H1550

0056807

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1550 was composed of two solid (soil) samples designated under SAF No. B01-113 with a Project Designation of: PFP Well Installation Sampling and Analysis – Soil.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on December 17 and 18, 2001.

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APR 0 8 2002
EDMC

2.0 ANALYSIS NOTES

2.1 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.4 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

2.6 Neptunium-237 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

12/19/01

Date

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

SDG 7116
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1550

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B12XD3	200 W.; Well 299-W15-764	SOLID		R110118-01	B01-113	B01-113-04	10/17/01 22:25
B12XD4	200 W.; Well 299-W15-764	SOLID		R110118-02	B01-113	B01-113-05	10/18/01 20:00
Method Blank		SOLID		R110118-04	B01-113		
Lab Control Sample		SOLID		R110118-03	B01-113		
Duplicate (R110118-01)	200 W.; Well 299-W15-764	SOLID		R110118-05	B01-113		10/17/01 22:25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

SDG 7116
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1550

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
7116	B01-113-04	B12XD3	SOLID	82.1	904.7 g		10/20/01	3	R110118-01	7116-001
	B01-113-05	B12XD4	SOLID	88.2	1075 g		10/20/01	2	R110118-02	7116-002
		Method Blank	SOLID						R110118-04	7116-004
		Lab Control Sample	SOLID						R110118-03	7116-003
		Duplicate (R110118-01)	SOLID	82.1	904.7 g		10/20/01	3	R110118-05	7116-005

Lab id TMANC
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

SDG 7116
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1550

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	7012-070	5.0	2			1	1	1/1		
NP	SOLID	Neptunium in Soil	7012-070	5.0	2			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7012-070	5.0	2			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7012-070	10.0	2			1	1	1/1		
Gas Proportional Counting												
93A	SOLID	Gross Alpha in Soil	7012-070	20.0	2			1	1	1/1		
93B	SOLID	Gross Beta in Soil	7012-070	15.0	2			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7012-070	15.0	2			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
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

SDG 7116
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1550

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B12XD3			R110118-01	7116-001	93A/93		11/19/01	12/17/01	MCM	Gross Alpha in Soil
200 W.; Well 299-W15-764		SOLID	10/17/01	7116-001	93B/93		11/19/01	12/17/01	MCM	Gross Beta in Soil
B01-113-04	B01-113		10/20/01	7116-001	AM		12/01/01	12/17/01	MCM	Americium 241 in Soil
				7116-001	GAM		12/17/01	12/18/01	MCM	Gamma Scan
				7116-001	NP		12/02/01	12/17/01	MCM	Neptunium in Soil
				7116-001	PU		12/04/01	12/17/01	MCM	Plutonium, Isotopic in Solids
				7116-001	SR		11/17/01	12/17/01	MCM	Total Strontium in Soil
B12XD4			R110118-02	7116-002	93A/93		11/19/01	12/17/01	MCM	Gross Alpha in Soil
200 W.; Well 299-W15-764		SOLID	10/18/01	7116-002	93B/93		11/19/01	12/17/01	MCM	Gross Beta in Soil
B01-113-05	B01-113		10/20/01	7116-002	AM		12/01/01	12/17/01	MCM	Americium 241 in Soil
				7116-002	GAM		12/06/01	12/18/01	MCM	Gamma Scan
				7116-002	NP		12/02/01	12/17/01	MCM	Neptunium in Soil
				7116-002	PU		12/04/01	12/17/01	MCM	Plutonium, Isotopic in Solids
				7116-002	SR		11/17/01	12/17/01	MCM	Total Strontium in Soil
Method Blank			R110118-04	7116-004	93A/93		11/19/01	12/17/01	MCM	Gross Alpha in Soil
		SOLID		7116-004	93B/93		11/19/01	12/17/01	MCM	Gross Beta in Soil
	B01-113			7116-004	AM		12/01/01	12/17/01	MCM	Americium 241 in Soil
				7116-004	GAM		11/30/01	12/18/01	MCM	Gamma Scan
				7116-004	NP		12/02/01	12/17/01	MCM	Neptunium in Soil
				7116-004	PU		12/05/01	12/17/01	MCM	Plutonium, Isotopic in Solids
				7116-004	SR		11/17/01	12/17/01	MCM	Total Strontium in Soil
Lab Control Sample			R110118-03	7116-003	93A/93		11/24/01	12/17/01	MCM	Gross Alpha in Soil
		SOLID		7116-003	93B/93		11/24/01	12/17/01	MCM	Gross Beta in Soil
	B01-113			7116-003	AM		12/01/01	12/17/01	MCM	Americium 241 in Soil
				7116-003	GAM		12/04/01	12/18/01	MCM	Gamma Scan
				7116-003	NP		12/02/01	12/17/01	MCM	Neptunium in Soil
				7116-003	PU		12/04/01	12/17/01	MCM	Plutonium, Isotopic in Solids
				7116-003	SR		11/17/01	12/17/01	MCM	Total Strontium in Soil
Duplicate (R110118-01)			R110118-05	7116-005	93A/93		11/19/01	12/17/01	MCM	Gross Alpha in Soil
200 W.; Well 299-W15-764		SOLID	10/17/01	7116-005	93B/93		11/19/01	12/17/01	MCM	Gross Beta in Soil
	B01-113		10/20/01	7116-005	AM		12/01/01	12/17/01	MCM	Americium 241 in Soil
				7116-005	GAM		12/17/01	12/18/01	MCM	Gamma Scan
				7116-005	NP		12/04/01	12/17/01	MCM	Neptunium in Soil
				7116-005	PU		12/04/01	12/17/01	MCM	Plutonium, Isotopic in Solids
				7116-005	SR		11/17/01	12/17/01	MCM	Total Strontium in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

SDG 7116
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1550

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	B01-113	Gross Alpha in Soil	900.0_ALPHABETA_GPC	2			1	1	1	5
93B/93	B01-113	Gross Beta in Soil	900.0_ALPHABETA_GPC	2			1	1	1	5
AM	B01-113	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	2			1	1	1	5
GAM	B01-113	Gamma Scan	GAMMA_GS	2			1	1	1	5
NP	B01-113	Neptunium in Soil	NP237_LLE_PLATE_AEA	2			1	1	1	5
PU	B01-113	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	2			1	1	1	5
SR	B01-113	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	2			1	1	1	5
TOTALS				14			7	7	7	35

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

R110118-04 Method Blank

METHOD BLANK

SDG	7116	Client/Case no	Hanford SDG H1550
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R110118-04	Client sample id	Method Blank
Dept sample id	7116-004	Material/Matrix	SOLID
		SAF No	B01-113

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.626	2.2	3.7	10	U	93A
Gross Beta	12587-47-2	-1.01	5.4	9.0	15	U	93B
Total Strontium	SR-RAD	0.014	0.13	0.27	1.0	U	SR
Americium 241	14596-10-2	0.013	0.054	0.10	1.0	U	AM
Neptunium 237	13994-20-2	-0.026	0.051	0.20	1.0	U	NP
Plutonium 238	13981-16-3	0.006	0.022	0.043	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.011	0.043	1.0	U	PU
Potassium 40	13966-00-2	U		0.41		U	GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.15		U	GAM
Antimony 125	14234-35-6	U		0.041		U	GAM
Cesium 137	10045-97-3	U		0.017	0.10	U	GAM
Radium 226	13982-63-3	U		0.040	0.10	U	GAM
Radium 228	15262-20-1	U		0.092	0.20	U	GAM
Europium 152	14683-23-9	U		0.057	0.10	U	GAM
Europium 154	15585-10-1	U		0.065	0.10	U	GAM
Europium 155	14391-16-3	U		0.058	0.10	U	GAM
Thorium 228	14274-82-9	U		0.025		U	GAM
Thorium 232	TH-232	U		0.092		U	GAM
Uranium 235	15117-96-1	U		0.096		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Americium 241	14596-10-2	U		0.14		U	GAM

PFP Well Install. Sampl. & Analysis

QC-BLANK 40261

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

R110118-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7116
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1550
Case no No. 630

Lab sample id R110118-03
Dept sample id 7116-003

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-113

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	105	10	3.6	10		93A	95.4	3.8	110	63-137	70-130
Gross Beta	112	8.6	7.6	15		93B	109	4.4	103	73-127	70-130
Total Strontium	22.7	0.59	0.16	1.0		SR	21.8	0.87	104	83-117	80-120
Americium 241	18.4	1.4	0.17	1.0		AM	19.1	0.76	96	86-114	80-120
Neptunium 237	19.1	1.5	0.18	1.0		NP	19.9	0.80	96	85-115	80-120
Plutonium 238	23.6	1.5	0.082	1.0		PU	24.6	0.98	96	87-113	80-120
Plutonium 239/240	25.3	1.6	0.082	1.0		PU	26.4	1.1	96	87-113	80-120
Cobalt 60	1.43	0.13	0.085	0.050		GAM	1.52	0.061	94	75-125	80-120
Cesium 137	1.70	0.12	0.094	0.10		GAM	1.77	0.071	96	75-125	80-120

