 %
2,4,5-Trichlorophenol		26 U J	25 U J	25 U	103 %	106 %

*= Outside of EPA CLP QC limits.

R 5/24/06

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Cust ID:	J10M57	J10M56	SBLKSX	SBLKSX BS	SBLKSX BSD
RFW#:	005	006	06LE0052-MB1	06LE0052-MB1	06LE0052-MB1
2-Chloronaphthalene	10 U	10 U	10 U	100 %	100 %
2-Nitroaniline	26 U J	25 U J	25 U	103 %	115 * %
Dimethylphthalate	10 U	10 U	10 U	107 %	113 %
Acenaphthylene	10 U J	10 U J	10 U	99 %	102 %
2,6-Dinitrotoluene	10 U	10 U	10 U	105 %	112 * %
3-Nitroaniline	26 U J	25 U J	25 U	53 %	28 %
Acenaphthene	10 U	10 U	10 U	99 %	104 %
2,4-Dinitrophenol	26 U J	25 U J	25 U	98 %	145 * %
4-Nitrophenol	26 U J	25 U J	25 U	105 %	119 * %
Dibenzofuran	10 U J	10 U J	10 U	102 %	110 %
2,4-Dinitrotoluene	10 U	10 U	10 U	111 %	123 * %
Diethylphthalate	10 U	10 U	10 U	105 %	113 %
4-Chlorophenyl-phenylether	10 U	10 U	10 U	102 %	107 %
Fluorene	10 U	10 U	10 U	100 %	108 %
4-Nitroaniline	26 U J	25 U J	25 U	91 %	73 %
4,6-Dinitro-2-methylphenol	26 U J	25 U J	25 U	101 %	134 * %
N-Nitrosodiphenylamine (1)	10 U J	10 U J	10 U	70 %	69 %
4-Bromophenyl-phenylether	10 U	10 U	10 U	94 %	96 %
Hexachlorobenzene	10 U	10 U	10 U	103 %	115 * %
Pentachlorophenol	26 U J	25 U J	25 U	125 * %	140 * %
Phenanthrene	10 U	10 U	10 U	95 %	112 %
Anthracene	10 U	10 U	10 U	98 %	114 %
Carbazole	10 U J	10 U J	10 U	104 %	93 %
Di-n-butylphthalate	10 ~~3~~ 4/12 JB U	10 ~~2~~ 4/12 JB U	3 J	103 %	119 %
Fluoranthene	10 U	10 U	10 U	103 %	122 * %
Pyrene	10 U J	10 U J	10 U	104 %	111 %
Butylbenzylphthalate	10 U J	10 U J	10 U	112 %	118 %
3,3'-Dichlorobenzidine	10 U J	10 U J	10 U	10 %	3 %
Benzo(a)anthracene	10 U	10 U	10 U	106 %	106 %
Chrysene	10 U	10 U	10 U	105 %	105 %
bis(2-Ethylhexyl)phthalate	10 ~~4~~ 4/12 JB U	10 ~~4~~ 4/12 JB U	4 J	116 %	109 %
Di-n-octyl phthalate	10 U J	10 U J	10 U	117 %	106 %
Benzo(b)fluoranthene	10 U	10 U	10 U	105 %	102 %
Benzo(k)fluoranthene	10 U J	10 U J	10 U	106 %	105 %
Benzo(a)pyrene	10 U J	10 U J	10 U	101 %	99 %
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	110 %	107 %
Dibenz(a,h)anthracene	10 U	10 U	10 U	110 %	110 %
Benzo(g,h,i)perylene	10 U	10 U	10 U	107 %	104 %

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

5/24/00

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RCG-048
LVL #: 0601L122
SDG/SAF # K0188/RCG-048

W.O. #: 11343-606-001-9999-00
Date Received: 01-20-2006

SEMIVOLATILE

Six (6) water samples were collected on 01-17,19-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3520C on 01-22-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 01-24,25-2006.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.

   The internal standard area for Perylene-$_{d12}$ in the matrix spike sample J10M59 MS was re-calculated manually due to a deuterium exchange during the extraction possibly due to the acidity. Consequently, several spike compounds were re-calculated to adjust the percent recoveries and reported. There is minimal impact on the data.
5. Thirty-one (31) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria.

   Twelve (12) of one hundred twenty-eight (128) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL.
7. Internal standard area and retention time criteria were met.
8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
9. 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.
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 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

2/2/06
Date

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som\gorup\data\bna\tnu-hanford\0601-122.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 3 4 pages.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06MS032

Initiator: Sharon Saylor
Date: 1-27-06
Client: TNU

Batch: 06 01L122
Samples: ms, msd, bs, bsd
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: Aqueous
Prep Batch: 06 LE0052

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)

low recovery of several analytes in the matrix spike, matrix spike dup, blank spike + blank spike dup several spike analytes biased high RCC 1/31/06

2. Known or Probable Causes(s)

loss during extraction

3. Discussion and Proposed Action

Other Description:

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

namute

4. Project Manager Instructions...signature/date: 1/30/06

✓ 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: 2/01/06

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	(✓)	X MS: Rychlak/Daley
—	__ Sample Prep: Beegle/Kiger	—	__ Log-in: Perry
		—	__ Admin: _____
		—	__ Other: _____

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QA-105-A-0805

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-68	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-04-003	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No.		Bill of Lading/Air Bill No. SEE OSPC		

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POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

000023

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG A-C	aG D E	aG FG-H
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium-226, Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time									
J10M59	WATER	JAN 17 2006	0940						X	X	X	X

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1-17-06 1215	RZ Stoffler R.J. Stoffler	1-17-06 1215
RZ Stoffler R.J. Stoffler	1-17-06 1345	3728 / 2A	1-19-06 1345
3728 / 2A	1-19-06 0930	RZ Stoffler R.J. Stoffler	1-19-06 0930
RZ Stoffler R.J. Stoffler	1-19-06 1500	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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-048-120 | Page 1 of 2

Collector: DURATEK D. R. BREWINGTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 399-1-1		SAF No.: RC-048
Ice Chest No.: AFS-04-09T 20 RZJ 1-19-06	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES JACKSONVILLE	Offsite Property No.: A060251		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

Sample No.	Matrix *	Sample Date	Sample Time									
J11163	WATER	JAN 19 2006	0938						X	X	X	X

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1220 1-19-06	RZ Steffler	1220 1-19-06
RZ Steffler	1500 1-19-06	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

Matrix *: S=Soil, SS=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, D2=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-048-119

Collector: DURATEK, D R BREWINGTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-N-73		SAF No.: RC-048
Ice Chest No.: AFS-04-~~022~~ 011 RCS 1-19-06	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060221		Bill of Lading/Air Bill No.: SEE OSPC

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POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

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SAMPLE ANALYSIS												
Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1 I	3 A-C	2 DE	3 FGH
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 – Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
Sample No. / Matrix * / Sample Date / Sample Time										
J11162 / WATER / JAN 17 2006 / 1150							X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: DURATEK D R BREWINGTON, Date/Time: 1-17-06 1215	Received By/Stored In: RZ Steffler R.Z. Steffler, Date/Time: 1-17-06 1215
Relinquished By/Removed From: RZ Steffler R.Z. Steffler, Date/Time: 1-17-06 1345	Received By/Stored In: 3728/2A, Date/Time: 1-17-06 1345
Relinquished By/Removed From: 3728/2A, Date/Time: 1-19-06 1000	Received By/Stored In: RZ Steffler R.Z. Steffler, Date/Time: 1-19-06 1000
Relinquished By/Removed From: RZ Steffler R.Z. Steffler WCH, Date/Time: 1-19-06 1500	Received By/Stored In: Fed Ex, Date/Time:
Relinquished By/Removed From: Fed Ex, Date/Time: 1-20-06 0940	Received By/Stored In: 1-20-06, Date/Time: 0940
Relinquished By/Removed From, Date/Time:	Received By/Stored In, Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

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

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-048-51

Collector DURATEK D R BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 7N	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048
Ice Chest No. ERC-02-501 ~~AFS-04-006~~ RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060220		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

RZS 1-19-06 ~~None~~ Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 – Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time									
J10M15	WATER	JAN 17 2006	0940						X	X	X	X

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D R BREWINGTON	1215 1-17-06	RZ Steffler	1215 1-17-06
RZ Steffler	1345 1-17-06	3728/2A	1345 1-17-06
3728/2A	1000 1-19-06	RZ Steffler	1000 1-19-06
RZ Steffler	1500 1-19-06	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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)

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-048-66

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 7N	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-12		SAF No. RC-048
Ice Chest No. AFS-04-022	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES ALJONVILLE	Offsite Property No. A060252		Bill of Lading/Air Bill No. SEE OSPC

00000028

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226, Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
5 J10M57	WATER	JAN 19 2006	1133							X	X	X	X

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1220 1-19-06	RZ Stiffler	1220 1-19-06
RZ Stiffler	1500 1-19-06	Fed Ex	
Fed Ex	1-20-06 094		1-20-06 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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-048-63

Collector: DURATEK ~~D.R. BREWINGTON~~	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 399-4-9		SAF No.: RC-048
Ice Chest No.: ERC-02-506 ~~AFS-04-020~~ RZS 1-19-06	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060225		Bill of Lading/Air Bill No.: SEE OSPC

000000031

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

000028

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 – Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
J10M56	WATER	JAN 19 2006	1057							X	X	X	X

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D.R. BREWINGTON	1220 1-19-06	RZ Steffler R.J. Steffler	1220 1-19-06
RZ Steffler R.J. Steffler	1500 1-19-06	Fed Ex	
Fed Ex	1-20-06 0940	1-20-06 0940	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA			DATA PACKAGE: K0188		
VALIDATOR: TLI		LAB: LLI		DATE: 5/10/00	
			SDG: K0188		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10M15 J10M56 J10M57 J10M55					
J10162 J11163					
					Walk

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: di-n-butylphthalate + bis(2-ethylhexyl)phthalate in mb - J all at RQL

no FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: 10 of MS/MSD over

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: 26 RPD's over - J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

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

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

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: 25 May 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Wet Chemistry - Data Package No. K0188-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0188-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10M15	1/17/06	Water	C	See note 1
J10M56	1/19/06	Water	C	See note 1 & 2
J10M57	1/19/06	Water	C	See note 1 & 2
J10M59	1/17/06	Water	C	See note 1
J11162	1/17/06	Water	C	See note 1 & 2
J11163	1/19/06	Water	C	See note 1 & 2

1 – IC anions by 300.0.
2 - Nitrate/nitrite by 353.2.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 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: Water samples must be analyzed within: 28 days for nitrate/nitrite, fluoride, bromide, chloride and sulfate; and 48 hours for phosphate, nitrate and nitrite.

