1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1585 was composed of one solid (soil) sample designated under SAF No. B01-008 with a Project Designation of: 200 Area Source Characterization 200-CS-1 OU – Waste Management.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on January 19, 2002.

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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

No problems were encountered during the course of the analyses.

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 Transuranic Analyses (Am-241 and Cm-242)

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

1/26/02

Date

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

SAMPLE SUMMARY

SDG 7144
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1585

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B13D72	200 East	SOLID		R111056-01	B02-008	B02-008-05	11/02/01 07:30
Method Blank		SOLID		R111056-03	B02-008		
Lab Control Sample		SOLID		R111056-02	B02-008		
Duplicate (R111056-01)	200 East	SOLID		R111056-04	B02-008		11/02/01 07:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

SDG 7144
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1585

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
7144	B02-008-05	B13D72	SOLID	91.7	1066 g		11/07/01	5	R111056-01	7144-001
		Method Blank	SOLID						R111056-03	7144-003
		Lab Control Sample	SOLID						R111056-02	7144-002
		Duplicate (R111056-01)	SOLID	91.7	1066 g		11/07/01	5	R111056-04	7144-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

SDG 7144
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1585

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	7012-173	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7012-173	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7012-173	5.0	1			1	1	1/1		
TP	SOLID	Americium 241/Curium in Solids	7012-173	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	7012-173	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7012-173	10.0	1			1	1	1/1		
Gas Proportional Counting												
93A	SOLID	Gross Alpha in Soil	7012-173	20.0	1			1	1	1/1		
93B	SOLID	Gross Beta in Soil	7012-173	15.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7012-173	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	7012-173	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7012-173	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 TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

SDG 7144
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1585

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B13D72			R111056-01	7144-001	93A/93		01/04/02	01/19/02	MCM	Gross Alpha in Soil
200 East		SOLID	11/02/01	7144-001	93B/93		01/04/02	01/19/02	MCM	Gross Beta in Soil
B02-008-05	B02-008		11/07/01	7144-001	C		12/12/01	01/19/02	MCM	Carbon 14 in Soil
				7144-001	GAM		12/17/01	01/19/02	MCM	Gamma Scan
				7144-001	NP		12/20/01	01/19/02	MCM	Neptunium in Soil
				7144-001	PU		12/21/01	01/19/02	MCM	Plutonium, Isotopic in Solids
				7144-001	SR		12/18/01	01/19/02	MCM	Total Strontium in Soil
				7144-001	TH		01/08/02	01/19/02	MCM	Thorium, Isotopic in Soil
				7144-001	TP		12/27/01	01/19/02	MCM	Americium 241/Curium in Solids
				7144-001	U		12/19/01	01/19/02	MCM	Uranium, Isotopic in Soil
				7144-001	U_T		12/19/01	01/19/02	MCM	Uranium, Total in Soil
Method Blank			R111056-03	7144-003	93A/93		01/04/02	01/19/02	MCM	Gross Alpha in Soil
		SOLID		7144-003	93B/93		01/04/02	01/19/02	MCM	Gross Beta in Soil
	B02-008			7144-003	C		12/12/01	01/19/02	MCM	Carbon 14 in Soil
				7144-003	GAM		12/17/01	01/19/02	MCM	Gamma Scan
				7144-003	NP		12/20/01	01/19/02	MCM	Neptunium in Soil
				7144-003	PU		12/21/01	01/19/02	MCM	Plutonium, Isotopic in Solids
				7144-003	SR		12/18/01	01/19/02	MCM	Total Strontium in Soil
				7144-003	TH		01/08/02	01/19/02	MCM	Thorium, Isotopic in Soil
				7144-003	TP		12/27/01	01/19/02	MCM	Americium 241/Curium in Solids
				7144-003	U		12/20/01	01/19/02	MCM	Uranium, Isotopic in Soil
				7144-003	U_T		12/19/01	01/19/02	MCM	Uranium, Total in Soil
Lab Control Sample			R111056-02	7144-002	93A/93		01/08/02	01/19/02	MCM	Gross Alpha in Soil
		SOLID		7144-002	93B/93		01/08/02	01/19/02	MCM	Gross Beta in Soil
	B02-008			7144-002	C		12/13/01	01/19/02	MCM	Carbon 14 in Soil
				7144-002	GAM		12/17/01	01/19/02	MCM	Gamma Scan
				7144-002	NP		12/20/01	01/19/02	MCM	Neptunium in Soil
				7144-002	PU		12/21/01	01/19/02	MCM	Plutonium, Isotopic in Solids
				7144-002	SR		12/18/01	01/19/02	MCM	Total Strontium in Soil
				7144-002	TH		01/09/02	01/19/02	MCM	Thorium, Isotopic in Soil
				7144-002	TP		12/27/01	01/19/02	MCM	Americium 241/Curium in Solids
				7144-002	U		12/20/01	01/19/02	MCM	Uranium, Isotopic in Soil
				7144-002	U_T		12/19/01	01/19/02	MCM	Uranium, Total in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

SDG 7144
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1585

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R111056-01)			R111056-04	7144-004	93A/93		01/04/02	01/19/02	MCM	Gross Alpha in Soil
200 East		SOLID	11/02/01	7144-004	93B/93		01/04/02	01/19/02	MCM	Gross Beta in Soil
	B02-008		11/07/01	7144-004	C		12/12/01	01/19/02	MCM	Carbon 14 in Soil
				7144-004	GAM		12/17/01	01/19/02	MCM	Gamma Scan
				7144-004	NP		12/20/01	01/19/02	MCM	Neptunium in Soil
				7144-004	PU		12/21/01	01/19/02	MCM	Plutonium, Isotopic in Solids
				7144-004	SR		12/18/01	01/19/02	MCM	Total Strontium in Soil
				7144-004	TH		01/08/02	01/19/02	MCM	Thorium, Isotopic in Soil
				7144-004	TP		12/27/01	01/19/02	MCM	Americium 241/Curium in Solids
				7144-004	U		12/20/01	01/19/02	MCM	Uranium, Isotopic in Soil
				7144-004	U_T		12/19/01	01/19/02	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	B02-008	Gross Alpha in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	B02-008	Gross Beta in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
C	B02-008	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1	4
GAM	B02-008	Gamma Scan	GAMMA_GS	1			1	1	1	4
NP	B02-008	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	B02-008	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	B02-008	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TH	B02-008	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1	4
TP	B02-008	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
U	B02-008	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1			1	1	1	4
U_T	B02-008	Uranium, Total in Soil	UTOT_KPA	1			1	1	1	4
TOTALS				11			11	11	11	44

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

R111056-03 Method Blank

METHOD BLANK

SDG	7144	Client/Case no	Hanford	SDG H1585	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R111056-03	Client sample id	Method Blank		
Dept sample id	7144-003	Material/Matrix		SOLID	
		SAF No	B02-008		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.099	1.6	3.1	10	U	93A
Gross Beta	12587-47-2	-2.31	3.3	6.0	15	U	93B
Carbon 14	14762-75-5	0.520	2.6	4.3	50	U	C
Total Strontium	SR-RAD	-0.070	0.12	0.25	1.0	U	SR
Thorium 228	14274-82-9	0.045	0.36	0.77		U	TH
Thorium 230	14269-63-7	-0.226	0.27	0.50	1.0	U	TH
Thorium 232	TH-232	0.045	0.090	0.35	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.001	0.002	0.10	U	U_T
Uranium 233/234	U-233/234	0.024	0.047	0.18	1.0	U	U
Uranium 235	15117-96-1	0	0.057	0.22	1.0	U	U
Uranium 238	U-238	0	0.047	0.18	1.0	U	U
Neptunium 237	13994-20-2	-0.032	0.063	0.24	1.0	U	NP
Plutonium 238	13981-16-3	0.013	0.026	0.099	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.026	0.099	1.0	U	PU
Curium 242	15510-73-3	0	0.023	0.054		U	TP
Americium 241	14596-10-2	0.006	0.045	0.062	1.0	U	TP
Sodium 22	13966-32-0	U		0.014		U	GAM
Potassium 40	13966-00-2	U		0.28		U	GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Antimony 125	14234-35-6	U		0.029		U	GAM
Tin 126	15832-50-5	U		0.028		U	GAM
Barium 133	13981-41-4	U		0.014		U	GAM
Cesium 134	13967-70-9	U		0.015		U	GAM
Cesium 137	10045-97-3	U		0.013	0.10	U	GAM
Radium 226	13982-63-3	U		0.026	0.10	U	GAM
Radium 228	15262-20-1	U		0.059	0.20	U	GAM
Europium 152	14683-23-9	U		0.033	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		0.041	0.10	U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/19/02

BLANK, cont.

SDG	7144	Client/Case no	Hanford SDG H1585
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R111056-03	Client sample id	Method Blank
Dept sample id	7144-003	Material/Matrix	SOLID
		SAF No	B02-008

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Thorium 228	14274-82-9	U		0.019		U	GAM
Thorium 232	TH-232	U		0.059		U	GAM
Uranium 235	15117-96-1	U		0.056		U	GAM
Uranium 238	U-238	U		1.9		U	GAM
Americium 241	14596-10-2	U		0.088		U	GAM

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 40585

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

R111056-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7144
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1585
Case no No. 630

Lab sample id R111056-02
Dept sample id 7144-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B02-008

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	218	15	3.3	10		93A	215	8.6	101	67-133	70-130
Gross Beta	230	12	8.9	15		93B	239	9.6	96	76-124	70-130
Carbon 14	10100	200	25	50		C	11300	450	89	85-115	80-120
Total Strontium	24.5	0.87	0.24	1.0		SR	22.8	0.91	108	82-118	80-120
Thorium 230	45.6	1.6	0.29	1.0		TH	44.8	1.8	102	89-111	80-120
Total Uranium (ug/g)	18.6	2.3	0.020	0.10		U_T	18.1	0.72	103	76-124	80-120
Uranium 233/234	18.1	1.7	0.83	1.0		U	19.3	0.77	94	84-116	80-120
Uranium 235	14.8	1.5	0.19	1.0		U	15.7	0.63	94	83-117	80-120
Uranium 238	19.7	1.8	0.80	1.0		U	21.0	0.84	94	84-116	80-120
Neptunium 237	19.9	1.5	0.079	1.0		NP	21.8	0.87	91	86-114	80-120
Plutonium 238	27.8	1.8	0.094	1.0		PU	27.2	1.1	102	86-114	80-120
Plutonium 239/240	29.2	1.9	0.094	1.0		PU	29.0	1.2	101	86-114	80-120
Curium 244	21.5	0.75	0.060	1.0		TP	21.6	0.86	100	89-111	80-120
Americium 241	21.2	0.74	0.047	1.0		TP	21.0	0.84	101	89-111	80-120
Cobalt 60	0.316	0.038	0.017	0.050		GAM	0.294	0.012	108	68-132	80-120
Cesium 137	0.372	0.034	0.022	0.10		GAM	0.343	0.014	108	71-129	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 40584

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

R111056-04 B13D72

DUPLICATE

SDG	7144			Client/Case no	Hanford SDG H1585
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R111056-04	Lab sample id	R111056-01	Client sample id	B13D72
Dept sample id	7144-004	Dept sample id	7144-001	Location/Matrix	200 East SOLID
		Received	11/07/01	Collected/Weight	11/02/01 07:30 1066 g
% solids	91.7	% solids	91.7	Custody/SAF No	B02-008-05 B02-008