PFP Well Install. Sampl. & Analysis

QC-LCS 40260

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

R110118-05

B12XD3

DUPLICATE

SDG 7116		Client/Case no Hanford	SDG H1550
Contact Melissa C. Mannion		Case no No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R110118-05	Lab sample id R110118-01	Client sample id B12XD3	
Dept sample id 7116-005	Dept sample id 7116-001	Location/Matrix 200 W.: Well 299-W15-764	SOLID
	Received 10/20/01	Collected/Weight 10/17/01 22:25	904.7 g
% solids 82.1	% solids 82.1	Custody/SAF No B01-113-04	B01-113

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	14.3	4.8	4.0	10		93A	11.3	4.1	3.9		23	85	
Gross Beta	21.4	6.4	9.3	15		93B	20.3	5.5	7.7		5	69	
Total Strontium	-0.012	0.13	0.26	1.0	U	SR	0.023	0.12	0.25	U	-		
Americium 241	0	0.050	0.095	1.0	U	AM	-0.019	0.077	0.15	U	-		
Neptunium 237	0.020	0.040	0.077	1.0	U	NP	0.026	0.10	0.20	U	-		
Plutonium 238	-0.010	0.040	0.096	1.0	U	PU	0	0.016	0.063	U	-		
Plutonium 239/240	0	0.020	0.077	1.0	U	PU	-0.008	0.016	0.063	U	-		
Potassium 40	15.9	1.2	0.74			GAM	15.5	1.2	0.63		3	36	
Cobalt 60	U		0.062	0.050	U	GAM	U		0.075	U	-		
Ruthenium 106	U		0.50		U	GAM	U		0.52	U	-		
Antimony 125	U		0.13		U	GAM	U		0.12	U	-		
Cesium 137	U		0.057	0.10	U	GAM	U		0.061	U	-		
Radium 226	1.03	0.099	0.091	0.10		GAM	1.05	0.14	0.13		2	40	
Radium 228	1.60	0.28	0.29	0.20		GAM	1.40	0.33	0.31		13	54	
Europium 152	U		0.14	0.10	U	GAM	U		0.14	U	-		
Europium 154	U		0.21	0.10	U	GAM	U		0.24	U	-		
Europium 155	U		0.15	0.10	U	GAM	U		0.19	U	-		
Thorium 228	1.55	0.074	0.068			GAM	1.57	0.079	0.067		1	33	
Thorium 232	1.60	0.28	0.29			GAM	1.40	0.33	0.31		13	54	
Uranium 235	U		0.21		U	GAM	U		0.20	U	-		
Uranium 238	U		7.3		U	GAM	U		7.6	U	-		
Americium 241	U		0.21		U	GAM	U		0.081	U	-		

PFP Well Install. Sampl. & Analysis

QC-DUP#1 40262

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

R110118-01 B12XD3

DATA SHEET

SDG	7116	Client/Case no	Hanford	SDG H1550	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R110118-01	Client sample id	B12XD3		
Dept sample id	7116-001	Location/Matrix	200 W.; Well 299-W15-764	SOLID	
Received	10/20/01	Collected/Weight	10/17/01 22:25	904.7 g	
% solids	82.1	Custody/SAF No	B01-113-04	B01-113	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	11.3	4.1	3.9	10		93A
Gross Beta	12587-47-2	20.3	5.5	7.7	15		93B
Total Strontium	SR-RAD	0.023	0.12	0.25	1.0	U	SR
Americium 241	14596-10-2	-0.019	0.077	0.15	1.0	U	AM
Neptunium 237	13994-20-2	0.026	0.10	0.20	1.0	U	NP
Plutonium 238	13981-16-3	0	0.016	0.063	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.008	0.016	0.063	1.0	U	PU
Potassium 40	13966-00-2	15.5	1.2	0.63			GAM
Cobalt 60	10198-40-0	U		0.075	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.52		U	GAM
Antimony 125	14234-35-6	U		0.12		U	GAM
Cesium 137	10045-97-3	U		0.061	0.10	U	GAM
Radium 226	13982-63-3	1.05	0.14	0.13	0.10		GAM
Radium 228	15262-20-1	1.40	0.33	0.31	0.20		GAM
Europium 152	14683-23-9	U		0.14	0.10	U	GAM
Europium 154	15585-10-1	U		0.24	0.10	U	GAM
Europium 155	14391-16-3	U		0.19	0.10	U	GAM
Thorium 228	14274-82-9	1.57	0.079	0.067			GAM
Thorium 232	TH-232	1.40	0.33	0.31			GAM
Uranium 235	15117-96-1	U		0.20		U	GAM
Uranium 238	U-238	U		7.6		U	GAM
Americium 241	14596-10-2	U		0.081		U	GAM

PFP Well Install. Sampl. & Analysis

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

R110118-02 B12XD4

DATA SHEET

SDG	7116	Client/Case no	Hanford	SDG H1550	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R110118-02	Client sample id	B12XD4		
Dept sample id	7116-002	Location/Matrix	200 W.; Well 299-W15-764	SOLID	
Received	10/20/01	Collected/Weight	10/18/01 20:00	1075 g	
% solids	88.2	Custody/SAF No	B01-113-05	B01-113	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	17.6	5.6	3.7	10		93A
Gross Beta	12587-47-2	19.9	4.5	5.5	15		93B
Total Strontium	SR-RAD	0.040	0.12	0.24	1.0	U	SR
Americium 241	14596-10-2	0	0.084	0.13	1.0	U	AM
Neptunium 237	13994-20-2	0	0.040	0.15	1.0	U	NP
Plutonium 238	13981-16-3	0	0.026	0.10	1.0	U	PU
Plutonium 239/240	PU-239/240	0.013	0.026	0.10	1.0	U	PU
Potassium 40	13966-00-2	3.84	0.56	0.46			GAM
Cobalt 60	10198-40-0	U		0.036	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.30		U	GAM
Antimony 125	14234-35-6	U		0.091		U	GAM
Cesium 137	10045-97-3	U		0.034	0.10	U	GAM
Radium 226	13982-63-3	2.58	0.12	0.077	0.10		GAM
Radium 228	15262-20-1	0.497	0.17	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	U		0.077		U	GAM
Thorium 232	TH-232	0.497	0.17	0.16			GAM
Uranium 235	15117-96-1	0.178	0.13	0.19		U	GAM
Uranium 238	U-238	U		5.3		U	GAM
Americium 241	14596-10-2	U		0.18		U	GAM

PFP Well Install. Sampl. & Analysis

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

Test AM Matrix SOLID
SDG 7116
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1550

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 7012-070						
B12XD3	R110118-01			7116-001	U	
B12XD4	R110118-02			7116-002	U	
BLK (QC ID=40261)	R110118-04			7116-004	U	
LCS (QC ID=40260)	R110118-03			7116-003	ok	
Duplicate (R110118-01)	R110118-05			7116-005	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
PFP Well Install. Sampl. & Analysis						

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 7012-070	2σ prep error 5.0 %			Reference Lab Notebook 7012 pg. 070												
B12XD3	R110118-01			0.15	0.500			56		219			45	11/30/01	12/01	SS-032
B12XD4	R110118-02			0.13	0.500			77		219			44	11/30/01	12/01	SS-033
BLK (QC ID=40261)	R110118-04			0.10	0.500			76		219				11/30/01	12/01	SS-043
LCS (QC ID=40260)	R110118-03			0.17	0.500			74		219				11/30/01	12/01	SS-041
Duplicate (R110118-01) (QC ID=40262)	R110118-05			0.095	0.500			86		#218			45	11/30/01	12/01	SS-047
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-940	Plutonium Separation and Purification, rev 3
	CP-960	Americium-Curium Purification, Large Aliquot, rev 4
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.13 ± 0.064
YIELD 74 ± 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

Test NP Matrix SOLID
SDG 7116
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1550

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 7012-070						
B12XD3	R110118-01			7116-001	U	
B12XD4	R110118-02			7116-002	U	
BLK (QC ID=40261)	R110118-04			7116-004	U	
LCS (QC ID=40260)	R110118-03			7116-003	ok	
Duplicate (R110118-01)	R110118-05			7116-005	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
PFP Well Install. Sampl. & Analysis						

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 7012-070	2σ prep error 5.0 %			Reference Lab Notebook 7012 pg. 070												
B12XD3	R110118-01			0.20	0.500			44		219			46	11/30/01	12/02	SS-031
B12XD4	R110118-02			0.15	0.500			53		219			45	11/30/01	12/02	SS-044
BLK (QC ID=40261)	R110118-04			0.20	0.500			43		218				11/30/01	12/02	SS-049
LCS (QC ID=40260)	R110118-03			0.18	0.500			45		218				11/30/01	12/02	SS-048
Duplicate (R110118-01) (QC ID=40262)	R110118-05			0.077	0.500			69		325			48	11/30/01	12/04	SS-044
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 5 SAMPLES				
MDA	0.16	±	0.10
YIELD	51	±	22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

Test PU Matrix SOLID
SDG 7116
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1550

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 7012-070								
B12XD3	R110118-01			7116-001	U		U	
B12XD4	R110118-02			7116-002	U		U	
BLK (QC ID=40261)	R110118-04			7116-004	U		U	
LCS (QC ID=40260)	R110118-03			7116-003	ok		ok	
Duplicate (R110118-01)	R110118-05			7116-005	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
PFP Well Install. Sampl. & Analysis								