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, the nitrate/nitrite result in sample J11162 was qualified as an estimate 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 80% to 120%. 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 79% 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 120% and a sample result less than the IDL, no qualification is required.

Due to the lack of an LCS analysis, the nitrate/nitrite result in sample J11162 was qualified as an estimate 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 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to the lack of a duplicate analysis, the nitrate/nitrite result in sample J11162 was qualified as an estimate and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **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 fluoride and nitrite results exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0188-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by greater than twice the limit, the nitrate/nitrite result in sample J11162 was qualified as an estimate and flagged "J".

- Due to the lack of a duplicate and LCS analysis, the nitrate/nitrite result in sample J11162 was qualified as an estimate and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All fluoride and nitrite results exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0188	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate/nitrite	J	J11162	Holding time
Nitrate/nitrite	J	J11162	No LCS or duplicate

* - 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

GENERAL CHEMISTRY ANALYSIS, WATER MATRIX, (MG/L)

Project: WASHINGTON CLOSURE HANFORD													
Laboratory: Lionville Laboratory Inc.													
Case	**SDG: K0188**												
Sample Number		J10M15		J10M56		J10M57		J10M59		J11162		J11163	
Remarks													
Sample Date		1/17/06		1/19/06		1/19/06		1/17/06		1/17/06		1/19/06	
General Chemistry	**CRDL**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
Bromide	**0.25**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Chloride	**0.1**	29.4		17.3		15.2		39.7		22.5		10	
Fluoride	**0.05**	0.25	U	0.34		0.25	U	0.25	U	0.74		0.27	
Nitrite	**0.05**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Nitrate	**0.05**	29.3		20.4		26.8		28.1		25.2		15.3	
Phosphate		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Sulfate	**0.25**	40.7		50.1		36.5		40.5		168		39.0	
Nitrate/Nitrite	**0.15**	7.3		5.4		6.8		8.3		5.4	J	4.1	

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

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/21/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L107

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11162	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	22.5	MG/L	2.5	10.0
		Fluoride by IC	0.74	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	25.2	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	168	MG/L	12.5	50.0
-002	J10M59	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	39.7	MG/L	2.5	10.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	28.1	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	40.5	MG/L	2.5	10.0
-003	J10M15	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	29.4	MG/L	2.5	10.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	29.3	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	40.7	MG/L	2.5	10.0

5/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/15/06

CLIENT: TNUHANFORD RCG-048 K0189 LVL LOT #: 0601L122
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10M59	Nitrate Nitrite	8.3	MG/L	0.20	10.0
-002	J11163	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	10	MG/L	2.5	10.0
		Fluoride by IC	0.27	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	15.3	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	39.0	MG/L	2.5	10.0
		Nitrate Nitrite	4.1	MG/L	0.10	5.0
-004	J10M15	Nitrate Nitrite	7.3	MG/L	0.20	10.0
-005	J10M57	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	15.2	MG/L	2.5	10.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	26.8	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	36.5	MG/L	2.5	10.0
		Nitrate Nitrite	6.8	MG/L	0.20	10.0
-006	J10M56	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	17.3	MG/L	2.5	10.0
		Fluoride by IC	0.34	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	20.4	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	50.1	MG/L	2.5	10.0
		Nitrate Nitrite	5.4	MG/L	0.20	10.0

5/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/21/06

CLIENT: INUHANFORD RCG-048 K0188 IVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J11162	Nitrate Nitrite	5 4 J	MG/L	0 20	10.0

5/24/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RCG-048 K0188
LVL#: 0601L107

W.O.#: 11343-606-001-9999-00
Date Received: 01-18-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 water samples.

2. The samples were prepared and analyzed in accordance with the method 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.

3. Sample holding times as required by the method and/or contract were met (see the sample chronology summary for analyses times for short hold samples).

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 and Sulfate were within the 75-125% control limits.

8. The replicate analyses for Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate and Sulfate were within the 20% Relative Percent Difference (RPD) control limit.

9. 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

2/21/06
Date

njp\01-107

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 15 pages.

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LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RCG-048 K0188
LVL#: 0601L122

W.O.#: 11343-606-001-9999-00
Date Received: 01-20-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 5 water 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.

3. Sample holding times as required by the method and/or contract were met (see the sample chronology summary for analyses times for short hold samples).

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, Sulfate and Nitrate Nitrite were within the 75-125% control limits.

8. The replicate analyses for Bromide, Chloride, Nitrite, Nitrate, Phosphate, Sulfate and Nitrate Nitrite were within the 20% RPD control limit.

9. 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.

Judy Stine
Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/24/06
Date

njp\i01-122

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 26 pages.

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LIONVILLE LABORATORY INC.

Analytical Report
****Addendum****

~~**Client:** INU-HANOFRD RCG-048 K0188~~ ~~**W.O.#:** 11343-606-001-9999-00~~
LVL#: 0601L122 **Date Received:** 01-20-06

INORGANIC NARRATIVE

This report is an addendum to the original reported on 02-24-06 to included Nitrate Nitrite analysis results for sample J11162.

1 This narrative covers the analysis of 1 water sample.

2. The sample was prepared and analyzed in accordance with the method 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.

3. Sample holding time as required by the method and/or contract was not met as the analysis was requested past hold.

4. The method blank was within the method criteria.

5. The Laboratory Control Sample (LCS) was within the laboratory control limits.

6. 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

3/21/06
Date

njp\i01-122

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 8 pages.

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RECEIVED
APR 2006

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RCG-048 K0188

DATE RECEIVED: 01/20/06 LVL LOT # :0601L122

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J11162						
NITRATE NITRITE	003	W	06LN3016	01/17/06	03/15/06	03/15/06
LAB QC:						
NITRATE NITRITE	MB1	W	06LN3016	N/A	03/15/06	03/15/06
NITRATE NITRITE	MB1 BS	W	06LN3016	N/A	03/15/06	03/15/06

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-51	Page 2 of 2

Collector DURATEK J.R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-02-501 ~~AFS-04-0060~~ RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060220		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C										
Type of Container	P	G/P										
No. of Container(s)	1	1										
Volume	500mL	500mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2										

000019

Sample No.	Matrix *	Sample Date	Sample Time										
4 J10M15	WATER	JAN 17 2006	0940		X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK J.R. BREWINGTON	1215 1-17-06	RZ Steffler R.Z. Steffler	1215 1-17-06
RZ Steffler R.Z. Steffler	1345 1-17-06	3728/24	1-17-06 1345
3728/24 1-19-06	1000	RZ Steffler R.Z. Steffler	1000 1-19-06
RZ Steffler R.Z. Steffler	1500 WCH 1-19-06	Fed Ex	
Fed Ex 1-20-06	0940	1-20-06	0940

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

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

Collector: DURATEK D. R. BREWINGTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-K-132		SAF No.: RC-048
Ice Chest No.: AFS-04-006	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060214		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C									
Type of Container	P	G/P									
No. of Container(s)	1	1									
Volume	500mL	500mL 3 1/10/06									
SAMPLE ANALYSIS	See item (4) in Special Instructions.	NO2/NO3 - 353.2									
Sample No.	Matrix *	Sample Date	Sample Time								
J10M15	WATER	JAN 17 2006	0940	X							

000020

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1-17-06 1215	RZ Steffler R.Z. Steffler	1-17-06 1215
RZ Steffler R.Z. Steffler	1-17-06 1400	Fed Ex	
FedEx	1/18/06 1315		

SPECIAL INSTRUCTIONS

3 1/10/06

(4) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

Matrix *

S=Soil
SS=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-63	Page 2 of 2

Collector DURATEK D.R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-9		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-02-506 ~~AFS-04-020~~ RES 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060225		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C									
Type of Container	P	G/P									
No. of Container(s)	1	1									
Volume	500mL	500mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2									

000021

	Sample No.	Matrix *	Sample Date	Sample Time										
6	J10M56	WATER	JAN 19 2006	1057		X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: DURATEK D.R. BREWINGTON	1220 1-19-06	RZ Stoffler	1220 1-19-06
Relinquished By/Removed From: RZ Stoffler	1500 1-19-06	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	1-20-06 0940	Received By/Stored In:	1-20-06 0940
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

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

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-63	Page 2 of 2

Collector: DURATEK, D. R. BREWINGTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days		
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 399-4-9	SAF No.: RC-048	Air Quality ☐
Ice Chest No.: ERC-02-506 ~~AFS-04-020~~ RZS 1-19-06	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060225		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C										
Type of Container	P	G/P										
No. of Container(s)	1	1										
Volume	500mL	500mL 3 1/12/06										
SAMPLE ANALYSIS	See item (J) in Special Instructions.	NO2/NO3 - 353.2										

Sample No.	Matrix *	Sample Date	Sample Time										
J10M56	WATER	JAN 19 2006	1057	X									

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: DURATEK D. R. BREWINGTON	1220 1-19-06	RZ Steffler R.J. Steffler	1220 1-19-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler	1500 1-19-06	Fed Ex	
Relinquished By/Removed From: Fed Ex	1-20-06 0940		1-20-06 0940
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

