0058764

EBERLINE SERVICES

January 20, 2003

JAN 2003 RECEIVED

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R2-11-099-7399, SDG H1982

Dear Mr. Trent:

Enclosed is the data report for one solid sample designated under SAF No. F03-005 received at Eberline Services on November 20, 2002. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package

RECEIVED
FEB 18 2003
EDMC

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H1982 was composed of one solid (soil) sample designated under SAF No. F03-005 with a Project Designations of: 200 Area Source Characterization 200-CS-1 OU – Waste Man. The sample in SDG H1982 (7399) was batched with the sample in SDG H1977 (7396).

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analyses

Per FH's instructions, sample B15YL8 was not analyzed for isotopic uranium (see e-mail attached).

2.6 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.8 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.9 Transplutonic Analyses (Am-241, Cm-242, and Cm-243/244)

No problems were encountered during the course of the analyses.

2.10 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

1/20/3

Date

Stephen_J_Trent@RL.gov
01/06/2003 01:08 PM

To: mmannion@eberlineservices.com
cc:
Subject: SDGs H1969, H1977, H1982, H1984, and H1996 total U

Melissa,

7391 7396 7399 7401 7414

We will not need to run isotopic U on SDGs SDGs H1969, H1977, H1982, H1984, and H1996.

Thanks,

Steve J. Trent
Sample Management Project Coordinator
Fluor Hanford - Central Plateau Project
Ph: (509) 373-5869
EFax: (866) 252-5816
Site Pager: 85-7344

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H1982

SDG	7399
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG H1982

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	01/20/03

SDG 7399
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H1982

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/20/03

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

SDG 7399
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1982

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B15YL8	SP-2	SOLID		R211099-01	F03-005	F03-005-012	11/15/02 09:40
Method Blank		SOLID		R211088-03	F03-005		
Method Blank		SOLID		R211088-06	F03-005		
Lab Control Sample		SOLID		R211088-02	F03-005		
Lab Control Sample		SOLID		R211088-05	F03-005		
Duplicate (R211099-01)	SP-2	SOLID		R211099-02	F03-005		11/15/02 09:40

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

SDG 7399
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1982

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7396		Method Blank	SOLID						R211088-03	7396-003
		Method Blank	SOLID						R211088-06	7396-006
		Lab Control Sample	SOLID						R211088-02	7396-002
		Lab Control Sample	SOLID						R211088-05	7396-005
7399	F03-005-012	B15YL8	SOLID	94.7	1015 g		11/20/02	5	R211099-01	7399-001
		Duplicate (R211099-01)	SOLID	94.7	1015 g		11/20/02	5	R211099-02	7399-002

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

SDG 7399
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1982

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
NP	SOLID	Neptunium in Soil	7052-079	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7052-079	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7052-079	5.0	1			1	1	1/1		
TP	SOLID	Americium 241/Curium in Solids	7052-079	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7052-079	10.0	1			1	1	1/1		
Gas Proportional Counting												
93A	SOLID	Gross Alpha in Soil	7052-079	20.0	1			1	1	1/1		
93B	SOLID	Gross Beta in Soil	7052-079	15.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7052-079	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	7052-079	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7052-079	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

SDG 7399
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1982

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B15YL8			R211099-01	7399-001	93A/93		01/06/03	01/20/03	MCM	Gross Alpha in Soil
SP-2		SOLID	11/15/02	7399-001	93B/93		01/06/03	01/20/03	MCM	Gross Beta in Soil
F03-005-012	F03-005		11/20/02	7399-001	C		12/24/02	01/20/03	MCM	Carbon 14 in Soil
				7399-001	GAM		01/09/03	01/20/03	MCM	Gamma Scan
				7399-001	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7399-001	PU		01/15/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7399-001	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7399-001	TH		01/09/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7399-001	TP		01/20/03	01/20/03	MCM	Americium 241/Curium in Solids
				7399-001	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil
Method Blank			R211088-03	7396-003	93A/93		01/06/03	01/20/03	MCM	Gross Alpha in Soil
		SOLID		7396-003	93B/93		01/06/03	01/20/03	MCM	Gross Beta in Soil
	F03-005			7396-003	C		12/23/02	01/20/03	MCM	Carbon 14 in Soil
				7396-003	GAM		01/06/03	01/20/03	MCM	Gamma Scan
				7396-003	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7396-003	PU		01/15/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7396-003	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7396-003	TH		01/07/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7396-003	TP		01/17/03	01/20/03	MCM	Americium 241/Curium in Solids
Method Blank			R211088-06	7396-006	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil
		SOLID								
	F03-005									
Lab Control Sample			R211088-02	7396-002	93A/93		01/07/03	01/20/03	MCM	Gross Alpha in Soil
		SOLID		7396-002	93B/93		01/07/03	01/20/03	MCM	Gross Beta in Soil
	F03-005			7396-002	C		12/24/02	01/20/03	MCM	Carbon 14 in Soil
				7396-002	GAM		01/06/03	01/20/03	MCM	Gamma Scan
				7396-002	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7396-002	PU		01/17/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7396-002	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7396-002	TH		01/07/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7396-002	TP		01/17/03	01/20/03	MCM	Americium 241/Curium in Solids
Lab Control Sample			R211088-05	7396-005	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil
		SOLID								
	F03-005									

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

SDG 7399
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1982

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R211099-01)			R211099-02	7399-002	93A/93		01/07/03	01/20/03	MCM	Gross Alpha in Soil
SP-2		SOLID	11/15/02	7399-002	93B/93		01/07/03	01/20/03	MCM	Gross Beta in Soil
	F03-005		11/20/02	7399-002	C		12/24/02	01/20/03	MCM	Carbon 14 in Soil
				7399-002	GAM		01/09/03	01/20/03	MCM	Gamma Scan
				7399-002	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7399-002	PU		01/16/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7399-002	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7399-002	TH		01/09/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7399-002	TP		01/17/03	01/20/03	MCM	Americium 241/Curium in Solids
				7399-002	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	F03-005	Gross Alpha in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	F03-005	Gross Beta in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
C	F03-005	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1	4
GAM	F03-005	Gamma Scan	GAMMA_GS	1			1	1	1	4
NP	F03-005	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	F03-005	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	F03-005	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TH	F03-005	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1	4
TP	F03-005	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
U_T	F03-005	Uranium, Total in Soil	UTOT_KPA	1			1	1	1	4
TOTALS				10			10	10	10	40

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

R211088-03 Method Blank

METHOD BLANK

SDG	7399	Client/Case no	Hanford SDG H1982
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R211088-03	Client sample id	Method Blank
Dept sample id	7396-003	Material/Matrix	SOLID
		SAF No	F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.368	0.95	2.3	10	U	93A
Gross Beta	12587-47-2	-0.624	3.1	5.5	15	U	93B
Carbon 14	14762-75-5	-2.15	1.8	3.1	50	U	C
Total Strontium	SR-RAD	-0.145	0.16	0.37	1.0	U	SR
Thorium 228	14274-82-9	0.037	0.15	0.28		U	TH
Thorium 230	14269-63-7	0.183	0.22	0.28	1.0	U	TH
Thorium 232	TH-232	0	0.073	0.28	1.0	U	TH
Neptunium 237	13994-20-2	-0.033	0.13	0.31	1.0	U	NP
Plutonium 238	13981-16-3	0.062	0.18	0.34	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.031	0.12	0.29	1.0	U	PU
Curium 242	15510-73-3	0	0.026	0.057		U	TP
Curium 243/244	CM-243/244	0.021	0.043	0.075	1.0	U	TP
Americium 241	14596-10-2	0.047	0.051	0.075	1.0	U	TP
Sodium 22	13966-32-0	U		0.014		U	GAM
Potassium 40	13966-00-2	U		0.16		U	GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Antimony 125	14234-35-6	U		0.028		U	GAM
Tin 126	15832-50-5	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.014		U	GAM
Cesium 134	13967-70-9	U		0.016		U	GAM
Cesium 137	10045-97-3	U		0.010	0.10	U	GAM
Radium 226	13982-63-3	U		0.022		U	GAM
Radium 228	15262-20-1	U		0.047		U	GAM
Europium 152	14683-23-9	U		0.034	0.10	U	GAM
Europium 154	15585-10-1	U		0.043	0.10	U	GAM
Europium 155	14391-16-3	U		0.027	0.10	U	GAM
Thorium 228	14274-82-9	U		0.016		U	GAM
Thorium 232	TH-232	U		0.047		U	GAM
Uranium 235	15117-96-1	U		0.036		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

B L A N K , c o n t .

SDG	7399	Client/Case no	Hanford SDG H1982
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R211088-03	Client sample id	Method Blank
Dept sample id	7396-003	Material/Matrix	SOLID
		SAF No	F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 238	U-238	U		1.4		U	GAM
Americium 241	14596-10-2	U		0.037		U	GAM

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 43470

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

E B E R L I N E S E R V I C E S / R I C H M O N D

SAMPLE DELIVERY GROUP H1982

R211088-06 **Method Blank**

M E T H O D B L A N K

SDG	7399	Client/Case no	Hanford SDG H1982
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R211088-06	Client sample id	Method Blank
Dept sample id	7396-006	Material/Matrix	SOLID
		SAF No	F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	0	0.002	0.005	0.10	U	U_T

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 43431

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

R211088-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7399
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1982
Contract No. 630

Lab sample id R211088-02
Dept sample id 7396-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No F03-005

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	197	14	3.5	10		93A	200	8.0	98	68-132	70-130
Gross Beta	207	11	6.5	15		93B	212	8.5	98	76-124	70-130
Carbon 14	1830	19	4.3	50		C	1910	76	96	84-116	80-120
Total Strontium	22.4	1.2	0.37	1.0		SR	21.2	0.85	106	81-119	80-120
Thorium 230	47.0	9.6	1.2	1.0		TH	40.8	1.6	115	63-137	80-120
Neptunium 237	17.6	2.0	0.36	1.0		NP	19.9	0.80	88	82-118	80-120
Plutonium 238	22.8	2.3	0.21	1.0		PU	24.4	0.98	93	83-117	80-120
Plutonium 239/240	25.9	2.6	0.21	1.0		PU	26.4	1.1	98	82-118	80-120
Curium 243/244	19.2	0.87	0.11	1.0		TP	18.8	0.75	102	88-112	80-120
Americium 241	18.5	0.85	0.10	1.0		TP	19.1	0.76	97	88-112	80-120
Cobalt 60	1.06	0.075	0.030	0.050		GAM	0.994	0.040	107	73-127	80-120
Cesium 137	1.42	0.074	0.045	0.10		GAM	1.30	0.052	109	73-127	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 43469

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

R211088-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7399
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1982
Contract No. 630

Lab sample id R211088-05
Dept sample id 7396-005

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No F03-005

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium (ug/g)	13.6	1.5	0.045	0.10		U_T	13.2	0.53	103	77-123	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 43430

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

R211099-02 B15YL8

DUPLICATE

SDG	7399			Client/Case no	Hanford SDG H1982
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R211099-02	Lab sample id	R211099-01	Client sample id	B15YL8
Dept sample id	7399-002	Dept sample id	7399-001	Location/Matrix	SP-2 SOLID
		Received	11/20/02	Collected/Weight	11/15/02 09:40 1015 g
% solids	94.7	% solids	94.7	Custody/SAF No	F03-005-012 F03-005