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
Gross Alpha	2.53	2.4	3.0	10	U	93A	2.23	2.5	3.3	U	-	
Gross Beta	19.6	5.3	7.5	15		93B	22.2	4.7	5.9		12	60
Carbon 14	-0.665	2.1	3.6	50	U	C	-0.621	2.4	4.1	U	-	
Total Strontium	4.03	0.35	0.21	1.0		SR	3.93	0.34	0.21		3	28
Thorium 228	0.669	0.45	0.55			TH	0.330	0.22	0.21		68	151
Thorium 230	1.11	0.54	0.42	1.0		TH	0.464	0.33	0.37	J	82	121
Thorium 232	0.709	0.36	0.34	1.0	J	TH	0.355	0.22	0.21	J	67	120
Total Uranium (ug/g)	0.228	0.031	0.020	0.10		U_T	0.247	0.033	0.020		8	34
Uranium 233/234	0.504	0.22	0.17	1.0	J	U	0.360	0.059	0.030	J	33	80
Uranium 235	0.080	0.11	0.20	1.0	U	U	0.024	0.022	0.026	U	-	
Uranium 238	0.504	0.22	0.17	1.0	J	U	0.360	0.059	0.025	J	33	80
Neptunium 237	0	0.051	0.19	1.0	U	NP	0.023	0.046	0.069	U	-	
Plutonium 238	0.017	0.033	0.13	1.0	U	PU	0	0.027	0.10	U	-	
Plutonium 239/240	-0.017	0.033	0.13	1.0	U	PU	-0.014	0.027	0.10	U	-	
Curium 242	0.005	0.018	0.035		U	TP	0	0.096	0.37	U	-	
Americium 241	-0.014	0.022	0.040	1.0	U	TP	0.075	0.15	0.29	U	-	
Sodium 22	U		0.061		U	GAM	U		0.050	U	-	
Potassium 40	10.9	0.92	0.66			GAM	11.2	0.81	0.36		3	36
Cobalt 60	U		0.047	0.050	U	GAM	U		0.048	U	-	
Antimony 125	U		0.11		U	GAM	U		0.093	U	-	
Tin 126	U		0.086		U	GAM	U		0.048	U	-	
Barium 133	U		0.048		U	GAM	U		0.044	U	-	
Cesium 134	U		0.097		U	GAM	U		0.050	U	-	
Cesium 137	0.849	0.069	0.058	0.10		GAM	0.817	0.058	0.038		4	36
Radium 226	0.547	0.094	0.098	0.10		GAM	0.544	0.089	0.080		1	48
Radium 228	0.700	0.21	0.21	0.20		GAM	0.692	0.20	0.19		1	70
Europium 152	U		0.12	0.10	U	GAM	U		0.10	U	-	
Europium 154	U		0.18	0.10	U	GAM	U		0.15	U	-	

200 Area Source Chara. 200-CS-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.C
Form	DVD-DUP
Version	3.06
Report date	01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

R111056-04

B13D72

DUPLICATE, cont.

SDG	7144			Client/Case no	Hanford SDG H1585
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R111056-04	Lab sample id	R111056-01	Client sample id	B13D72
Dept sample id	7144-004	Dept sample id	7144-001	Location/Matrix	200 East SOLID
		Received	11/07/01	Collected/Weight	11/02/01 07:30 1066 g
% solids	91.7	% solids	91.7	Custody/SAF No	B02-008-05 B02-008

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
Europium 155	U		0.11	0.10	U	GAM	U		0.071	U	-		
Thorium 228	0.634	0.050	0.056			GAM	0.831	0.072	0.067		27	37	
Thorium 232	0.700	0.21	0.21			GAM	0.692	0.20	0.19		1	70	
Uranium 235	U		0.16		U	GAM	U		0.13	U	-		
Uranium 238	U		5.6		U	GAM	U		4.8	U	-		
Americium 241	U		0.16		U	GAM	U		0.053	U	-		

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 40586

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

R111056-01 B13D72

DATA SHEET

SDG	7144	Client/Case no	Hanford	SDG H1585	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R111056-01	Client sample id	B13D72		
Dept sample id	7144-001	Location/Matrix	200 East	SOLID	
Received	11/07/01	Collected/Weight	11/02/01 07:30	1066 g	
% solids	91.7	Custody/SAF No	B02-008-05	B02-008	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.23	2.5	3.3	10	U	93A
Gross Beta	12587-47-2	22.2	4.7	5.9	15		93B
Carbon 14	14762-75-5	-0.621	2.4	4.1	50	U	C
Total Strontium	SR-RAD	3.93	0.34	0.21	1.0		SR
Thorium 228	14274-82-9	0.330	0.22	0.21			TH
Thorium 230	14269-63-7	0.464	0.33	0.37	1.0	J	TH
Thorium 232	TH-232	0.355	0.22	0.21	1.0	J	TH
Total Uranium (ug/g)	7440-61-1	0.247	0.033	0.020	0.10		U_T
Uranium 233/234	U-233/234	0.360	0.059	0.030	1.0	J	U
Uranium 235	15117-96-1	0.024	0.022	0.026	1.0	U	U
Uranium 238	U-238	0.360	0.059	0.025	1.0	J	U
Neptunium 237	13994-20-2	0.023	0.046	0.069	1.0	U	NP
Plutonium 238	13981-16-3	0	0.027	0.10	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.014	0.027	0.10	1.0	U	PU
Curium 242	15510-73-3	0	0.096	0.37		U	TP
Americium 241	14596-10-2	0.075	0.15	0.29	1.0	U	TP
Sodium 22	13966-32-0	U		0.050		U	GAM
Potassium 40	13966-00-2	11.2	0.81	0.36			GAM
Cobalt 60	10198-40-0	U		0.048	0.050	U	GAM
Antimony 125	14234-35-6	U		0.093		U	GAM
Tin 126	15832-50-5	U		0.048		U	GAM
Barium 133	13981-41-4	U		0.044		U	GAM
Cesium 134	13967-70-9	U		0.050		U	GAM
Cesium 137	10045-97-3	0.817	0.058	0.038	0.10		GAM
Radium 226	13982-63-3	0.544	0.089	0.080	0.10		GAM
Radium 228	15262-20-1	0.692	0.20	0.19	0.20		GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.15	0.10	U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

R111056-01 B13D72

DATA SHEET, cont

SDG	7144	Client/Case no	Hanford	SDG H1585
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R111056-01	Client sample id	B13D72	
Dept sample id	7144-001	Location/Matrix	200 East	SOLID
Received	11/07/01	Collected/Weight	11/02/01 07:30	1066 g
% solids	91.7	Custody/SAF No	B02-008-05	B02-008

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Europium 155	14391-16-3	U		0.071	0.10	U	GAM
Thorium 228	14274-82-9	0.831	0.072	0.067			GAM
Thorium 232	TH-232	0.692	0.20	0.19			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Americium 241	14596-10-2	U		0.053		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test NP Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 7012-173						
B13D72	R111056-01			7144-001	U	
BLK (QC ID=40585)	R111056-03			7144-003	U	
LCS (QC ID=40584)	R111056-02			7144-002	ok	
Duplicate (R111056-01)	*R111056-04*			*7144-004*	-	*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 7012-173	2σ prep error 5.0 %				Reference Lab Notebook 7012 pg. 173											
B13D72	R111056-01			0.069	0.500			90		112			48	12/19/01	12/20	SS-047
BLK (QC ID=40585)	R111056-03			0.24	0.500			69		113				12/19/01	12/20	SS-049
LCS (QC ID=40584)	R111056-02			0.079	0.500			77		112				12/19/01	12/20	SS-048
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.19	0.500			80		113			48	12/19/01	12/20	SS-050
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 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.14	±	0.17
	YIELD	79	±	17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test PU Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 7012-173								
B13D72	R111056-01			7144-001	U		U	
BLK (QC ID=40585)	R111056-03			7144-003	U		U	
LCS (QC ID=40584)	R111056-02			7144-002	ok		ok	
Duplicate (R111056-01)	R111056-04			7144-004	-	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 7012-173	2σ prep error 5.0 %			Reference Lab Notebook 7012 pg. 173												
B13D72	R111056-01			0.10	0.500			81		198			49	12/21/01	12/21	SS-045
BLK (QC ID=40585)	R111056-03			0.099	0.500			87		206				12/21/01	12/21	SS-048
LCS (QC ID=40584)	R111056-02			0.094	0.500			91		205				12/21/01	12/21	SS-047
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.13	0.500			71		206			49	12/21/01	12/21	SS-049
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 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.11	±	0.033
	YIELD	82	±	17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test TH Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 230
Preparation batch 7012-173					
B13D72	R111056-01			7144-001	0.464 J
BLK (QC ID=40585)	R111056-03			7144-003	U
LCS (QC ID=40584)	R111056-02			7144-002	ok
Duplicate (R111056-01)	R111056-04			7144-004	ok
Nominal values and limits from method 200 Area Source Chara. 200-CS-1 OU				RDLs (pCi/g)	1.0

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 7012-173	2σ prep error 5.0 %					Reference Lab Notebook 7012 pg. 173										
B13D72	R111056-01			0.37	0.250			94		172			67	01/07/02	01/08	SS-045
BLK (QC ID=40585)	R111056-03			0.50	0.250			80		174				01/07/02	01/08	SS-021
LCS (QC ID=40584)	R111056-02			0.29	0.250			88		729				01/07/02	01/09	SS-043
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.42	0.250			94		174			67	01/07/02	01/08	SS-022
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-905	Thorium in Water and Dissolved Solid Sample Using TRU and AG 1x8 Resin, rev 1
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.40	±	0.18
	YIELD	89	±	13

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test TP Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241/CURIUM IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Curium 244	Americium 241	
Preparation batch 7012-173							
B13D72	R111056-01			7144-001		U	
BLK (QC ID=40585)	R111056-03			7144-003		U	
LCS (QC ID=40584)	R111056-02			7144-002	ok	ok	
Duplicate (R111056-01)	R111056-04			7144-004		-	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 7012-173	2σ prep error 5.0 %			Reference Lab Notebook 7012 pg. 173												
B13D72	R111056-01			0.37	0.500			57		105			55	12/27/01	12/27	SS-050
BLK (QC ID=40585)	R111056-03			0.062	0.500			40		1040				12/27/01	12/27	SS-042
LCS (QC ID=40584)	R111056-02			0.060	0.500			70		1040				12/27/01	12/27	SS-032
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.040	0.500			62		1039			55	12/27/01	12/27	SS-043
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-961	Am-Cu Purification, Large Aliquot by Oxalate Precipitation, rev 2
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.13	±	0.32
	YIELD	57	±	25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test U Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7012-173											
B13D72	R111056-01			7144-001	0.360 J	U	0.360 J	100	23	7	6
BLK (QC ID=40585)	R111056-03			7144-003	U	U	U				
LCS (QC ID=40584)	R111056-02			7144-002	ok	ok	ok				
Duplicate (R111056-01)	R111056-04			7144-004	ok J	- U	ok J	100	62	16	23
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200 Area Source Chara. 200-CS-1 OU								Averages 100		11	