3 1/12/06

(J) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

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-048-66	Page 2 of 2

Collector DURATEK D.R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-12		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-022	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060252		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C										
Type of Container	P	G/P										
No. of Container(s)	1	1										
Volume	500mL	500mL 3 DD 122205										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2										

000023

	Sample No.	Matrix *	Sample Date	Sample Time										
5	J10M57	WATER	JAN 19 2006	1133	X									

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: DURATEK D.R. BREWINGTON	Date/Time 1220 1-19-06	Received By/Stored In: RZ Stoffler	Date/Time 1220 1-19-06
Relinquished By/Removed From: RZ Stoffler	Date/Time 1500 1-19-06	Received By/Stored In: Fed Ex	Date/Time
Relinquished By/Removed From: Fed Ex	Date/Time 1-20-06 0940	Received By/Stored In:	Date/Time 1-20-06 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
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

3 DD 122205

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

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-048-66	Page 2 of 2

Collector DURATEK D.H. BRIDWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-12		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-022	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060252		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C										
Type of Container	P	G/P										
No. of Container(s)	1	1										
Volume	500mL	500mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2										

000024

Sample No.	Matrix *	Sample Date	Sample Time										
J10M57	WATER	JAN 19 2006	1133		X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From DURATEK D.H. BRIDWINGTON	1220 1-19-06	Received By/Stored In RZ Steffler R.J. Steffler	1220 1-19-06
Relinquished By/Removed From RZ Steffler R.J. Steffler	1500 1-19-06	Received By/Stored In Fed EX	
Relinquished By/Removed From Fed Ex	1-20-06 0940	Received By/Stored In	1-20-06 0940
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 [Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate]

Matrix *

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

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-119	Page 2 of 2

Collector DURATEK D. R. BRIEWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-N-73		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-011 RCS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060221		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C									
Type of Container	P	G/P J									
No. of Container(s)	1	1									
Volume	500mL	500mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2									

000025

Sample No.	Matrix *	Sample Date	Sample Time										
3 J11162	WATER	JAN 17 2006	1150		X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BRIEWINGTON	1-17-06 1215	RZ Steffler	1-17-06 1215
RZ Steffler	1-17-06 1345	3728/2A	1-17-06 1345
3728/2A	1-19-06 1000	RZ Steffler	1-19-06 1000
RZ Steffler	1-19-06 1500	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

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-048-119

Collector: DURATEK D. R. BRIEWINGTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality: ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-N-73		SAF No.: RC-048
Ice Chest No.: AFS-04-006 RLS 1-17-06	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES ALIONVILLE	Offsite Property No.: A060214		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C
Type of Container	P	G/P
No. of Container(s)	1	1
Volume	500mL	500mL
		3 SAB 11206
SAMPLE ANALYSIS	See item (#) in Special Instructions	NO2/NO3 - 353.2

0000026

Sample No.	Matrix *	Sample Date	Sample Time			
J11162	WATER	JAN 17 2006	1150	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BRIEWINGTON	1-17-06 1215	RZ Steffler	1-17-06 1215
RZ Steffler	1-17-06 1400	Fed Ex	
FedEx	1/18/06 1315	JKenny	

SPECIAL INSTRUCTIONS

3 SAB 11206

IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

Matrix *

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solid
DL=Drum Liqs
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-048-68	Page 2 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days 12
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-02-009 ~~ERC-04-003~~	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060219		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C										
Type of Container	P	G/P										
No. of Container(s)	1	1										
Volume	500mL	500mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2										

Sample No.	Matrix *	Sample Date	Sample Time										
J10M59	WATER	JAN 17 2006	0940		X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From DURATEK D. R. BREWINGTON	1-17-06 1215	RZ Stoffler	1-17-06 1215
Relinquished By/Removed From RZ Stoffler	1-17-06 1345	Received By/Stored In 3728 12A	1-17-06 1345
Relinquished By/Removed From 3728 12A	1-19-06 0930	Received By/Stored In RZ Stoffler	1-19-06 0930
Relinquished By/Removed From RZ Stoffler	1-19-06 WCH 1500	Received By/Stored In Fed Ex	
Relinquished By/Removed From Fed Ex	1-20-06 0940	Received By/Stored In	1-20-06 0940
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

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)

0000027

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector DURATEK D R BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 7N	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048
Ice Chest No. AFS-04-006 ~~ERL-04-003~~ RZS. 1-11-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060214		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C									
Type of Container	P	G/P									
No. of Container(s)	1	1									
Volume	500mL	500mL 3 [illegible]									
SAMPLE ANALYSIS	See item (X) in Special Instructions.	NO2/NO3 - 353.2									

000028

Sample No.	Matrix *	Sample Date	Sample Time										
J10M59	WATER	JAN 17 2006	0940	X									

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From D R. BREWINGTON	1-17-06 1215	Received By/Stored In RZ Stiffler R.Z. Stiffler	1-17-06 1215
Relinquished By/Removed From RZ Stiffler R.Z. Stiffler	1-17-06 1400	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From FEDEX	1/18/06 1315	Received By/Stored In [illegible]	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
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

3 [illegible] 906

(X) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

Matrix *

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

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-048-120	Page 2 of 2
Collector DURAUER D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N / Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-1-1		SAF No. RC-048	Air Quality ☐
Ice Chest No. AFS-04-0020 RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060251		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage
Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C									
Type of Container	P	G/P 1									
No. of Container(s)	1	1									
Volume	500mL. 3	500mL. AA 11806									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2									

620029

Sample No.	Matrix *	Sample Date	Sample Time										
J11163	WATER	JAN 19 2006	0938	✓									

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D. R. BREWINGTON	1220 1-19-06	RZ Stoffler R.J. Stoffler	1220 1-19-06
RZ Stoffler R.J. Stoffler	1500 1-19-06	Fed Ex	
Fed Ex	1-20-06 0940	[illegible]	1-20-06 0940

SPECIAL INSTRUCTIONS
3 AA 11806
(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

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

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-120	Page 2 of 2
Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N / Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-1-1	SAF No. RC-048	Air Quality ☐
Ice Chest No. AFS-04-001 20 RZS 1-19-06	Field Logbook No. EL-1592 / COA BESRAS6520	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES / JONVILLE	Offsite Property No. A060251	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C									
Type of Container	P	G/P									
No. of Container(s)	1	1									
Volume	500mL	500mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	NO2/NO3 - 353.2									

000030

Sample No.	Matrix *	Sample Date	Sample Time										
J11163	WATER	JAN 19 2006	0930		X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: DURATEK D. R. BREWINGTON	1220 1-19-06	RZ Steffler	1220 1-19-06
Relinquished By/Removed From: RZ Steffler	1500 1-19-06	Fed Ex	
Relinquished By/Removed From: Fed Ex	1-20-06 0940	1-20-06	0940
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

Matrix *
S=Soil
SB=Sediment
SD=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: 100/300 RCBRA			DATA PACKAGE: K0188		
VALIDATOR: JLI		LAB: LLI		DATE: 5/16/06	
			SDG: K0188		

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
J10M15 J10M57 J10M59 J10M56 J11162 J11163
Water

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 MS

NO2/NO3 -62 no LCS Jall

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: NO^2/NO^3 – G2 – no duplicate – J

6. HOLDING TIMES (all levels)

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

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

Comments: G2 – NO^2/NO^3 over hold – J

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: all undetected Sulfate + nitrite. cm

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/21/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L107

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LIC009-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/21/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L107

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J10M59	Bromide by IC	9.5	0.076	10.0	94.6	2.0
		Chloride by IC	139	39.7	100	99.5	20.0
		Fluoride by IC	9.7	0.098	10.0	96.4	1.0
		Nitrite by IC	10.0	0.25u	10.0	100.5	2.0
		Nitrate by IC	127	28.1	110	89.7	20.0
		Phosphate by IC	9.3	0.25u	10.0	93.0	2.0
		Sulfate by IC	143	40.5	100	102.3	20.0
BLANK10	06LIC009-MB1	Bromide by IC	4.9	0.25u	5.0	98.1	1.0
		Chloride by IC	4.8	0.25u	5.0	95.4	1.0
		Fluoride by IC	5.0	0.25u	5.0	99.4	1.0
		Nitrite by IC	5.02	0.25u	5.00	100.3	1.0
		Nitrate by IC	4.90	0.25u	5.00	98.0	1.0
		Phosphate by IC	5.4	0.25u	5.0	108.6	1.0
		Sulfate by IC	4.9	0.25u	5.0	98.6	1.0

08

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/21/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L107

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
~~-002REP~~	~~J10M59~~	~~Bromide by IC~~	~~0.25u~~	~~0.25u~~	~~NC~~	~~1.0~~
		Chloride by IC	39.7	39.5	0.60	10.0
		Fluoride by IC	0.25u	0.25u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	28.1	28.8	2.5	10.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	40.5	41.0	1.0	10.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/15/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LN3005-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	06LIC010-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/15/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J11163	Bromide by IC	9.2	0.00	10.0	91.6	2.0
		Chloride by IC	110	10	100	100.0	20.0
		Fluoride by IC	9.3	0.27	10.0	90.1	2.0
		Nitrite by IC	9.29	0.25u	10.0	92.9	2.0
		Nitrate by IC	119	15.3	100	103.9	20.0
		Phosphate by IC	10.1	0.25u	10.0	101.2	2.0
		Sulfate by IC	145	39.0	100	105.6	20.0
		Nitrate Nitrite	9.2	4.1	5.0	102.2	10.0
BLANK10	06LN3005-MB1	Nitrate Nitrite	0.50	0.02u	0.50	100.6	1.0
BLANK10	06LIC010-MB1	Bromide by IC	4.9	0.25u	5.0	97.1	1.0
		Chloride by IC	4.6	0.25u	5.0	91.9	1.0
		Fluoride by IC	4.8	0.25u	5.0	96.4	1.0
		Nitrite by IC	5.00	0.25u	5.00	100.0	1.0
		Nitrate by IC	4.83	0.25u	5.00	96.5	1.0
		Phosphate by IC	5.4	0.25u	5.0	107.4	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/15/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-002REP	J11163	Bromide by IC	0.25u	0.25u	NC	1.0
		Chloride by IC	10	10.6	6.3	10.0
		Fluoride by IC	0.27	0.27	3.0	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	15.3	16.2	5.5	10.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	39.0	40.7	4.2	10.0
		Nitrate Nitrite	4.1	4.0	0.86	5.0

Lionville Laboratory Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/21/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LN3016-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0

Lionville Laboratory Inc.