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 7012-070	2σ prep error 5.0 %					Reference Lab Notebook 7012 pg. 070										
B12XD3	R110118-01			0.063	0.500			81		322			48	11/30/01	12/04	SS-045
B12XD4	R110118-02			0.10	0.500			55		322			47	11/30/01	12/04	SS-047
BLK (QC ID=40261)	R110118-04			0.043	0.500			64		631				11/30/01	12/05	SS-048
LCS (QC ID=40260)	R110118-03			0.082	0.500			66		322				11/30/01	12/04	SS-048
Duplicate (R110118-01) (QC ID=40262)	R110118-05			0.096	0.500			70		323			48	11/30/01	12/04	SS-050
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 5 SAMPLES
MDA 0.077 ± 0.048
YIELD 67 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

Test SR Matrix SOLID
SDG 7116
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1550

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 7012-070						
B12XD3	R110118-01			7116-001	U	
B12XD4	R110118-02			7116-002	U	
BLK (QC ID=40261)	R110118-04			7116-004	U	
LCS (QC ID=40260)	R110118-03			7116-003	ok	
Duplicate (R110118-01)	R110118-05			7116-005	-	U
Nominal values and limits from method			RDLs (pCi/g)		1.0	
PFP Well Install. Sampl. & Analysis						

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 7012-070	2σ prep error 10.0 % Reference Lab Notebook 7012 pg. 070															
B12XD3	R110118-01			0.25	1.00			95		100			31	11/17/01	11/17	GRB-217
B12XD4	R110118-02			0.24	1.00			95		100			30	11/17/01	11/17	GRB-218
BLK (QC ID=40261)	R110118-04			0.27	1.00			84		100				11/17/01	11/17	GRB-220
LCS (QC ID=40260)	R110118-03			0.16	1.00			91		200				11/17/01	11/17	GRB-221
Duplicate (R110118-01) (QC ID=40262)	R110118-05			0.26	1.00			93		100			31	11/17/01	11/17	GRB-221
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 5 SAMPLES				
	MDA	0.24	±	0.088
	YIELD	92	±	9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

Test 93A Matrix SOLID
SDG 7116
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1550

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 7012-070					
B12XD3	R110118-01	93		7116-001	11.3
B12XD4	R110118-02	93		7116-002	17.6
BLK (QC ID=40261)	R110118-04	93		7116-004	U
LCS (QC ID=40260)	R110118-03	93		7116-003	ok
Duplicate (R110118-01)	R110118-05	93		7116-005	ok
Nominal values and limits from method				RDLs (pCi/g)	10
PFP Well Install. Sampl. & Analysis					

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 7012-070	2σ prep error 20.0 % Reference Lab Notebook 7012 pg. 070															
B12XD3	R110118-01	93		3.9	0.100			33		100			33	11/18/01	11/19	GRB-115
B12XD4	R110118-02	93		3.7	0.100			60		100			32	11/18/01	11/19	GRB-101
BLK (QC ID=40261)	R110118-04	93		3.7	0.100			21		100				11/18/01	11/19	GRB-105
LCS (QC ID=40260)	R110118-03	93		3.6	0.100			21		100				11/18/01	11/24	GRB-115
Duplicate (R110118-01) (QC ID=40262)	R110118-05	93		4.0	0.100			34		100			33	11/18/01	11/19	GRB-108
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 5 SAMPLES				
	MDA	3.8	±	0.33
	RESIDUE	34	±	32

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

Test 938 Matrix SOLID
SDG 7116
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1550

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 7012-070					
B12XD3	R110118-01	93		7116-001	20.3
B12XD4	R110118-02	93		7116-002	19.9
BLK (QC ID=40261)	R110118-04	93		7116-004	U
LCS (QC ID=40260)	R110118-03	93		7116-003	ok
Duplicate (R110118-01)	R110118-05	93		7116-005	ok

Nominal values and limits from method RDLs (pCi/g) 15
PFP Well Install. Sampl. & Analysis

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 7012-070	2σ prep error 15.0 %							Reference Lab Notebook 7012 pg. 070								
B12XD3	R110118-01	93		7.7	0.100			33		100			33	11/18/01	11/19	GRB-115
B12XD4	R110118-02	93		5.5	0.100			60		100			32	11/18/01	11/19	GRB-101
BLK (QC ID=40261)	R110118-04	93		9.0	0.100			21		100				11/18/01	11/19	GRB-105
LCS (QC ID=40260)	R110118-03	93		7.6	0.100			21		100				11/18/01	11/24	GRB-115
Duplicate (R110118-01) (QC ID=40262)	R110118-05	93		9.3	0.100			34		100			33	11/18/01	11/19	GRB-108
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 5 SAMPLES
MDA 7.8 ± 3.0
RESIDUE 34 ± 32

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1550

Test GAM Matrix SOLID
SDG 7116
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1550

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 7012-070								
B12XD3	R110118-01			7116-001	U		U	
B12XD4	R110118-02			7116-002	U		U	
BLK (QC ID=40261)	R110118-04			7116-004	U		U	
LCS (QC ID=40260)	R110118-03			7116-003	ok		ok	
Duplicate (R110118-01)	R110118-05			7116-005	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
PFP Well Install. Sampl. & Analysis								

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 7012-070	2σ prep error 15.0 % Reference Lab Notebook 7012 pg. 070															
B12XD3	R110118-01			0.20	678					110			61	11/20/01	12/17	02,01,00
B12XD4	R110118-02			0.036	542					111			49	11/20/01	12/06	02,04,00
BLK (QC ID=40261)	R110118-04			0.019	542					132				11/20/01	11/30	MB,05,00
LCS (QC ID=40260)	R110118-03			0.085	542					107				11/20/01	12/04	01,03,00
Duplicate (R110118-01) (QC ID=40262)	R110118-05			0.17	678					142			61	11/20/01	12/17	02,03,00
Nominal values and limits from method				0.050	542					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 5 SAMPLES
MDA 0.10 ± 0.16
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/18/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-04	Page 1 of 1
Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100 H1550 (7116)	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: RJN 10/18/01 121.0' - 123.5' 200 West; Well 299-W15-764; ~~120.0' - 122.5'~~ depth	SAF No.: B01-113	Air Quality ☐
Ice Chest No.: ERC 01-020	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA TMA	Offsite Property No.: A020008	Bill of Lading/Air Bill No.: 4235 7954 8144	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/18/01. Collector not available to relinquish samples on 10/18/01 for shipment.

RT 1018.0

SAMPLE ANALYSIS

Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL
	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (4) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time								
B12XD3	SOIL	10/17/01	2225		X						X

Historical Data indicates < 2000 pCi/g

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson	10/18/01 0435	Stored in Ref#2C	10/18/01 0435
R. Nielson	10-19-01 0900	R. Rhone	10-19-01 0900
R. Rhone ERC	10-19-01 0900	FED Ex	10-19-01
FED EXPRESS	10-20-01 4:00	Elvia Martes	10-22-01 8:AM

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

RT 10-19-01 RJN 9/20/01

~~(1) Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) (Tributyl phosphate)~~

~~(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); NO2/NO3 - 353.2; pH (Soil) - 9045~~ RJN 9/20/01

~~(3) ICP Metals - 6010A (TAL) (Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium); ICP Metals - 6010A (Add-on) (Phosphorus)~~

(4) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, ~~Cesium-134~~, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 – Total Sr RJN 9/20/01

*Matrix **

S=Soil
SD=Sediment
SO=Solid
S=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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-05	Page 1 of 1
Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100 H1550 (7116)	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: RJN 10/18/01 200 West; Well 299-W15-764; ~~135.0' - 137.5' depth~~ 123.5'	SAF No.: B01-113	Air Quality ☐
Ice Chest No.: ERC 01-020	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA TMA	Offsite Property No.: A020608	Bill of Lading/Air Bill No.: 4235795 4-8144	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.#2C at the 3728 Shipping Facility on 10/19/01. Collector not available to relinquish samples on 10/19/01 for shipment.

RT 10-19-01

SAMPLE ANALYSIS											
Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	~~Cool 4C~~		
Type of Container	~~sG~~	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	~~1~~	1	1	1	1	1	1	1	1		
Volume	~~60mL~~	60mL	120mL	120mL	250mL	~~250mL~~	~~500mL~~	500mL	1000mL		
	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.		
Sample No.	Matrix *	Sample Date	Sample Time								
B12XD4 ✓	SOIL ✓	10/19/01	2000 ✓		X ✓					X ✓	~~B12XF3~~

Historical Data indicates < 2000 PCi/g

CHAIN OF POSSESSION 10/19/01		Sign/Print Names	
Relinquished By: Renee Nielson 10/19/01	Date/Time: 0430	Received By: RJN 10/19/01 Ref #2C 10/19/01 RJN 10/19/01	Date/Time: 0430
Relinquished By: Removed from Ref 2C 3728 10-19-01	Date/Time: 0900	Received By: R Thoren R.T. 10-19-01	Date/Time: 0900
Relinquished By: R Thoren R.T. ERC 10-19-01	Date/Time: 0900	Received By: FED Ex 10-19-01	Date/Time:
Relinquished By: FED EXPRESS	Date/Time: 10-20-01	Received By: Elvie Maestas	Date/Time: 8:00 10-22-01
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by RPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) ~~Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) (Tributyl phosphate)~~

(2) ~~IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); NO2/NO3 - 353.2; pH (Bailey-Scott) Rev. 4/23/01~~

(3) ~~ICP Metals - 6010A (TAL) (Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium); ICP Metals - 6010A (Add-On) (Phosphorus)~~ RJN 10/26/01

(4) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, ~~Cesium-134~~, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 -- Total Sr

RT 10-19-01 4/20/01

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)

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc. Date/Time received 10-20-01 4:PM

CoC No. B01-113-04, B01-113-05, B01-113-19 AND B01-113-20.