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	3.25	2.5	2.8	10		93A	2.31	2.3	2.9	U	34	188	
Gross Beta	15.5	4.0	5.2	15		93B	13.1	4.1	5.7		17	68	
Carbon 14	13.3	1.6	1.9	50		C	12.2	1.4	1.8		9	33	
Total Strontium	0.164	0.18	0.32	1.0	U	SR	0.100	0.16	0.31	U	-		
Thorium 228	0.214	0.21	0.41		U	TH	0.162	0.16	0.31	U	-		
Thorium 230	0.797	0.43	0.41	1.0		TH	0.363	0.24	0.31		75	128	
Thorium 232	0.159	0.21	0.41	1.0	U	TH	0.282	0.24	0.31	U	-		
Total Uranium (ug/g)	0.589	0.065	0.005	0.10		U_T	0.566	0.062	0.005		4	30	
Neptunium 237	0	0.050	0.075	1.0	U	NP	0.031	0.062	0.094	U	-		
Plutonium 238	0.030	0.061	0.23	1.0	U	PU	0.027	0.055	0.21	U	-		
Plutonium 239/240	0.060	0.061	0.23	1.0	U	PU	0.191	0.16	0.21	U	-		
Curium 242	0.005	0.020	0.048		U	TP	0	0.084	0.32	U	-		
Curium 243/244	0.038	0.031	0.037	1.0		TP	-0.032	0.064	0.25	U	200	305	
Americium 241	0.008	0.030	0.042	1.0	U	TP	0	0.064	0.24	U	-		
Sodium 22	U		0.015		U	GAM	U		0.033	U	-		
Potassium 40	13.1	0.31	0.14			GAM	12.8	0.80	0.35		2	33	
Cobalt 60	U		0.013	0.050	U	GAM	U		0.030	U	-		
Antimony 125	U		0.029		U	GAM	U		0.076	U	-		
Tin 126	U		0.036		U	GAM	U		0.16	U	-		
Barium 133	U		0.013		U	GAM	U		0.029	U	-		
Cesium 134	U		0.017		U	GAM	U		0.043	U	-		
Cesium 137	0.611	0.017	0.012	0.10		GAM	0.642	0.046	0.037		5	34	
Radium 226	0.523	0.029	0.028			GAM	0.495	0.060	0.055		6	37	
Radium 228	0.774	0.066	0.060			GAM	0.758	0.15	0.14		2	45	
Europium 152	U		0.035	0.10	U	GAM	U		0.075	U	-		
Europium 154	U		0.044	0.10	U	GAM	U		0.097	U	-		
Europium 155	U		0.065	0.10	U	GAM	U		0.070	U	-		
Thorium 228	0.669	0.018	0.018			GAM	0.710	0.040	0.038		6	33	

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

DUPLICATE, cont.

SDG	7399			Client/Case no	Hanford SDG H1982
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R211099-02	Lab sample id	R211099-01	Client sample id	B15YL8
Dept sample id	7399-002	Dept sample id	7399-001	Location/Matrix	SP-2 SOLID
		Received	11/20/02	Collected/Weight	11/15/02 09:40 1015 g
% solids	94.7	% solids	94.7	Custody/SAF No	F03-005-012 F03-005

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Thorium 232	0.774	0.066	0.060			GAM	0.758	0.15	0.14		2	45
Uranium 235	U		0.061		U	GAM	U		0.11	U	-	
Uranium 238	U		2.5		U	GAM	U		3.8	U	-	
Americium 241	U		0.097		U	GAM	U		0.043	U	-	

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 43449

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

R211099-01 B15YL8

DATA SHEET

SDG	7399	Client/Case no	Hanford	SDG H1982	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R211099-01	Client sample id	B15YL8		
Dept sample id	7399-001	Location/Matrix	SP-2	SOLID	
Received	11/20/02	Collected/Weight	11/15/02 09:40	1015 g	
% solids	94.7	Custody/SAF No	F03-005-012	F03-005	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.31	2.3	2.9	10	U	93A
Gross Beta	12587-47-2	13.1	4.1	5.7	15		93B
Carbon 14	14762-75-5	12.2	1.4	1.8	50		C
Total Strontium	SR-RAD	0.100	0.16	0.31	1.0	U	SR
Thorium 228	14274-82-9	0.162	0.16	0.31		U	TH
Thorium 230	14269-63-7	0.363	0.24	0.31	1.0		TH
Thorium 232	TH-232	0.282	0.24	0.31	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0.566	0.062	0.005	0.10		U_T
Neptunium 237	13994-20-2	0.031	0.062	0.094	1.0	U	NP
Plutonium 238	13981-16-3	0.027	0.055	0.21	1.0	U	PU
Plutonium 239/240	PU-239/240	0.191	0.16	0.21	1.0	U	PU
Curium 242	15510-73-3	0	0.084	0.32		U	TP
Curium 243/244	CM-243/244	-0.032	0.064	0.25	1.0	U	TP
Americium 241	14596-10-2	0	0.064	0.24	1.0	U	TP
Sodium 22	13966-32-0	U		0.033		U	GAM
Potassium 40	13966-00-2	12.8	0.80	0.35			GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Antimony 125	14234-35-6	U		0.076		U	GAM
Tin 126	15832-50-5	U		0.16		U	GAM
Barium 133	13981-41-4	U		0.029		U	GAM
Cesium 134	13967-70-9	U		0.043		U	GAM
Cesium 137	10045-97-3	0.642	0.046	0.037	0.10		GAM
Radium 226	13982-63-3	0.495	0.060	0.055			GAM
Radium 228	15262-20-1	0.758	0.15	0.14			GAM
Europium 152	14683-23-9	U		0.075	0.10	U	GAM
Europium 154	15585-10-1	U		0.097	0.10	U	GAM
Europium 155	14391-16-3	U		0.070	0.10	U	GAM
Thorium 228	14274-82-9	0.710	0.040	0.038			GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

DATA SHEET, cont

SDG	7399	Client/Case no	Hanford	SDG H1982	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R211099-01	Client sample id	B15YL8		
Dept sample id	7399-001	Location/Matrix	SP-2	SOLID	
Received	11/20/02	Collected/Weight	11/15/02 09:40	1015 g	
% solids	94.7	Custody/SAF No	F03-005-012	F03-005	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Thorium 232	TH-232	0.758	0.15	0.14			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.8		U	GAM
Americium 241	14596-10-2	U		0.043		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test NP Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 7052-079						
B15YL8	R211099-01			7399-001	U	
BLK (QC ID=43470)	R211088-03			7396-003	U	
LCS (QC ID=43469)	R211088-02			7396-002	ok	
Duplicate (R211099-01)	R211099-02			7399-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 5.0 %							Reference Lab Notebook 7052 pg. 079								
B15YL8	R211099-01			0.094	0.500			68		138			61	01/14/03	01/15	SS-040
BLK (QC ID=43470)	R211088-03			0.31	0.500			67		138				01/14/03	01/15	SS-024
LCS (QC ID=43469)	R211088-02			0.36	0.500			64		137				01/14/03	01/15	SS-022
Duplicate (R211099-01) (QC ID=43449)	R211099-02			0.075	0.500			86		138			61	01/14/03	01/15	SS-041
Nominal values and limits from method				1.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.21	±	0.29
	YIELD	71	±	20

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test PU Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 7052-079								
B15YL8	R211099-01			7399-001	U		U	
BLK (QC ID=43470)	R211088-03			7396-003	U		U	
LCS (QC ID=43469)	R211088-02			7396-002	ok		ok	
Duplicate (R211099-01)	R211099-02			7399-002	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200 Area Source Chara. 200-CS-1 OU								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 5.0 %				Reference Lab Notebook 7052 pg. 079											
B15YL8	R211099-01			0.21	0.500			82		120			61	01/14/03	01/15	SS-044
BLK (QC ID=43470)	R211088-03			0.34	0.500			86		120				01/14/03	01/15	SS-021
LCS (QC ID=43469)	R211088-02			0.21	0.500			89		124				01/14/03	01/17	SS-051
Duplicate (R211099-01) (QC ID=43449)	R211099-02			0.23	0.500			77		122			62	01/14/03	01/16	SS-055
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.25 ± 0.12
YIELD 84 ± 10

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test TH Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 230
Preparation batch 7052-079					
B15YL8	R211099-01			7399-001	0.363
BLK (QC ID=43470)	R211088-03			7396-003	U
LCS (QC ID=43469)	R211088-02			7396-002	ok
Duplicate (R211099-01)	R211099-02			7399-002	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0

200 Area Source Chara. 200-CS-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 5.0 %			Reference Lab Notebook 7052 pg. 079												
B15YL8	R211099-01			0.31	0.250			100		153			55	01/06/03	01/09	SS-059
BLK (QC ID=43470)	R211088-03			0.28	0.250			103		156				01/06/03	01/07	SS-065
LCS (QC ID=43469)	R211088-02			1.2	0.250			26		156				01/06/03	01/07	SS-064
Duplicate (R211099-01) (QC ID=43449)	R211099-02			0.41	0.250			69		153			55	01/06/03	01/09	SS-060
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-907	Thorium in Water and Dissolved Solid Samples by TEVA and Anion Exchange Column Method, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD	MDA	0.55	± 0.87
FOR 4 SAMPLES	YIELD	74	± 72

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test TP Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241/CURIUM IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Curium 243/244	Americium 241	
Preparation batch 7052-079							
B15YL8	R211099-01			7399-001	U	U	
BLK (QC ID=43470)	R211088-03			7396-003	U	U	
LCS (QC ID=43469)	R211088-02			7396-002	ok	ok	
Duplicate (R211099-01)	R211099-02			7399-002	ok	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	
200 Area Source Chara. 200-CS-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079 2σ prep error 5.0 % Reference Lab Notebook 7052 pg. 079																
B15YL8	R211099-01			0.25	0.500			78		109			66	01/17/03	01/20	SS-056
BLK (QC ID=43470)	R211088-03			0.075	0.500			70		987				01/17/03	01/17	SS-024
LCS (QC ID=43469)	R211088-02			0.11	0.500			61		987				01/17/03	01/17	SS-022
Duplicate (R211099-01) (QC ID=43449)	R211099-02			0.042	0.500			82		973			63	01/17/03	01/17	SS-051
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.12	±	0.18
	YIELD	73	±	19

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test SR Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 7052-079						
B15YL8	R211099-01			7399-001	U	
BLK (QC ID=43470)	R211088-03			7396-003	U	
LCS (QC ID=43469)	R211088-02			7396-002	ok	
Duplicate (R211099-01)	R211099-02			7399-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079 2σ prep error 10.0 % Reference Lab Notebook 7052 pg. 079																
B15YL8	R211099-01			0.31	1.00			92		100			52	01/06/03	01/06	GRB-205
BLK (QC ID=43470)	R211088-03			0.37	1.00			76		100				01/06/03	01/06	GRB-202
LCS (QC ID=43469)	R211088-02			0.37	1.00			84		60				01/06/03	01/06	GRB-202
Duplicate (R211099-01) (QC ID=43449)	R211099-02			0.32	1.00			92		100			52	01/06/03	01/06	GRB-201
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-502	Strontium in Solids, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	0.34	±	0.064
YIELD	86	±	15