INORGANICS ACCURACY REPORT 03/21/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
BLANK10	06LN3016-MB1	Nitrate Nitrite	0.50	0.02u	0 50	99.6	1 0

Date: 25 May 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: PCB/Pesticide - Data Package No. K0188-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0188-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10M15	1/17/06	Water	C	See note 1
J10M56	1/19/06	Water	C	See note 1 & 2
J10M57	1/19/06	Water	C	See note 1
J10M59	1/17/06	Water	C	See note 1
J11162	1/17/06	Water	C	See note 1
J11163	1/19/06	Water	C	See note 1

1 – Pesticides by 8081A and PCBs by 8082.
2 – Reprepared and reanalyzed as J10M56R.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 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: Water 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

No field blanks were submitted for analysis.

- **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 80% to 120%. 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.

Due to the lack of a matrix spike or matrix spike duplicate analysis, all pesticide results in sample J10M56R were qualified as estimates and flagged "J".

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other 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.

Due to surrogate recoveries outside QC limits (18% & 20%), all pesticide results in sample J10M56 were qualified as estimates and flagged "J".

Due to a surrogate recovery outside QC limits (24%), all PCB results in sample J10M56 were qualified as estimates and flagged "J".

All other 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 water samples, results must be within RPD limits of plus/minus 20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (31%), all aldrin results (except those in sample J10M56R) were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the project specific RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data Package No. K0188 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 the lack of a matrix spike or matrix spike duplicate analysis, all pesticide results in sample J10M56R were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".
- Due to surrogate recoveries outside QC limits (18% & 20%), all pesticide results in sample J10M56 were qualified as estimates and flagged "J".
- Due to a surrogate recovery outside QC limits (24%), all PCB results in sample J10M56 were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (31%), all aldrin results (except those in sample J10M56R) were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

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: K0188	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All pesticide results	J	J10M56R	No MS or MSD
Toxaphene	J	All	No MS, MSD or LCS
All pesticide & PCB	J	J10M56	Surrogate recovery
Aldrin	J	J10M56R	RPD

* - 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

PESTICIDE/PCB ANALYSIS, WATER MATRIX, (UG/L)

Project: WASHINGTON CLOSURE HANFORD
Laboratory: LLI SDG: K0188

Sample Number		J10M15		J10M56		J10M57		J10M59		J11162		J11163			
Remarks															
Sample Date		1/17/06		1/19/06		1/19/06		1/17/06		1/17/06		1/19/06			
Extraction Date		1/22/06		1/22/06		1/22/06		1/22/06		1/22/06		1/22/06			
Analysis Date		1/25/06		1/25/06		1/25/06		1/24/06		1/24/06		1/24/06			
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016		0.40	U	0.40	UJ	0.40	U	0.41	U	0.41	U	0.40	U		
Aroclor-1221		0.40	U	0.40	UJ	0.40	U	0.41	U	0.41	U	0.40	U		
Aroclor-1232	16.5	0.40	U	0.40	UJ	0.40	U	0.41	U	0.41	U	0.40	U		
Aroclor-1242	16.5	0.40	U	0.40	UJ	0.40	U	0.41	U	0.41	U	0.40	U		
Aroclor-1248		0.40	U	0.40	UJ	0.40	U	0.41	U	0.41	U	0.40	U		
Aroclor-1254	16.5	0.40	U	0.40	UJ	0.40	U	0.41	U	0.41	U	0.40	U		
Aroclor-1260	16.5	0.40	U	0.40	UJ	0.40	U	0.41	U	0.41	U	0.40	U		

Sample Number		J10M15		J10M56		J10M57		J10M59		J11162		J11163		J10M56	
Remarks														REPREP	
Sample Date		1/17/06		1/19/06		1/19/06		1/17/06		1/17/06		1/19/06		1/19/06	
Extraction Date		1/22/06		1/22/06		1/22/06		1/22/06		1/22/06		1/22/06		1/31/06	
Analysis Date		1/27/06		1/27/06		1/27/06		1/26/06		1/27/06		1/26/06		2/1/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Gamma-BHC (Lindane)	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Beta-BHC	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Heptachlor	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Delta-BHC	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Aldrin	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Heptachlor Epoxide	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Endosulfan I	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Dieldrin	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
4,4'-DDE	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Endrin	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Endosulfan II	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
4,4'-DDD	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Endosulfan Sulfate	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
4,4'-DDT	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Methoxychlor	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Endrin Ketone	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Endrin Aldehyde	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
alpha-Chlordane	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
gamma-Chlordane	5	0.050	U	0.050	UJ	0.050	U	0.051	U	0.051	U	0.050	U	0.051	UJ
Toxaphene	5	0.50	UJ	0.50	UJ	0.50	UJ	0.51	UJ	0.51	UJ	0.50	UJ	0.51	UJ

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.

000011

PCBs by GC

Report Date: 02/01/06 11:54

RFW Batch Number: 0601L122 Client: TNUHANFORD RCG-048 K0188 Work Order: 11343606001 Page: 1

000000004

	Cust ID:	J10M59	J11163	J11162	J11162	J11162	J10M15
Sample Information	RFW#:	001	002	003	003 MS	003 MSD	004
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate: Tetrachloro-m-xylene		84 %	66 %	67 %	64 %	55 %	51 %
Decachlorobiphenyl		87 %	73 %	62 %	70 %	60 %	64 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		0.41 U	0.40 U	0.41 U	95 %	87 %	0.40 U
Aroclor-1221		0.41 U	0.40 U	0.41 U	0.40 U	0.40 U	0.40 U
Aroclor-1232		0.41 U	0.40 U	0.41 U	0.40 U	0.40 U	0.40 U
Aroclor-1242		0.41 U	0.40 U	0.41 U	0.40 U	0.40 U	0.40 U
Aroclor-1248		0.41 U	0.40 U	0.41 U	0.40 U	0.40 U	0.40 U
Aroclor-1254		0.41 U	0.40 U	0.41 U	0.40 U	0.40 U	0.40 U
Aroclor-1260		0.41 U	0.40 U	0.41 U	95 %	89 %	0.40 U

	Cust ID:	J10M57	J10M56	PBLKAI	PBLKAI BS
Sample Information	RFW#:	005	006	06LE0053-MB1	06LE0053-MB1
	Matrix:	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L
Surrogate: Tetrachloro-m-xylene		51 %	24 * %	61 %	56 %
Decachlorobiphenyl		55 %	27 %	53 %	52 %
		fl	fl	fl	fl
Aroclor-1016		0.40 U	0.40 U J	0.40 U	89 %
Aroclor-1221		0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1232		0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1242		0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1248		0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1254		0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1260		0.40 U	0.40 U	0.40 U	80 %

000012

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

5/23/06

Pesticide/PCBs by GC, CLP List

Report Date: 02/03/06 10:16

RFW Batch Number: 0601L122 Client: TNUHANFORD RCG-048 K0188 Work Order: 11343606001 Page: 1

	Cust ID:	J10M59	J11163	J11163	J11163	J11162	J10M15
Sample Information	RFW#:	001	002	002 MS	002 MSD	003	004
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate:	Tetrachloro-m-xylene	64 %	52 %	55 %	44 %	54 %	39 %
	Decachlorobiphenyl	67 %	59 %	57 %	56 %	49 %	51 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		0.051 U	0.050 U	101 %	90 %	0.051 U	0.050 U
gamma-BHC (Lindane)		0.051 U	0.050 U	99 %	92 %	0.051 U	0.050 U
Beta-BHC		0.051 U	0.050 U	91 %	86 %	0.051 U	0.050 U
Heptachlor		0.051 U	0.050 U	92 %	88 %	0.051 U	0.050 U
Delta-BHC		0.051 U	0.050 U	97 %	92 %	0.051 U	0.050 U
Aldrin		0.051 U	0.050 U	90 %	66 %	0.051 U	0.050 U
Heptachlor epoxide		0.051 U	0.050 U	95 %	92 %	0.051 U	0.050 U
gamma-Chlordane		0.051 U	0.050 U	92 %	89 %	0.051 U	0.050 U
Endosulfan I		0.051 U	0.050 U	94 %	92 %	0.051 U	0.050 U
alpha-Chlordane		0.051 U	0.050 U	91 %	89 %	0.051 U	0.050 U
4,4'-DDE		0.051 U	0.050 U	101 %	98 %	0.051 U	0.050 U
Dieldrin		0.051 U	0.050 U	108 %	105 %	0.051 U	0.050 U
Endrin		0.051 U	0.050 U	102 %	96 %	0.051 U	0.050 U
4,4'-DDD		0.051 U	0.050 U	110 %	104 %	0.051 U	0.050 U
Endosulfan II		0.051 U	0.050 U	100 %	99 %	0.051 U	0.050 U
4,4'-DDT		0.051 U	0.050 U	105 %	102 %	0.051 U	0.050 U
Endrin aldehyde		0.051 U	0.050 U	78 %	77 %	0.051 U	0.050 U
Endosulfan sulfate		0.051 U	0.050 U	99 %	96 %	0.051 U	0.050 U
Methoxychlor		0.051 U	0.050 U	99 %	94 %	0.051 U	0.050 U
Endrin ketone		0.051 U	0.050 U	100 %	98 %	0.051 U	0.050 U
Toxaphene		0.51 UJ	0.50 UJ	0.50 U	0.51 U	0.51 UJ	0.50 UJ