Container I.D. No. BRC01-020 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: 4 SAMPLES
7. Number of containers per sample: check on (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 Eric J. Maestas Date: 10-22-01 Time: 8: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.

Analytical Report

Client: TNU-HANFORD B01-113 H1550
LVL#: 0110L151

W.O.#: 11343-606-001-9999-00
Date Received: 10-20-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

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

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

4. The 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.

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

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis and Total Organic Carbon samples are dried prior to analysis.

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.

for Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11-15-01
Date

njp\i10-151

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

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

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		✓ 9071A/413.1	
Carbon, Total Organic and Inorganic		__ 9060	✓ Lloyd Kahn (mod)/415.1 (mod
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	___ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

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

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

Nitrate Nitrite EPA 353.2 (mod.)

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 11/14/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12XD3	% Solids	82.1		%	0.01	1.0
		Chloride by IC	23.4		MG/KG	1.5	1.0
		Fluoride by IC	3.0	u	MG/KG	3.0	1.0
		Nitrite by IC	1.52	u	MG/KG	1.52	1.0
		Nitrate by IC	48.9		MG/KG	1.52	1.0
		Phosphate by IC	1.5	u	MG/KG	1.5	1.0
		Chromium VI	0.88		MG/KG	0.49	1.0
		Sulfate by IC	34.5		MG/KG	1.5	1.0
		Nitrate Nitrite	11.4		MG/KG	0.24	1.0
		Total Organic Carbon	2210		MG/KG	400	2.0
		Oil & Grease Gravimetri	454		MG/KG	162	1.0
		Total Inorganic Carbon	2160		MG/KG	392	1.0
-002	B12XD4	% Solids	85.4		%	0.01	1.0
		Chloride by IC	13.0		MG/KG	1.5	1.0
		Fluoride by IC	3.0		MG/KG	2.9	1.0
		Nitrite by IC	1.46	u	MG/KG	1.46	1.0
		Nitrate by IC	37.4		MG/KG	1.46	1.0
		Phosphate by IC	1.5	u	MG/KG	1.5	1.0
		Chromium VI	0.63		MG/KG	0.47	1.0
		Sulfate by IC	64.2		MG/KG	2.9	2.0
		Nitrate Nitrite	9.0		MG/KG	0.24	1.0
		Total Organic Carbon	50500		MG/KG	9800	50.0
		Oil & Grease Gravimetri	156	u	MG/KG	156	1.0
		Total Inorganic Carbon	18300		MG/KG	9800	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/14/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LIC072-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
BLANK10	01LVI085-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	01LN3A59-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	01LTZ037-MB1	Total Organic Carbon	20.0	u	MG/KG	20.0	1.0
BLANK10	01LOG039-MB1	Oil & Grease Gravimetri	133	u	MG/KG	133	1.0
BLANK10	01LTZA37-MB1	Total Inorganic Carbon	20.0	u	MG/KG	20.0	1.0
BLANK10	01LICB73-MB1	Sulfate by IC	1.2	u	MG/KG	1.2	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/14/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12XD3	Chloride by IC	57.3	23.4	30.5	111.4	1.0
		Fluoride by IC	66.1	0.46	60.9	107.7	1.0
		Nitrite by IC	30.3	1.52u	30.5	99.5	1.0
		Nitrate by IC	114	48.9	60.9	106.2	2.0
		Phosphate by IC	32.0	1.5 u	30.5	105.1	1.0
		Sulfate by IC	98.2	34.5	60.9	104.6	2.0
		Nitrate Nitrite	17.4	11.4	6.3	94.7	2.0
		Total Organic Carbon	9070	2210	7140	96.0	2.0
		Oil & Grease Gravimetr	9510	454	8070	112.2	1.0
-002	B12XD4	Soluble Chromium VI	5.7	0.63	4.7	108.1	1.0
		Insoluble Chromium VI	1260	0.63	1430	87.7	100
BLANK10	01LIC072-MB1	Chloride by IC	24.9	1.2 u	25.0	99.5	1.0
		Fluoride by IC	53.9	2.5 u	50.0	107.8	1.0
		Nitrite by IC	24.0	1.25u	25.0	96.2	1.0
		Nitrate by IC	25.5	1.25u	25.0	102.1	1.0
		Phosphate by IC	26.4	1.2 u	25.0	105.4	1.0
		Sulfate by IC	24.6	1.2 u	25.0	98.6	1.0
BLANK10	01LVI085-MB1	Soluble Chromium VI	3.9	0.40u	4.0	98.4	1.0
		Insoluble Chromium VI	1220	0.40u	1220	99.9	100
BLANK10	01LN3A59-MB1	Nitrate Nitrite	5.2	0.20u	5.0	104.0	1.0
BLANK10	01LTZ037-MB1	Total Organic Carbon	400	20.0 u	400	100.1	1.0
BLANK10	01LOG039-MB1	Oil & Grease Gravimetr	7610	133 u	6630	114.9	1.0
BLANK10	01LTZA37-MB1	Total Inorganic Carbon	400	20.0 u	400	100.1	1.0
BLANK10	01LICB73-MB1	Sulfate by IC	23.9	1.2 u	25.0	95.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/14/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12XD3	% Solids	82.1	81.7	0.49	1.0
		Chloride by IC	23.4	23.7	1.2	1.0
		Fluoride by IC	3.0 u	3.0 u	NC	1.0
		Nitrite by IC	1.52u	1.52u	NC	1.0
		Nitrate by IC	48.9	49.6	1.4	1.0
		Phosphate by IC	1.5 u	1.5 u	NC	1.0
		Sulfate by IC	34.5	35.2	2.2	1.0
		Nitrate Nitrite	11.4	11.5	0.51	1.0
		Total Organic Carbon	2210	1880	16.3	2.0
		Oil & Grease Gravimetri	454	373	19.6	1.0
-002REP	B12XD4	Chromium VI	0.63	0.57	9.9	1.0

Lionville Laboratory Use Only: 01 10L151

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU Hanford B01-113

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

Date Rec'd: 10.20.01 Date Due: 11-19-01

		A	B						C		D	E	F	G		
Refrigerator #		1	6						6		6	6	6	6		
#/Type Container	Liquid															
	Solid	1 log	1 log						1 log		1 log	1 log	1 log	1 log		
Volume	Liquid															
	Solid	250	250						500		60	120	120	500		
Preservatives		—	—						—		—	—	—	—		
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: TCLP Metal	CN	Oil + Grease	Hex Chrom	Tic-TOC	IC Anions		
Lionville Laboratory Use Only		0624X	0625X						MET ①		LOGGE	ICP6	ITIC IOCT	IC ①		

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	VOA	BNA	Pest/PCB	Herb				TCLP Metal	CN	Oil + Grease	Hex Chrom	Tic-TOC	IC Anions		
001	B12XD3			S	10/17/01	2225	X	X						X		X	X	X	X		
002	B12XD4			S	10/18/01	2000	X	X						X		X	X	X	X		

Special Instructions:

SAF # B01-113

Run Matrix QC

DATE/REVISIONS:

MET ① 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, P

IC ① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2

3.

4.

5.

6.

Lionville Laboratory Use Only

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

2) Ambient or (Chilled)

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

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

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 2.3 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/20/01	10:20

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 8155

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-04	Page 1 of 1

Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 8N; Air Quality ☐; Date Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: 200 West; Well 299-W15-764; ~~120.0'-122.5'~~ 121'-123.5' RJN 10/18/01 depth	SAF No.: B01-113	
Ice Chest No.: ERC96-044	Field Logbook No.: BV-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A020021	Bill of Lading/Air Bill No.: 4735795 4-8155	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/17/01. Collector not available to relinquish samples on 10/19/01 for shipment.

RT 10.19.01

Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL	
SAMPLE ANALYSIS	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	

Sample No.	Matrix *	Sample Date	Sample Time									
B12XD3	SOIL	10/17/01	2225	X		X	X	X	X	X	X	

RT 10.19.01 ~~RT 10.19.01~~ ~~B12XF2~~

HISTORICAL DATA INDICATES <2000 pCi/g

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson	10/18/01 0435	STORED IN REF #2C	10/18/01 0435
Removed from Ref 2C 3728	10.19.01 0900	R. Thoren	10-19-01 0900
R. Thoren ERC	10-19-01 0900	FEDEX	
Fed Ex	10.20.01 10:20		10.20.01 10:20

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} RJN 9/20/01

(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; ~~pH (Soil) - 9045~~ RJN 9/20/01

(3) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium}; ICP Metals - 6010A (Add-on) {Phosphorus}

~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60}; Gamma Spec - Add-On {Antimony-125, Europium-154, Ruthenium-106}; Americium-241, Neptunium-237, Isotopic Plutonium, Strontium-89,90~~ -- Total Sr RJN 9/20/01

RT 10-19-01

Matrix *: S=Soil; SD=Sediment; SO=Solid; S=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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-05	Page 1 of 1

Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days; Air Quality ☐
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: 200 West; Well 299-W15-764; ~~125.0' - 127.5' depth~~ RJN 10/18/01 123.5'	SAF No.: B01-113	
Ice Chest No.: ERC96.044	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA REFRA	Offsite Property No.: A020001	Bill of Lading/Air Bill No.: 42357954-8155	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/18/01. Collector not available to relinquish samples on 10/19/01 for shipment.