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test 93A Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 7052-079					
B15YL8	R211099-01	93		7399-001	U
BLK (QC ID=43470)	R211088-03	93		7396-003	U
LCS (QC ID=43469)	R211088-02	93		7396-002	ok
Duplicate (R211099-01)	R211099-02	93		7399-002	ok
Nominal values and limits from method				RDLs (pCi/g)	10
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079 2σ prep error 20.0 % Reference Lab Notebook 7052 pg. 079																
B15YL8	R211099-01	93		2.9	0.100			24		100			52	01/06/03	01/06	GRB-102
BLK (QC ID=43470)	R211088-03	93		2.3	0.100			20		107				01/06/03	01/06	GRB-111
LCS (QC ID=43469)	R211088-02	93		3.5	0.100			21		100				01/06/03	01/07	GRB-115
Duplicate (R211099-01) (QC ID=43449)	R211099-02	93		2.8	0.100			24		100			53	01/06/03	01/07	GRB-101
Nominal values and limits from method				10	0.100			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	2.9	±	0.98
	RESIDUE	22	±	4

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test 93B Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 7052-079					
B15YL8	R211099-01	93		7399-001	13.1
BLK (QC ID=43470)	R211088-03	93		7396-003	U
LCS (QC ID=43469)	R211088-02	93		7396-002	ok
Duplicate (R211099-01)	R211099-02	93		7399-002	ok
Nominal values and limits from method				RDLs (pCi/g)	15

200 Area Source Chara. 200-CS-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 15.0 %							Reference Lab Notebook 7052 pg. 079								
B15YL8	R211099-01	93		5.7	0.100			24		100			52	01/06/03	01/06	GRB-102
BLK (QC ID=43470)	R211088-03	93		5.5	0.100			20		107				01/06/03	01/06	GRB-111
LCS (QC ID=43469)	R211088-02	93		6.5	0.100			21		100				01/06/03	01/07	GRB-115
Duplicate (R211099-01) (QC ID=43449)	R211099-02	93		5.2	0.100			24		100			53	01/06/03	01/07	GRB-101
Nominal values and limits from method				15	0.100			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD	MDA	5.7	±	1.1
FOR 4 SAMPLES	RESIDUE	22	±	4

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test GAM Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7052-079						
B15YL8	R211099-01			7399-001	U	0.642
BLK (QC ID=43470)	R211088-03			7396-003	U	U
LCS (QC ID=43469)	R211088-02			7396-002	ok	ok
Duplicate (R211099-01)	R211099-02			7399-002	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.10
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 15.0 % Reference Lab Notebook 7052 pg. 079															
B15YL8	R211099-01			0.27	801					101			55	01/02/03	01/09	MB,07,00
BLK (QC ID=43470)	R211088-03			0.12	719					99				01/02/03	01/06	01,04,00
LCS (QC ID=43469)	R211088-02			0.030	719					101				01/02/03	01/06	MB,05,00
Duplicate (R211099-01) (QC ID=43449)	R211099-02			0.12	801					784			55	01/02/03	01/09	MB,05,00
Nominal values and limits from method				0.050	719					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 4
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.14	±	0.20
	YIELD		±	

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test U T Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 7052-079					
B15YL8	R211099-01			7399-001	0.566
BLK (QC ID=43431)	R211088-06			7396-006	U
LCS (QC ID=43430)	R211088-05			7396-005	ok
Duplicate (R211099-01)	R211099-02			7399-002	ok
Nominal values and limits from method 200 Area Source Chara. 200-CS-1 OU				RDLs (ug/g)	0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079 2σ prep error 9.0 % Reference Lab Notebook 7052 pg. 079																
B15YL8	R211099-01			0.005	0.100								34	12/19/02	12/19	KPA-001
BLK (QC ID=43431)	R211088-06			0.005	0.100									12/19/02	12/19	KPA-001
LCS (QC ID=43430)	R211088-05			0.045	0.100									12/19/02	12/19	KPA-001
Duplicate (R211099-01) (QC ID=43449)	R211099-02			0.005	0.100								34	12/19/02	12/19	KPA-001
Nominal values and limits from method				0.10	0.100								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-060	Soil Preparation, rev 4
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.015 ± 0.040
YIELD ____ ± ____

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1982

Test C Matrix SOLID
SDG 7399
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1982

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14
Preparation batch 7052-079					
B15YL8	R211099-01			7399-001	12.2
BLK (QC ID=43470)	R211088-03			7396-003	U
LCS (QC ID=43469)	R211088-02			7396-002	ok
Duplicate (R211099-01)	R211099-02			7399-002	ok
Nominal values and limits from method				RDLs (pCi/g)	50
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 10.0 %				Reference Lab Notebook 7052 pg. 079											
B15YL8	R211099-01			1.8	0.331			100		100			39	12/23/02	12/24	LSC-006
BLK (QC ID=43470)	R211088-03			3.1	0.334			100		100				12/23/02	12/23	LSC-006
LCS (QC ID=43469)	R211088-02			4.3	0.334			100		44				12/23/02	12/24	LSC-006
Duplicate (R211099-01) (QC ID=43449)	R211099-02			1.9	0.301			100		100			39	12/23/02	12/24	LSC-006
Nominal values and limits from method				50	0.334					50			180			

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-251	Tritium/Carbon-14 Oxidation, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	2.8	±	2.4
YIELD	100	±	0

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REPORT GUIDE

Client Hanford
Contract No. 630
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SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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Contact Melissa C. Mannion

REPORT GUIDE

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1
Collector: R. Nielson	Company Contact: Steve Trent; Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-2 H1982 (T399)	SAF No.: F03-005	Air Quality ☐
Ice Chest No.: ERC-96-036	Field Logbook No.: HNF-N-3251; COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA)	Offsite Property No.: A030054	Bill of Lading/Air Bill No.: 79063553872	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RIN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082 RIN 11/19/02	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3 RIN 11/15/02	

Sample No.	Matrix *	Sample Date	Sample Time										
✓ B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X		

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson / R. Nielson	1330 11-15-02	REF # 18 / 3728	1330 11-15-02
REF # 18 / 3728	11/19/02 1230	R. Nielson / R. Nielson	11/19/02 1230
R. Nielson / R. Nielson	11/19/02 1300	Fed Ex	11/19/02 1300
Fed Ex	11/20/02 9:55		11/20/02 9:55 AM

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

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

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

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

EBERLINE SERVICES **ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

Wa - Hanford SAMPLE RECEIPT

Client: FH - Central Plateau Project Date/Time received 11/20/02 9:55 AM

CoC No. F03- 005 - 012

Container I.D. No. GRC-96-036 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1
7. Number of containers per sample: 1 each (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by [signature] Date: 11/20/02 Time: 9:55 AM

Customer Sample No.	cpm	mr/hr	wipe	Customer Sample No.	cpm	mr/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____

Alpha meter Ser. No. _____ Calibration date _____

Survey Meter Ser. No. _____ Calibration date _____

LIONVILLE LABORATORY INC.

27 December 2002

DEC 2002
RECEIVED

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

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

LvLI Batch #	0211L186
SDG #	H1982
SAF #	F03-005
Date Received	11-20-02
# Samples	1
Matrix	Soil
Volatiles	X
Semivolatiles	X
Pest/PCB	X
DRO/GRO	X
GC Scan	X
Metals	X
Inorganics	X

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

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

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

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

RFW LOT # :0211L186

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B15YL8	001	S	02LVX658	11/15/02	11/20/02	N/A	11/22/02
B15YL8	001 MS	S	02LVX658	11/15/02	11/20/02	N/A	11/22/02
B15YL8	001 MSD	S	02LVX658	11/15/02	11/20/02	N/A	11/22/02
LAB QC:							
VBLKZT	MB1	S	02LVX658	N/A	N/A	N/A	11/22/02
VBLKZT	MB1 BS	S	02LVX658	N/A	N/A	N/A	11/22/02

12-11-02

DEC 2002
RECEIVED

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD F03-005
LVL #: 0211L186
SDG/SAF #: H1982/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-20-2002

GC/MS VOLATILE

One (1) soil sample was collected on 11-15-2002.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL volatile target compounds on 11-22-2002.

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

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

2. The required holding time for analysis was met.

3. Non-target compounds were not detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

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

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

7. Internal standard area and retention time criteria were met.

8. Manual integrations are performed according to OP L-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. "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."

By _____ 12-12-02
J. Michael Taylor — Date
President
Lionville Laboratory Incorporated

som\group\data\voa\tnu-hanford\0211-186.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 1 0 pages.

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

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

VLI
VONMILL LABORATORY INC

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP - Missed Peak: manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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

Report Date: 12/10/02 16:24

RFW Batch Number: 0211L186 Client: TNUHANFORD F03-005 H1982 Work Order: 11343606001 Page: 1a

	Cust ID:	B15YL8		B15YL8		B15YL8		VBLKZT		VBLKZT BS	
Sample Information	RFW#:	001		001 MS		001 MSD		02LVX658-MB1		02LVX658-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.09		1.02		1.06		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	102	%	105	%	105	%	96	%	102	%
	Bromofluorobenzene	97	%	102	%	97	%	93	%	100	%
	1,2-Dichloroethane-d4	100	%	105	%	107	%	96	%	101	%
Chloromethane		11	U	11	U	11	U	10	U	10	U
Bromomethane		11	U	11	U	11	U	10	U	10	U
Vinyl Chloride		11	U	11	U	11	U	10	U	10	U
Chloroethane		11	U	11	U	11	U	10	U	10	U
Methylene Chloride		5	J	16		16		5	U	5	U
Acetone		11	U	11	U	11	U	10	U	10	U
Carbon Disulfide		6	U	6	U	6	U	5	U	5	U
1,1-Dichloroethene		6	U	84	%	85	%	5	U	80	%
1,1-Dichloroethane		6	U	6	U	6	U	5	U	5	U
1,2-Dichloroethene (total)		6	U	6	U	6	U	5	U	5	U
Chloroform		6	U	6	U	6	U	5	U	5	U
1,2-Dichloroethane		6	U	6	U	6	U	5	U	5	U
2-Butanone		11	U	11	U	11	U	10	U	10	U
1,1,1-Trichloroethane		6	U	6	U	6	U	5	U	5	U
Carbon Tetrachloride		6	U	6	U	6	U	5	U	5	U
Bromodichloromethane		6	U	6	U	6	U	5	U	5	U
1,2-Dichloropropane		6	U	6	U	6	U	5	U	5	U
cis-1,3-Dichloropropene		6	U	6	U	6	U	5	U	5	U
Trichloroethene		6	U	111	%	110	%	5	U	106	%
Dibromochloromethane		6	U	6	U	6	U	5	U	5	U
1,1,2-Trichloroethane		6	U	6	U	6	U	5	U	5	U
Benzene		6	U	96	%	99	%	5	U	92	%
Trans-1,3-Dichloropropene		6	U	6	U	6	U	5	U	5	U
Bromoform		6	U	6	U	6	U	5	U	5	U
4-Methyl-2-pentanone		11	U	11	U	11	U	10	U	10	U
2-Hexanone		11	U	11	U	11	U	10	U	10	U
Tetrachloroethene		6	U	6	U	6	U	5	U	5	U
1,1,2,2-Tetrachloroethane		6	U	6	U	6	U	5	U	5	U
Toluene		6	U	104	%	104	%	5	U	99	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0211L186** Client: **TNUHANFORD F03-005 H1982** Work Order: 11343606001 Page: 1b