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

0000000005

0000013

5/23/06

2/6/6

Pesticide/PCBs by GC, CLP List

Report Date: 02/03/06 10:16

RFW Batch Number: 0601L122 Client: TNUHANFORD RCG-048 K0188 Work Order: 11343606001 Page: 2

	Cust ID:	J10M57	J10M56	J10M56	PBLKAI	PBLKAI BS	PBLKAQ
Sample Information	RFW#:	005	006	006	06LE0053-MB1	06LE0053-MB1	06LE0075-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
				REPREP			
Surrogate: Tetrachloro-m-xylene		42 %	18 * %	67 %	45 %	51 %	58 %
Decachlorobiphenyl		43 %	20 * %	72 %	40 %	45 %	72 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		0.050 U	0.050 U J	0.051 U J	0.050 U	106 %	0.050 U
gamma-BHC (Lindane)		0.050 U	0.050 U	0.051 U	0.050 U	103 %	0.050 U
Beta-BHC		0.050 U	0.050 U	0.051 U	0.050 U	93 %	0.050 U
Heptachlor		0.050 U	0.050 U	0.051 U	0.050 U	93 %	0.050 U
Delta-BHC		0.050 U	0.050 U	0.051 U	0.050 U	102 %	0.050 U
Aldrin		0.050 U	0.050 U	0.051 U	0.050 U	83 %	0.050 U
Heptachlor epoxide		0.050 U	0.050 U	0.051 U	0.050 U	98 %	0.050 U
gamma-Chlordane		0.050 U	0.050 U	0.051 U	0.050 U	96 %	0.050 U
Endosulfan I		0.050 U	0.050 U	0.051 U	0.050 U	100 %	0.050 U
alpha-Chlordane		0.050 U	0.050 U	0.051 U	0.050 U	95 %	0.050 U
4,4'-DDE		0.050 U	0.050 U	0.051 U	0.050 U	105 %	0.050 U
Dieldrin		0.050 U	0.050 U	0.051 U	0.050 U	112 %	0.050 U
Endrin		0.050 U	0.050 U	0.051 U	0.050 U	104 %	0.050 U
4,4'-DDD		0.050 U	0.050 U	0.051 U	0.050 U	114 %	0.050 U
Endosulfan II		0.050 U	0.050 U	0.051 U	0.050 U	107 %	0.050 U
4,4'-DDT		0.050 U	0.050 U	0.051 U	0.050 U	110 %	0.050 U
Endrin aldehyde		0.050 U	0.050 U	0.051 U	0.050 U	82 %	0.050 U
Endosulfan sulfate		0.050 U	0.050 U	0.051 U	0.050 U	103 %	0.050 U
Methoxychlor		0.050 U	0.050 U	0.051 U	0.050 U	103 %	0.050 U
Endrin ketone		0.050 U	0.050 U	0.051 U	0.050 U	104 %	0.050 U
Toxaphene		0.50 U J	0.50 U	0.51 U	0.50 U	0.50 U	0.50 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

JR 5/23/06

JR 2/9/06

000014

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0000000007

Sample Information	Cust ID:	PBLKAQ BS	PBLKAQ BSD
	RFW#:	06LE0075-MB1	06LE0075-MB1
	Matrix:	WATER	WATER
	D.F.:	1.00	1.00
	Units:	UG/L	UG/L

Surrogate:	Tetrachloro-m-xylene	68	%	62	%
	Decachlorobiphenyl	75	%	71	%

Alpha-BHC	99	%	93	%
gamma-BHC (Lindane)	97	%	91	%
Beta-BHC	95	%	80	%
Heptachlor	92	%	84	%
Delta-BHC	95	%	88	%
Aldrin	92	%	81	%
Heptachlor epoxide	93	%	85	%
gamma-Chlordane	92	%	85	%
Endosulfan I	93	%	86	%
alpha-Chlordane	92	%	84	%
4,4'-DDE	98	%	90	%
Dieldrin	99	%	90	%
Endrin	107	%	99	%
4,4'-DDD	101	%	92	%
Endosulfan II	95	%	88	%
4,4'-DDT	101	%	91	%
Endrin aldehyde	87	%	79	%
Endosulfan sulfate	95	%	87	%
Methoxychlor	97	%	90	%
Endrin ketone	96	%	88	%
Toxaphene	0.50	U	0.50	U

0000015

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

5/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RCG-048
LVL #: 0601L122
SDG/SAF # K0188/RCG-048

W.O. #: 11343-606-001-9999-00
Date Received: 01-20-2006

PCB

Six (6) water samples were collected on 01-17,19-2006.

The samples and their associated QC samples were extracted on 01-22-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 01-24,25-2006. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. The samples were extracted and analyzed within required holding time.
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. One (1) of twenty (20) surrogate recoveries was outside acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per sample).
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. 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.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/2/6
Date

som\r:\group\data\pest\tnu hanford\0601-122.pcbs
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 2 1 pages.

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

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RCG-048
LVL #: 0601L122
SDG/SAF # K0188/RCG-048

W.O. #: 11343-606-001-9999-00
Date Received: 01-20-2006

CHLORINATED PESTICIDES

Six (6) water samples were collected on 01-17,19-2006.

The samples and their associated QC samples were extracted on 01-22,31-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 01-26,27-2006 and 02-01-2006. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8081A.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Sample 006 was originally extracted within its required holding time. Due to poor surrogate recoveries, the sample was re-extracted. Both the original and the re-extracted results have been reported. A copy of the Sample Discrepancy Report has been enclosed.
3. The samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.
4. The method blanks were below the reporting limits for all target compounds.
5. Two (2) of twenty-eight (28) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report has been enclosed.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. Copies of the following SDRs are associated with this narrative: 06GC028.
10. 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.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/6/06
Date

rt\r:\group\data\pest\tnu hanford\0601-122.pst
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 24 pages.

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 060060

Initiator: JR
Date: 1/31/06
Client: MU

Batch: 0601L122
Samples: 06
Method: SW846/MCAWW/CLP/

Parameter: 0608H
Matrix: WATER
Prep Batch: 06LE053

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) Both TCX and DCB recoveries out low 19, 20%.
Re-extract?

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

reextract

4. Project Manager Instructions...signature/date: [signature] 1/31/06

✓ 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: BC 2/6/06 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X 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
1	X Project Mgr: Stone/Johnson	2	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-048-51 | Page 1 of 2

Collector DURATEK D R BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 7N	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048
Ice Chest No. ERC-02-501 ~~AFS-04-006~~ RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060220		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

RZS 1-19-06 ~~None~~ Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
J10M15	WATER	JAN 17 2006	0940							X	X	X	X

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1215 1-17-06	RZ Steffler RZ Steffler	1215 1-17-06
RZ Steffler RZ Steffler	1345 1-17-06	3728 / 2A	1345 1-17-06
3728 / 2A 1-19-06	1000	RZ Steffler RZ Steffler	1000 1-19-06
RZ Steffler RZ Steffler	1500 1-19-06	Fed Ex	
Fed Ex 1-20-06	0940		1-20-06 0940
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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)

000020

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Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-048-63 | Page 1 of 2

Collector: DURATEK ~~D. R. BREWINGTON~~	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 399-4-9		SAF No.: RC-048
Ice Chest No.: ERC-02-506 ~~AFS-04-020~~ RZS 1-19-06	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060225		Bill of Lading/Air Bill No.: SEE OSPC

0000021

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226, Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time										
J10M56	WATER	JAN 19 2006	1057							X	X	X	X

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1-19-06 1220	RZ Steffler R.Z. Steffler	1-19-06 1220
RZ Steffler R.Z. Steffler	1-19-06 1500	Fed Ex	
Fed Ex	1-20-06 0940	[illegible]	1-20-06 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) [Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238]

(2) ICP Metals - 6010 (Full List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc]; Mercury - 7470 - (CV)

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)

000021

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-048-66 | Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 7N	Data Turnaround 45 Days		
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-12		SAF No. RC-048
Air Quality ☐			
Ice Chest No. AFS-04-022	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES, JONVILLE	Offsite Property No. A060252		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	None	HNO3 to pH < 2	HNO3 to pH < 2	HNO3 to pH < 2	HNO3 to pH < 2	HNO3 to pH < 2	HNO3 to pH < 2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
5 J19M57 (Sample No.; Matrix: WATER; Sample Date: JAN 19 2006; Sample Time: 1133)							X	X	X	X

060022

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1220 1-19-06	RZ Steffler	1220 1-19-06
RZ Steffler	1500 1-19-06	Fed Ex	
Fed Ex	1-20-06 094		1-20-06 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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-048-68 | Page 1 of 2

Collector: DURATEK / D R BREWINGTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality: ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-K-132		SAF No.: RC-048
Ice Chest No.: ERC-04-003	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG A-C	aG D E	aG F G H
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226, Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
J10M59	WATER	JAN 17 2006	0940							X	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK / D R BREWINGTON	1-17-06 1215	RZ Stoffler	1-17-06 1215
RZ Stoffler	1-17-06 1345	3728 / 2A	1-17-06 1345
3728 / 2A	1-19-06 0930	RZ Stoffler	1-19-06 0930
RZ Stoffler	1-19-06 1500	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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-048-119	Page 1 of 2

Collector DURATEK D.R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 7N	Data Turnaround 45 Days		
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-N-73		SAF No. RC-048
Air Quality ☐			
Ice Chest No. AFS-04-~~022~~ 011 RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060221		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