RT 10.19.01

Preservation	Cool 4C	None RJ 10/19/01	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None RJ 10/19.01	
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG	sG	
No. of Container(s)	1		1	1	1	1	1	1	1	
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL	
SAMPLE ANALYSIS	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	

Sample No.	Matrix *	Sample Date	Sample Time										
B12XD4	SOIL	10/18/01	2000	X		X	X	X	X	X	X		~~B12XF3~~
													~~B12XF9~~

RT 10/19/01 HISTORICAL DATA INDICATES < 2000 PCi/g

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson 10/18/01	0430	Ref #2C 10/18/01 (RJN 10/19/01)	0430
Ref 2C 3728	0900 10.19.01	R. Thoren	0900 10-19-01
R. Thoren ERC	0900 10.19.01	FEDEX	
FedEx	10.20.01 10:20	102001	10:20

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) (Tributyl phosphate)

(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); NO2/NO3 - 353.2 ~~pH (Soil) - 9045~~ RJN 9/20/01

(3) ICP Metals - 6010A (TAL) (Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium); ICP Metals - 6010A (Add-on) (Phosphorus) RJN 9/20/01

~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, Europium-154, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 -- Total Sr~~

RT 10-19-01

Matrix *

S=Soil; SD=Sediment; SO=Solid; S=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: 10.20.01 / 10:20

SDG#: 0110L151

Work Order Number: _____ SAF# B01-113

Shipping Container ID: ERC 96-044 Chain of Custody # B01-113-04 B01-113-05

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 2.3°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 14
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 B01-113
LVL#: 0110L151
SDG/SAF#: H1550/B01-113

W.O.#: 11343-606-001-9999-00
Date Received: 10-20-01

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Sample B12XD4 was reported with a twenty fold dilution for Calcium.

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

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

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

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

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B12XD3	Iron	20,000	77.8
	Calcium	20,000	83.2

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 14 pages.

12. All duplicate analyses were within 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

11-05-01
Date

gmb/m10-151

LVLI
LIONVILLE LABORATORY INC

METALS METHOD GLOSSARY

'he following methods are used as reference for the digestion and analysis of samples contained within this ,ot#: 0110L151

.eaching Procedure: __1310 __1311 __1312 __Other:_____

:LP 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: Phosphorous Method: 6010B

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.

RFW 21-21L-033/O-01/97

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/02/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12XD3	Calcium, Total	13300	MG/KG	1.1	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	20.9	MG/KG	0.07	1.0
		Iron, Total	18200	MG/KG	2.1	1.0
		Magnesium, Total	6960	MG/KG	0.50	1.0
		Sodium, Total	296	MG/KG	0.44	1.0
		Nickel, Total	17.4	MG/KG	0.12	1.0
		Phosphorus, Total	752	MG/KG	0.61	1.0
-002	B12XD4	Calcium, Total	208000	MG/KG	20.8	20.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.7	MG/KG	0.07	1.0
		Iron, Total	9530	MG/KG	2.0	1.0
		Magnesium, Total	13000	MG/KG	0.48	1.0
		Sodium, Total	509	MG/KG	0.42	1.0
		Nickel, Total	8.3	MG/KG	0.12	1.0
		Phosphorus, Total	305	MG/KG	0.59	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/02/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0697-MB1	Calcium, Total	1.4	MG/KG	0.89	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.06 u	MG/KG	0.06	1.0
		Iron, Total	6.5	MG/KG	1.7	1.0
		Magnesium, Total	1.5	MG/KG	0.41	1.0
		Sodium, Total	3.0	MG/KG	0.36	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Phosphorus, Total	2.5	MG/KG	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/02/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12XD3	Calcium, Total	17800	13300	3040	146.5*	1.0
		Cadmium, Total	5.5	0.04u	6.1	90.2	1.0
		Chromium, Total	44.2	20.9	24.4	95.5	1.0
		Iron, Total	18800	18200	122	525.7*	1.0
		Magnesium, Total	10000	6960	3040	100.1	1.0
		Sodium, Total	3230	296	3040	96.3	1.0
		Nickel, Total	73.7	17.4	60.9	92.4	1.0
		Phosphorus, Total	1340	752	609	96.1	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/02/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12XD3	Calcium, Total	13300	15000	11.4	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	20.9	21.1	0.95	1.0
		Iron, Total	18200	18600	2.5	1.0
		Magnesium, Total	6960	7030	1.0	1.0
		Sodium, Total	296	269	9.5	1.0
		Nickel, Total	17.4	18.5	6.1	1.0
		Phosphorus, Total	752	803	6.6	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/02/01

CLIENT: TNUHANFORD B01-113 H1550 LVL LOT #: 0110L151

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0697-LC1	Calcium, LCS	2430	2500	MG/KG	97.3
		Cadmium, LCS	24.3	25.0	MG/KG	97.2
		Chromium, LCS	49.7	50.0	MG/KG	99.4
		Iron, LCS	498	500	MG/KG	99.5
		Magnesium, LCS	2480	2500	MG/KG	99.4
		Sodium, LCS	2380	2500	MG/KG	95.4
		Nickel, LCS	195	200	MG/KG	97.6
		Phosphorus, LCS	475	500	MG/KG	95.1

Lionville Laboratory Use Only
01 10L151

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B01-113
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

Date Rec'd: 10-20-01 Date Due: 11-19-01

		A	B	C	D	E	F	G
Refrigerator #		1	6	6	6	6	6	6
#/Type Container	Liquid							
	Solid	1 jar	1 jar	1 jar	1 jar	1 jar	1 jar	1 jar
Volume	Liquid							
	Solid	250	250	500	60	120	120	500
Preservatives		—	—	—	—	—	—	—
ANALYSES REQUESTED		ORGANIC: VOA	ORGANIC: BNA	ORGANIC: Pest/PCB	ORGANIC: Herb	INORG: ICP Metal	INORG: CN	INORG: Oil + Grease
								INORG: Hex Chrome
								INORG: TIC, TOC
								INORG: IC Anions
Lionville Laboratory Use Only		0624X	0625X	MET ①		EOGGE	ICP6	ITIC IOCT
								IC ①

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	0624X	0625X	MET ①	EOGGE	ICP6	ITIC IOCT	IC ①
001	B12XD3			S	10/17/01	2225	X	X	X	X	X	X	X
002	B12XD4			S	10/18/01	2000	X	X	X	X	X	X	X

Special Instructions:
SAF # B01-113
Run Matrix QC

DATE/REVISIONS:
MET ① 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, P
IC ① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2
3.
4.
5.
6.

Lionville Laboratory Use Only

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

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.3 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 8155

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/20/01	10:20

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-04	Page 1 of 1

Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: 121'- 123.5' RJN 10/18/01; 200 West; Well 299-W15-764; ~~120.0' - 122.5'~~ depth	SAF No.: B01-113	Air Quality ☐
Ice Chest No.: ERC96-044	Field Logbook No.: BV-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA RECRA	Offsite Property No.: A020021	Bill of Lading/Air Bill No.: 4235 7954-8155	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/17/01. Collector not available to relinquish samples on 10/19/01 for shipment.

RT 10.19.01

SAMPLE ANALYSIS

Preservation				Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None RT 10-19-01	
Type of Container				aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)				1	1	1	1	1	1	1	1	1	
Volume				60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL	
				Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	
Sample No.	Matrix *	Sample Date	Sample Time										
B12XD3	SOIL	10/17/01	2225	X		X	X	X	X	X	X		
												RT 10-19-01	
												~~RT 10-19-01~~	
												~~B12XF2~~	
												HISTORICAL DATA INDICATES	
												<2000 DC1/g	

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
R Nielson	10/18/01 0435	STORED IN REF #2C	10/18/01 0435
Removed from Ref 2C 3728	10.19.01 0900	R. Thoren	10-19-01 0900
R. Thoren ERC	10-19-01 0900	FEDEX	
Fed Ex	10.20.01 10:20		10.20.01 10:20

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} RJN 9/20/01

(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; ~~pH (Boil) - 9045~~ RJN 9/20/01

(3) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium}; ICP Metals - 6010A (Add-on) {Phosphorus} RJN 9/20/01

~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60}; Gamma Spec - Add-on {Antimony-125, Cesium-134, Ruthenium-106}; Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90~~ Total Sr RT 10-19-01

Matrix *

S=Soil
SD=Sediment
SO=Solid
S=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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-05	Page 1 of 1

Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days; Air Quality ☐
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: 200 West; Well 299-W15-764; ~~135.0' - 137.5' depth~~ 123.5' RJN 10/18/01	SAF No.: B01-113	
Ice Chest No.: ERC96-044	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA REBRA	Offsite Property No.: 1A020001	Bill of Lading/Air Bill No.: 4236795 4-8155	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/18/01. Collector not available to relinquish samples on 10/19/01 for shipment.
RT, 10-19-01