Cust ID:	B15YL8	B15YL8	B15YL8	VBLKZT	VBLKZT BS
RFW#:	001	001 MS	001 MSD	02LVX658-MB1	02LVX658-MB1
Chlorobenzene	6 U	102 %	102 %	5 U	98 %
Ethylbenzene	6 U	6 U	6 U	5 U	5 U
Styrene	6 U	6 U	6 U	5 U	5 U
Xylene (total)	6 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

0211L186

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: Charlotte Johnson

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 11-20-02 Date Due: 12-20-02

		A	B	C		D			E		F	G				
Refrigerator #		1	4	4		4			4		4	4				
#/Type Container	Liquid															
	Solid	1 jar	1 jar	1 jar		1 jar			1 jar		1 jar	1 jar				
Volume	Liquid	0	0	0					0			0				
	Solid	60	250	250		60			125		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED		ORGANIC							INORG							
		TCL VOA	BNA (1)	Pest PCB	Herb	Alcohols Glycols Ketones			ICP Metal (2)	CN	IC Anions (3)	pH				
		Lionville Laboratory Use Only														
		06244	625X	ODRO	OPCB	OGESC			METO	ZCRG	INORG1	IPH				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	06244	625X	ODRO	OPCB	OGESC			METO	ZCRG	INORG1	IPH				
001	B15YL8	X	X	S	11-15-02	0940	X	X	X		X			X		X	X				

Special Instructions: SAF # F03-005

ODRO - Report KRO+DRO Compounds

DATE/REVISIONS:

METO 1. As, Ba, Cd, Cr, Pb, Fe, Ag, Al, Be, Bi, B, Ca,
2. Cu, Fe, Mg, Mn, Mo, Ni, K, Se, Na, Tl, V, Zn, Hg

INORG 1 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
4. IN3N2, INH3N, ISFD, ICNTO
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # 7901 4356 9959
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'd (Y) or N
Cooler Temp. 0.9 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11-20-02	0820

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1

Collector R. Nielson	Company Contact: Steve Trent — Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code 8N — Data Turnaround 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-2	SAF No.: F03-005	Air Quality ☐
Ice Chest No.: ERC-02-006 / ERC-02-403	Field Logbook No.: HNF-N-325 / — COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA) RECLK	Offsite Property No.: A030042	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RJN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ dG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3 RJN 11/15/02	

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X		
											RJN 11/19/02		

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	R. Nielson	11-15-02 1330	REF # 18 / 3728	11-15-02 1330
Relinquished By/Removed From	REF # 18 / 3728	11/19/02 1230	R. Nielson	11/19/02 1230
Relinquished By/Removed From	R. Nielson	11/19/02 1301	Fed Ex	11/19/02 1300
Relinquished By/Removed From	Fed Ex	11.20.02 0920		11.20.02 0920
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

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

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hanford

Purchase Order/Project:

DATE: 11-20-02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L186

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

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

Cooler # / temp (°C) and Comments:

ERC-02-006 / 0.9°C

Laboratory Sample Custodian: D. Johnson

Laboratory Project Manager:

10

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL8	001	S	02LE1393	11/15/02	11/21/02	11/27/02
B15YL8	001 MS	S	02LE1393	11/15/02	11/21/02	11/27/02
B15YL8	001 MSD	S	02LE1393	11/15/02	11/21/02	11/27/02
LAB QC:						
SBLKIM	MB1	S	02LE1393	N/A	11/21/02	11/25/02
SBLKIM	MB1 BS	S	02LE1393	N/A	11/21/02	11/25/02

12-04-03

DEC 2002
RECEIVED

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD F03-005
LVL #: 0211L186
SDG/SAF #: H1982/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-20-2002

SEMIVOLATILE

One (1) soil sample was collected on 11-15-2002.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 11-21-2002 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compounds on 11-25,27-2002.

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 a sample that met LvLI's sample acceptance policy.
2. The sample was extracted and analyzed within required holding time.
3. Non-target compounds were detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.
7. The method blank contained the common laboratory contaminant Di-n-butylphthalate at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
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.

J. Michael Taylor
President
Lionville Laboratory Incorporated

12-05-02
Date

som\gorup\data\bna\tnu-hanford-0211-186.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 1 2 pages.

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

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

RFW Batch Number: 0211L186 Client: TNUHANFORD F03-005 H1982 Work Order: 11343606001 Report Date: 12/02/02 08:48 Page: 1a

	Cust ID:	B15YL8	B15YL8	B15YL8	SBLKIM	SBLKIM BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE1393-MB1	02LE1393-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	64 %	69 %	69 %	69 %	79 %
	2-Fluorobiphenyl	65 %	72 %	72 %	77 %	82 %
	p-Terphenyl-d14	67 %	75 %	76 %	78 %	80 %
	Phenol-d5	65 %	65 %	67 %	68 %	71 %
	2-Fluorophenol	65 %	65 %	71 %	74 %	81 %
	2,4,6-Tribromophenol	58 %	72 %	79 %	67 %	91 %
Phenol		350 U	68 %	71 %	330 U	74 %
bis(2-Chloroethyl)ether		350 U	350 U	350 U	330 U	330 U
2-Chlorophenol		350 U	65 %	70 %	330 U	77 %
1,3-Dichlorobenzene		350 U	350 U	350 U	330 U	330 U
1,4-Dichlorobenzene		350 U	64 %	69 %	330 U	79 %
1,2-Dichlorobenzene		350 U	350 U	350 U	330 U	330 U
2-Methylphenol		350 U	350 U	350 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		350 U	350 U	350 U	330 U	330 U
3- and/or 4-Methylphenol		350 U	350 U	350 U	330 U	330 U
N-Nitroso-Di-n-propylamine		350 U	71 %	78 %	330 U	87 %
Hexachloroethane		350 U	350 U	350 U	330 U	330 U
Nitrobenzene		350 U	350 U	350 U	330 U	330 U
Isophorone		350 U	350 U	350 U	330 U	330 U
2-Nitrophenol		350 U	350 U	350 U	330 U	330 U
2,4-Dimethylphenol		350 U	350 U	350 U	330 U	330 U
bis(2-Chloroethoxy)methane		350 U	350 U	350 U	330 U	330 U
2,4-Dichlorophenol		350 U	350 U	350 U	330 U	330 U
1,2,4-Trichlorobenzene		350 U	69 %	68 %	330 U	86 %
Naphthalene		350 U	350 U	350 U	330 U	330 U
4-Chloroaniline		350 U	350 U	350 U	330 U	330 U
Hexachlorobutadiene		350 U	350 U	350 U	330 U	330 U
4-Chloro-3-methylphenol		350 U	72 %	69 %	330 U	82 %
2-Methylnaphthalene		350 U	350 U	350 U	330 U	330 U
Hexachlorocyclopentadiene		350 U	350 U	350 U	330 U	330 U
2,4,6-Trichlorophenol		350 U	350 U	350 U	330 U	330 U
2,4,5-Trichlorophenol		880 U	880 U	880 U	840 U	840 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0211L186 Client: TNUHANFORD F03-005 H1982 Work Order: 11343606001 Page: 1b

Cust ID:	B15YL8		B15YL8		B15YL8		SBLKIM		SBLKIM BS	
RFW#:	001		001 MS		001 MSD		02LE1393-MB1		02LE1393-MB1	
2-Chloronaphthalene	350	U	350	U	350	U	330	U	330	U
2-Nitroaniline	880	U	880	U	880	U	840	U	840	U
Dimethylphthalate	350	U	350	U	350	U	330	U	330	U
Acenaphthylene	350	U	350	U	350	U	330	U	330	U
2,6-Dinitrotoluene	350	U	350	U	350	U	330	U	330	U
3-Nitroaniline	880	U	880	U	880	U	840	U	840	U
Acenaphthene	350	U	73	%	73	%	330	U	82	%
2,4-Dinitrophenol	880	U	880	U	880	U	840	U	840	U
4-Nitrophenol	880	U	83	%	95	%	840	U	97	%
Dibenzofuran	350	U	350	U	350	U	330	U	330	U
2,4-Dinitrotoluene	350	U	76	%	79	%	330	U	90 *	%
Diethylphthalate	350	U	350	U	350	U	330	U	330	U
4-Chlorophenyl-phenylether	350	U	350	U	350	U	330	U	330	U
Fluorene	350	U	350	U	350	U	330	U	330	U
4-Nitroaniline	880	U	880	U	880	U	840	U	840	U
4,6-Dinitro-2-methylphenol	880	U	880	U	880	U	840	U	840	U
N-Nitrosodiphenylamine (1)	350	U	350	U	350	U	330	U	330	U
4-Bromophenyl-phenylether	350	U	350	U	350	U	330	U	330	U
Hexachlorobenzene	350	U	350	U	350	U	330	U	330	U
Pentachlorophenol	880	U	72	%	78	%	840	U	93	%
Phenanthrene	350	U	350	U	350	U	330	U	330	U
Anthracene	350	U	350	U	350	U	330	U	330	U
Carbazole	350	U	350	U	350	U	330	U	330	U
Di-n-Butylphthalate	350	U	350	U	350	U	21	J	330	U
Fluoranthene	350	U	350	U	350	U	330	U	330	U
Pyrene	350	U	68	%	70	%	330	U	72	%
Butylbenzylphthalate	350	U	350	U	350	U	330	U	330	U
3,3'-Dichlorobenzidine	350	U	350	U	350	U	330	U	330	U
Benzo(a)anthracene	350	U	350	U	350	U	330	U	330	U
Chrysene	350	U	350	U	350	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	350	U	350	U	45	J	330	U	330	U
Di-n-Octyl phthalate	350	U	350	U	350	U	330	U	330	U
Benzo(b)fluoranthene	350	U	350	U	350	U	330	U	330	U
Benzo(k)fluoranthene	350	U	350	U	350	U	330	U	330	U
Benzo(a)pyrene	350	U	350	U	350	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	350	U	350	U	350	U	330	U	330	U
Dibenzo(a,h)anthracene	350	U	350	U	350	U	330	U	330	U
Benzo(g,h,i)perylene	350	U	350	U	350	U	330	U	330	U
Tributylphosphate	350	U	350	U	350	U	330	U	330	U

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B15YL8

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-005 H1982

Matrix: (soil/water) SOIL

Lab Sample ID: 0211L186-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: C112711

Level: (low/med) LOW

Date Received: 11/20/02

% Moisture: 5 decanted: (Y/N)__

Date Extracted: 11/21/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 11/27/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	5.439	2000	JAB
2.	ALDOL CONDENSATE	6.019	40000	JAB
3.	ALODL CONDENSATE	7.475	3000	JAB
4.	ALDOL CONDENSATE	8.800	500	JAB