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 7012-173	2σ prep error 5.0 %				Reference Lab Notebook 7012 pg. 173											
B13D72	R111056-01			0.030	0.500			99		1054			47	12/19/01	12/19	SS-062
BLK (QC ID=40585)	R111056-03			0.22	0.500			89		111				12/19/01	12/20	SS-032
LCS (QC ID=40584)	R111056-02			0.83	0.500			108		111				12/19/01	12/20	SS-031
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.20	0.500			91		112			48	12/19/01	12/20	SS-044
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.32 ± 0.70
YIELD 97 ± 17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test SR Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 7012-173					
B13D72	R111056-01			7144-001	3.93
BLK (QC ID=40585)	R111056-03			7144-003	U
LCS (QC ID=40584)	R111056-02			7144-002	ok
Duplicate (R111056-01)	R111056-04			7144-004	ok
Nominal values and limits from method 200 Area Source Chara. 200-CS-1 OU				RDLs (pCi/g)	1.0

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 7012-173 2σ prep error 10.0 % Reference Lab Notebook 7012 pg. 173																
B13D72	R111056-01			0.21	1.00			100		100			46	12/18/01	12/18	GRB-202
BLK (QC ID=40585)	R111056-03			0.25	1.00			96		100				12/18/01	12/18	GRB-223
LCS (QC ID=40584)	R111056-02			0.24	1.00			96		100				12/18/01	12/18	GRB-222
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.21	1.00			97		100			46	12/18/01	12/18	GRB-203
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 4
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.23 ± 0.041
YIELD 97 ± 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test 93A Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 7012-173						
B13D72	R111056-01	93		7144-001	U	
BLK (QC ID=40585)	R111056-03	93		7144-003	U	
LCS (QC ID=40584)	R111056-02	93		7144-002	ok	
Duplicate (R111056-01)	R111056-04	93		7144-004	-	U
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 7012-173	2σ prep error 20.0 %				Reference Lab Notebook 7012 pg. 173											
B13D72	R111056-01	93		3.3	0.100			36		100			63	12/27/01	01/04	GRB-109
BLK (QC ID=40585)	R111056-03	93		3.1	0.100			20		100				12/27/01	01/04	GRB-111
LCS (QC ID=40584)	R111056-02	93		3.3	0.100			20		100				12/27/01	01/08	GRB-114
Duplicate (R111056-01) (QC ID=40586)	R111056-04	93		3.0	0.100			36		100			63	12/27/01	01/04	GRB-112
Nominal values and limits from method				10	0.100			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	3.2	±	0.30
	RESIDUE	28	±	18

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test 93B Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN SOIL

GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 7012-173					
B13D72	R111056-01	93		7144-001	22.2
BLK (QC ID=40585)	R111056-03	93		7144-003	U
LCS (QC ID=40584)	R111056-02	93		7144-002	ok
Duplicate (R111056-01)	R111056-04	93		7144-004	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 7012-173	2σ prep error 15.0 % Reference Lab Notebook 7012 pg. 173															
B13D72	R111056-01	93		5.9	0.100			36		100			63	12/27/01	01/04	GRB-109
BLK (QC ID=40585)	R111056-03	93		6.0	0.100			20		100				12/27/01	01/04	GRB-111
LCS (QC ID=40584)	R111056-02	93		8.9	0.100			20		100				12/27/01	01/08	GRB-114
Duplicate (R111056-01) (QC ID=40586)	R111056-04	93		7.5	0.100			36		100			63	12/27/01	01/04	GRB-112
Nominal values and limits from method				15	0.100			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	7.1	±	2.8
	RESIDUE	28	±	18

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test GAM Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7012-173						
B13D72	R111056-01			7144-001	U	0.817
BLK (QC ID=40585)	R111056-03			7144-003	U	U
LCS (QC ID=40584)	R111056-02			7144-002	ok	ok
Duplicate (R111056-01)	R111056-04			7144-004	- 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 7012-173	2σ prep error 15.0 % Reference Lab Notebook 7012 pg. 173															
B13D72	R111056-01			0.36	769					142			45	12/12/01	12/17	02,01,00
BLK (QC ID=40585)	R111056-03			0.097	769					142				12/12/01	12/17	MB,05,00
LCS (QC ID=40584)	R111056-02			0.017	769					115				12/12/01	12/17	MB,05,00
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.35	769					137			45	12/12/01	12/17	02,03,00
Nominal values and limits from method				0.050	769					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 3
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.21 ± 0.35
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test U T Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 7012-173					
B13D72	R111056-01			7144-001	0.247
BLK (QC ID=40585)	R111056-03			7144-003	U
LCS (QC ID=40584)	R111056-02			7144-002	ok
Duplicate (R111056-01)	R111056-04			7144-004	ok
Nominal values and limits from method				RDLs (ug/g)	0.10
200 Area Source Chara. 200-CS-1 OU					

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 7012-173 2σ prep error 9.0 % Reference Lab Notebook 7012 pg. 173																
B13D72	R111056-01			0.020	0.100								47	12/19/01	12/19	KPA-001
BLK (QC ID=40585)	R111056-03			0.002	0.100									12/19/01	12/19	KPA-001
LCS (QC ID=40584)	R111056-02			0.020	0.100									12/19/01	12/19	KPA-001
Duplicate (R111056-01) (QC ID=40586)	R111056-04			0.020	0.100								47	12/19/01	12/19	KPA-001
Nominal values and limits from method				0.10	0.100								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 3
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.016 ± 0.018
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1585

Test C Matrix SOLID
SDG 7144
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1585

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 7012-173						
B13D72	R111056-01			7144-001	U	
BLK (QC ID=40585)	R111056-03			7144-003	U	
LCS (QC ID=40584)	R111056-02			7144-002	ok	
Duplicate (R111056-01)	R111056-04			7144-004	-	U
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 7012-173	2σ prep error 10.0 % Reference Lab Notebook 7012 pg. 173															
B13D72	R111056-01			4.1	0.218			100		100			40	12/11/01	12/12	LSC-005
BLK (QC ID=40585)	R111056-03			4.3	0.200			100		100				12/11/01	12/12	LSC-005
LCS (QC ID=40584)	R111056-02			25	0.200			100		3				12/11/01	12/13	LSC-005
Duplicate (R111056-01) (QC ID=40586)	R111056-04			3.6	0.234			100		100			40	12/11/01	12/12	LSC-005
Nominal values and limits from method				50	0.200					50			180			

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-060	Soil Preparation, rev 3
	CP-251	Tritium/Carbon-14 Oxidation, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	9.2	±	21
	YIELD	100	±	0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/02

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-05	Page 1 of 1

Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East H1585 (~~7145~~) 7144	SAF No.: B02-008	Price Code: 8N; Air Quality ☐
Ice Chest No.: ERC 99.002	Field Logbook No.: EC-1551	COA: B20CS1673C	Method of Shipment: Fed Ex
Shipped To: TMA/~~RSORA~~	Offsite Property No.: A020003		Bill of Lading/~~Air Bill~~ No.: 4235 7954-8740

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS: FIELD INSTRUMENTS INDICATE 412CPM B/B DIRECT ON SOIL

Special Handling and/or Storage: TIC TO B13D83

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		

Sample No.	Matrix *	Sample Date	Sample Time								
B13D72	SOIL	11/2/01	0730	X							

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 11/2/01. Collector not available to relenquish samples on 11/6/01 for shipment. RT 11-6-01

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	DS Watson	11/2/01 1115	REF 3B 3728 Shipping	11/2/01 1115
Relinquished By/Removed From	Ref 3B 3728	11-6-01 0700	R.T. Thorne	11-6-01 0700
Relinquished By/Removed From	R.T. Thorne ERC	11-6-01 0700	FEDEX	11-6-01
Relinquished By/Removed From	FED EXPRESS	11-7-01 9:30	E.R. Masters SCA-2	11-7-02 9:30
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

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and karosene range compounds from WTPH-D analysis

(1) 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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126}; Strontium-89,90 -- Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Neptunium-237; Isotopic Uranium
(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196~~
(3) ~~NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010.~~
(4) ~~Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~

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

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

BHI-EE-011 (10/99)

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc. Date/Time received 11-7-01 9:30 Am

CoC No. B02-008-05

Container I.D. No. ERC99-002 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. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1 SAMPLE
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 Chris L. Masters Date: 11-7-01 Time: 9:30 Am

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

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B02-008
LVL #: 0111L291
SDG/SAF #: H1585/B02-008

W.O. #: 11343-606-001-9999-00
Date Received: 11-07-2001

GC/MS VOLATILE

One (1) soil sample was collected on 11-02-2001.

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 11-14-2001.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The analysis holding time was met.

3. A non-target compound was 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. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.

8. Internal standard area criteria were not met for the sample and its associated matrix spike samples. The analysis of associated matrix spike samples fulfills the reanalysis requirement.

9. A spectral search was performed for Decane; however, it was not detected in the sample.

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

12-05-01
Date

som\group\data\voa\tnu-hanford\0111-291.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 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.

VLI
LIONVILLE LABORATORY INC.

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
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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.

Volatiles by GC/MS, HSL List

Report Date: 11/30/01 14:58

RFW Batch Number: **0111L291** Client: **TNUHANFORD B02-008 H1585** Work Order: 11343606001 Page: 1a

	Cust ID:	B13D72		B13D72		B13D72		VBLKYY		VBLKYY BS	
Sample Information	RFW#:	001		001 MS		001 MSD		01LVG054-MB1		01LVG054-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.02		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	118	%	131	%	129	%	101	%	100	%
	Bromofluorobenzene	77	%	74	%	76	%	93	%	92	%
	1,2-Dichloroethane-d4	117	%	121	%	118	%	108	%	105	%
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		14	B	21	B	18	B	2	J	4	JB
Acetone		66		92		100		10	U	10	U
Carbon Disulfide		6	U	6	U	6	U	5	U	5	U
1,1-Dichloroethene		6	U	125	%	123	%	5	U	99	%
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	88	%	94	%	5	U	97	%
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		8		97	%	98	%	5	U	98	%
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	132	%	137	%	5	U	104	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0111L291 Client: TNUHANFORD B02-008 H1585 Work Order: 11343606001 Page: 1b

Cust ID:	B13D72		B13D72		B13D72		VBLKYY		VBLKYY BS	
RFW#:	001		001 MS		001 MSD		01LVG054-MB1		01LVG054-MB1	
Chlorobenzene	6	U	98	%	105	%	5	U	99	%
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.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B13D72

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

Client: TNUHANFORD B02-008 H1585

Matrix: SOIL

Lab Sample ID: 0111L291-001

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: q111419

Level: (low/med) LOW

Date Received: 11/07/01

% Moisture: not dec. 8

Date Analyzed: 11/14/01

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	19.684	9	J

FORM 1 VOA-TIC 12/88 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKYY

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

Client: TNUHANFORD B02-006 H1584

Matrix: SOIL

Lab Sample ID: 01LVG054-MB1

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: q111408

Level: (low/med) LOW

Date Received: 11/14/01

% Moisture: not dec. 0

Date Analyzed: 11/14/01

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

FORM 1 VOA-TIC 12/88 Rev.

Lionville Laboratory Use Only

01111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: as

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#/Type Container	Liquid															
	Solid	1pg	1pg	1pg					1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED →		ORGANIC							INORG							
		Pest VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (2)	CN	NO2/NO3 IC Anions	pH	Hydrocarbon D1385			
		Lionville Laboratory Use Only														
		0624H OGCSC	0625X ODEO	0PCB					ICP6 MCTO		INORG ①	IpH	IHYZN			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected												
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	B13D72	X	X	S	11/2/01	0730	X	X	X				X		X	X	X	

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG ① 3. IN3N2, ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. ISFD, IN43N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 4235 7954 8729
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. 5.6 °C

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

NOTES:

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	11/7/01	15:25

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Lionville Laboratory Use Only

0111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: as

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#/Type Container	Liquid															
	Solid	1AG	1AG	1AG					1AG		1AG	1AG	1AG			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		Neat VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (2)	CN	Nitr/Amm Ic Chrom	pH	Hydrazine DI3SS			
		Lionville Laboratory Use Only														
		0624H OGCSC	ODEO 0625X	OPCB					ICAL6 MET(1)		INORG(1)	IPH	IHY2N			

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	0624H OGCSC	ODEO 0625X	OPCB					ICAL6 MET(1)		INORG(1)	IPH	IHY2N			
001	B13D72	X	X	S	11/6/01	0730	X	X	X					X		X	X	X			

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG(1) 3. IN3N2, ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. ISFD, IN43N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 4235 7954 8729
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. 5.6 °C

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

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	11/7/01	15:05

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-05	Page 1 of 1

Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS — Telephone No.: 372-9638	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East	SAF No.: B02-008	Air Quality ☐
Ice Chest No.: SML-382	Field Logbook No.: EL-1551 — COA: B20CS1673C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA~~ RECRA	Offsite Property No.: A020032	Bill of Lading/Air Bill No.: 4235 7954 8729	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD INSTRUMENTS INDICATE 4120pm β/γ DIRECT ON SOIL

Samples stored in Ref.# 33 at the 3728 Shipping Facility on 11/2/01.
Collector not available to relenquish samples on 11/6/01 for shipment. RT 11-6-01

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	100mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (I-Propanol, Ethanol)	Hydrazine - D1385	T	TCTO
Sample No.	Matrix *	Sample Date	Sample Time							
B13D72	SOIL	11/2/01	0730		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
DS WATSON	11/2/01 1115	REF. 33 3728 BLG.	11/2/01 1115
Rof 33 3728	11-6-01 0700	R.L. Thorp	11-6-01 0700
R.L. Thorp ERC	11-6-01 0700	FEDEX	
FedEx	11-7-01 15:25		11-7-01 15:25

SPECIAL INSTRUCTIONS
** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compouds from WTPH-D analysis

~~(1) 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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 -- Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237;~~ Isotopic Uranium 11-2-01 DJW
(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

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

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

BHI-EE-011 (10/99)

DEC 2001
RECEIVED

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-008 H1585

DATE RECEIVED: 11/07/01 LVL LOT # :0111L291

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13D72	001	S	01LE1344	11/02/01	11/08/01	11/21/01
B13D72	001 MS	S	01LE1344	11/02/01	11/08/01	11/21/01
B13D72	001 MSD	S	01LE1344	11/02/01	11/08/01	11/21/01

LAB QC:

SBLKJP	MB1	S	01LE1344	N/A	11/08/01	11/21/01
SBLKJP	MB1 BS	S	01LE1344	N/A	11/08/01	11/21/01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B02-008
LVL #: 0111L291
SDG/SAF #: H1585/B02-008

W.O. #: 11343-606-001-9999-00
Date Received: 11-07-2001

SEMIVOLATILE

One (1) soil sample was collected on 11-02-2001.

The sample and its associated QC samples were extracted on 11-08-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified and Tributylphosphate Semivolatile target compounds on 11-21-2001.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
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. Internal standard area and retention time criteria were met.
8. 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.

for J. Michael Taylor
President
Lionville Laboratory Incorporated

12-05-01
Date

som\gorup\data\bna\tnu-hanford-0111-291.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 1 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 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.

Semivolatiles by GC/MS, Special List — Report Date: 11/30/01 14:38

RFW Batch Number: **0111L291** — Client: **TNUHANFORD B02-008 H1585** — Work Order: 11343606001 — Page: 1a

	Cust ID:	B13D72		B13D72		B13D72		SBLKJP		SBLKJP BS	
Sample Information	RFW#:	001		001 MS		001 MSD		01LE1344-MB1		01LE1344-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	90	%	72	%	88	%	86	%	93	%
	2-Fluorobiphenyl	94	%	75	%	86	%	90	%	96	%
	p-Terphenyl-d14	106	%	94	%	104	%	110	%	113	%
	Phenol-d5	88	%	74	%	89	%	87	%	92	%
	2-Fluorophenol	84	%	67	%	83	%	83	%	85	%
	2,4,6-Tribromophenol	86	%	81	%	84	%	80	%	82	%
Phenol		360	U	76	%	87	%	330	U	94 *	%
bis(2-Chloroethyl)ether		360	U	360	U	360	U	330	U	330	U
2-Chlorophenol		360	U	71	%	84	%	330	U	87	%
1,3-Dichlorobenzene		360	U	360	U	360	U	330	U	330	U
1,4-Dichlorobenzene		360	U	65	%	77	%	330	U	81	%
1,2-Dichlorobenzene		360	U	360	U	360	U	330	U	330	U
2-Methylphenol		360	U	360	U	360	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		360	U	360	U	360	U	330	U	330	U
4-Methylphenol		360	U	360	U	360	U	330	U	330	U
N-Nitroso-Di-n-propylamine		360	U	80	%	92	%	330	U	100	%
Hexachloroethane		360	U	360	U	360	U	330	U	330	U
Nitrobenzene		360	U	360	U	360	U	330	U	330	U
Isophorone		360	U	360	U	360	U	330	U	330	U
2-Nitrophenol		360	U	360	U	360	U	330	U	330	U
2,4-Dimethylphenol		360	U	360	U	360	U	330	U	330	U
bis(2-Chloroethoxy)methane		360	U	360	U	360	U	330	U	330	U
2,4-Dichlorophenol		360	U	360	U	360	U	330	U	330	U
1,2,4-Trichlorobenzene		360	U	69	%	81	%	330	U	90	%
Naphthalene		360	U	360	U	360	U	330	U	330	U
4-Chloroaniline		360	U	360	U	360	U	330	U	330	U
Hexachlorobutadiene		360	U	360	U	360	U	330	U	330	U
4-Chloro-3-methylphenol		360	U	86	%	90	%	330	U	90	%
2-Methylnaphthalene		360	U	360	U	360	U	330	U	330	U
Hexachlorocyclopentadiene		360	U	360	U	360	U	330	U	330	U
2,4,6-Trichlorophenol		360	U	360	U	360	U	330	U	330	U
2,4,5-Trichlorophenol		910	U	910	U	910	U	830	U	830	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0111L291 Client: TNUHANFORD B02-008 H1585 Work Order: 11343606001 Page: 1b

Cust ID:	B13D72		B13D72		B13D72		SBLKJP		SBLKJP BS	
RFW#:	001		001 MS		001 MSD		01LE1344-MB1		01LE1344-MB1	
2-Chloronaphthalene	360	U	360	U	360	U	330	U	330	U
2-Nitroaniline	910	U	910	U	910	U	830	U	830	U
Dimethylphthalate	360	U	360	U	360	U	330	U	330	U
Acenaphthylene	360	U	360	U	360	U	330	U	330	U
2,6-Dinitrotoluene	360	U	360	U	360	U	330	U	330	U
3-Nitroaniline	910	U	910	U	910	U	830	U	830	U
Acenaphthene	360	U	75	%	84	%	330	U	87	%
2,4-Dinitrophenol	910	U	910	U	910	U	830	U	830	U
4-Nitrophenol	910	U	63	%	67	%	830	U	72	%
Dibenzofuran	360	U	360	U	360	U	330	U	330	U
2,4-Dinitrotoluene	360	U	82	%	87	%	330	U	85	%
Diethylphthalate	360	U	360	U	360	U	330	U	330	U
4-Chlorophenyl-phenylether	360	U	360	U	360	U	330	U	330	U
Fluorene	360	U	360	U	360	U	330	U	330	U
4-Nitroaniline	910	U	910	U	910	U	830	U	830	U
4,6-Dinitro-2-methylphenol	910	U	910	U	910	U	830	U	830	U
N-Nitrosodiphenylamine (1)	360	U	360	U	360	U	330	U	330	U
4-Bromophenyl-phenylether	360	U	360	U	360	U	330	U	330	U
Hexachlorobenzene	360	U	360	U	360	U	330	U	330	U
Pentachlorophenol	910	U	71	%	80	%	830	U	86	%
Phenanthrene	360	U	360	U	360	U	330	U	330	U
Anthracene	360	U	360	U	360	U	330	U	330	U
Carbazole	360	U	360	U	360	U	330	U	330	U
Di-n-Butylphthalate	360	U	360	U	360	U	330	U	330	U
Fluoranthene	360	U	360	U	360	U	330	U	330	U
Pyrene	360	U	95	%	101	%	330	U	113	%
Butylbenzylphthalate	360	U	360	U	360	U	330	U	330	U
3,3'-Dichlorobenzidine	360	U	360	U	360	U	330	U	330	U
Benzo(a)anthracene	360	U	360	U	360	U	330	U	330	U
Chrysene	360	U	360	U	360	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	360	U	360	U	360	U	330	U	330	U
Di-n-Octyl phthalate	360	U	360	U	360	U	330	U	330	U
Benzo(b)fluoranthene	360	U	360	U	360	U	330	U	330	U
Benzo(k)fluoranthene	360	U	360	U	360	U	330	U	330	U
Benzo(a)pyrene	360	U	360	U	360	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	360	U	360	U	360	U	330	U	330	U
Dibenzo(a,h)anthracene	360	U	360	U	360	U	330	U	330	U
Benzo(g,h,i)perylene	360	U	360	U	360	U	330	U	330	U
Tributylphosphate	360	U	360	U	360	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.

B13D72

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

Client: TNUHANFORD B02-008 H1585

Matrix: (soil/water) SOIL

Lab Sample ID: 0111L291-001

Sample wt/vol: 30.1 (g/mL) G

Lab File ID: A112113

Level: (low/med) LOW

Date Received: 11/07/01

% Moisture: 8 decanted: (Y/N)__

Date Extracted: 11/08/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 11/21/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.952	700	JB
2.	UNKNOWN	21.693	80	J
3.	UNKNOWN	22.654	300	J
4.	ALKANE	23.769	100	J
5.	UNKNOWN	23.822	70	J
6.	ALKANE	24.467	70	J
7.	ALKANE	25.310	400	J
8.	ALKANE	27.523	400	J
9.	UNKNOWN	27.820	80	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKJP

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

Client: TNUHANFORD B02-008 H1585

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE1344-MB1

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

Lab File ID: A112108

Level: (low/med) LOW

Date Received: 11/08/01

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

Date Extracted: 11/08/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 11/21/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.953	600	J

FORM 1 SV-TIC RFW (v3.3)

9

Lionville Laboratory Use Only

01111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLP

Client: TNU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#/Type Container	Liquid															
	Solid	1pg	1pg	1pg					1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		TCL VOA	BNA (+)	Pest/PCB	Herb				ICP Metal (+)	CN	NO2/NO3 Inc Anions	pH	Hydrazine D1385			
		Lionville Laboratory Use Only														
		0624H OGCSC	0625D 0625X	OPCB					ICP6 MET(+)		INORG(+)	IPH	IHYZN			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H OGCSC	0625D 0625X	OPCB				ICP6 MET(+)		INORG(+)	IPH	IHYZN			
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	B13D72	X	X	S	11/6/01	0730	X	X	X				X		X	X	X			

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG(+) 3. IN3N2, ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. ISFD, IN43N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ____
Airbill # 4235 7954 8729
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. 5.6 °C

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

NOTES:

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	11/7/01	15:05

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-05	Page 1 of 1

Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East	SAF No.: B02-008	
Ice Chest No.: SML-382	Field Logbook No.: EL-1551	COA: B20CS1673C	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A020032	Bill of Lading/Air Bill No.: 4235 7954 8729	

POSSIBLE SAMPLE HAZARDS/REMARKS

FIELD INSTRUMENTS INDICATE 412 ppm B/8 DIRECT ON SOIL

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 11/2/01. Collector not available to relenquish samples on 11/6/01 for shipment. RT 11-6-01

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	100mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		

Sample No.	Matrix *	Sample Date	Sample Time									
B13D72	SOIL	11/2/01	0730		X	X	X	X	X	X	X	

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: DS Watson	11/2/01 1115	Received By/Stored In: REF. 3B 3728	11/2/01 1115
Relinquished By/Removed From: Ref 3B 3728	11-6-01 0700	Received By/Stored In: R.L. Thorell	11-6-01 0700
Relinquished By/Removed From: R.L. Thorell	11-6-01 0700	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FEDEX	11-7-01 15:25	Received By/Stored In: D. Smith	11-7-01 15:25
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

~~(1) 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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 -- Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237;~~ Isotopic Uranium 11-2-01 DJW

(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(4) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

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

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

BHI-EE-011 (10/99)

Lionville Laboratory, Inc.
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1585

DEC 2001 RECEIVED

DATE RECEIVED: 11/07/01 LVL LOT # :0111L291

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13D72	001	S	01LJLB12	11/02/01	11/12/01	11/12/01
B13D72	001 MS	S	01LJLB12	11/02/01	11/12/01	11/12/01
B13D72	001 MSD	S	01LJLB12	11/02/01	11/12/01	11/12/01
LAB QC:						
BLK	MB1	S	01LJLB12	N/A	11/12/01	11/12/01
BLK	MB1 BS	S	01LJLB12	N/A	11/12/01	11/12/01
BLK	MB1 BSD	S	01LJLB12	N/A	11/12/01	11/12/01

11/15/01

11/15/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD B02-008
LVL#: 0111L291
SDG/SAF#: H1585/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-07-01

GC SCAN

One (1) soil sample was collected on 11-02-01.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on Method 8015B for target compounds Ethanol and n-Propyl Alcohol on 11-12-01.

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

1. The sample was packaged and stored as specified in the method protocol.

2. Surrogates are not currently employed in the methodology.

3. All initial calibrations were within acceptance criteria.

4. All continuing calibrations run prior to analysis were within acceptance criteria.

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. 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
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/21/01
Date

r:\share\gcpest\narr temp\thu291gcsc.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 9 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.

mmz\10-94\gloss.voa

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.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 11/15/01 11:44

RFW Batch Number: 0111L291 Client: TNU-HANFORD B02-008 Work Order: 11343606001 Page: 1

	Cust ID:	B13D72		B13D72		B13D72		BLK		BLK BS		BLK BSD	
Sample Information	RFW#:	001		001 MS		001 MSD		01LJLB12-MB1		01LJLB12-MB1		01LJLB12-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	
==========		==========	fl	==========	fl	==========	fl	==========	fl	==========	fl	==========	fl
n-Propyl Alcohol		5.5	U	80	%	83	%	5.0	U	94	%	98	%
Ethanol		5.5	U	85	%	84	%	5.0	U	97	%	96	%

Flag w/ 1.5a

JK 11-15-01

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: 0111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

VLI

Client: TMU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: as

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#/Type Container	Liquid															
	Solid	1pg	1pg	1pg					1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		Pest VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (2)	CN	NO2/NO3 TSC TOC Chloride	PH	Hydrocarbon D1385			
		Lionville Laboratory Use Only														
		0624H OGCSC	OGRO 0625X	OPCB					ICAL6 MET(1)		INORG(1)	IPH	IHYZN			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
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	B13D72	X	X	S	11/6/01	0730	X	X	X					X		X	X	X		

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG(1) 3. IN3N2, ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. ISFD, INH3N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 4235 7954 8729
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. 5.6 °C

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	11/7/01	15:25

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

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

NOTES:

Lionville Laboratory Use Only
01111291

Custody Transfer Record/Lab Work Request

Page 1 of 1

VLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TMU-Hanford B02-008
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: eJ
QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C	D	E	F	G
Refrigerator #		1	2	2	2	2	2	2
#Type Container	Liquid							
	Solid	1pg	1pg	1pg	1pg	1pg	1pg	1pg
Volume	Liquid							
	Solid	120	1L	120	500	1L	60	120
Preservatives		—	—	—	—	—	—	—
ANALYSES REQUESTED		ORGANIC			INORG			
		Pest VOA	BNA (4)	Pest PCB	Herb	ICP Metal (2)	CN	NO2/NO3 AC Chloride	TPH	Hydrides DI335
Lionville Laboratory Use Only		0624 H 0GCSC	0SPED	0625 X	0PCB	ICP6 MET(1)		INORG(1)	IPH	INH3N
Matrix	Date Collected	Time Collected								
S	11/6/01	0730	X	X	X	X		X	X	X

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
001	B13D72	X	X	S	11/6/01	0730

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 # B02-008
OGCSC = Propanol, Ethanol

DATE/REVISIONS:
MET(1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca,
2. Cu, Fe, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
INORG(1) 3. IN3N2, ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
4. ISFD, INH3N, ICNTO
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 4235 7954 8729
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. 5.6 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	11/7/01	15:25

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-05	Page 1 of 1

Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East	SAF No.: B02-008	
Ice Chest No.: SML-382	Field Logbook No.: EL-455'	COA: B20CS1673C	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A020032	Bill of Lading/Air Bill No.: 4235 7954 8729	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD INSTRUMENTS INDICATE 412 ppm β/γ DIRECT ON SOIL

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 11/2/01.
Collector not available to relenquish samples on 11/6/01 for shipment.
RT 11-6-01

SAMPLE ANALYSIS

Preservation				None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container				sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				100mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
				See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		TEPO
Sample No.	Matrix *	Sample Date	Sample Time										
B13D72	SOIL	11/2/01	0730		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
DS WATSON/DJ Bowers	11/2/01 1115	REF 3B 3728 BLDG	11/2/01 1115
Rof 3B 3728	11-6-01 0900	R.L. Thorey	11-6-01 0700
R.L. Thorey ERC	11-6-01 0700	FEDEX	
FEDEX	11-7-01 15:25	D. Smith	11-7-01 15:25

SPECIAL INSTRUCTIONS
** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) ~~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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 -- Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237;~~ Isotopic Uranium 11-2-01 DJW
(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 11.7.01 / 15:25

SDG#: 0111L291

Work Order Number: _____ SAF# B02.008

Shipping Container ID: SML 382 Chain of Custody # B02.008.05

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 5.6°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 7
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: _____ Date: _____

Telephoned to: _____ On _____ By _____

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B02-008
LVL#: 0111L291
SDG/SAF#: H1585/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-07-01

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 Beryllium in file PS1115A. The Titanium result was high in file TA1114C. Beryllium is an IEC for Titanium on the Trace ICP. Therefore Beryllium was rerun on the Poly ICP.

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

4. The cooler temperature has been recorded on the Chain of Custody.

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. The preparation/method blank for 1 analyte was outside 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.

   a). The MB result for Boron was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and the sample read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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

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 15 pages.

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

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 3 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:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B13D72	Aluminum	20,000	103.7
	Iron	30,000	103.6
	Manganese	1200	99.4

12. The duplicate analyses for 6 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
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11-20-01
Date

gmb/m11-291

LVLI
LIONVILLE LABORATORY INC

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: O1111L291

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.

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/20/01

CLIENT: TNU-HANFORD B02-008 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13D72	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Aluminum, Total	6750	MG/KG	1.4	1.0
		Arsenic, Total	3.0	MG/KG	0.33	1.0
		Boron, Total	5.8	MG/KG	0.18	1.0
		Barium, Total	68.7	MG/KG	0.01	1.0
		Beryllium, Total	0.39	MG/KG	0.04	1.0
		Bismuth, Total	0.33 u	MG/KG	0.33	1.0
		Calcium, Total	6590	MG/KG	0.91	1.0
		Cadmium, Total	0.27	MG/KG	0.03	1.0
		Chromium, Total	8.3	MG/KG	0.06	1.0
		Copper, Total	12.9	MG/KG	0.05	1.0
		Iron, Total	22400	MG/KG	1.8	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1740	MG/KG	2.0	1.0
		Manganese, Total	315	MG/KG	0.01	1.0
		Molybdenum, Total	0.55	MG/KG	0.11	1.0
		Sodium, Total	457	MG/KG	0.37	1.0
		Nickel, Total	9.1	MG/KG	0.10	1.0
		Lead, Total	4.5	MG/KG	0.19	1.0
		Selenium, Total	0.22 u	MG/KG	0.22	1.0
		Thallium, Total	0.29 u	MG/KG	0.29	1.0
		Vanadium, Total	58.1	MG/KG	0.05	1.0
		Zinc, Total	41.4	MG/KG	0.03	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/20/01

CLIENT: TNU-HANFORD B02-008 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0745-MB1	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Aluminum, Total	6.1	MG/KG	1.4	1.0
		Arsenic, Total	0.32 u	MG/KG	0.32	1.0
		Boron, Total	1.2	MG/KG	0.18	1.0
		Barium, Total	0.06	MG/KG	0.01	1.0
		Beryllium, Total	0.04 u	MG/KG	0.04	1.0
		Bismuth, Total	0.32 u	MG/KG	0.32	1.0
		Calcium, Total	2.4	MG/KG	0.89	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.11	MG/KG	0.06	1.0
		Copper, Total	0.33	MG/KG	0.05	1.0
		Iron, Total	4.0	MG/KG	1.7	1.0
		Potassium, Total	6.5	MG/KG	1.9	1.0
		Manganese, Total	0.01 u	MG/KG	0.01	1.0
		Molybdenum, Total	0.11 u	MG/KG	0.11	1.0
		Sodium, Total	8.8	MG/KG	0.36	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.35	MG/KG	0.19	1.0
		Selenium, Total	0.23	MG/KG	0.22	1.0
		Thallium, Total	0.28 u	MG/KG	0.28	1.0
		Vanadium, Total	0.05 u	MG/KG	0.05	1.0
		Zinc, Total	0.12	MG/KG	0.03	1.0
BLANK1	01C0359-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/20/01

CLIENT: TNU-HANFORD B02-008 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13D72	Silver, Total	4.6	0.06u	5.1	90.2	1.0
		Aluminum, Total	7800	6750	204	515.2*	1.0
		Arsenic, Total	182	3.0	204	87.8	1.0
		Boron, Total	96.9	5.8	102	89.3	1.0
		Barium, Total	254	68.7	204	90.6	1.0
		Beryllium, Total	4.9	0.39	5.1	88.4	1.0
		Bismuth, Total	463	0.33u	510	90.7	1.0
		Calcium, Total	9020	6590	2550	95.1	1.0
		Cadmium, Total	4.7	0.27	5.1	86.9	1.0
		Chromium, Total	28.0	8.3	20.4	96.6	1.0
		Copper, Total	36.3	12.9	25.5	91.8	1.0
		Iron, Total	23600	22400	102	1210 *	1.0
		Mercury, Total	0.18	0.02u	0.18	104.5	1.0
		Potassium, Total	4360	1740	2550	103.1	1.0
		Manganese, Total	380	315	51.0	128.8*	1.0
		Molybdenum, Total	92.1	0.55	102	89.8	1.0
		Sodium, Total	2920	457	2550	96.7	1.0
		Nickel, Total	55.7	9.1	51.0	91.4	1.0
		Lead, Total	48.4	4.5	51.0	86.1	1.0
		Selenium, Total	170	0.22u	204	83.2	1.0
		Thallium, Total	172	0.29u	204	84.3	1.0
		Vanadium, Total	107	58.1	51.0	96.7	1.0
		Zinc, Total	87.7	41.4	51.0	90.8	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/20/01

CLIENT: TNU-HANFORD B02-008 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13D72	Silver, Total	0.06u	0.06u	NC	1.0
		Aluminum, Total	6750	6400	5.3	1.0
		Arsenic, Total	3.0	2.4	22.2	1.0
		Boron, Total	5.8	4.1	34.3	1.0
		Barium, Total	68.7	67.4	1.9	1.0
		Beryllium, Total	0.39	0.39	1.0	1.0
		Bismuth, Total	0.33u	0.33u	NC	1.0
		Calcium, Total	6590	8250	22.4	1.0
		Cadmium, Total	0.27	0.22	21.7	1.0
		Chromium, Total	8.3	7.8	6.2	1.0
		Copper, Total	12.9	13.5	4.5	1.0
		Iron, Total	22400	20500	8.6	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	1740	1710	1.6	1.0
		Manganese, Total	315	302	4.3	1.0
		Molybdenum, Total	0.55	0.44	20.6	1.0
		Sodium, Total	457	414	10	1.0
		Nickel, Total	9.1	8.0	12.9	1.0
		Lead, Total	4.5	4.0	11.8	1.0
		Selenium, Total	0.22u	0.28	NC Z03	1.0
		Thallium, Total	0.29u	0.29u	NC	1.0
		Vanadium, Total	58.1	53.7	7.9	1.0
		Zinc, Total	41.4	39.3	5.2	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/20/01

CLIENT: TNU-HANFORD B02-008

LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0745-LC1	Silver, LCS	44.3	50.0	MG/KG	88.6
		Aluminum, LCS	505	500	MG/KG	101.0
		Arsenic, LCS	987	1000	MG/KG	98.7
		Boron, LCS	516	500	MG/KG	103.3
		Barium, LCS	483	500	MG/KG	96.6
		Beryllium, LCS	24.6	25.0	MG/KG	98.4
		Bismuth, LCS	486	500	MG/KG	97.2
		Calcium, LCS	2460	2500	MG/KG	98.3
		Cadmium, LCS	24.3	25.0	MG/KG	97.2
		Chromium, LCS	49.2	50.0	MG/KG	98.4
		Copper, LCS	125	125	MG/KG	100.1
		Iron, LCS	491	500	MG/KG	98.3
		Potassium, LCS	2650	2500	MG/KG	106.1
		Manganese, LCS	76.8	75.0	MG/KG	102.4
		Molybdenum, LCS	495	500	MG/KG	99.0
		Sodium, LCS	2490	2500	MG/KG	99.7
		Nickel, LCS	197	200	MG/KG	98.6
		Lead, LCS	241	250	MG/KG	96.4
		Selenium, LCS	961	1000	MG/KG	96.1
		Thallium, LCS	997	1000	MG/KG	99.7
		Vanadium, LCS	250	250	MG/KG	99.9
		Zinc, LCS	96.8	100	MG/KG	96.8
LCS1	01C0359-LC1	Mercury, LCS	2.5	2.5	MG/KG	99.6

Lionville Laboratory Use Only

0111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU-Hanford B02-008

Est. Final Proj. Sampling Date:

Project #: 11363-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: 45

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11-7-01 Date Due: 12-7-01

		A	B	C	D	E	F	G
Refrigerator #		1	2	2	2	2	2	2
#/Type Container	Liquid							
	Solid	1AG	1AG	1AG	1AG	1AG	1AG	1AG
Volume	Liquid							
	Solid	120	1L	120	500	1L	60	120
Preservatives		—	—	—	—	—	—	—
ANALYSES REQUESTED		ORGANIC: Tot VOA	ORGANIC: BNA (4)	ORGANIC: Pest/PCB	ORGANIC: Herb	INORG: ICP Metal (2)	INORG: CN	INORG: NO2/NO3 HCl Chloride
								INORG: pH
								INORG: Hydrazine D1385
Lionville Laboratory Use Only		0624H OGCSC	0625H OPAB	0625X OPCB		ICP6 METC		INORGA
								IPH
								INHYZN

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	0624H OGCSC	0625H OPAB	0625X OPCB	ICP6 METC	INORGA	IPH	INHYZN
001	B13D72	X	X	S	11/6/01	0730	X	X	X	X	X	X	X

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORGA 3. IN3N2, ICCL, ICFC, ICNO3, ICNO2, ICPO4, ICSO4,

4. ISFD, IN43N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # 4235 7954 8729

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. 5.6 °C

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

NOTES:

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	11/7/01	15:55

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

14

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B02-008-05	Page 1 of 1
Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ	Price Code: 8N
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East		SAF No.: B02-008	Air Quality ☐
Ice Chest No.: SML-382	Field Logbook No.: EL-1551	COA: B20CS1673C	Method of Shipment: Fed Ex	Data Turnaround: 45 Days
Shipped To: IMA/RECRA	Offsite Property No.: A020032		Bill of Lading/Air Bill No.: 4235 7954 8729	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD INSTRUMENTS INDICATE 4120 mR/hr DIRECT ON SOIL

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 11/2/01. Collector not available to relenquish samples on 11/6/01 for shipment. RT 11-6-01

SAMPLE ANALYSIS												
Preservation				None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container				sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				100mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
				See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		
Sample No.	Matrix *	Sample Date	Sample Time										
B13D72	SOIL	11/2/01	0730		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
DJ WATSON	11/2/01 1115	REF. 3B 3728 BHG	11/2/01 1115
Ref 3B 3728	11-6-01 0700	R.L. Thorp	11-6-01 0700
R.L. Thorp ERC	11-6-01 0700	FEDEX	
FEDEX	11-7-01 15:25	D. Smith	11-7-01 15:25

SPECIAL INSTRUCTIONS
** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

~~(1) 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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 — Total Sr, Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237;~~ Isotopic Uranium 11-2-01 DJW
(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

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

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

BHI-EE-011 (10/99)

DEC 2001
RECEIVED

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-008 H1585

DATE RECEIVED: 11/07/01 LVL LOT # :0111L291

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13D72	001	S	01LE1342	11/02/01	11/08/01	11/17/01
B13D72	001 MS	S	01LE1342	11/02/01	11/08/01	11/17/01
B13D72	001 MSD	S	01LE1342	11/02/01	11/08/01	11/17/01

LAB QC:

PBLKVL	MB1	S	01LE1342	N/A	11/08/01	11/17/01
PBLKVL	MB1 BS	S	01LE1342	N/A	11/08/01	11/17/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD B02-008
LVL#: 0111L291
SDG/SAF#: H1585/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-07-01

PCB

One (1) soil sample was collected on 11-02-01.

The sample and its associated QC samples were extracted on 11-08-01 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-17-01. 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. The cooler temperature has been recorded on the chain-of-custody.
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. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was 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
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/21/01
Date

pef\r:\group\data\pest\11L-291.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.

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

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: 11/20/01 15:19

RFW Batch Number: 0111L291 Client: TNUHANFORD B02-008 H1585 Work Order: 11343606001 Page: 1

	Cust ID:	B13D72	B13D72	B13D72	PBLKVL	PBLKVL BS
Sample Information	RFW#:	001	001 MS	001 MSD	01LE1342-MB1	01LE1342-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	95 %	90 %	92 %	105 %	98 %
	Decachlorobiphenyl	94 %	93 %	97 %	90 %	96 %
Aroclor-1016		36 U	36 U	36 U	33 U	33 U
Aroclor-1221		72 U	73 U	73 U	67 U	67 U
Aroclor-1232		36 U	36 U	36 U	33 U	33 U
Aroclor-1242		36 U	36 U	36 U	33 U	33 U
Aroclor-1248		36 U	36 U	36 U	33 U	33 U
Aroclor-1254		36 U	89 %	97 %	33 U	91 %
Aroclor-1260		36 U	36 U	36 U	33 U	33 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

01111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

VLI

9

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: JS

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#/Type Container	Liquid															
	Solid	1aq	1aq	1aq					1aq		1aq	1aq	1aq			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		Pet VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (2)	CN	NO2/NO3 Chloride Sulfate	PH	Hydrazine DIESEL			
		Lionville Laboratory Use Only														
		0624H OGCSC	0625H 0625X	0PCB					ICP6 MET①		IN0R6①	IPH	IHYZN			

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	0624H OGCSC	0625H 0625X	0PCB					ICP6 MET①		IN0R6①	IPH	IHYZN			
001	B13D72	X	X	S	11/2/01	0730	X	X	X					X		X	X	X			

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG① 3. IN3N2, ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. ISFD, IN43N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # 4235 7954 8729
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. 5.6 °C

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

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	11/7/01	15:05

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Lionville Laboratory Use Only: 0111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: as

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#Type Container	Liquid															
	Solid	1pg	1pc	1pg					1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		Part VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (2)	CN	NO2/NO3 TIC Errors	pH	Hydrazine D1385			
		Lionville Laboratory Use Only														
		0624H	OGCSC	0625X	OPCB				ICML MET(1)		INORG(1)	IPH	IHYZN			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H	OGCSC	0625X	OPCB				ICML MET(1)		INORG(1)	IPH	IHYZN			
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	B13D72	X	X	S	11/6/01	0730	X	X	X					X		X	X	X			

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG(1) 3. IN3N2, ICCL, ICFL, ICAO3, ICAO2, ICPO4, ICSO4,

4. ISFD, IN43N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # 4235 7954 8729

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. 5.6 °C

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	11/7/01	15:05

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

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

NOTES:

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-05	Page 1 of 1

Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ
Price Code: 8N	Date Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East	SAF No.: B02-008	
Ice Chest No.: SML-382	Field Logbook No.: EL-1551	COA: B20CS1673C	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A020032	Bill of Lading/Air Bill No.: 4235 7954-8729	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD INSTRUMENTS INDICATE 4120 pm β/γ DIRECT ON SOIL

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 11/2/01.
Collector not available to relenquish samples on 11/6/01 for shipment.
RT 11-6-01

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	100mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		
Sample No.	Matrix *	Sample Date	Sample Time							
B13D72	SOIL	11/2/01	0730		X	X	X	X	X	X	X		

TCLP

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DJ Watson	11/2/01 1115	REF. 3B 3728	11/2/01 1115
Ref 3B 3728	11-6-01 0700	R.L. Thorner	11-6-01 0700
R.L. Thorner ERC	11-6-01 0700	FEDEX	
FEDEX	11-7-01 15:25	D. Smith	11-7-01 15:25

SPECIAL INSTRUCTIONS
** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

~~(1) 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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 -- Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237;~~
Isotopic Uranium 11-2-01 DJW
(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 11.7.01 / 15:25

SDG#: 01111L291

Work Order Number: _____ SAF# B02-008

Shipping Container ID: SML 382 Chain of Custody # B02 008-05

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 56°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 7
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels

9. Samples are:
   ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: _____ Date: _____

Telephoned to: _____ On _____ By _____

DEC 2001 RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-008 H1585

DATE RECEIVED: 11/07/01 LVL LOT # :0111L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13D72						
% SOLIDS	001	S	01L%S154	11/02/01	11/08/01	11/09/01
% SOLIDS	001 REP	S	01L%S154	11/02/01	11/08/01	11/09/01
CHLORIDE BY IC	001	S	01LYC076	11/02/01	11/15/01	11/15/01
CHLORIDE BY IC	001 REP	S	01LYC076	11/02/01	11/15/01	11/15/01
CHLORIDE BY IC	001 MS	S	01LYC076	11/02/01	11/15/01	11/15/01
FLUORIDE BY IC	001	S	01LIC075	11/02/01	11/12/01	11/12/01
FLUORIDE BY IC	001 REP	S	01LIC075	11/02/01	11/12/01	11/12/01
FLUORIDE BY IC	001 MS	S	01LIC075	11/02/01	11/12/01	11/12/01
NITRITE BY IC	001	S	01LIC075	11/02/01	11/12/01	11/12/01
NITRITE BY IC	001 REP	S	01LIC075	11/02/01	11/12/01	11/12/01
NITRITE BY IC	001 MS	S	01LIC075	11/02/01	11/12/01	11/12/01
NITRATE BY IC	001	S	01LIC075	11/02/01	11/12/01	11/12/01
NITRATE BY IC	001 REP	S	01LIC075	11/02/01	11/12/01	11/12/01
NITRATE BY IC	001 MS	S	01LYC076	11/02/01	11/15/01	11/15/01
TOTAL CYANIDE	001	S	01LC099	11/02/01	11/13/01	11/13/01
TOTAL CYANIDE	001 REP	S	01LC099	11/02/01	11/13/01	11/13/01
TOTAL CYANIDE	001 MS	S	01LC099	11/02/01	11/13/01	11/13/01
PHOSPHATE BY IC	001	S	01LIC075	11/02/01	11/12/01	11/12/01
PHOSPHATE BY IC	001 REP	S	01LIC075	11/02/01	11/12/01	11/12/01
PHOSPHATE BY IC	001 MS	S	01LIC075	11/02/01	11/12/01	11/12/01
CHROMIUM VI	001	S	01LVI087	11/02/01	11/13/01	11/13/01
CHROMIUM VI	001 REP	S	01LVI087	11/02/01	11/13/01	11/13/01
CHROMIUM VI	001 MS	S	01LVI087	11/02/01	11/13/01	11/13/01
CHROMIUM VI	001 MS	S	01LVI087	11/02/01	11/13/01	11/13/01
SULFATE BY IC	001	S	01LIC075	11/02/01	11/12/01	11/12/01
SULFATE BY IC	001 REP	S	01LIC075	11/02/01	11/12/01	11/12/01
SULFATE BY IC	001 MS	S	01LIC075	11/02/01	11/12/01	11/12/01
HYDRAZINE	001	S	01LHZ005	11/02/01	11/08/01	11/08/01
HYDRAZINE	001 REP	S	01LHZ005	11/02/01	11/08/01	11/08/01
HYDRAZINE	001 MS	S	01LHZ005	11/02/01	11/08/01	11/08/01
NITRATE NITRITE	001	S	01LN3061	11/02/01	11/15/01	11/15/01
NITRATE NITRITE	001 REP	S	01LN3061	11/02/01	11/15/01	11/15/01
NITRATE NITRITE	001 MS	S	01LN3061	11/02/01	11/15/01	11/15/01
AMMONIA	001	S	01LAMA53	11/02/01	11/20/01	11/20/01
AMMONIA	001 REP	S	01LAMA53	11/02/01	11/20/01	11/20/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-008 H1585

DATE RECEIVED: 11/07/01 LVL LOT # :0111L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AMMONIA	001 MS	S	01LAMA53	11/02/01	11/20/01	11/20/01
PH	001	S	01LPH077	11/02/01	11/08/01	11/08/01
PH	001 REP	S	01LPH077	11/02/01	11/08/01	11/08/01
SULFIDE	001	S	01LSD063	11/02/01	11/09/01	11/09/01
SULFIDE	001 REP	S	01LSD063	11/02/01	11/09/01	11/09/01
SULFIDE	001 MS	S	01LSD063	11/02/01	11/09/01	11/09/01

LAB QC:

CHLORIDE BY IC	MB1	S	01LYC076	N/A	11/15/01	11/15/01
CHLORIDE BY IC	MB1 BS	S	01LYC076	N/A	11/15/01	11/15/01
FLUORIDE BY IC	MB1	S	01LIC075	N/A	11/12/01	11/12/01
FLUORIDE BY IC	MB1 BS	S	01LIC075	N/A	11/12/01	11/12/01
NITRITE BY IC	MB1	S	01LIC075	N/A	11/12/01	11/12/01
NITRITE BY IC	MB1 BS	S	01LIC075	N/A	11/12/01	11/12/01
NITRATE BY IC	MB1	S	01LIC075	N/A	11/12/01	11/12/01
NITRATE BY IC	MB1 BS	S	01LIC075	N/A	11/12/01	11/12/01
NITRATE BY IC	MB1	S	01LYC076	N/A	11/15/01	11/15/01
NITRATE BY IC	MB1 BS	S	01LYC076	N/A	11/15/01	11/15/01
TOTAL CYANIDE	LCS L	S	01LC099	N/A	11/13/01	11/13/01
TOTAL CYANIDE	LCS L	S	01LC099	N/A	11/13/01	11/13/01
TOTAL CYANIDE	MB1	S	01LC099	N/A	11/13/01	11/13/01
PHOSPHATE BY IC	MB1	S	01LIC075	N/A	11/12/01	11/12/01
PHOSPHATE BY IC	MB1 BS	S	01LIC075	N/A	11/12/01	11/12/01
CHROMIUM VI	MB1	S	01LVI087	N/A	11/13/01	11/13/01
CHROMIUM VI	MB1 BS	S	01LVI087	N/A	11/13/01	11/13/01
CHROMIUM VI	MB1 BS	S	01LVI087	N/A	11/13/01	11/13/01
SULFATE BY IC	MB1	S	01LIC075	N/A	11/12/01	11/12/01
SULFATE BY IC	MB1 BS	S	01LIC075	N/A	11/12/01	11/12/01
HYDRAZINE	MB1	S	01LHZ005	N/A	11/08/01	11/08/01
HYDRAZINE	MB1 BS	S	01LHZ005	N/A	11/08/01	11/08/01
NITRATE NITRITE	MB1	S	01LN3061	N/A	11/15/01	11/15/01
NITRATE NITRITE	MB1 BS	S	01LN3061	N/A	11/15/01	11/15/01
AMMONIA	MB1	S	01LAMA53	N/A	11/20/01	11/20/01
AMMONIA	MB1 BS	S	01LAMA53	N/A	11/20/01	11/20/01
AMMONIA	MB1 BSD	S	01LAMA53	N/A	11/20/01	11/20/01
SULFIDE	MB1	S	01LSD063	N/A	11/09/01	11/09/01
SULFIDE	MB1 BS	S	01LSD063	N/A	11/09/01	11/09/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-008 H1585

DATE RECEIVED: 11/07/01 LVL LOT # :0111L291

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	MB1 BSD	S	01LSD063	N/A	11/09/01	11/09/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B02-008 H1585
LVL#: 0111L291

W.O.#: 11343-606-001-9999-00
Date Received: 11-07-01

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 cooler temperature was recorded on the chain of custody.

5. The method blanks were within the method criteria.

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

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% RPD control limit.

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

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

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11-30-01
Date

njp\i11-291

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 15 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: Hydrazine **Method:** USAFSAM-Report TR-82-29

Other: Nitrate Nitrite **Method** EPA 353.2 (mod.)

Ammonia EPA 350.3 (mod.)

Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate } EPA 300.0 (mod.)

L-WI-034/B-01/01

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
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 11/26/01

CLIENT: TNUHANFORD B02-008 H1585 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13D72	% Solids	91.6		%	0.01	1.0
		Chloride by IC	17.9		MG/KG	2.7	2.0
		Fluoride by IC	5.5	u	MG/KG	5.5	2.0
		Nitrite by IC	2.73	u	MG/KG	2.73	2.0
		Nitrate by IC	833		MG/KG	27.3	20.0
		Cyanide, Total	0.48	u	MG/KG	0.48	1.0
		Phosphate by IC	5.3		MG/KG	2.7	2.0
		Chromium VI	4.4	u	MG/KG	4.4	10.0
		Sulfate by IC	76.2		MG/KG	2.7	2.0
		Hydrazine	1.1	u	MG/KG	1.1	1.0
		Nitrate Nitrite	230		MG/KG	10.7	50.0
		Ammonia, as N	4.4		MG/KG	3.6	1.0
		pH	8.5		SOIL PH	0.01	1.0
		Sulfide	43.4	u	MG/KG	43.4	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/26/01

CLIENT: TNUHANFORD B02-008 H1585 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LYC076-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.25	u	MG/KG	1.25	1.0
BLANK10	01LIC075-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	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	01LC099-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	01LVI087-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	01LHZ005-MB1	Hydrazine	1.0	u	MG/KG	1.0	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	01LAMA53-MB1	Ammonia, as N	2.5	u	MG/KG	2.5	1.0
BLANK10	01LSD063-MB1	Sulfide	40.0	u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/26/01

CLIENT: TNUHANFORD B02-008 H1585 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13D72	Chloride by IC	74.2	17.9	55.0	102.3	2.0
		Fluoride by IC	115	0.0	109	105.4	2.0
		Nitrite by IC	55.1	2.73u	54.6	100.9	2.0
		Nitrate by IC	2390	833	1360	114.4	50.0
		Cyanide, Total	3.93	0.48u	4.40	89.4	1.0
		Phosphate by IC	60.7	5.3	54.6	101.4	2.0
		Soluble Chromium VI	50.7	4.4u	43.7	110.2	10.0
		Insoluble Chromium VI	1720	4.4u	1550	110.8	100
		Sulfate by IC	211	76.2	137	98.7	5.0
		Hydrazine	5.7	1.1 u	5.5	103.8	1.0
		Nitrate Nitrite	522	230	261	111.7	50.0
		Ammonia, as N	124	4.4	120	100.1	1.0
		Sulfide	578	8.7	606	93.9	1.0
BLANK10	01LYC076-MB1	Chloride by IC	24.5	1.2 u	25.0	98.0	1.0
		Nitrate by IC	25.0	1.25u	25.0	100.0	1.0
BLANK10	01LIC075-MB1	Chloride by IC	24.7	1.2 u	25.0	98.8	1.0
		Fluoride by IC	53.1	2.5 u	50.0	106.1	1.0
		Nitrite by IC	25.5	1.25u	25.0	102.0	1.0
		Nitrate by IC	24.9	1.25u	25.0	99.8	1.0
		Phosphate by IC	26.1	1.2 u	25.0	104.4	1.0
		Sulfate by IC	24.3	1.2 u	25.0	97.1	1.0
BLANK10	01LVI087-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.5	1.0
		Insoluble Chromium VI	1190	0.40u	1220	97.4	100
BLANK10	01LHZ005-MB1	Hydrazine	5.1	1.0 u	5.0	101.4	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.0	1.0
BLANK10	01LAMAS3-MB1	Ammonia, as N	96.8	2.5 u	100	96.8	1.0
		Ammonia, as N MSD	105	2.5 u	100	105.0	1.0
BLANK10	01LSD063-MB1	Sulfide	513	40.0 u	542	94.6	1.0
		Sulfide MSD	517	40.0 u	542	95.3	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 11/26/01

CLIENT: TNUHANFORD B02-008 H1585 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	01LAMA53-MB1	Ammonia, as N	96.8	105.0	8.2
BLANK10	01LSD063-MB1	Sulfide	94.6	95.3	0.78

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/26/01

CLIENT: TNUHANFORD B02-008 H1585 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13D72	% Solids	91.6	91.3	0.24	1.0
		Chloride by IC	17.9	20.2	11.9	2.0
		Fluoride by IC	5.5 u	5.5 u	NC	2.0
		Nitrite by IC	2.73u	2.73u	NC	2.0
		Nitrate by IC	833	806	3.3	20.0
		Cyanide, Total	0.48u	0.40u	NC	1.0
		Phosphate by IC	5.3	5.4	0.62	2.0
		Chromium VI	4.4 u	4.4 u	NC	10.0
		Sulfate by IC	76.2	76.1	0.16	2.0
		Hydrazine	1.1 u	1.1 u	NC	1.0
		Nitrate Nitrite	230	214	6.8	50.0
		Ammonia, as N	4.4	3.2 u	NC	1.0
		pH	8.5	8.5	0.0	1.0
		Sulfide	43.4 u	38.2 u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/26/01

CLIENT: TNUHANFORD B02-008 H1585 LVL LOT #: 0111L291

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	01LC099-LCS1	Cyanide, Total LCS	1.85	2.0	MG/KG	92.6
LCSS2	01LC099-LCS2	Cyanide, Total LCS	10.0	10.0	MG/KG	100.4

Lionville Laboratory Use Only

0111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TMU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: 05

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#/Type Container	Liquid															
	Solid	1aq	1aq	1aq					1aq		1aq	1aq	1aq			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		Total VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (2)	CN	NO2/NO3 Hic Chlorid	Fl	Hydrazine Disso			
		Lionville Laboratory Use Only														
		0624H	OGCSC	0820	0625X	OPCB			ICP6 MET(1)		INORG(1)	IPH	IHYZN			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H	OGCSC	0820	0625X	OPCB				ICP6 MET(1)		INORG(1)	IPH	IHYZN			
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	B13D72	X	X	S	11/6/01	0730	X	X	X						X		X	X	X			

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG(1) 3. IN3N2, ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

4. ISFD, IN43N, ICN10

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___
Airbill # 4235 7954 8729
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. 5.6 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	11/7/01	15:25

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

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

NOTES:

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-05	Page 1 of 1

Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East	SAF No.: B02-008	
Ice Chest No.: SML-382	Field Logbook No.: EL-1551	COA: B20CS1673C	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A020032	Bill of Lading/Air Bill No.: 4235795 4-8729	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD INSTRUMENTS INDICATE 4126 ppm B/X DIRECT ON SOIL

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 11/2/01. Collector not available to relenquish samples on 11/6/01 for shipment. RT 11-6-01

SAMPLE ANALYSIS												
Preservation				None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container				aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				100mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
				See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		
Sample No.	Matrix *	Sample Date	Sample Time										
B13D72	SOIL	11/2/01	0730		X	X	X	X	X	X	X		

TCLP

B13D83

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DJ Watson/Bowers	11/2/01 1115	REF. 3B 3728 BHG	11/2/01 1115
Rob 3B 3728	11-6-01 0900	R.L. Thorey	11-6-01 0700
R.L. Thorey ERC	11-6-01 0700	FEDEX	
FEDEX	11-7-01 15:25	D. [illegible]	11-7-01 15:25

SPECIAL INSTRUCTIONS
** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compouds from WTPH-D analysis

~~(1) 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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126}; Strontium-89,90 – Total Sr, Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Neptunium-237;~~ Isotopic Uranium 11-2-01 DJW
(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 11.7.01 / 15:25

SDG#: 0111L291

Work Order Number: _____ SAF# B02 008

Shipping Container ID: SML 382 Chain of Custody # B02 008-05

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 5.6°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 7
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: _____ Date: _____

Telephoned to: _____ On _____ By _____

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H\585

DEC 2001 RECEIVED

RFW LOT # :0111L291

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B13D72	001	S	01LE1343	11/02/01	11/07/01	11/12/01	11/13/01
B13D72	001 MS	S	01LE1343	11/02/01	11/07/01	11/12/01	11/13/01
B13D72	001 MSD	S	01LE1343	11/02/01	11/07/01	11/12/01	11/13/01
LAB QC:							
BLK	MB1	S	01LE1343	N/A	N/A	11/12/01	11/13/01
BLK	MB1 BS	S	01LE1343	N/A	N/A	11/12/01	11/13/01

LK 11-14-01
Flgn 11/16/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD B02-008
LVL#: 0111L291
SDG/SAF#: H1585/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-07-01

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 11-02-01.

The sample and its associated QC samples were prepared on 11-12-01 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-13-01. The analysis met the intent of method WTPH-D.

1. The cooler temperature has been recorded on the chain-of-custody.

2. All required holding times for extraction and analysis were met.

3. All initial calibrations associated with this data set were within acceptance criteria.

4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. All surrogate recoveries were within acceptance criteria.

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. 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
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/21/01
Date

R:\share\dro\11-291.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 10ug/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 a compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.

ABBREVIATIONS

BS	=	Indicates blank spike reagent grade water spiked with the matrix spiking solution. Spike recoveries are reported.
BSD	=	Indicates a blank spike duplicate.
MS	=	Indicates a matrix spike.
MSD	=	Indicates a matrix spike duplicate.
NA	=	Not Applicable.
NS	=	Not spiked.
DF	=	Dilution factor.
NR	=	Not required.
SP	=	Indicates a spiked compound.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 11/14/01 08:30

RFW Batch Number: 0111L291 Client: TNU-HANFORD B02-008 Work Order: 11343606001 Page: 1

	Cust ID:	B13D72	B13D72	B13D72	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	01LE1343-MB1	01LE1343-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	77 %	98 %	101 %	92 %	79 %
Diesel Range Organics		13.0 U	82 %	83 %	12.0 U	78 %
Kerosene		13.0 U	NS	NS	12.0 U	NS

UC 11-14-01

JLG 11-16-01

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: 0111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TMU-Hanford B02-008

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

Lionville Laboratory Project Manager: 05

QC: SPEC Del: STD TAT: 30 day

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			LP
#/Type Container	Liquid															
	Solid	1pg	1pg	1pg					1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		Pet VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (2)	CN	Nitr/Nitr HC	pH	Hydrocarbons DRO			
Lionville Laboratory Use Only		0624H OGCSC	ODRO 0625X	OPCB					ICP6 METO		INORG①	IPH	IHYZN			

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H OGCSC	ODRO 0625X	OPCB					ICP6 METO		INORG①	IPH	IHYZN			
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	B13D72	X	X	S	11/6/01	0730	X	X	X					X		X	X	X			

Special Instructions:

SAF # B02-008

OGCSC = Propanol, Ethanol

DATE/REVISIONS:

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

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

INORG① 3. IN3N2, ICCL, ICFL, ICAN3, ICAN2, ICPO4, ICSO4,

4. ISFD, IN43N, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___
Airbill # 9235 7954 8729
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. 5.6 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	11/7/01	15:25

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

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

NOTES:

Lionville Laboratory Use Only
0111L291

Custody Transfer Record/Lab Work Request

Page 1 of 1

VLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B02-008
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: es
QC: SPEC Del: STD TAT: 30 dy

Date Rec'd: 11.7.01 Date Due: 12-7-01

		A	B	C					D		E	F	G			
Refrigerator #		1	2	2					2		2	2	2			
#Type Container	Liquid															
	Solid	1pg	1pg	1pg					1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	1L	120					500		1L	60	120			
Preservatives		—	—	—					—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA (4)	Pest/PCB	Herb				ICP Metal (3)	CN	NO2/NO3	Cl, Br, SO4	F	Hydrocarbons	DISSOC	
		Lionville Laboratory Use Only														
		0624H	OGCSC	ODEO	0625X	OPCB			ICP6 MET(1)		INORG(1)	IPH	INH3N			

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	0624H	OGCSC	ODEO	0625X	OPCB				ICP6 MET(1)		INORG(1)	IPH	INH3N			
001	B13D72	X	X	S	11/6/01	0730	X		X		X				X		X	X	X			

Special Instructions:
SAF # B02-008
OGCSC = Propanol, Ethanol

DATE/REVISIONS:
MET(1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca,
2. Cu, Fe, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
INORG(1) 3. IN3N2, ICCL, ICFL, ICAN3, ICAN2, ICPO4, ICSO4,
4. ISFD, IN4H3N, ICNTO
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 4235 7954 8729
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. 5.6 °C

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

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	11/7/01	15:25

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-05	Page 1 of 1

Collector: Bowers DL/Watson DJ	Company Contact: Cearlock, CS — Telephone No.: 372-9638	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East	SAF No.: B02-008	Air Quality ☐
Ice Chest No.: SML-382	Field Logbook No.: EL-1551 — COA: B20CS1673C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A020032	Bill of Lading/Air Bill No.: 4235795 4-8729	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD INSTRUMENTS INDICATE 4120pm B/8
DIRECT ON SOIL

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 11/2/01.
Collector not available to relenquish samples on 11/6/01 for shipment.
RT 11-6-01

SAMPLE ANALYSIS

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		T e TO
Sample No.	Matrix *	Sample Date	Sample Time									
B13D72	SOIL	11/2/01	0730		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
DS WATSON	11/2/01 1115	REF. 3B 3728 BHG	11/2/01 1115
Ref 3B 3728	11-6-01 0900	R. C. Thorey	11-6-01 0700
R. C. Thorey ERC	11-6-01 0700	FEDEX	
FEDEX	11-7-01 15:25	[illegible]	11-7-01 1525
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
** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

~~(1) 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, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126), Strontium-89,90 – Total Sr, Carbon-14;~~ Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); ~~Americium-241; Neptunium-237;~~ Isotopic Uranium 11-2-01 DJW
(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, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 11.7.01 / 15:25

SDG#: 0111L291

Work Order Number: _____ SAF# B02-008

Shipping Container ID: SMC-382 Chain of Custody # B02-008-05

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 5.6°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 7
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: _____ Date: _____

Telephoned to: _____ On _____ By _____