Preservation	Cool 4C	None RJ 10/19/01	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None RJ 10/19/01	
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG	sG	
No. of Container(s)	1		1	1	1	1	1	1	1	
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL	
SAMPLE ANALYSIS	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	RT 10/19/01 ~~FIETO~~
Sample No.	Matrix *	Sample Date	Sample Time							
B12XD4	SOIL	10/18/01	2000	X		X	X	X	X	X	X	~~B12XF3~~
										RT 10/19/01 ~~B12XF2~~
										HISTORICAL DATA
										INDICATES < 2000
										PCi/g

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Renee Nielson	10/18/01 0430	Stored Ref #2C 10/18/01 RJN 10/19/01	0430
Renee Nielson Ref 2C 3728	10/19/01 0900	R Thoren	10/19/01 0900
R Thoren ERC	10/19/01 0900	FED EX	
FED EX	10/20/01 10:20		10/20/01 10:20

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; ~~pH (Soil) - 9045~~ RJN 9/20/01
(3) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium}; ICP Metals - 6010A (Add-on) {Phosphorus} RJN 9/20/01
~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, Europium-154, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 -- Total Se~~ RT 10-19-01

Matrix *: S=Soil; SD=Sediment; SO=Solid; S=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.

Client: TNU-HANFORD B01-113
LVL #: 0110L151
SDG/SAF #: H1550/B01-113

W.O. #: 11343-606-001-9999-00
Date Received: 10-20-2001

GC/MS VOLATILE

Two (2) soil samples were collected on 10-17,18-2001.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for client specified Volatile target compounds on 10-23-2001.

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. Samples were analyzed within required holding time.
3. Non-target compounds were detected in the samples.
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 Acetone at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor
President
Lionville Laboratory Incorporated

11/7/01
Date

som\group\data\voa\tnu-hanford\0110-151.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 0 pages.

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

GLOSSARY OF VOA DATA

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
DONTHIE 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
HONVILLE LABORATORY INC.

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, Special List

Report Date: 11/03/01 10:02

RFW Batch Number: **0110L151** Client: **TNUHANFORD B01-113 H1550** Work Order: 11343606001 Page: 1a

	Cust ID:	B12XD3		B12XD3		B12XD3		B12XD4		VBLKWV		VBLKWV BS	
Sample Information	RFW#:	001		001 MS		001 MSD		002		01LVX455-MB1		01LVX455-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.04		0.962		0.909		0.980		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	93	%	88	%	91	%	97	%	94	%	92	%
	Bromofluorobenzene	107	%	105	%	106	%	108	%	116	%	100	%
	1,2-Dichloroethane-d4	112	%	100	%	96	%	98	%	94	%	87	%
			fl		fl		fl		fl		fl		fl
Chloromethane		13	U	12	U	11	U	11	U	10	U	10	U
Bromomethane		13	U	12	U	11	U	11	U	10	U	10	U
Vinyl Chloride		13	U	12	U	11	U	11	U	10	U	10	U
Chloroethane		13	U	12	U	11	U	11	U	10	U	10	U
Methylene Chloride		6	U	6	U	6	U	6	U	5	U	5	U
Acetone		13	U	12	U	11	U	11	U	1	J	1	JB
Carbon Disulfide		6	U	6	U	6	U	6	U	5	U	5	U
1,1-Dichloroethene		6	U	89	%	89	%	6	U	5	U	90	%
1,1-Dichloroethane		6	U	6	U	6	U	6	U	5	U	5	U
1,2-Dichloroethene (total)		6	U	6	U	6	U	6	U	5	U	5	U
Chloroform		6	U	6	U	6	U	6	U	5	U	5	U
1,2-Dichloroethane		6	U	6	U	6	U	6	U	5	U	5	U
2-Butanone		13	U	12	U	11	U	11	U	10	U	10	U
1,1,1-Trichloroethane		6	U	6	U	6	U	6	U	5	U	5	U
Carbon Tetrachloride		4	J	2	J	2	J	6	U	5	U	5	U
Bromodichloromethane		6	U	6	U	6	U	6	U	5	U	5	U
1,2-Dichloropropane		6	U	6	U	6	U	6	U	5	U	5	U
cis-1,3-Dichloropropene		6	U	6	U	6	U	6	U	5	U	5	U
Trichloroethene		6	U	96	%	102	%	6	U	5	U	99	%
Dibromochloromethane		6	U	6	U	6	U	6	U	5	U	5	U
1,1,2-Trichloroethane		6	U	6	U	6	U	6	U	5	U	5	U
Benzene		6	U	95	%	96	%	6	U	5	U	92	%
Trans-1,3-Dichloropropene		6	U	6	U	6	U	6	U	5	U	5	U
Bromoform		6	U	6	U	6	U	6	U	5	U	5	U
4-Methyl-2-pentanone		13	U	12	U	11	U	11	U	10	U	10	U
2-Hexanone		13	U	12	U	11	U	11	U	10	U	10	U
Tetrachloroethene		6	U	6	U	6	U	6	U	5	U	5	U
1,1,2,2-Tetrachloroethane		6	U	6	U	6	U	6	U	5	U	5	U
Toluene		6	U	89	%	91	%	6	U	5	U	89	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0110L151 Client: TNUHANFORD B01-113 H1550 Work Order: 11343606001 Page: 1b

Cust ID:	B12XD3	B12XD3	B12XD3	B12XD4	VBLKWV	VBLKWV BS
RFW#:	001	001 MS	001 MSD	002	01LVX455-MB1	01LVX455-MB1
Chlorobenzene	6 U	95 %	93 %	6 U	5 U	94 %
Ethylbenzene	6 U	6 U	6 U	6 U	5 U	5 U
Styrene	6 U	6 U	6 U	6 U	5 U	5 U
Xylene (total)	6 U	6 U	6 U	6 U	5 U	5 U
N-butylbenzene	6 U	6 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

01 10L151

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI LIONVILLE LABORATORY, INC.

Client: TNU Hanford B01-113

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

Date Rec'd: 10.20.01 Date Due: 11-19-01

		A	B						C		D	E	F	G		
Refrigerator #		1	6						6		6	6	6	6		
#/Type Container	Liquid															
	Solid	1 jar	1 jar						1 jar		1 jar	1 jar	1 jar	1 jar		
Volume	Liquid															
	Solid	250	250						500		60	120	120	500		
Preservatives		—	—						—		—	—	—	—		
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				ICP Metal	CN	Oil + Grease	Hex Chrome	Tic, TOC	HC Anions		
Lionville Laboratory Use Only		0624X	0625X						MCT①		1OGGE	ICR6	ITIC IOCT	IC①		
Matrix Codes: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish																
Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected										
001	B12XD3			S	10/17/01	2225	X	X			X	X	X	X		
002	B12XD4			S	10/18/01	2000	X	X			X	X	X	X		

Special Instructions:

SAF # B01-113

Run Matrix QC

DATE/REVISIONS:

METO 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, P

IC① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2

3.

4.

5.

6.

Lionville Laboratory Use Only

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

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

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

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

Cooler Temp. 2.3 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/20/01	10:20

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 8155

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-04	Page 1 of 1

Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: 200 West; Well 299-W15-764; ~~120.0'-122.5'~~ 121'-123.5' depth RJN 10/18/01	SAF No.: B01-113	Air Quality ☐
Ice Chest No.: ERC96-044	Field Logbook No.: EW-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A020021	Bill of Lading/Air Bill No.: 4235 7954-8155	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/17/01. Collector not available to relinquish samples on 10/19/01 for shipment.

RT 10-19-01

Preservation	Cool 4C	None RT 10/19/01	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None RT 10-19-01
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.
B12XD3	SOIL	10/17/01	2225	X		X	X	X	X	X	X	

RT 10-19-01 ~~B12XF2~~

HISTORICAL DATA INDICATES <2000 pCi/g

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
R Nielson / R Nielson	10/18/01 0435	STORED IN REF #2C	10/18/01 0435
Removed from Ref 2C 3728	10/19/01 0900	R. Thoren	10-19-01 0900
R. Thoren ERC	10-19-01 0900	FEDEX	
Fed Ex	10-20-01 10:20		10-20-01 10:20

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} RJN 9/20/01

(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; pH (Soil) - 9045 RJN 9/20/01

(3) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium}; ICP Metals - 6010A (Add-on) {Phosphorus}

~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, Europium-154, Ruthenium-106); Americium-241, Neptunium-237, Isotopic Plutonium, Strontium-89,90 -- Total Sr~~ RJN 9/20/01

RT 10-19-01

Matrix *: S=Soil; SD=Sediment; SO=Solid; Z=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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-05	Page 1 of 1

Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: 200 West; Well 299-W15-764; ~~135.0' - 137.5' depth~~ RJN 10/18/01 123.5'	SAF No.: B01-113	Air Quality ☐
Ice Chest No.: ERC96-044	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA REERA	Offsite Property No.: A020001	Bill of Lading/Air Bill No.: 42357954-8155	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/18/01. *Collector not available to relinquish* samples on 10/19/01 for shipment.