00000024

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1 I	3 Ac	2 DE	3 FGH
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 – Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226, Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time									
J11162	WATER	JAN 17 2006	1150						X	X	X	X

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From DURATEK D.R. BREWINGTON	1-17-06 1142	Received By/Stored In RZ Steffler R.J. Steffler	1-17-06 1215
Relinquished By/Removed From RZ Steffler R.J. Steffler	1-17-06 1345	Received By/Stored In 3728/2A	1-17-06 1345
Relinquished By/Removed From 3728/2A	1-19-06 1000	Received By/Stored In RZ Steffler R.J. Steffler	1-19-06 1000
Relinquished By/Removed From RZ Steffler R.J. Steffler WCH	1-19-06 1500	Received By/Stored In Fed Ex	
Relinquished By/Removed From Fed Ex	1-20-06 0940	Received By/Stored In	1-20-06 0940
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) [Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238]

(2) ICP Metals - 6010 (Full List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc]; Mercury - 7470 - (CV)

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-048-120 | Page 1 of 2

Collector: DURATEK D. R. BREWINGTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 399-1-1		SAF No.: RC-048
Ice Chest No.: AFS-04-0020 RZS 1-19-06	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES (JONVILLE)	Offsite Property No.: A060251		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium-226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
J11163	WATER	JAN 19 2006	0938							X	X	X	X

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1220 1-19-06	RZ Stoffler	1220 1-19-06
RZ Stoffler	1500 WCH 1-19-06	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA			DATA PACKAGE: K0188		
VALIDATOR: TLI		LAB: LLI		DATE: 5/16/06	
			SDG: K0188		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10M59	J11163	J11162	J10M15	J10M57	J10M56
					J10M56R
					Water

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: no FB

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: MS6 – surr – J all PCBs no PAS
MS6 – Surr – J all pest
no MS/MSD MS6K – pest J all
no MSD/MS/LCS – toxaphene – J all

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: no toxaphene dup - J all no RPD for MSCR - Pass - J all aldrin 31% RPD - J all but SLR

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: _____

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: 25 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Inorganics - Data Package No. K0188-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0188 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
J10M15	1/17/06	Water	C	See note 1
J10M56	1/19/06	Water	C	See note 1
J10M57	1/19/06	Water	C	See note 1
J10M59	1/17/06	Water	C	See note 1
J11162	1/17/06	Water	C	See note 1
J11163	1/19/06	Water	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 and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 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: Water 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 "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

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

All preparation blank results were acceptable.

Field (Equipment) Blank

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 80% to 120%. 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 79% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% 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 20%, 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

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 and 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K0188 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

None found.

REFERENCES

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

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

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: K0188	REVIEWER: TLI	PROJECT: RCBRA	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

Project: WASHINGTON CLOSURE HANFORD													
Laboratory: LLI	SDG: K0188												
Sample Number		J10M15		J10M56		J10M57		J10M59		J11162		J11163	
Remarks													
Sample Date		1/17/06		1/19/06		1/19/06		1/17/06		1/17/06		1/19/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	10	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Aluminum	50	18.3	U	18.3	U	27.8		18.3	U	18.3	U	18.3	U
Arsenic	100	5.1		7.0		9.6		4.5		9.0		4.6	
Boron		23.1		39.1		32.1		24.6		19.5		28.2	
Barium	20	38.8		70.8		48.6		39.3		19.4		67.6	
Beryllium	5	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Bismuth		6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
Calcium		63000		52100		54200		61400		16200		40200	
Cadmium	5	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U
Cobalt		1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
Chromium	10	138		3.1		2.4		146		7.8		2.6	
Copper	10	1.6		1.2		25.1		1.8		2.1		1.8	
Iron	50	32.1	U	132		110		60.8		54.3		122	
Mercury	0.5	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Potassium		4390		5040		5700		4270		2740		4010	
Lithium		5.0		4.2		5.2		4.8		4.5		8.4	
Magnesium		7540		10800		10700		7320		3420		9300	
Manganese	5	0.20	U	3.6		0.20	U	0.34		0.88		1.9	
Molybdenum		1.3	U	4.9		6.2		1.3	U	6.9		4.8	
Sodium		47800		23000		18700		47500		143000		18500	
Nickel	40	9.5		1.3	U	1.3	U	10.2		2.8		1.3	U
Phosphorous		8.3	U	156		35.9		8.3	U	81.1		95.2	
Lead	50	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U
Antimony	60	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
Selenium		3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
Silicon		11300		11200		14500		11400		15500		11000	
Tin	100	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U
Strontium		330		232		218		323		79.5		190	
Thallium		6.4	U	6.4	U	6.4	U	6.4	U	6.6		6.4	U
Uranium	3000	20.6	U	79.6		23.1		20.6	U	20.6	U	51.4	
Vanadium	25	3.4		6.9		8.8		3.4		16.1		7.1	
Zinc	10	0.68		4.2		28.0		0.50	U	0.90		12.1	

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

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188

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

LVL LOT #: 0601L122

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J10M15	Silver, Total	1.4	u	UG/L	1.4	1.0
		Aluminum, Total	18.3	u	UG/L	18.3	1.0
		Arsenic, Total	5.1		UG/L	3.4	1.0
		Boron, Total	23.1		UG/L	2.7	1.0
		Barium, Total	38.8		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.1	u	UG/L	6.1	1.0
		Calcium, Total	63000		UG/L	11.9	1.0
		Cadmium, Total	0.70	u	UG/L	0.70	1.0
		Cobalt, Total	1.2	u	UG/L	1.2	1.0
		Chromium, Total	138		UG/L	1.6	1.0
		Copper, Total	1.6		UG/L	1.2	1.0
		Iron, Total	32.1	u	UG/L	32.1	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	4390		UG/L	55.4	1.0
		Lithium, Total	5.0		UG/L	0.30	1.0
		Magnesium, Total	7540		UG/L	13.5	1.0
		Manganese, Total	0.20	u	UG/L	0.20	1.0
		Molybdenum, Total	1.3	u	UG/L	1.3	1.0
		Sodium, Total	47800		UG/L	1.7	1.0
		Nickel, Total	9.5		UG/L	1.3	1.0
		Phosphorus, Total	8.3	u	UG/L	8.3	1.0
		Lead, Total	3.1	u	UG/L	3.1	1.0
		Antimony, Total	4.0	u	UG/L	4.0	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Silicon, Total	11300		UG/L	8.4	1.0
		Tin, Total	5.2	u	UG/L	5.2	1.0
		Strontium, Total	330		UG/L	0.10	1.0
		Thallium, Total	6.4	u	UG/L	6.4	1.0
		Uranium, Total	20.6	u	UG/L	20.6	1.0
		Vanadium, Total	3.4		UG/L	0.90	1.0
		Zinc, Total	0.68		UG/L	0.50	1.0

5/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188

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

LVL LOT #: 0601L122

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J10M56	Silver, Total	1.4	u	UG/L	1.4	1.0
		Aluminum, Total	18.3	u	UG/L	18.3	1.0
		Arsenic, Total	7.0		UG/L	3.4	1.0
		Boron, Total	39.1		UG/L	2.7	1.0
		Barium, Total	70.8		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.1	u	UG/L	6.1	1.0
		Calcium, Total	52100		UG/L	11.9	1.0
		Cadmium, Total	0.70	u	UG/L	0.70	1.0
		Cobalt, Total	1.2	u	UG/L	1.2	1.0
		Chromium, Total	3.1		UG/L	1.6	1.0
		Copper, Total	1.2		UG/L	1.2	1.0
		Iron, Total	132		UG/L	32.1	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	5040		UG/L	55.4	1.0
		Lithium, Total	4.2		UG/L	0.30	1.0
		Magnesium, Total	10800		UG/L	13.5	1.0
		Manganese, Total	3.6		UG/L	0.20	1.0
		Molybdenum, Total	4.9		UG/L	1.3	1.0
		Sodium, Total	23000		UG/L	1.7	1.0
		Nickel, Total	1.3	u	UG/L	1.3	1.0
		Phosphorus, Total	156		UG/L	8.3	1.0
		Lead, Total	3.1	u	UG/L	3.1	1.0
		Antimony, Total	4.0	u	UG/L	4.0	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Silicon, Total	11200		UG/L	8.4	1.0
		Tin, Total	5.2	u	UG/L	5.2	1.0
		Strontium, Total	232		UG/L	0.10	1.0
		Thallium, Total	6.4	u	UG/L	6.4	1.0
		Uranium, Total	79.6		UG/L	20.6	1.0
		Vanadium, Total	6.9		UG/L	0.90	1.0
		Zinc, Total	4.2		UG/L	0.50	1.0

5/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J10N57	Silver, Total	1.4	u	UG/L	1.4	1.0
		Aluminum, Total	27.8		UG/L	18.3	1.0
		Arsenic, Total	9.6		UG/L	3.4	1.0
		Boron, Total	32.1		UG/L	2.7	1.0
		Barium, Total	48.6		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.1	u	UG/L	6.1	1.0
		Calcium, Total	54200		UG/L	11.9	1.0
		Cadmium, Total	0.70	u	UG/L	0.70	1.0
		Cobalt, Total	1.2	u	UG/L	1.2	1.0
		Chromium, Total	2.4		UG/L	1.6	1.0
		Copper, Total	25.1		UG/L	1.2	1.0
		Iron, Total	110		UG/L	32.1	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	5700		UG/L	55.4	1.0
		Lithium, Total	5.2		UG/L	0.30	1.0
		Magnesium, Total	10700		UG/L	13.5	1.0
		Manganese, Total	0.20	u	UG/L	0.20	1.0
		Molybdenum, Total	6.2		UG/L	1.3	1.0
		Sodium, Total	18700		UG/L	1.7	1.0
		Nickel, Total	1.3	u	UG/L	1.3	1.0
		Phosphorus, Total	35.9		UG/L	8.3	1.0
		Lead, Total	3.1	u	UG/L	3.1	1.0
		Antimony, Total	4.0	u	UG/L	4.0	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Silicon, Total	14500		UG/L	8.4	1.0
		Tin, Total	5.2	u	UG/L	5.2	1.0
		Strontium, Total	218		UG/L	0.10	1.0
		Thallium, Total	6.4	u	UG/L	6.4	1.0
		Uranium, Total	23.1		UG/L	20.6	1.0
		Vanadium, Total	8.8		UG/L	0.90	1.0
		Zinc, Total	28.0		UG/L	0.50	1.0