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKIM

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-005 H1982

Matrix: (soil/water) SOIL

Lab Sample ID: 02LE1393-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: C112515

Level: (low/med) LOW

Date Received: 11/21/02

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 11/21/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 11/25/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	5.238	100	JA
2.	ALDOL CONDENSATE	5.757	2000	JA
3.	ALDOL CONDENSATE	6.390	50000	JA
4.	ALDOL CONDENSATE	7.784	2000	JA
5.	ALDOL CONDENSATE	9.109	500	JA

9

Lionville Laboratory Use Only

0211L186

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 30 ~~45~~ days

Date Rec'd: 11-20-02 Date Due: 12-20-02

		A	B	C		D			E		F	G				
Refrigerator #		1	4	4		4			4		4	4				
#/Type Container	Liquid															
	Solid	1 jar	1 jar	1 jar		1 jar			1 jar		1 jar	1 jar				
Volume	Liquid	0	0	0		0			0		0	0				
	Solid	60	250	250		60			125		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED →		ORGANIC							INORG							
		TCL VOA	BNA (1)	Pest PCB	Herb	Alcohols Glycols Ketones			ICP Metal (2)	CN	IC Anions (3)	pH				
		Lionville Laboratory Use Only														
		06244	625X ODRO	OPB		OGCSC			MET (1) ICAB		INORG (1)	IPH				
001	B15YL8	X	X	X		X			X		X	X				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
001	B15YL8	X	X	S	11-15-02	0940

Special Instructions: SAF # F03-005

ODRO - Report KRO + DRO Compounds

DATE/REVISIONS:

MET (1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca,
2. Cu, Fe, Mg, Mn, Mo, Ni, K, Se, Na, Tl, V, Zn, Hg

INORG (1) 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
4. IN3N2, INH3N, ISFD, ICNTO
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 7901 4356 9959
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

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

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.9 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11-20-02	0920

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1
Collector R. Nielson	Company Contact: Steve Trent; Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-2	SAF No.: F03-005	Air Quality ☐
Ice Chest No.: ERC-02-006 / ERC-02-403	Field Logbook No.: HNF-N-325 / COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA) RECLK	Offsite Property No.: A030042	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ dG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3 RJN 11/15/02	

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X		
											RJN 11/19/02		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson / R. Nielson	11-15-02 1330	REF # 1B / 3728	11-15-02 1330
REF # 1B / 3728	11/19/02 1230	R. Nielson / R. Nielson	11/19/02 1230
R. Nielson / R. Nielson	11/19/02 1300	Fed Ex	11/19/02 1300
Fed Ex	11.20.02 0920	D. Johnson	11.20.02 0920

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

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

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hanford

Purchase Order/Project:

DATE: 11-20-02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L186

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

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

Cooler # / temp (°C) and Comments:

ERC-02-006 / 0.9°C

Laboratory Sample Custodian: D. Johnson

Laboratory Project Manager:

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL8	001	S	02LE1394	11/15/02	11/21/02	11/28/02
B15YL8	001 MS	S	02LE1394	11/15/02	11/21/02	11/28/02
B15YL8	001 MSD	S	02LE1394	11/15/02	11/21/02	11/28/02

LAB QC:

PBLKGK	MB1	S	02LE1394	N/A	11/21/02	11/28/02
PBLKGK	MB1 BS	S	02LE1394	N/A	11/21/02	11/28/02

DEC 2002
RECEIVED

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005
LVL #: 0211L186
SDG/SAF #: H1982/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-20-02

PCB

One (1) soil sample was collected on 11-15-02.

The sample and its associated QC samples were extracted on 11-21-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-28-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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. All required holding times for extraction and analysis have been met.
3. The sample and its associated QC samples received a Sulfuric Acid and a Sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. Four (4) of ten (10) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
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

12/6/02
Date

pef\r:\group\data\pest\tnu hanford\11L-186.pcb

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 9 pages.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 026C558

Initiator: Bryce Santoro
Date: 12/3/02
Client: TDU

Batch: 02 112 168, 186, 187
Samples: See below
Method: SW846/MCAWW/CLP/

Parameter: OPCB
Matrix: Soil
Prep Batch: 02LB1394

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)

(1) High surrogate recoveries in the following samples: 168-001, 186-001MS, 186-001MSD, 187-006. All other surrogate and spike recoveries are good. All samples are clean.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description: None

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

4. Project Manager Instructions...signature/date: 12/3/02

✓ 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: 12/3/02 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/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

QA-105-A-0801

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P	=	This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

R:/SHARE/HPLC/PESTICIDE/PCBGLOS

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 12/02/02 17:29

RFW Batch Number: **0211L186** Client: ***TNUHANFORD F03-005 H1982*** Work Order: 11343606001 Page: 1

	Cust ID:	B15YL8	B15YL8	B15YL8	PBLKGK	PBLKGK BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE1394-MB1	02LE1394-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	100 %	120 * %	130 * %	90 %	95 %
	Decachlorobiphenyl	115 %	135 * %	145 * %	100 %	105 %
Aroclor-1016		35 U	116 %	126 %	33 U	92 %
Aroclor-1221		70 U	70 U	70 U	67 U	67 U
Aroclor-1232		35 U	35 U	35 U	33 U	33 U
Aroclor-1242		35 U	35 U	35 U	33 U	33 U
Aroclor-1248		35 U	35 U	35 U	33 U	33 U
Aroclor-1254		35 U	35 U	35 U	33 U	33 U
Aroclor-1260		35 U	117 %	126 %	33 U	90 %

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

Lionville Laboratory Use Only

0211L186

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 30 ~~15~~ days

Date Rec'd: 11-20-02 Date Due: 12-20-02

	A	B	C	D	E	F	G
Refrigerator #	1	4	4	4	4	4	4
#/Type Container, Solid	1	1	1	1	1	1	1
Volume, Liquid	0	0	0	1	0	1	1
Volume, Solid	60	250	250	60	125	500	60
Preservatives	—	—	—	—	—	—	—
ANALYSES REQUESTED	ORGANIC				INORG		
	TCL VOA	BNA (1)	Pest PCB	Herb	ICP Metal (2)	CN	IC Anions (3)	pH

Lionville Laboratory Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H	0625X ODRO	OPCB		OGCSC			METO ICRG		IMEG1	IPH				
001	B15YL8	X	X	S	11-15-02	0940	X	X	X		X			X		X	X				

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

Special Instructions: SAF # F03-005

ODRO - Report KRO+DRO Compounds

DATE/REVISIONS:

METO 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca,
2. Cu, Fe, Mg, Mn, Mo, Ni, K, Sn, Na, Tl, V, Zn, Hg

INORG 1 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
4. IN3N2, INH3N, ISFD, ICNTO
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 7901435209959
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

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

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.9 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11-20-02	0520

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1

Collector: R. Nielson	Company Contact: Steve Trent	Telephone No.: 373-5869	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-2	SAF No.: F03-005	
Ice Chest No.: ERC-02-006 / ERC-02-403	Field Logbook No.: HNF-N-3251	COA: 117514ES10	Method of Shipment: Federal Express
Shipped To: EBERLINE SERVICES (Formerly TMA) RECAK	Offsite Property No.: A030042		Bill of Lading/Air Bill No.: SEE OSR

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RJN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3 RJN 11/15/02	

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X		
											RJN 11/19/02		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: R. Nielson 11-15-02	1330	Received By/Stored In: REF # 18/3728 11-15-02	1330
Relinquished By/Removed From: REF # 18/3728 11/19/02	1230	Received By/Stored In: R. Nielson 11/19/02	1230
Relinquished By/Removed From: R. Nielson 11/19/02	1300	Received By/Stored In: Fed Ex 11/19/02	1300
Relinquished By/Removed From: Fed Ex 11.20.02	0920	Received By/Stored In: 11.20.02	0920
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

** Please see SAF for specific sampling instructions.

(1) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

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

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hanford

Purchase Order/Project:

DATE: 11-20-02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L186

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

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

Cooler # / temp (°C) and Comments:

ERC-02-006 / 0.9°C

Laboratory Sample Custodian: D. Johnson

Laboratory Project Manager:

9

Lionville Laboratory, Inc.
GCSC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL8	001	S	02LE1426	11/15/02	11/25/02	11/25/02
B15YL8	001 MS	S	02LE1426	11/15/02	11/25/02	11/25/02
B15YL8	001 MSD	S	02LE1426	11/15/02	11/25/02	11/25/02
LAB QC:						
BLK	MB1	S	02LE1426	N/A	11/25/02	11/25/02
BLK	MB1 BS	S	02LE1426	N/A	11/25/02	11/25/02
BLK	MB1 BSD	S	02LE1426	N/A	11/25/02	11/25/02

DEC 2002
RECEIVED

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD F03-005
LVL#: 0211L186
SDG/SAF#: H1982/F03-005

W.O.#: 11343-606-001-9999-00
Date Received: 11-29-02

GC SCAN

One (1) soil sample was collected on 11-15-02.

The sample and its associated QC samples were analyzed on 11-25-02 according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures based on method 8015B for n-propyl Alcohol and Ethanol.

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

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

2. All required holding times for analysis have been met.

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

4. Surrogates are not currently employed in the methodology.

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All initial calibrations were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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 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

12/6/02
Date

r:\group\data\gcsc\11L-186.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 7 pages.

GLOSSARY OF GC SCAN DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 12/03/02 15:08

RFW Batch Number: **0211L186** Client: **TNUHANFORD F03-005 H1982** Work Order: 11343606001 Page: 1

	Cust ID:	B15YL8	B15YL8	B15YL8	BLK	BLK BS	BLK BSD
Sample Information	RFW#:	001	001 MS	001 MSD	02LE1426-MB1	02LE1426-MB1	02LE1426-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

n-Propyl Alcohol	26	U	99	%	100	%	25	U	101	%	98	%
Ethanol	26	U	99	%	101	%	25	U	103	%	102	%

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

Lionville Laboratory Use Only

0211L186

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: Charlotte Johnson

QC: SPEC Del: STD TAT: 30 ~~15~~ days

Date Rec'd: 11-20-02 Date Due: 12-20-02

		A	B	C		D			E		F	G				
Refrigerator #		1	4	4		4			4		4	4				
#/Type Container	Liquid															
	Solid	1 jar	1 jar	1 jar		1 jar			1 jar		1 jar	1 jar				
Volume	Liquid	0	0	0		0			0		0	0				
	Solid	60	250	250		60			125		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED		ORGANIC							INORG							
		TCL VOA	BNA (1)	Pest PCB	Herb	Alcohols Glycols Ketones			ICP Metal (2)	CN	TC Ignitability (3)	pH				
Lionville Laboratory Use Only		06244	06270 X	08270		8015C			MCT ICRL		IMEG	IPH				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	06244	06270 X	08270		8015C			MCT ICRL		IMEG	IPH				
001	B15YL8	X	X	S	11-15-02	0940	X	X	X		X			X		X	X				

Special Instructions: SAF # F03-005

ODRO - Report KRO + DRO Compounds

DATE/REVISIONS:

MET (1) 1. As, Ba, Cd, Cr, Pb, Fe, Ag, Al, Be, Bi, B, Ca,

2. Cu, Fe, Mg, Mn, Mo, Ni, K, Se, Na, Tl, V, Zn, Hg

INORG (1) 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. IN3N2, INH3N, ISFD, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # 7901 4357 9959

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.9 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11-20-02	0920

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1

Collector: R. Nielson	Company Contact: Steve Trent — Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days — Air Quality ☐
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-2	SAF No.: F03-005	
Ice Chest No.: ERC-02-006 / ERC-02-403	Field Logbook No.: HNF-N-3251 — COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA) RECLA	Offsite Property No.: A030042	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RJN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ dG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3	
B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X		RJN 11/15/02
											RJN 11/19/02		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: R. Nielson 11-15-02	1330	Received By/Stored In: REF # 1B/3728 11-15-02	1330
Relinquished By/Removed From: REF # 1B/3728 11/19/02	1230	Received By/Stored In: R. Nielson 11/19/02	1230
Relinquished By/Removed From: R. Nielson 11/19/02	1300	Received By/Stored In: Fed Ex 11/19/02	1300
Relinquished By/Removed From: Fed Ex 11.20.02	0920	Received By/Stored In: [illegible] 11.20.02	0920
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 – Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

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

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hanford

Purchase Order/Project:

DATE: 11-20-02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L186

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

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

Cooler # / temp (°C) and Comments:

ERC-02-006 / 0.9°C

Laboratory Sample Custodian: D. Ymon

Laboratory Project Manager:

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL8	001	S	02LE1395	11/15/02	11/21/02	11/27/02
B15YL8	001 MS	S	02LE1395	11/15/02	11/21/02	11/27/02
B15YL8	001 MSD	S	02LE1395	11/15/02	11/21/02	11/27/02
LAB QC:						
BLK	MB1	S	02LE1395	N/A	11/21/02	11/27/02
BLK	MB1 BS	S	02LE1395	N/A	11/21/02	11/27/02

DEC 2002
RECEIVED

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005
LVL #: 0211L186
SDG/SAF #: H1982/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-20-02

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 11-15-02.

The sample and its associated QC samples were extracted on 11-21-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-27-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B. The analysis met the intent of method WTPH-D.

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. All required holding times for extraction and analysis have been met.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
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 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

12/6/02
Date

pef\r:\group\data\dro\tnu hanford\11L-186.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 8 pages.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 12/03/02 13:02

RFW Batch Number: **0211L186** Client: **TNUHANFORD F03-005 H1982** Work Order: 11343606001 Page: 1

	Cust ID:	B15YL8	B15YL8	B15YL8	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE1395-MB1	02LE1395-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
	p-Terphenyl	87 %	95 %	85 %	90 %	91 %
Diesel Range Organics		12.7 U	71 %	56 %	12.0 U	65 %
Kerosene		12.7 U	12.7 U	12.7 U	12.0 U	12.0 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

Lionville Laboratory Use Only

0211L186

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI 9

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 11-20-02 Date Due: 12-20-02

	A	B	C	D	E	F	G
Refrigerator #	1	4	4	4	4	4	4
#/Type Container – Solid	1 jar	1 jar	1 jar	1 jar	1 jar	1 jar	1 jar
Volume – Liquid	0	0	0	0	0	0	0
Volume – Solid	60	250	250	60	125	500	60
Preservatives	—	—	—	—	—	—	—
ANALYSES REQUESTED	ORGANIC: TCL VOA	ORGANIC: BNA (1)	ORGANIC: Pest/PCB	ORGANIC: Herb	ORGANIC: Alcohols (5) Glycols (5) Ketones (5)	INORG: ICP Metal (2)	INORG: CN
						INORG: IC Anions (3)	INORG: pH

Lionville Laboratory Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	062344	0625X ODRO	OATB	OGESC	METO ZCRG	INORG	IPH
001	B15YL8	X	X	S	11-15-02	0940	X	X	X	X	X	X	X

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

Special Instructions: SAF # F03-005

ODRO - Report KAO+DRO Compounds

DATE/REVISIONS:

METO 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca,

2. Cu, Fe, Mg, Mn, Mo, Ni, K, Sn, Na, Tl, V, Zn, Hg

INORG 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. IN3N2, INH3N, ISFD, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # 7901 4356 9959

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.9 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11-20-02	0520

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1

Collector R. Nielson	Company Contact Steve Trent / Telephone No. 373-5869	Project Coordinator TRENT, SJ	Price Code 8N / Data Turnaround 45 Days / Air Quality ☐
Project Designation 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location SP-2	SAF No. F03-005	
Ice Chest No. ERC-02-006 / ERC-02-403	Field Logbook No. HNF-N-3251 / COA 117514ES10	Method of Shipment Federal Express	
Shipped To EBERLINE SERVICES (Formerly TMA) RECLA	Offsite Property No. A030042	Bill of Lading/Air Bill No. SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RIN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ dG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3 RJN 11/15/02	

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X (2) RJN 11/21/02		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	1330 11-15-02	REF # 18/3728	1330 11-15-02
REF # 18/3728	11/19/02 1230	R. Nielson	11/19/02 1230
R. Nielson	11/19/02 1300	Fed Ex	11/19/02 1300
Fed Ex	11.20.02 0920		11.20.02 0920

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

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

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hanford

Purchase Order/Project:

DATE: 11-20-02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L186

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

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

Cooler # / temp (°C) and Comments:

ERC-02-006 / 0.9°C

Laboratory Sample Custodian: D. Johnson

Laboratory Project Manager:

DEC 2002
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL8						
SILVER, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
SILVER, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
SILVER, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
ALUMINUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
ALUMINUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
ALUMINUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
ARSENIC, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
ARSENIC, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
ARSENIC, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
BORON, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
BORON, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
BORON, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
BARIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
BARIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
BARIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
BERYLLIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
BERYLLIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
BERYLLIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
BISMUTH, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
BISMUTH, TOTAL REP	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
BISMUTH, TOTAL SPIKE	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
CALCIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
CALCIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
CALCIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
CADMIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
CADMIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
CADMIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
CHROMIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
CHROMIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
CHROMIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
COPPER, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
COPPER, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
COPPER, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
IRON, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
IRON, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
IRON, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
MERCURY, TOTAL	001	S	02C0350	11/15/02	11/26/02	11/27/02
MERCURY, TOTAL	001 REP	S	02C0350	11/15/02	11/26/02	11/27/02
MERCURY, TOTAL	001 MS	S	02C0350	11/15/02	11/26/02	11/27/02
POTASSIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
POTASSIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
POTASSIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
MAGNESIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
MAGNESIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
MAGNESIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
MANGANESE, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
MANGANESE, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
MANGANESE, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
MOLYBDENUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
MOLYBDENUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
MOLYBDENUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
SODIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
SODIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
SODIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
NICKEL, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
NICKEL, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
NICKEL, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
LEAD, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
LEAD, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
LEAD, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
SELENIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
SELENIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
SELENIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
THALLIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
THALLIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
THALLIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
VANADIUM, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
VANADIUM, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
VANADIUM, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02
ZINC, TOTAL	001	S	02L0691	11/15/02	11/25/02	11/27/02
ZINC, TOTAL	001 REP	S	02L0691	11/15/02	11/25/02	11/27/02
ZINC, TOTAL	001 MS	S	02L0691	11/15/02	11/25/02	11/27/02

LAB QC:

SILVER LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
ALUMINUM LABORTORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
ALUMINUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
ARSENIC LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
ARSENIC, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BORON LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BORON, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BARIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BARIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BERYLLIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BERYLLIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BISMUTH, LCS	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BISMUTH, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
CALCIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
CALCIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
CADMIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
CADMIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
CHROMIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
CHROMIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
COPPER LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
COPPER, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
IRON LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
IRON, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
MERCURY LABORATORY	LC1 BS	S	02C0350	N/A	11/26/02	11/27/02
MERCURY, TOTAL	MB1	S	02C0350	N/A	11/26/02	11/27/02
POTASSIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
POTASSIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
MAGNESIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
MAGNESIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
MANGANESE LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
MANGANESE, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
MOLYBDENUM LABORATOR	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
MOLYBDENUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
SODIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
SODIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
NICKEL LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
NICKEL, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
LEAD LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
SELENIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
SELENIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
THALLIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
THALLIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
VANADIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
VANADIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
ZINC LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
ZINC, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005
LVL#: 0211L186
SDG/SAF#: H1982/F03-005

W.O.#: 11343-606-001-9999-00
Date Received: 11-20-02

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

   The sample was rerun for Aluminum, Calcium, Potassium, Magnesium, and Sodium.

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

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

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

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

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

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

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

10. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

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 16 pages.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B15XM2	Aluminum	40,000	104.1
	Iron	20,000	115.3

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

13. 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.