RT 10-19-01

Preservation	Cool 4C	None RT 10/18/01	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None RT 10-19-01
Type of Container	sG		sG	sG	sG	sG	sG	sG	sG
No. of Container(s)	1		1	1	1	1	1	1	1
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	
B12XD4	SOIL	10/18/01	2000	X		X	X	X	X	X	X		RT 10-19-01 ~~B12XF3~~
													RT 10-19-01 ~~B12XF2~~
													HISTORICAL DATA INDICATES < 2000 PCI/g

CHAIN OF POSSESSION — Sign/Print Names: RJN 10/19/01

Relinquished By	Date/Time	Received By	Date/Time
R Nielson 10/18/01	10/19/01 0430	Stored 10/19/01 RJN Ref #2C 10/18/01	0430
Removed from Ref 2C 3728 10-19-01	0900	R Thoren	0900 10-19-01
R Thoren ERC 10-19-01	0900	ED	
ED 10-20-01	10:20	10-20-01	10:20

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(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) (Tributyl phosphate)

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RT 10-19-01

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

BHI-EE-011 (10/99)

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-113
LVL #: 0110L151
SDG/SAF #: H1550/B01-113

W.O. #: 11343-606-001-9999-00
Date Received: 10-20-2001

SEMIVOLATILE

Two (2) soil samples were collected on 10-17,18-2001.

The samples and their associated QC samples were extracted on 10-24-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 10-30-2001.

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. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. Internal standard area and retention time criteria were met.
8. 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

11/5/01
Date

som\gorup\data\bna\tnu-hanford-0110-151.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 5 pages.

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

GLOSSARY OF BNA DATA

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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

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BSD	=	Indicates blank spike duplicate.
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MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
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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: 10/31/01 09:33

RFW Batch Number: 0110L151 — Client: TNUHANFORD B01-113 H1550 — Work Order: 11343606001 — Page: 1a

	Cust ID:	B12XD3		B12XD4		B12XD4		B12XD4		SBLKIK		SBLKIK BS	
Sample Information	RFW#:	001		002		002 MS		002 MSD		01LE1277-MB1		01LE1277-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	35	%	70	%	74	%	73	%	72	%	76	%
	2-Fluorobiphenyl	32	%	68	%	73	%	72	%	78	%	77	%
	p-Terphenyl-d14	42	%	109	%	109	%	103	%	106	%	105	%
	Phenol-d5	35	%	66	%	71	%	70	%	72	%	72	%
	2-Fluorophenol	33	%	62	%	67	%	64	%	68	%	68	%
	2,4,6-Tribromophenol	33	%	79	%	89	%	87	%	82	%	87	%
			fl		fl		fl		fl		fl		fl
Phenol		410	U	390	U	73	%	69	%	330	U	71	%
bis(2-Chloroethyl)ether		410	U	390	U	390	U	390	U	330	U	330	U
2-Chlorophenol		410	U	390	U	77	%	72	%	330	U	73	%
1,3-Dichlorobenzene		410	U	390	U	390	U	390	U	330	U	330	U
1,4-Dichlorobenzene		410	U	390	U	58	%	63	%	330	U	67	%
1,2-Dichlorobenzene		410	U	390	U	390	U	390	U	330	U	330	U
2-Methylphenol		410	U	390	U	390	U	390	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		410	U	390	U	390	U	390	U	330	U	330	U
4-Methylphenol		410	U	390	U	390	U	390	U	330	U	330	U
N-Nitroso-Di-n-propylamine		410	U	390	U	60	%	66	%	330	U	65	%
Hexachloroethane		410	U	390	U	390	U	390	U	330	U	330	U
Nitrobenzene		410	U	390	U	390	U	390	U	330	U	330	U
Isophorone		410	U	390	U	390	U	390	U	330	U	330	U
2-Nitrophenol		410	U	390	U	390	U	390	U	330	U	330	U
2,4-Dimethylphenol		410	U	390	U	390	U	390	U	330	U	330	U
bis(2-Chloroethoxy)methane		410	U	390	U	390	U	390	U	330	U	330	U
2,4-Dichlorophenol		410	U	390	U	390	U	390	U	330	U	330	U
1,2,4-Trichlorobenzene		410	U	390	U	66	%	67	%	330	U	70	%
Naphthalene		410	U	390	U	390	U	390	U	330	U	330	U
4-Chloroaniline		410	U	390	U	390	U	390	U	330	U	330	U
Hexachlorobutadiene		410	U	390	U	390	U	390	U	330	U	330	U
4-Chloro-3-methylphenol		410	U	390	U	82	%	78	%	330	U	76	%
2-Methylnaphthalene		410	U	390	U	390	U	390	U	330	U	330	U
Hexachlorocyclopentadiene		410	U	390	U	390	U	390	U	330	U	330	U
2,4,6-Trichlorophenol		410	U	390	U	390	U	390	U	330	U	330	U
2,4,5-Trichlorophenol		1000	U	970	U	960	U	970	U	840	U	840	U

*= Outside of EPA CLP QC limits.

Cust ID:	B12XD3		B12XD4		B12XD4		B12XD4		SBLKIK		SBLKIK BS	
RFW#:	001		002		002 MS		002 MSD		01LE1277-MB1		01LE1277-MB1	
2-Chloronaphthalene	410	U	390	U	390	U	390	U	330	U	330	U
2-Nitroaniline	1000	U	970	U	960	U	970	U	840	U	840	U
Dimethylphthalate	410	U	390	U	390	U	390	U	330	U	330	U
Acenaphthylene	410	U	390	U	390	U	390	U	330	U	330	U
2,6-Dinitrotoluene	410	U	390	U	390	U	390	U	330	U	330	U
3-Nitroaniline	1000	U	970	U	960	U	970	U	840	U	840	U
Acenaphthene	410	U	390	U	80	%	77	%	330	U	76	%
2,4-Dinitrophenol	1000	U	970	U	960	U	970	U	840	U	840	U
4-Nitrophenol	1000	U	970	U	63	%	88	%	840	U	80	%
Dibenzofuran	410	U	390	U	390	U	390	U	330	U	330	U
2,4-Dinitrotoluene	410	U	390	U	72	%	83	%	330	U	82	%
Diethylphthalate	410	U	390	U	390	U	390	U	330	U	330	U
4-Chlorophenyl-phenylether	410	U	390	U	390	U	390	U	330	U	330	U
Fluorene	410	U	390	U	390	U	390	U	330	U	330	U
4-Nitroaniline	1000	U	970	U	960	U	970	U	840	U	840	U
4,6-Dinitro-2-methylphenol	1000	U	970	U	960	U	970	U	840	U	840	U
N-Nitrosodiphenylamine (1)	410	U	390	U	390	U	390	U	330	U	330	U
4-Bromophenyl-phenylether	410	U	390	U	390	U	390	U	330	U	330	U
Hexachlorobenzene	410	U	390	U	390	U	390	U	330	U	330	U
Pentachlorophenol	1000	U	970	U	82	%	80	%	840	U	76	%
Phenanthrene	410	U	390	U	390	U	390	U	330	U	330	U
Anthracene	410	U	390	U	390	U	390	U	330	U	330	U
Carbazole	410	U	390	U	390	U	390	U	330	U	330	U
Di-n-Butylphthalate	410	U	390	U	390	U	390	U	330	U	330	U
Fluoranthene	410	U	390	U	390	U	390	U	330	U	330	U
Pyrene	410	U	390	U	93	%	90	%	330	U	89	%
Butylbenzylphthalate	410	U	390	U	390	U	390	U	330	U	330	U
3,3'-Dichlorobenzidine	410	U	390	U	390	U	390	U	330	U	330	U
Benzo(a)anthracene	410	U	390	U	390	U	390	U	330	U	330	U
Chrysene	410	U	390	U	390	U	390	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	410	U	390	U	390	U	390	U	330	U	330	U
Di-n-Octyl phthalate	410	U	390	U	390	U	390	U	330	U	330	U
Benzo(b)fluoranthene	410	U	390	U	390	U	390	U	330	U	330	U
Benzo(k)fluoranthene	410	U	390	U	390	U	390	U	330	U	330	U
Benzo(a)pyrene	410	U	390	U	390	U	390	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	410	U	390	U	390	U	390	U	330	U	330	U
Dibenzo(a,h)anthracene	410	U	390	U	390	U	390	U	330	U	330	U
Benzo(g,h,i)perylene	410	U	390	U	390	U	390	U	330	U	330	U
Tributylphosphate	410	U	390	U	390	U	390	U	330	U	330	U

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

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

RFW Batch Number: **0110L151** Client: **TNUHANFORD B01-113 H1550** Work Order: 11343606001 Report Date: 10/31/01 09:33 Page: 2a

Cust ID: **SBLKIK BSD**

Sample Information		
RFW#:	**01LE1277-MB1**	
Matrix:	SOIL	
D.F.:	1.00	
Units:	ug/Kg	

Surrogate Recovery			
	Nitrobenzene-d5	78	%
	2-Fluorobiphenyl	83	%
	p-Terphenyl-d14	108	%
	Phenol-d5	72	%
	2-Fluorophenol	67	%
	2,4,6-Tribromophenol	87	%

Phenol	71	%
bis(2-Chloroethyl)ether	330	U
2-Chlorophenol	75	%
1,3-Dichlorobenzene	330	U
1,4-Dichlorobenzene	69	%
1,2-Dichlorobenzene	330	U
2-Methylphenol	330	U
2,2'-oxybis(1-Chloropropane)	330	U
4-Methylphenol	330	U
N-Nitroso-Di-n-propylamine	68	%
Hexachloroethane	330	U
Nitrobenzene	330	U
Isophorone	330	U
2-Nitrophenol	330	U
2,4-Dimethylphenol	330	U
bis(2-Chloroethoxy)methane	330	U
2,4-Dichlorophenol	330	U
1,2,4-Trichlorobenzene	75	%
Naphthalene	330	U
4-Chloroaniline	330	U
Hexachlorobutadiene	330	U
4-Chloro-3-methylphenol	82	%
2-Methylnaphthalene	330	U
Hexachlorocyclopentadiene	330	U
2,4,6-Trichlorophenol	330	U
2,4,5-Trichlorophenol	840	U

*= Outside of EPA CLP QC limits.

Cust ID: SBLKIK BSD

RFW#: 01LE1277-MB1

2-Chloronaphthalene	330	U
2-Nitroaniline	840	U
Dimethylphthalate	330	U
Acenaphthylene	330	U
2,6-Dinitrotoluene	330	U
3-Nitroaniline	840	U
Acenaphthene	80	%
2,4-Dinitrophenol	840	U
4-Nitrophenol	76	%
Dibenzofuran	330	U
2,4-Dinitrotoluene	84	%
Diethylphthalate	330	U
4-Chlorophenyl-phenylether	330	U
Fluorene	330	U
4-Nitroaniline	840	U
4,6-Dinitro-2-methylphenol	840	U
N-Nitrosodiphenylamine (1)	330	U
4-Bromophenyl-phenylether	330	U
Hexachlorobenzene	330	U
Pentachlorophenol	59	%
Phenanthrene	330	U
Anthracene	330	U
Carbazole	330	U
Di-n-Butylphthalate	330	U
Fluoranthene	330	U
Pyrene	92	%
Butylbenzylphthalate	330	U
3,3'-Dichlorobenzidine	330	U
Benzo(a)anthracene	330	U
Chrysene	330	U
bis(2-Ethylhexyl)phthalate	330	U
Di-n-Octyl phthalate	330	U
Benzo(b)fluoranthene	330	U
Benzo(k)fluoranthene	330	U
Benzo(a)pyrene	330	U
Indeno(1,2,3-cd)pyrene	330	U
Dibenzo(a,h)anthracene	330	U
Benzo(g,h,i)perylene	330	U
Tributylphosphate	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.

B12XD3

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

Client: TNUHANFORD B01-113 H1550

Matrix: (soil/water) SOIL

Lab Sample ID: 0110L151-001

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

Lab File ID: C103011

Level: (low/med) LOW

Date Received: 10/20/01

% Moisture: 18 decanted: (Y/N)__

Date Extracted: 10/24/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 10/30/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.140	200	JB

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B12XD4

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

Client: TNUHANFORD B01-113 H1550

Matrix: (soil/water) SOIL

Lab Sample ID: 0110L151-002

Sample wt/vol: 30.2 (g/mL) G

Lab File ID: C103013

Level: (low/med) LOW

Date Received: 10/20/01

% Moisture: 15 decanted: (Y/N)__

Date Extracted: 10/24/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 10/30/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.139	600	JB

11

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKIK

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

Client: TNUHANFORD B01-113 H1550

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE1277-MB1

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

Lab File ID: C103008

Level: (low/med) LOW

Date Received: 10/24/01

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

Date Extracted: 10/24/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 10/30/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.148	300	J

Lionville Laboratory Use Only: 01 10L151

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI Lionville Laboratory Inc

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B01-113

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

Date Rec'd: 10.20.01 Date Due: 11-19-01

		A	B						C		D	E	F	G		
Refrigerator #		1	6						6		6	6	6	6		
#/Type Container	Liquid															
	Solid	1 jar	1 jar						1 jar		1 jar	1 jar	1 jar	1 jar		
Volume	Liquid															
	Solid	250	250						500		60	120	120	500		
Preservatives		—	—						—		—	—	—	—		
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				ICP Metal	CN	Oil + Grease	Hex Chrom	TIC, TOC	HC Anions		
		Lionville Laboratory Use Only														
		0624Y	0625X						MET①		1OGGE	1CR6	ITIC 1OCT	IC①		

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	0624Y	0625X	MET①	1OGGE	1CR6	ITIC 1OCT	IC①
001	B12XD3			S	10/17/01	2225	X	X	X	X	X	X	X
002	B12XD4			S	10/18/01	2000	X	X	X	X	X	X	X

Special Instructions:
SAF # B01-113
Run Matrix QC

DATE/REVISIONS:
MET① 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, P
IC① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, ICNO2
3.
4.
5.
6.

Lionville Laboratory Use Only

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

Tamper Resistant Seal was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 2.3 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	10/20/01	10:20

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

4235 7954 8155

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-113-04	Page 1 of 1
Collector Renee Nielson	Company Contact Virginia Rohay	Telephone No. 372-9100	Project Coordinator TRENT, SJ	Price Code 8N Air Quality ☐
Project Designation PFP Well Installation Sampling and Analysis - Soil	Sampling Location 200 West; Well 299-W15-764; ~~120.0' - 122.5'~~ 121' - 123.5' RJN 10/18/01 depth		SAF No. B01-113	Date Turnaround 45 Days
Ice Chest No. ERC96-044	Field Logbook No. 1562	COA T20ZP1D722	Method of Shipment Federal Express	
Shipped To TMA/RECRA RECRA	Offsite Property No. A020021		Bill of Lading/Air Bill No. 4235 7954 - 8155	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/17/01. Collector not available to relinquish samples on 10/19/01 for shipment.

RT 10.19.01

Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None RT 10.19.01	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL	
SAMPLE ANALYSIS	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	
Sample No.	Matrix *	Sample Date	Sample Time							
B12XD3	SOIL	10/17/01	2225	X		X	X	X	X	X

RT 10.19.01 ~~B12XF2~~

HISTORICAL DATA INDICATES <2000 pCi/g

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R Nielson	Date/Time: 10/18/01 0435	Received By: Stored in REF #2C	Date/Time: 10/18/01 0435
Relinquished By: Removed from Ref 2C 3728	Date/Time: 10-19-01 0900	Received By: R Thoren	Date/Time: 10-19-01 0900
Relinquished By: R Thoren ERC	Date/Time: 10-19-01 0900	Received By: FEDEX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10.20.01 10:20	Received By: [illegible]	Date/Time: 10.20.01 10:20
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) (Tributyl phosphate) RJN 9/20/01

(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); NO2/NO3 - 353.2; ~~pH (Soil) - 9045~~ RJN 9/20/01

(3) ICP Metals - 6010A (TAL) (Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium); ICP Metals - 6010A (Add-on) (Phosphorus) RJN 9/20/01

~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, Cesium-134, Ruthenium-106); Americium-241, Neptunium-237, Isotopic Plutonium, Strontium-89,90 -- Total Sr~~ RT 10-19-01

Matrix *: S=Soil; SD=Sediment; SO=Solid; S=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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-05	Page 1 of 1

Collector: Renee Nielson	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Soil	Sampling Location: 200 West; Well 299-W15-764; ~~135.0' - 137.5' depth~~ 123.5' RJN 10/18/01	SAF No.: B01-113	Air Quality ☐
Ice Chest No.: ERC96-014	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA REBRA	Offsite Property No.: A020001	Bill of Lading/Air Bill No.: 4235795 4-8185	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/18/01. Collector not available to relinquish samples on 10/19/01 for shipment.

RT 10-19-01

SAMPLE ANALYSIS

Preservation	Cool 4C	None RJ 10/19/01	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None RJ 10/19/01	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1		1	1	1	1	1	1	1	
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	1000mL	
	Oil & Grease - 413.1	Gross Alpha; Gross Beta	Chromium Hex - 7196	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	

Sample No.	Matrix *	Sample Date	Sample Time										
B12XD4	SOIL	10/18/01	2000	X		X	X	X	X	X	X		~~B12XF5~~ RT 10-19-01 B12XF5

RT 10/19/01 FIELD

HISTORICAL DATA INDICATES < 2000 PCi/g

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson RJN 10/18/01	10/18/01 0430	Stored RJN 10/19/01 Ref #2C	10/18/01 0430
Removed from Ref 2C 3728	10/19/01 0900	R Thoren	10-19-01 0900
R. Thoren ERC	10-19-01 0900	FED EX	
FED EX	10-20-01 10:20		10-20-01 10:20

SPECIAL INSTRUCTIONS

** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.

** If a limited quantity of sample material is received, perform analyses in the order listed on the FSR.

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) (Tributyl phosphate) RJN 9/20/01

(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); NO2/NO3 - 353.2; ~~pH (Soil) - 9045~~ RJN 9/20/01

(3) ICP Metals - 6010A (TAL) (Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium); ICP Metals - 6010A (Add-on) (Phosphorus) RJN 9/20/01

~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, Cesium-134, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 -- Total Sr~~

RT 10-19-01

Matrix *

S=Soil; SD=Sediment; SO=Solid; S=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)