5/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10M59	Silver, Total	1.4	u	UG/L	1.4	1.0
		Aluminum, Total	18.3	u	UG/L	18.3	1.0
		Arsenic, Total	4.5		UG/L	3.4	1.0
		Boron, Total	24.6		UG/L	2.7	1.0
		Barium, Total	39.3		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.1	u	UG/L	6.1	1.0
		Calcium, Total	61400		UG/L	11.9	1.0
		Cadmium, Total	0.70	u	UG/L	0.70	1.0
		Cobalt, Total	1.2	u	UG/L	1.2	1.0
		Chromium, Total	146		UG/L	1.6	1.0
		Copper, Total	1.8		UG/L	1.2	1.0
		Iron, Total	60.8		UG/L	32.1	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	4270		UG/L	55.4	1.0
		Lithium, Total	4.8		UG/L	0.30	1.0
		Magnesium, Total	7320		UG/L	13.5	1.0
		Manganese, Total	0.34		UG/L	0.20	1.0
		Molybdenum, Total	1.3	u	UG/L	1.3	1.0
		Sodium, Total	47500		UG/L	1.7	1.0
		Nickel, Total	10.2		UG/L	1.3	1.0
		Phosphorus, Total	8.3	u	UG/L	8.3	1.0
		Lead, Total	3.1	u	UG/L	3.1	1.0
		Antimony, Total	4.0	u	UG/L	4.0	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Silicon, Total	11400		UG/L	8.4	1.0
		Tin, Total	5.2	u	UG/L	5.2	1.0
		Strontium, Total	323		UG/L	0.10	1.0
		Thallium, Total	6.4	u	UG/L	6.4	1.0
		Uranium, Total	20.6	u	UG/L	20.6	1.0
		Vanadium, Total	3.4		UG/L	0.90	1.0
		Zinc, Total	0.50	u	UG/L	0.50	1.0

5/23/06 5/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J11162	Silver, Total	1.4	u	UG/L	1.4	1.0
		Aluminum, Total	18.3	u	UG/L	18.3	1.0
		Arsenic, Total	9.0		UG/L	3.4	1.0
		Boron, Total	19.5		UG/L	3.7	1.0
		Barium, Total	19.4		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.1	u	UG/L	6.1	1.0
		Calcium, Total	16200		UG/L	11.9	1.0
		Cadmium, Total	0.70	u	UG/L	0.70	1.0
		Cobalt, Total	1.2	u	UG/L	1.2	1.0
		Chromium, Total	7.8		UG/L	1.6	1.0
		Copper, Total	2.1		UG/L	1.2	1.0
		Iron, Total	54.3		UG/L	32.1	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	2740		UG/L	55.4	1.0
		Lithium, Total	4.5		UG/L	0.30	1.0
		Magnesium, Total	3420		UG/L	13.5	1.0
		Manganese, Total	0.88		UG/L	0.20	1.0
		Molybdenum, Total	6.9		UG/L	1.3	1.0
		Sodium, Total	143000		UG/L	28.2	1.0
		Nickel, Total	2.8		UG/L	1.3	1.0
		Phosphorus, Total	81.1		UG/L	8.3	1.0
		Lead, Total	3.1	u	UG/L	3.1	1.0
		Antimony, Total	4.0	u	UG/L	4.0	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Silicon, Total	15500		UG/L	8.4	1.0
		Tin, Total	5.2	u	UG/L	5.2	1.0
		Strontium, Total	79.5		UG/L	0.10	1.0
		Thallium, Total	6.6		UG/L	6.4	1.0
		Uranium, Total	20.6	u	UG/L	20.6	1.0
		Vanadium, Total	16.1		UG/L	0.90	1.0
		Zinc, Total	0.90		UG/L	0.50	1.0

R 5/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J11163	Silver, Total	1.4	u	UG/L	1.4	1.0
		Aluminum, Total	18.3	u	UG/L	18.3	1.0
		Arsenic, Total	4.6		UG/L	3.4	1.0
		Boron, Total	28.2		UG/L	2.7	1.0
		Barium, Total	67.6		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.1	u	UG/L	6.1	1.0
		Calcium, Total	40200		UG/L	11.9	1.0
		Cadmium, Total	0.70	u	UG/L	0.70	1.0
		Cobalt, Total	1.2	u	UG/L	1.2	1.0
		Chromium, Total	2.6		UG/L	1.6	1.0
		Copper, Total	1.8		UG/L	1.2	1.0
		Iron, Total	122		UG/L	32.1	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	4010		UG/L	55.4	1.0
		Lithium, Total	8.4		UG/L	0.30	1.0
		Magnesium, Total	9300		UG/L	13.5	1.0
		Manganese, Total	1.9		UG/L	0.20	1.0
		Molybdenum, Total	4.8		UG/L	1.3	1.0
		Sodium, Total	18500		UG/L	1.7	1.0
		Nickel, Total	1.3	u	UG/L	1.3	1.0
		Phosphorus, Total	95.2		UG/L	8.3	1.0
		Lead, Total	3.1	u	UG/L	3.1	1.0
		Antimony, Total	4.0	u	UG/L	4.0	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Silicon, Total	11000		UG/L	8.4	1.0
		Tin, Total	5.2	u	UG/L	5.2	1.0
		Strontium, Total	190		UG/L	0.10	1.0
		Thallium, Total	6.4	u	UG/L	6.4	1.0
		Uranium, Total	51.4		UG/L	20.6	1.0
		Vanadium, Total	7.1		UG/L	0.90	1.0
		Zinc, Total	12.1		UG/L	0.50	1.0

5/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RCG-048
LVL#: 0601L122
SDG/SAF#: K0188/RCG-048

W.O.#: 11343-606-001-9999-00
Date Received: 01-20-06

METALS CASE NARRATIVE

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

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Results for Silicon and Phosphorous on all samples, and for Sodium on sample J11162, were reported from a different instrument due to high concentrations and sample matrix.

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

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

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

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

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

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

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

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

11. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 41 pages.

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

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

13. 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

3/1/00
Date

jjw/m01-122

LvLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-68	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-04-003	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No.		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG A-C	aG D E	aG F G H
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium-226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
J10M59	WATER	JAN 17 2006	0940							X	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D R BREWINGTON	1-17-06 1415	RZ Steffler R.J. Steffler	1-17-06 1215
RZ Steffler R.J. Steffler	1-17-06 1345	3728 / 2A	1-19-06 1345
3728 / 2A	1-19-06 0930	RZ Steffler R.J. Steffler	1-19-06 0930
RZ Steffler R.J. Steffler	1-19-06 1500	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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-048-120	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-1-1		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-09T 20 821 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES JONVILLE	Offsite Property No. A060251		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium-226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
Sample No. / Matrix * / Sample Date / Sample Time										
J11163 / WATER / JAN 19 2006 / 0938							X	X	X	X

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DURATEK D. R. BREWINGTON	1220 1-19-06	RZ Steffler	1220 1-19-06
RZ Steffler	1500 WCH 1-19-06	Fed Ex	
Fed Ex	1-20-06 0940		1-20-06 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

Matrix *

S=Soil
SS=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-048-119	Page 1 of 2

Collector DURATEK D.P. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-N-73		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-~~02X~~ 011 RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060221		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

22000022

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1 I	3 A-C	2 DE	3 FGH
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time										
J11162	WATER	JAN 17 2006	1150							X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From DURATEK D.P. BREWINGTON		1-17-06 1215
Received By/Stored In RZ Stoffler		1-17-06 1215
Relinquished By/Removed From RZ Stoffler		1-17-06 1345
Received By/Stored In 3728/2A		1-17-06 1345
Relinquished By/Removed From 3728/2A		1-19-06 1000
Received By/Stored In RZ Stoffler		1-19-06 1000
Relinquished By/Removed From RZ Stoffler		1-19-06 1500
Received By/Stored In Fed Ex		
Relinquished By/Removed From Fed Ex		1-20-06 0940
Received By/Stored In		1-20-06 0940
Relinquished By/Removed From		
Received By/Stored In		

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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-048-51	Page 1 of 2

Collector DURATEK D R BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-K-132		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-02-501 ~~AFS 04-0010~~ RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060220		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

RZS 1-19-06 ~~None~~ Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time									
J10M15	WATER	JAN 17 2006	0940						X	X	X	X

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: D R BREWINGTON	1215 1-17-06	Received By/Stored In: RZ Steffler R.J. Steffler	1215 1-17-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler	1345 1-17-06	Received By/Stored In: 3728/2A	1-17-06 1345
Relinquished By/Removed From: 3728/2A 1-19-06	1000	Received By/Stored In: RZ Steffler R.J. Steffler	1000 1-19-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler	1800 1-19-06	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	1-20-06 0940	Received By/Stored In:	1-20-06 0940
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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-048-66	Page 1 of 2

Collector DURATEK D. R. BREWINGTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-12		SAF No. RC-048	Air Quality ☐	
Ice Chest No. AFS-04-022	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060252		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 – Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium-226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081
Sample No.	Matrix *	Sample Date	Sample Time								
5 J10M57	WATER	JAN 19 2006	1133					X	X	X	X