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

12-13-02
Date

gmb/m11-186

METALS METHOD GLOSSARY

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

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

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

Other:_____ Method:_____

L-WI-033/M-03/01

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/12/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B15YL8	Silver, Total	0.48	MG/KG	0.14	1.0
		Aluminum, Total	5550	MG/KG	2.2	1.0
		Arsenic, Total	3.8	MG/KG	0.39	1.0
		Boron, Total	0.56	MG/KG	0.21	1.0
		Barium, Total	79.5	MG/KG	0.03	1.0
		Beryllium, Total	0.17	MG/KG	0.02	1.0
		Bismuth, Total	0.60 u	MG/KG	0.60	1.0
		Calcium, Total	6080	MG/KG	1.9	1.0
		Cadmium, Total	0.06	MG/KG	0.04	1.0
		Chromium, Total	13.4	MG/KG	0.10	1.0
		Copper, Total	17.7	MG/KG	0.13	1.0
		Iron, Total	24200	MG/KG	2.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1040	MG/KG	50.5	1.0
		Magnesium, Total	4490	MG/KG	4.0	1.0
		Manganese, Total	378	MG/KG	0.02	1.0
		Molybdenum, Total	0.29	MG/KG	0.17	1.0
		Sodium, Total	193	MG/KG	2.6	1.0
		Nickel, Total	9.2	MG/KG	0.13	1.0
		Lead, Total	4.4	MG/KG	0.24	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Thallium, Total	0.57 u	MG/KG	0.57	1.0
		Vanadium, Total	64.7	MG/KG	0.10	1.0
		Zinc, Total	45.2	MG/KG	0.08	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/12/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	02L0691-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	2.2 u	MG/KG	2.2	1.0
		Arsenic, Total	0.38 u	MG/KG	0.38	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	0.04	MG/KG	0.03	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Bismuth, Total	0.59 u	MG/KG	0.59	1.0
		Calcium, Total	3.0	MG/KG	1.9	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.26	MG/KG	0.10	1.0
		Copper, Total	0.20	MG/KG	0.13	1.0
		Iron, Total	2.0 u	MG/KG	2.0	1.0
		Potassium, Total	49.8 u	MG/KG	49.8	1.0
		Magnesium, Total	3.9 u	MG/KG	3.9	1.0
		Manganese, Total	0.04	MG/KG	0.02	1.0
		Molybdenum, Total	0.18	MG/KG	0.17	1.0
		Sodium, Total	4.6	MG/KG	2.6	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.24 u	MG/KG	0.24	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
		Thallium, Total	0.56 u	MG/KG	0.56	1.0
		Vanadium, Total	0.10 u	MG/KG	0.10	1.0
		Zinc, Total	0.14	MG/KG	0.08	1.0
BLANK1	02C0350-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/12/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B15YL8	Silver, Total	5.8	0.48	5.2	102.2	1.0
		Aluminum, Total	5980	5550	209	204.2*	1.0
		Arsenic, Total	207	3.8	209	97.4	1.0
		Boron, Total	97.6	0.56	104	92.9	1.0
		Barium, Total	274	79.5	209	93.2	1.0
		Beryllium, Total	5.2	0.17	5.2	96.6	1.0
		Bismuth, Total	498	0.60u	522	95.3	1.0
		Calcium, Total	8440	6080	2610	90.4	1.0
		Cadmium, Total	5.2	0.06	5.2	98.8	1.0
		Chromium, Total	34.7	13.4	20.9	101.9	1.0
		Copper, Total	38.8	17.7	26.1	80.8	1.0
		Iron, Total	25500	24200	104	1224 *	1.0
		Mercury, Total	0.17	0.02u	0.16	105.6	1.0
		Potassium, Total	3400	1040	2610	90.6	1.0
		Magnesium, Total	6860	4490	2610	90.7	1.0
		Manganese, Total	433	378	52.2	106.9*	1.0
		Molybdenum, Total	103	0.29	104	98.0	1.0
		Sodium, Total	2700	193	2610	96.2	1.0
		Nickel, Total	60.9	9.2	52.2	99.0	1.0
		Lead, Total	56.4	4.4	52.2	99.6	1.0
		Selenium, Total	196	0.39u	209	93.9	1.0
		Thallium, Total	210	0.57u	209	100.7	1.0
		Vanadium, Total	118	64.7	52.2	102.5	1.0
		Zinc, Total	97.0	45.2	52.2	99.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/12/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B15YL8	Silver, Total	0.48	0.52	7.0	1.0
		Aluminum, Total	5550	5510	0.72	1.0
		Arsenic, Total	3.8	5.3	33.0	1.0
		Boron, Total	0.56	0.63	11.1	1.0
		Barium, Total	79.5	79.6	0.13	1.0
		Beryllium, Total	0.17	0.17	2.3	1.0
		Bismuth, Total	0.60u	0.57u	NC	1.0
		Calcium, Total	6080	6150	1.1	1.0
		Cadmium, Total	0.06	0.04u	NC	1.0
		Chromium, Total	13.4	14.6	8.6	1.0
		Copper, Total	17.7	13.5	26.9	1.0
		Iron, Total	24200	25500	5.2	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	1040	1010	2.4	1.0
		Magnesium, Total	4490	4490	0.036	1.0
		Manganese, Total	378	421	10.8	1.0
		Molybdenum, Total	0.29	0.21	29.2	1.0
		Sodium, Total	193	183	5.6	1.0
		Nickel, Total	9.2	9.5	3.2	1.0
		Lead, Total	4.4	4.7	6.6	1.0
		Selenium, Total	0.39u	0.37u	NC	1.0
		Thallium, Total	0.57u	0.54u	NC	1.0
		Vanadium, Total	64.7	68.3	5.4	1.0
		Zinc, Total	45.2	46.0	1.8	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/12/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	02L0691-LC1	Silver, LCS	49.8	50.0	MG/KG	99.6
		Aluminum, LCS	488	500	MG/KG	97.5
		Arsenic, LCS	949	1000	MG/KG	94.9
		Boron, LCS	472	500	MG/KG	94.4
		Barium, LCS	494	500	MG/KG	98.8
		Beryllium, LCS	24.5	25.0	MG/KG	98.0
		Bismuth, LCS	485	500	MG/KG	97.0
		Calcium, LCS	2420	2500	MG/KG	96.8
		Cadmium, LCS	24.7	25.0	MG/KG	98.8
		Chromium, LCS	51.6	50.0	MG/KG	103.2
		Copper, LCS	126	125	MG/KG	101.0
		Iron, LCS	506	500	MG/KG	101.2
		Potassium, LCS	2380	2500	MG/KG	95.4
		Magnesium, LCS	2390	2500	MG/KG	95.4
		Manganese, LCS	78.0	75.0	MG/KG	104.0
		Molybdenum, LCS	512	500	MG/KG	102.4
		Sodium, LCS	2440	2500	MG/KG	97.5
		Nickel, LCS	200	200	MG/KG	99.9
		Lead, LCS	247	250	MG/KG	98.9
		Selenium, LCS	910	1000	MG/KG	91.0
		Thallium, LCS	999	1000	MG/KG	99.9
		Vanadium, LCS	258	250	MG/KG	103.3
		Zinc, LCS	98.6	100	MG/KG	98.6
LCS1	02C0350-LC1	Mercury, LCS	2.3	2.5	MG/KG	92.4

Lionville Laboratory Use Only

0211L186

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

VLI

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 30 Days

Date Rec'd: 11-20-02 Date Due: 12-20-02

		A	B	C		D			E		F	G				
Refrigerator #		1	4	4		4			4		4	4				
#/Type Container	Liquid															
	Solid	1 jar	1 jar	1 jar		1 jar			1 jar		1 jar	1 jar				
Volume	Liquid	0	0	0		0			0		0	0				
	Solid	60	250	250		60			125		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED →		ORGANIC							INORG							
		TCL VOA	BNA (1)	Pest PCB	Herb	Alcohols Glycols Ketones			ICP Metal (2)	CN	IC Anions (3)	pH				
		Lionville Laboratory Use Only														
		06244	6257X ODRO	OATB		OGESC			METO ICRG		INORG	IPH				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	06244	6257X ODRO	OATB		OGESC			METO ICRG		INORG	IPH				
001	B15YL8	X	X	S	11-15-02	0910	X	X	X		X			X		X	X				

Special Instructions: SAF # F03-005

ODRO - Report KRO + DRO Compounds

DATE/REVISIONS:

METO 1. As, Ba, Cd, Cr, Pb, Fe, Ag, Al, Be, Bi, B, Ca,

2. Cu, Fe, Mg, Mn, Mo, Ni, K, Se, Na, Tl, V, Zn, Hg

INORG 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. IN3N2, INH3N, ISFD, ICNTD

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # 7901 4352 9959

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.9 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11-20-02	0920

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

14

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1

Collector: R. Nielson	Company Contact: Steve Trent — Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-2	SAF No.: F03-005	Air Quality ☐
Ice Chest No.: ERC-02-006 / ERC-02-403	Field Logbook No.: HNF-N-325 / — COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA) RECLA	Offsite Property No.: A030042	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RJN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ dG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3 RJN 11/15/02	

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X		
											RJN 11/19/02		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	11-15-02 1330	REF # 18 / 3728	11-15-02 1330
REF # 18 / 3728	11/19/02 1230	R. Nielson	11/19/02 1230
R. Nielson	11/19/02 1300	Fed Ex	11/19/02 1300
Fed Ex	11-20-02 0920	[illegible]	11-20-02 0920

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) (Curium-242)

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

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TMU Hanford

Purchase Order/Project:

DATE: 11-20-02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L186

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

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

Cooler # / temp (°C) and Comments:

ERC-02-006 / 0.9°C

Laboratory Sample Custodian: D. Johnson

Laboratory Project Manager:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL8						
% SOLIDS	001	S	02L%S128	11/15/02	11/21/02	11/22/02
% SOLIDS	001 REP	S	02L%S128	11/15/02	11/21/02	11/22/02
CHLORIDE BY IC	001	S	02LICB81	11/15/02	11/27/02	11/27/02
CHLORIDE BY IC	001 REP	S	02LICB81	11/15/02	11/27/02	11/27/02
CHLORIDE BY IC	001 MS	S	02LICB81	11/15/02	11/27/02	11/27/02
FLUORIDE BY IC	001	S	02LICB81	11/15/02	11/27/02	11/27/02
FLUORIDE BY IC	001 REP	S	02LICB81	11/15/02	11/27/02	11/27/02
FLUORIDE BY IC	001 MS	S	02LICB81	11/15/02	11/27/02	11/27/02
NITRITE BY IC	001	S	02LICB81	11/15/02	11/27/02	11/27/02
NITRITE BY IC	001 REP	S	02LICB81	11/15/02	11/27/02	11/27/02
NITRITE BY IC	001 MS	S	02LICB81	11/15/02	11/27/02	11/27/02
NITRATE BY IC	001	S	02LICB81	11/15/02	11/27/02	11/27/02
NITRATE BY IC	001 REP	S	02LICB81	11/15/02	11/27/02	11/27/02
NITRATE BY IC	001 MS	S	02LICB81	11/15/02	11/27/02	11/27/02
TOTAL CYANIDE	001	S	02LC090	11/15/02	11/24/02	11/24/02
TOTAL CYANIDE	001 REP	S	02LC090	11/15/02	11/24/02	11/24/02
TOTAL CYANIDE	001 MS	S	02LC090	11/15/02	11/24/02	11/24/02
PHOSPHATE BY IC	001	S	02LICB81	11/15/02	11/27/02	11/27/02
PHOSPHATE BY IC	001 REP	S	02LICB81	11/15/02	11/27/02	11/27/02
PHOSPHATE BY IC	001 MS	S	02LICB81	11/15/02	11/27/02	11/27/02
CHROMIUM VI	001	S	02LVI038	11/15/02	12/05/02	12/05/02
CHROMIUM VI	001 REP	S	02LVI038	11/15/02	12/05/02	12/05/02
CHROMIUM VI	001 MS	S	02LVI038	11/15/02	12/05/02	12/05/02
CHROMIUM VI	001 MSD	S	02LVI038	11/15/02	12/05/02	12/05/02
SULFATE BY IC	001	S	02LICB81	11/15/02	11/27/02	11/27/02
SULFATE BY IC	001 REP	S	02LICB81	11/15/02	11/27/02	11/27/02
SULFATE BY IC	001 MS	S	02LICB81	11/15/02	11/27/02	11/27/02
NITRATE NITRITE	001	S	02LN3D85	11/15/02	11/22/02	11/22/02
NITRATE NITRITE	001 REP	S	02LN3D85	11/15/02	11/22/02	11/22/02
NITRATE NITRITE	001 MS	S	02LN3D85	11/15/02	11/22/02	11/22/02
AMMONIA	001	S	02LAMA34	11/15/02	12/02/02	12/05/02
AMMONIA	001 REP	S	02LAMA34	11/15/02	12/02/02	12/05/02
AMMONIA	001 MS	S	02LAMA34	11/15/02	12/02/02	12/05/02
PH	001	S	02LPH093	11/15/02	11/21/02	11/21/02
PH	001 REP	S	02LPH093	11/15/02	11/21/02	11/21/02