000024

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From DURATEK D. R. BREWINGTON	1220 1-19-06	Received By/Stored In RZ Stiffler	1220 1-19-06
Relinquished By/Removed From RZ Stiffler	1500 1-19-06	Received By/Stored In Fed Ex	
Relinquished By/Removed From Fed Ex	1-20-06 094	Received By/Stored In	1-20-06 0940
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

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-048-63	Page 1 of 2

Collector DURATEK ~~D. R. BREWINGTON~~	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 399-4-9		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERC-02-506 ~~AFS-04-020~~ RZS 1-19-06	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060225		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE < DOT LIMITS

Special Handling and/or Storage

Cool 4°C

000025

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C
Type of Container	P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	3	2	3
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 – Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium-226; Ra-228	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081

Sample No.	Matrix *	Sample Date	Sample Time										
J10M56	WATER	JAN 19 2006	1057							X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: DURATEK D. R. BREWINGTON	Date/Time 1220 1-19-06	Received By/Stored In: RZ Steffler	Date/Time 1220 1-19-06
Relinquished By/Removed From: RZ Steffler	Date/Time 1500 1-19-06	Received By/Stored In: Fed Ex	Date/Time
Relinquished By/Removed From: Fed Ex	Date/Time 1-20-06 0940	Received By/Stored In:	Date/Time 1-20-06 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
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

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

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA			DATA PACKAGE: K0188		
VALIDATOR: TCI		LAB: LLI		DATE: 5/16/08	
			SDG: K0188		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10M59	J11163	J11162	J10M15	J10M57	J10M56
					Water

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: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

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

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

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

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

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0057-MB1	Silver, Total	1.4	u	UG/L	1.4	1.0
		Aluminum, Total	18.3	u	UG/L	18.3	1.0
		Arsenic, Total	3.4	u	UG/L	3.4	1.0
		Boron, Total	2.7	u	UG/L	2.7	1.0
		Barium, Total	0.32		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.1	u	UG/L	6.1	1.0
		Calcium, Total	24.8		UG/L	11.9	1.0
		Cadmium, Total	0.70	u	UG/L	0.70	1.0
		Cobalt, Total	1.2	u	UG/L	1.2	1.0
		Chromium, Total	1.6	u	UG/L	1.6	1.0
		Copper, Total	1.2	u	UG/L	1.2	1.0
		Iron, Total	32.1	u	UG/L	32.1	1.0
		Potassium, Total	55.4	u	UG/L	55.4	1.0
		Lithium, Total	0.30	u	UG/L	0.30	1.0
		Magnesium, Total	13.5	u	UG/L	13.5	1.0
		Manganese, Total	0.20	u	UG/L	0.20	1.0
		Molybdenum, Total	1.3	u	UG/L	1.3	1.0
		Sodium, Total	1.7	u	UG/L	1.7	1.0
		Nickel, Total	1.3	u	UG/L	1.3	1.0
		Phosphorus, Total	8.3	u	UG/L	8.3	1.0
		Lead, Total	3.1	u	UG/L	3.1	1.0
		Antimony, Total	4.0	u	UG/L	4.0	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Silicon, Total	13.6		UG/L	8.4	1.0
		Tin, Total	5.2	u	UG/L	5.2	1.0
		Strontium, Total	0.21		UG/L	0.10	1.0
		Thallium, Total	6.4	u	UG/L	6.4	1.0
		Uranium, Total	20.6	u	UG/L	20.6	1.0
		Vanadium, Total	0.90	u	UG/L	0.90	1.0
		Zinc, Total	0.50	u	UG/L	0.50	1.0
BLANK1	06C0014-MB1	Mercury, Total	0.10	u	UG/L	0.10	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J10M59	Mercury, Total	0.99	0.10u	1.0	99.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J11163	Silver, Total	52.3	1.4 u	50.0	104.6	1.0
		Aluminum, Total	2070	18.3 u	2000	103.3	1.0
		Arsenic, Total	2070	4.6	2000	103.1	1.0
		Boron, Total	1060	28.2	1000	102.7	1.0
		Barium, Total	2170	67.6	2000	104.9	1.0
		Beryllium, Total	51.9	0.10u	50.0	103.8	1.0
		Bismuth, Total	5610	6.1 u	5000	112.3	1.0
		Calcium, Total	65900	40200	25000	103.0	1.0
		Cadmium, Total	51.2	0.70u	50.0	102.4	1.0
		Cobalt, Total	516	1.2 u	500	103.2	1.0
		Chromium, Total	212	2.6	200	105.0	1.0
		Copper, Total	258	1.8	250	102.5	1.0
		Iron, Total	1220	122	1000	110.0	1.0
		Potassium, Total	30800	4010	25000	107.0	1.0
		Lithium, Total	1130	8.4	1000	111.8	1.0
		Magnesium, Total	35300	9300	25000	103.9	1.0
		Manganese, Total	523	1.9	500	104.2	1.0
		Molybdenum, Total	1040	4.8	1000	103.4	1.0
		Sodium, Total	43100	18500	25000	98.5	1.0
		Nickel, Total	512	1.3 u	500	102.3	1.0
		Phosphorus, Total	5030	95.2	5000	98.7	1.0
		Lead, Total	513	3.1 u	500	102.6	1.0
		Antimony, Total	519	4.0 u	500	103.7	1.0
		Selenium, Total	2070	3.6 u	2000	103.5	1.0
		Silicon, Total	11900	11000	1000	90.2*	1.0
		Tin, Total	1030	5.2 u	1000	103.5	1.0
		Strontium, Total	1230	190	1000	104.3	1.0
		Thallium, Total	2150	6.4 u	2000	107.3	1.0
		Uranium, Total	2600	51.4	~~5000~~ 2500	~~52.0~~ 104.0	1.0
		Vanadium, Total	532	7.1	500	105.0	1.0
		Zinc, Total	526	12.1	500	102.8	1.0

corrected value pw 2/28/06

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J10M59	Silver, Total	1.4 u	1.4 u	NC	1.0
		Aluminum, Total	18.3 u	18.3 u	NC	1.0
		Arsenic, Total	4.5	3.8	16.9	1.0
		Boron, Total	24.6	23.6	4.1	1.0
		Barium, Total	39.3	38.6	1.8	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Bismuth, Total	6.1 u	6.1 u	NC	1.0
		Calcium, Total	61400	62600	2.1	1.0
		Cadmium, Total	0.70u	0.70u	NC	1.0
		Cobalt, Total	1.2 u	1.2 u	NC	1.0
		Chromium, Total	146	148	1.0	1.0
		Copper, Total	1.8	1.4	25.0	1.0
		Iron, Total	60.8	32.1 u	~~NC~~ 200	1.0
		Mercury, Total	0.10u	0.10u	NC	1.0
		Potassium, Total	4270	4300	0.65	1.0
		Lithium, Total	4.8	4.9	2.1	1.0
		Magnesium, Total	7320	7450	1.8	1.0
		Manganese, Total	0.34	0.23	38.6	1.0
		Molybdenum, Total	1.3 u	1.3 u	NC	1.0
		Sodium, Total	47500	48300	1.7	1.0
		Nickel, Total	10.2	11.1	8.5	1.0
		Phosphorus, Total	8.3 u	8.3 u	NC	1.0
		Lead, Total	3.1 u	3.1 u	NC	1.0
		Antimony, Total	4.0 u	4.0 u	NC	1.0
		Selenium, Total	3.6 u	3.6 u	NC	1.0
		Silicon, Total	11400	11300	0.80	1.0
		Tin, Total	5.2 u	5.2 u	NC	1.0
		Strontium, Total	323	327	1.2	1.0
		Thallium, Total	6.4 u	6.4 u	NC	1.0
		Uranium, Total	20.6 u	20.6 u	NC	1.0
		Vanadium, Total	3.4	2.9	15.9	1.0
		Zinc, Total	0.50u	0.50u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/28/06

CLIENT: TNUHANFORD RCG-048 K0188 LVL LOT #: 0601L122

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0057-LC1	Silver, LCS	508	500	UG/L	101.6
		Aluminum, LCS	5130	5000	UG/L	102.5
		Arsenic, LCS	10100	10000	UG/L	101.2
		Boron, LCS	5180	5000	UG/L	103.6
		Barium, LCS	5090	5000	UG/L	101.9
		Beryllium, LCS	257	250	UG/L	102.9
		Bismuth, LCS	5400	5000	UG/L	107.9
		Calcium, LCS	25800	25000	UG/L	103.1
		Cadmium, LCS	258	250	UG/L	103.0
		Cobalt, LCS	2560	2500	UG/L	102.3
		Chromium, LCS	512	500	UG/L	102.5
		Copper, LCS	1270	1250	UG/L	101.9
		Iron, LCS	5180	5000	UG/L	103.5
		Potassium, LCS	26100	25000	UG/L	104.2
		Lithium, LCS	5300	5000	UG/L	105.9
		Magnesium, LCS	25700	25000	UG/L	102.9
		Manganese, LCS	782	750	UG/L	104.2
		Molybdenum, LCS	5170	5000	UG/L	103.4
		Sodium, LCS	25000	25000	UG/L	99.9
		Nickel, LCS	2060	2000	UG/L	103.0
		Phosphorus, LCS	4760	5000	UG/L	95.3
		Lead, LCS	2570	2500	UG/L	102.6
		Antimony, LCS	3100	3000	UG/L	103.5
		Selenium, LCS	10300	10000	UG/L	103.0
		Silicon, LCS	4930	5000	UG/L	98.6
		Tin, LCS	5130	5000	UG/L	102.6
		Strontium, LCS	5090	5000	UG/L	101.6
		Thallium, LCS	10400	10000	UG/L	103.7
		Uranium, LCS	2460	2500	UG/L	98.2
		Vanadium, LCS	2580	2500	UG/L	103.1
		Zinc, LCS	1030	1000	UG/L	102.6
LCS1	06C0014-LC1	Mercury, LCS	5.1	5.0	UG/L	101.1