DEC 2002
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1982

DATE RECEIVED: 11/20/02 LVL LOT # :0211L186

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	001	S	02LSDB55	11/15/02	11/22/02	11/22/02
SULFIDE	001 REP	S	02LSDB55	11/15/02	11/22/02	11/22/02
SULFIDE	001 MS	S	02LSDB55	11/15/02	11/22/02	11/22/02

LAB QC:

CHLORIDE BY IC	MB1	S	02LICB81	N/A	11/27/02	11/27/02
CHLORIDE BY IC	MB1 BS	S	02LICB81	N/A	11/27/02	11/27/02
FLUORIDE BY IC	MB1	S	02LICB81	N/A	11/27/02	11/27/02
FLUORIDE BY IC	MB1 BS	S	02LICB81	N/A	11/27/02	11/27/02
NITRITE BY IC	MB1	S	02LICB81	N/A	11/27/02	11/27/02
NITRITE BY IC	MB1 BS	S	02LICB81	N/A	11/27/02	11/27/02
NITRATE BY IC	MB1	S	02LICB81	N/A	11/27/02	11/27/02
NITRATE BY IC	MB1 BS	S	02LICB81	N/A	11/27/02	11/27/02
TOTAL CYANIDE	LCS L	S	02LC090	N/A	11/24/02	11/24/02
TOTAL CYANIDE	LCS L	S	02LC090	N/A	11/24/02	11/24/02
TOTAL CYANIDE	MB1	S	02LC090	N/A	11/24/02	11/24/02
PHOSPHATE BY IC	MB1	S	02LICB81	N/A	11/27/02	11/27/02
PHOSPHATE BY IC	MB1 BS	S	02LICB81	N/A	11/27/02	11/27/02
CHROMIUM VI	MB1	S	02LVI038	N/A	12/05/02	12/05/02
CHROMIUM VI	MB1 BS	S	02LVI038	N/A	12/05/02	12/05/02
CHROMIUM VI	MB1 BSD	S	02LVI038	N/A	12/05/02	12/05/02
SULFATE BY IC	MB1	S	02LICB81	N/A	11/27/02	11/27/02
SULFATE BY IC	MB1 BS	S	02LICB81	N/A	11/27/02	11/27/02
NITRATE NITRITE	MB1	S	02LN3D85	N/A	11/22/02	11/22/02
NITRATE NITRITE	MB1 BS	S	02LN3D85	N/A	11/22/02	11/22/02
AMMONIA	MB1	S	02LAMA34	N/A	12/02/02	12/05/02
AMMONIA	MB1 BS	S	02LAMA34	N/A	12/02/02	12/05/02
AMMONIA	MB1 BSD	S	02LAMA34	N/A	12/02/02	12/05/02
SULFIDE	MB1	S	02LSDB55	N/A	11/22/02	11/22/02
SULFIDE	MB1 BS	S	02LSDB55	N/A	11/22/02	11/22/02
SULFIDE	MB1 BSD	S	02LSDB55	N/A	11/22/02	11/22/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005 H1982
LVL#: 0211L186

W.O.#: 11343-606-001-9999-00
Date Received: 11-20-02

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

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

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

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia and Sulfide were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries for Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Phosphate, Sulfate, Nitrate Nitrite, Ammonia, Chromium VI and Sulfide were within the 75-125% control limits.

8. The replicate analyses Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Sulfate, Nitrate Nitrite, Ammonia, Chromium VI, Percent Solids, pH and Sulfide were within the 20% RPD control limit, however replicate analysis for Phosphate was outside the control limit that may be attributed to sample inhomogeneity.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12-12-02
Date

njp\i11-186

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 14 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

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

Other: Chloride, Fluoride, Nitrate **Method:** EPA 300.0 (mod.)

Other: Nitrite, Phosphate, Sulfate **Method**

Nitrate Nitrite EPA 353.2 (mod)

Ammonia EPA 350.3 (mod.)

L-WI-034/B-01/01

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B15YL8	% Solids	94.8		%	0.01	1.0
		Chloride by IC	1.3	u	MG/KG	1.3	1.0
		Fluoride by IC	1.3	u	MG/KG	1.3	1.0
		Nitrite by IC	1.32	u	MG/KG	1.32	1.0
		Nitrate by IC	21.1		MG/KG	1.32	1.0
		Cyanide, Total	0.30	u	MG/KG	0.30	1.0
		Phosphate by IC	2.4		MG/KG	1.3	1.0
		Chromium VI	1.6		MG/KG	0.42	1.0
		Sulfate by IC	4.3		MG/KG	1.3	1.0
		Nitrate Nitrite	2.6		MG/KG	0.21	1.0
		Ammonia, as N	2.4	u	MG/KG	2.4	1.0
		pH	8.7		SOIL PH	0.01	1.0
		Sulfide	20.4	u	MG/KG	20.4	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/10/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	02LICB81-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	1.2	u	MG/KG	1.2	1.0
		Nitrite by IC	1.25	u	MG/KG	1.25	1.0
		Nitrate by IC	1.25	u	MG/KG	1.25	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK1	02LC090-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	02LVI038-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	02LN3D85-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	02LAMA34-MB1	Ammonia, as N	2.5	u	MG/KG	2.5	1.0
BLANK10	02LSDB55-MB1	Sulfide	40.0	u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B15YL8	Chloride by IC	30.4	0.91	26.4	111.9	1.0
		Fluoride by IC	28.3	0.57	26.4	105.1	1.0
		Nitrite by IC	26.6	1.32u	26.4	101.1	1.0
		Nitrate by IC	49.6	21.1	26.4	108.0	1.0
		Cyanide, Total	4.28	0.30u	4.37	98.0	1.0
		Phosphate by IC	30.9	2.4	26.4	108.1	1.0
		Soluble Chromium VI	6.8	1.6	4.2	123.9	1.0
		Insoluble Chromium VI	1180	1.6	1020	116.1	100
		Sulfate by IC	31.0	4.3	26.4	101.2	1.0
		Nitrate Nitrite	7.2	2.6	5.1	89.7	1.0
		Ammonia, as N	102	2.4 u	100	101.8	1.0
		Sulfide	235	6.6	245	93.2	1.0
BLANK10	02LICB81-MB1	Chloride by IC	24.3	1.2 u	25.0	97.1	1.0
		Fluoride by IC	24.6	1.2 u	25.0	98.4	1.0
		Nitrite by IC	24.2	1.25u	25.0	96.7	1.0
		Nitrate by IC	23.7	1.25u	25.0	94.7	1.0
		Phosphate by IC	24.1	1.2 u	25.0	96.3	1.0
		Sulfate by IC	23.7	1.2 u	25.0	94.9	1.0
BLANK10	02LVI038-MB1	Soluble Chromium VI	4.2	0.40u	4.0	104.6	1.0
		Insoluble Chromium VI	1320	0.40u	1220	108.3	100
BLANK10	02LN3D85-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.0	1.0
BLANK10	02LAMA34-MB1	Ammonia, as N	102	2.5 u	100	102.0	1.0
		Ammonia, as N MSD	104	2.5 u	100	103.8	1.0
BLANK10	02LSDB55-MB1	Sulfide	464	40.0 u	467	99.3	1.0
		Sulfide MSD	440	40.0 u	467	94.2	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	02LAMA34-MB1	Ammonia, as N	102.0	103.8	1.7
BLANK10	02LSDB55-MB1	Sulfide	99.3	94.2	5.3

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B15YL8	% Solids	94.8	94.4	0.48	1.0
		Chloride by IC	1.3 u	1.3 u	NC	1.0
		Fluoride by IC	1.3 u	1.3 u	NC	1.0
		Nitrite by IC	1.32u	1.32u	NC	1.0
		Nitrate by IC	21.1	19.6	7.3	1.0
		Cyanide, Total	0.30u	0.42u	NC	1.0
		Phosphate by IC	2.4	1.8	30.6	1.0
		Chromium VI	1.6	1.7	9.2	1.0
		Sulfate by IC	4.3	3.9	9.6	1.0
		Nitrate Nitrite	2.6	2.5	7.5	1.0
		Ammonia, as N	2.4 u	2.6 u	NC	1.0
		pH	8.7	8.7	0.1	1.0
		Sulfide	20.4 u	21.0 u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1982 LVL LOT #: 0211L186

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	02LC090-LCS1	Cyanide, Total LCS	2.14	2.0	MG/KG	106.8
LCSS2	02LC090-LCS2	Cyanide, Total LCS	10.1	10.0	MG/KG	101.2

Lionville Laboratory Use Only

0211L186

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 30 ~~15~~ days

Date Rec'd: 11-20-02 Date Due: 12-20-02

		A	B	C		D			E		F	G				
Refrigerator #		1	4	4		4			4		4	4				
#/Type Container	Liquid															
	Solid	1 jar	1 jar	1 jar		1 jar			1 jar		1 jar	1 jar				
Volume	Liquid	0	0	0		0			0		0	0				
	Solid	60	250	250		60			125		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED →		ORGANIC: TCL VOA	ORGANIC: BNA (1)	ORGANIC: Reg PCB	ORGANIC: Herb	ORGANIC: Alcohols Glycols Ketones			INORG: ICP Metal (2)	INORG: CN	INORG: IC Anions (3)	INORG: pH				
Lionville Laboratory Use Only		06244	6254 ODRO	0418		OGCSC			MET① ZCRL		INORG①	ZPH				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	06244	6254 ODRO	0418		OGCSC			MET① ZCRL		INORG①	ZPH				
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	B15YL8	X	X	S	11-15-02	0940	X	X	X		X			X		X	X				

Special Instructions: SAF # F03-005

ODRO - Report KRO+DRO Compounds

DATE/REVISIONS:

MET① 1. As, Ba, Cd, Cr, Pb, Fe, Ag, Al, Be, Bi, B, Ca,

2. Cu, Fe, Mg, Mn, Mo, Ni, K, Se, Na, Tl, V, Zn, Hg

INORG① 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. IN3N2, INH3N, ISFD, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # 7901 4356 9959

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.9 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11-20-02	0920

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-012	Page 1 of 1

Collector: R. Nielson	Company Contact: Steve Trent	Telephone No.: 373-5869	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-2	SAF No.: F03-005	
Ice Chest No.: ERC-02-006 / ERC-02-403	Field Logbook No.: HNF-N-3251	COA: 117514ES10	Method of Shipment: Federal Express
Shipped To: EBERLINE SERVICES (Formerly TMA) RECLA	Offsite Property No.: A030042		Bill of Lading/Air Bill No.: SEE OSR

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	RUN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ dG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3 RJN 11/15/02	

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL8	SOIL	11-15-02	0940	X	X	X	X	X	X	X	X		
											RJN 11/19/02		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	11-15-02 1330	REF # 18/3728	11-15-02 1330
REF # 18/3728	11/19/02 1230	R. Nielson	11/19/02 1230
R. Nielson	11/19/02 1300	Fed Ex	11/19/02 1300
Fed Ex	11.20.02 0920		11.20.02 0920
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

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; *TPH-Diesel Range - WTPH-D*
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

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

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

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

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hanford

Purchase Order/Project:

DATE: 11-20-02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L186

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

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

Cooler # / temp (°C) and Comments:

ERC-02-006 / 0.9°C

Laboratory Sample Custodian: D. Johnson

Laboratory Project Manager: