1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1543 was composed of one solid (soil) sample designated under SAF No. B01-113 with a Project Designation of: PFP Well Installation Sampling and Analysis – Soil.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on December 12, 2001.

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 Neptunium-237 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 Gross Alpha and Beta Analyses

No problems were encountered during the course of the analyses.

2.6 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

12/19/01
Date

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JAN 24 2002
EDMC

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

SDG 7113
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1543

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B12XD2	200 W.; Well 299-W15-764	SOLID		R110100-01	B01-113	B01-113-03	10/12/01 00:50
Method Blank		SOLID		R110100-03	B01-113		
Lab Control Sample		SOLID		R110100-02	B01-113		
Duplicate (R110100-01)	200 W.; Well 299-W15-764	SOLID		R110100-04	B01-113		10/12/01 00:50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

SDG 7113
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1543

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
7113	B01-113-03	B12XD2	SOLID	96.1	986.4 g		10/16/01	4	R110100-01	7113-001
		Method Blank	SOLID						R110100-03	7113-003
		Lab Control Sample	SOLID						R110100-02	7113-002
		Duplicate (R110100-01)	SOLID	96.1	986.4 g		10/16/01	4	R110100-04	7113-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

SDG 7113
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1543

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	7012-056	5.0	1			1	1	1/1		
NP	SOLID	Neptunium in Soil	7012-056	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7012-056	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7012-056	10.0	1			1	1	1/1		
Gas Proportional Counting												
93A	SOLID	Gross Alpha in Soil	7012-056	20.0	1			1	1	1/1		
93B	SOLID	Gross Beta in Soil	7012-056	15.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7012-056	15.0	1			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

SDG 7113
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1543

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B12XD2			R110100-01	7113-001	93A/93		11/19/01	12/13/01	MCM	Gross Alpha in Soil
200 W.; Well 299-W15-764		SOLID	10/12/01	7113-001	93B/93		11/19/01	12/13/01	MCM	Gross Beta in Soil
B01-113-03	B01-113		10/16/01	7113-001	AM		11/30/01	12/13/01	MCM	Americium 241 in Soil
				7113-001	GAM		11/20/01	12/13/01	MCM	Gamma Scan
				7113-001	NP		12/04/01	12/13/01	MCM	Neptunium in Soil
				7113-001	PU		11/21/01	12/13/01	MCM	Plutonium, Isotopic in Solids
				7113-001	SR		11/15/01	12/13/01	MCM	Total Strontium in Soil
Method Blank			R110100-03	7113-003	93A/93		11/19/01	12/13/01	MCM	Gross Alpha in Soil
		SOLID		7113-003	93B/93		11/19/01	12/13/01	MCM	Gross Beta in Soil
	B01-113			7113-003	AM		12/04/01	12/13/01	MCM	Americium 241 in Soil
				7113-003	GAM		11/20/01	12/13/01	MCM	Gamma Scan
				7113-003	NP		12/02/01	12/13/01	MCM	Neptunium in Soil
				7113-003	PU		11/21/01	12/13/01	MCM	Plutonium, Isotopic in Solids
				7113-003	SR		11/15/01	12/13/01	MCM	Total Strontium in Soil
Lab Control Sample			R110100-02	7113-002	93A/93		11/24/01	12/13/01	MCM	Gross Alpha in Soil
		SOLID		7113-002	93B/93		11/24/01	12/13/01	MCM	Gross Beta in Soil
	B01-113			7113-002	AM		12/04/01	12/13/01	MCM	Americium 241 in Soil
				7113-002	GAM		11/20/01	12/13/01	MCM	Gamma Scan
				7113-002	NP		12/04/01	12/13/01	MCM	Neptunium in Soil
				7113-002	PU		11/21/01	12/13/01	MCM	Plutonium, Isotopic in Solids
				7113-002	SR		11/15/01	12/13/01	MCM	Total Strontium in Soil
Duplicate (R110100-01)			R110100-04	7113-004	93A/93		11/19/01	12/13/01	MCM	Gross Alpha in Soil
200 W.; Well 299-W15-764		SOLID	10/12/01	7113-004	93B/93		11/19/01	12/13/01	MCM	Gross Beta in Soil
	B01-113		10/16/01	7113-004	AM		11/30/01	12/13/01	MCM	Americium 241 in Soil
				7113-004	GAM		11/20/01	12/13/01	MCM	Gamma Scan
				7113-004	NP		12/02/01	12/13/01	MCM	Neptunium in Soil
				7113-004	PU		11/21/01	12/13/01	MCM	Plutonium, Isotopic in Solids
				7113-004	SR		11/15/01	12/13/01	MCM	Total Strontium in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

SDG 7113
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1543

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	1			1	1	1	4
93B/93	B01-113	Gross Beta in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
AM	B01-113	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
GAM	B01-113	Gamma Scan	GAMMA_GS	1			1	1	1	4
NP	B01-113	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	B01-113	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	B01-113	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TOTALS				7			7	7	7	28

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

R110100-03 Method Blank

METHOD BLANK

SDG 7113	Client/Case no Hanford	SDG H1543	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R110100-03	Client sample id Method Blank		
Dept sample id 7113-003	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	0.633	2.2	3.7	10	U	93A
Gross Beta	12587-47-2	-1.45	5.4	9.0	15	U	93B
Total Strontium	SR-RAD	0.058	0.17	0.34	1.0	U	SR
Americium 241	14596-10-2	0.027	0.054	0.069	1.0	U	AM
Neptunium 237	13994-20-2	0	0.14	0.38	1.0	U	NP
Plutonium 238	13981-16-3	0	0.051	0.20	1.0	U	PU
Plutonium 239/240	PU-239/240	0.051	0.051	0.20	1.0	U	PU
Antimony 125	14234-35-6	U		0.045		U	GAM
Potassium 40	13966-00-2	U		0.27		U	GAM
Ruthenium 106	13967-48-1	U		0.15		U	GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.10	U	GAM
Radium 226	13982-63-3	U		0.045	0.10	U	GAM
Radium 228	15262-20-1	U		0.074	0.20	U	GAM
Europium 152	14683-23-9	U		0.056	0.10	U	GAM
Europium 154	15585-10-1	U		0.086	0.10	U	GAM
Europium 155	14391-16-3	U		0.050	0.10	U	GAM
Thorium 228	14274-82-9	U		0.026		U	GAM
Thorium 232	TH-232	U		0.074		U	GAM
Uranium 235	15117-96-1	U		0.065		U	GAM
Uranium 238	U-238	U		2.5		U	GAM
Americium 241	14596-10-2	U		0.065		U	GAM

PFP Well Install. Smpling. & Analys.

QC-BLANK 40201

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

R110100-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7113
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1543
Case no No. 630

Lab sample id R110100-02
Dept sample id 7113-002

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	180	14	3.2	10		93A	200	8.0	90	70-130	70-130
Gross Beta	214	11	9.1	15		93B	218	8.7	98	76-124	70-130
Total Strontium	23.1	0.89	0.26	1.0		SR	21.8	0.87	106	82-118	80-120
Americium 241	18.5	1.1	0.12	1.0		AM	19.1	0.76	97	87-113	80-120
Neptunium 237	21.3	1.2	0.10	1.0		NP	21.2	0.85	100	87-113	80-120
Plutonium 238	23.8	3.1	0.37	1.0		PU	24.6	0.98	97	79-121	80-120
Plutonium 239/240	26.6	3.5	0.37	1.0		PU	26.4	1.1	101	78-122	80-120
Cobalt 60	1.22	0.063	0.032	0.050		GAM	1.10	0.044	111	73-127	80-120
Cesium 137	1.48	0.057	0.035	0.10		GAM	1.27	0.051	116	72-128	80-120

PFP Well Install. Smpling. & Analys.

QC-LCS 40200

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

R110100-04 B12XD2

DUPLICATE

SDG	7113			Client/Case no	Hanford SDG H1543
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R110100-04	Lab sample id	R110100-01	Client sample id	B12XD2
Dept sample id	7113-004	Dept sample id	7113-001	Location/Matrix	200 W.; Well 299-W15-764 SOLID
		Received	10/16/01	Collected/Weight	10/12/01 00:50 986.4 g
% solids	96.1	% solids	96.1	Custody/SAF No	B01-113-03 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 PROT TOT LIMIT
Gross Alpha	3.10	2.9	3.7	10	U	93A	2.44	2.2	2.7	U	-	
Gross Beta	16.9	6.2	9.3	15		93B	12.4	3.9	5.3	J	31	82
Total Strontium	-0.078	0.16	0.33	1.0	U	SR	-0.029	0.14	0.30	U	-	
Americium 241	0.038	0.11	0.21	1.0	U	AM	0.024	0.096	0.18	U	-	
Neptunium 237	-0.035	0.14	0.34	1.0	U	NP	0.045	0.045	0.067	U	-	
Plutonium 238	0	0.064	0.25	1.0	U	PU	0	0.049	0.19	U	-	
Plutonium 239/240	0.032	0.064	0.25	1.0	U	PU	0	0.049	0.19	U	-	
Antimony 125	U		0.048		U	GAM	U		0.087	U	-	
Potassium 40	15.8	0.57	0.24			GAM	14.9	1.1	0.47		6	34
Ruthenium 106	U		0.19		U	GAM	U		0.38	U	-	
Cobalt 60	U		0.025	0.050	U	GAM	U		0.058	U	-	
Cesium 137	U		0.021	0.10	U	GAM	U		0.046	U	-	
Radium 226	0.415	0.042	0.037	0.10		GAM	0.387	0.083	0.077		7	47
Radium 228	0.668	0.11	0.10	0.20		GAM	0.579	0.23	0.23		14	69
Europium 152	U		0.050	0.10	U	GAM	U		0.093	U	-	
Europium 154	U		0.088	0.10	U	GAM	U		0.17	U	-	
Europium 155	U		0.062	0.10	U	GAM	U		0.083	U	-	
Thorium 228	0.540	0.030	0.028			GAM	0.513	0.044	0.043		5	35
Thorium 232	0.668	0.11	0.10			GAM	0.579	0.23	0.23		14	69
Uranium 235	U		0.093		U	GAM	U		0.12	U	-	
Uranium 238	U		3.1		U	GAM	U		6.1	U	-	
Americium 241	U		0.084		U	GAM	U		0.054	U	-	

PFP Well Install. Smpling. & Analys.

QC-DUP#1 40202

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

R110100-01 B12XD2

DATA SHEET

SDG	7113	Client/Case no	Hanford SDG H1543
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R110100-01	Client sample id	B12XD2
Dept sample id	7113-001	Location/Matrix	200 W.; Well 299-W15-764 SOLID
Received	10/16/01	Collected/Weight	10/12/01 00:50 986.4 g
% solids	96.1	Custody/SAF No	B01-113-03 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	2.44	2.2	2.7	10	U	93A
Gross Beta	12587-47-2	12.4	3.9	5.3	15	J	93B
Total Strontium	SR-RAD	-0.029	0.14	0.30	1.0	U	SR
Americium 241	14596-10-2	0.024	0.096	0.18	1.0	U	AM
Neptunium 237	13994-20-2	0.045	0.045	0.067	1.0	U	NP
Plutonium 238	13981-16-3	0	0.049	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.049	0.19	1.0	U	PU
Antimony 125	14234-35-6	U		0.087		U	GAM
Potassium 40	13966-00-2	14.9	1.1	0.47			GAM
Ruthenium 106	13967-48-1	U		0.38		U	GAM
Cobalt 60	10198-40-0	U		0.058	0.050	U	GAM
Cesium 137	10045-97-3	U		0.046	0.10	U	GAM
Radium 226	13982-63-3	0.387	0.083	0.077	0.10		GAM
Radium 228	15262-20-1	0.579	0.23	0.23	0.20		GAM
Europium 152	14683-23-9	U		0.093	0.10	U	GAM
Europium 154	15585-10-1	U		0.17	0.10	U	GAM
Europium 155	14391-16-3	U		0.083	0.10	U	GAM
Thorium 228	14274-82-9	0.513	0.044	0.043			GAM
Thorium 232	TH-232	0.579	0.23	0.23			GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		6.1		U	GAM
Americium 241	14596-10-2	U		0.054		U	GAM

PFP Well Install. Smpling. & Analys.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

Test AM Matrix SOLID
SDG 7113
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1543

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 7012-056						
B12XD2	R110100-01			7113-001	U	
BLK (QC ID=40201)	R110100-03			7113-003	U	
LCS (QC ID=40200)	R110100-02			7113-002	ok	
Duplicate (R110100-01)	R110100-04			7113-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
PFP Well Install. Smpling. & Analys.						

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 7012-056	2σ prep error 5.0 %				Reference Lab Notebook 7012 pg. 056											
B12XD2	R110100-01			0.18	0.500			50		203			49	11/30/01	11/30	SS-049
BLK (QC ID=40201)	R110100-03			0.069	0.500			82		325				11/30/01	12/04	SS-042
LCS (QC ID=40200)	R110100-02			0.12	0.500			79		325				11/30/01	12/04	SS-041
Duplicate (R110100-01) (QC ID=40202)	R110100-04			0.21	0.500			84		204			49	11/30/01	11/30	SS-022
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 4 SAMPLES
MDA 0.14 ± 0.13
YIELD 74 ± 32

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

Test NP Matrix SOLID
SDG 7113
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1543

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 7012-056						
B12XD2	R110100-01			7113-001	U	
BLK (QC ID=40201)	R110100-03			7113-003	U	
LCS (QC ID=40200)	R110100-02			7113-002	ok	
Duplicate (R110100-01)	R110100-04			7113-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
PFP Well Install. Smpling. & Analys.						

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 7012-056	2σ prep error 5.0 %			Reference Lab Notebook 7012 pg. 056												
B12XD2	R110100-01			0.067	0.500			34		325			53	11/30/01	12/04	SS-031
BLK (QC ID=40201)	R110100-03			0.38	0.500			43		214				11/30/01	12/02	SS-021
LCS (QC ID=40200)	R110100-02			0.10	0.500			53		325				11/30/01	12/04	SS-032
Duplicate (R110100-01) (QC ID=40202)	R110100-04			0.34	0.500			43		214			51	11/30/01	12/02	SS-022
Nominal values and limits from method				1.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.22	±	0.32
	YIELD	43	±	16

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

Test PU Matrix SOLID
SDG 7113
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1543

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 7012-056								
B12XD2	R110100-01			7113-001	U		U	
BLK (QC ID=40201)	R110100-03			7113-003	U		U	
LCS (QC ID=40200)	R110100-02			7113-002	ok		ok	
Duplicate (R110100-01)	R110100-04			7113-004	-	U	-	U
Nominal values and limits from method PFP Well Install. Smpling. & Analys.				RDLs (pCi/g)	1.0		1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7012-056 2σ prep error 5.0 % Reference Lab Notebook 7012 pg. 056																
B12XD2	R110100-01			0.19	0.500			86		104			40	11/21/01	11/21	SS-045
BLK (QC ID=40201)	R110100-03			0.20	0.500			87		104				11/21/01	11/21	SS-048
LCS (QC ID=40200)	R110100-02			0.37	0.500			46		103				11/21/01	11/21	SS-047
Duplicate (R110100-01) (QC ID=40202)	R110100-04			0.25	0.500			66		116			40	11/21/01	11/21	SS-031
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	
	PUISO_PLATE_AEA	
	CP-060	Soil Preparation, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.25 ± 0.17
YIELD 71 ± 39

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

Test SR Matrix SOLID
SDG 7113
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1543

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 7012-056						
B12XD2	R110100-01			7113-001	U	
BLK (QC ID=40201)	R110100-03			7113-003	U	
LCS (QC ID=40200)	R110100-02			7113-002	ok	
Duplicate (R110100-01)	R110100-04			7113-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
PFP Well Install. Smpling. & Analys.						

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 7012-056 2σ prep error 10.0 % Reference Lab Notebook 7012 pg. 056																
B12XD2	R110100-01			0.30	1.00			94		100			34	11/15/01	11/15	GRB-205
BLK (QC ID=40201)	R110100-03			0.34	1.00			85		100				11/15/01	11/15	GRB-207
LCS (QC ID=40200)	R110100-02			0.26	1.00			84		100				11/15/01	11/15	GRB-217
Duplicate (R110100-01) (QC ID=40202)	R110100-04			0.33	1.00			94		100			34	11/15/01	11/15	GRB-208
Nominal values and limits from method				1.0	1.00			30-105		100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.31	±	0.072
	YIELD	89	±	11

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

Test 93A Matrix SOLID
SDG 7113
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1543

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 7012-056						
B12XD2	R110100-01	93		7113-001	U	
BLK (QC ID=40201)	R110100-03	93		7113-003	U	
LCS (QC ID=40200)	R110100-02	93		7113-002	ok	
Duplicate (R110100-01)	R110100-04	93		7113-004	-	U
Nominal values and limits from method PFP Well Install. Smpling. & Analys.				RDLs (pCi/g)	10	

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 7012-056 2σ prep error 20.0 % Reference Lab Notebook 7012 pg. 056																
B12XD2	R110100-01	93		2.7	0.100			24		100			38	11/16/01	11/19	GRB-101
BLK (QC ID=40201)	R110100-03	93		3.7	0.100			21		100				11/16/01	11/19	GRB-105
LCS (QC ID=40200)	R110100-02	93		3.2	0.100			21		100				11/16/01	11/24	GRB-114
Duplicate (R110100-01) (QC ID=40202)	R110100-04	93		3.7	0.100			25		100			38	11/16/01	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 4 SAMPLES
MDA 3.3 ± 0.96
RESIDUE 23 ± 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

Test 93B Matrix SOLID	Client Hanford
SDG 7113	Contract No. 630
Contact Melissa C. Mannion	Contract SDG H1543

METHOD SUMMARY

GROSS BETA IN SOIL

GAS PROPORTIONAL COUNTING

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta	
Preparation batch 7012-056						
B12XD2	R110100-01	93		7113-001	12.4	J
BLK (QC ID=40201)	R110100-03	93		7113-003	U	
LCS (QC ID=40200)	R110100-02	93		7113-002	ok	
Duplicate (R110100-01)	R110100-04	93		7113-004	ok	
Nominal values and limits from method				RDLs (pCi/g)	15	
PFP Well Install. Smpling. & Analys.						

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 7012-056	2σ prep error 15.0 % Reference Lab Notebook 7012 pg. 056															
B12XD2	R110100-01	93		5.3	0.100			24		100			38	11/16/01	11/19	GRB-101
BLK (QC ID=40201)	R110100-03	93		9.0	0.100			21		100				11/16/01	11/19	GRB-105
LCS (QC ID=40200)	R110100-02	93		9.1	0.100			21		100				11/16/01	11/24	GRB-114
Duplicate (R110100-01) (QC ID=40202)	R110100-04	93		9.3	0.100			25		100			38	11/16/01	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 4 SAMPLES				
	MDA	8.2	±	3.8
	RESIDUE	23	±	4

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	12/13/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1543

Test GAM Matrix SOLID
SDG 7113
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1543

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 7012-056								
B12XD2	R110100-01			7113-001	U		U	
BLK (QC ID=40201)	R110100-03			7113-003	U		U	
LCS (QC ID=40200)	R110100-02			7113-002	ok		ok	
Duplicate (R110100-01)	R110100-04			7113-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
PFP Well Install. Smpling. & Analys.								

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 7012-056	2σ prep error 15.0 % Reference Lab Notebook 7012 pg. 056															
B12XD2	R110100-01			0.058	755					106			39	11/19/01	11/20	02,01,00
BLK (QC ID=40201)	R110100-03			0.025	755					106				11/19/01	11/20	01,03,00
LCS (QC ID=40200)	R110100-02			0.032	755					107				11/19/01	11/20	MB,07,00
Duplicate (R110100-01) (QC ID=40202)	R110100-04			0.025	755					140			39	11/19/01	11/20	02,04,00
Nominal values and limits from method				0.050	755					100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.035 ± 0.031
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/13/01

A1543 K

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-03	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: H1543 (7113) 200 West; Well 299-W15-764; 60.0' - 62.5' depth	SAF No.: B01-113	
Ice Chest No.: ERC-01-027	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA TMA	Offsite Property No.: A020011	Bill of Lading/Air Bill No.: 4235 7954-8030	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 10/12/01. Collector not available to relinquish samples on 10/15/01 for shipment.

RT 10-15-01

SAMPLE ANALYSIS

Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	
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							
B12XD2	SOIL	10/12/01	0050		X	(2X)			X	B12XD1-

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	R. Nielson	10/12/01 0430	Stored in Ref #2C	10/12/01 0430
Relinquished By	Removed from Ref 2C 3728	10-15-01 0900	R. Thore	10-15-01 0900
Relinquished By	R. Thore ERC	10-15-01 0900	FED EX	10-15-01
Relinquished By	Fed Ex	10-16-01 9:45	Elvia R. Marstas	10-16-01
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

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

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

~~(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) - 9045C~~

~~(3) ICP Metals - 6010A (TCL) (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

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)

From: Melissa Mannion

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: BECHTEL HANFORD INC. Date/Time received 10-16-01 9:45

CoC No. B01-113-18

Container I.D. No. ERC-01-029 Requested TAT (Days) 45 DAYS 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: 2
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 Chris A. Maestas Date: 10-16-01 Time: 9:45 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 B01-112 H~~11543~~ H1543 **W.O.#:** 11343-606-001-9999-00
LVL#: 0110L105 cg 11/9/01 **Date Received:** 10-16-01

INORGANIC NARRATIVE

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

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

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

4. The cooler temperature was recorded on the chain of custody.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

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.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11-9-01
Date

njp\i10-105

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 12 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
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 11/09/01

CLIENT: TNUHANFORD B01-113 H1543 LVL LOT #: 0110L105

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12XD2	% Solids	96.4		%	0.01	1.0
		Chloride by IC	5.5		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.30	u	MG/KG	1.30	1.0
		Nitrate by IC	4.69		MG/KG	1.30	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Chromium VI	1.3		MG/KG	0.42	1.0
		Sulfate by IC	10		MG/KG	1.3	1.0
		Nitrate Nitrite	1.1		MG/KG	0.21	1.0
		Total Organic Carbon	111	u	MG/KG	111	1.0
		Oil & Grease Gravimetri	166		MG/KG	138	1.0
		Total Inorganic Carbon	1190		MG/KG	110	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/09/01

CLIENT: TNUHANFORD B01-113 H1543 LVL LOT #: 0110L105

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	01LVI084-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	01LN3A58-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	01LTZ035-MB1	Total Organic Carbon	20.0	u	MG/KG	20.0	1.0
BLANK10	01LOG037-MB1	Oil & Grease Gravimetri	133	u	MG/KG	133	1.0
BLANK10	01LTZA35-MB1	Total Inorganic Carbon	20.0	u	MG/KG	20.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/09/01

CLIENT: TNUHANFORD B01-113 H1543 LVL LOT #: 0110L105

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12XD2	Chloride by IC	32.0	5.5	25.9	102.1	1.0
		Fluoride by IC	56.0	0.35	51.9	107.2	1.0
		Nitrite by IC	25.6	1.30u	25.9	98.8	1.0
		Nitrate by IC	31.2	4.69	25.9	102.1	1.0
		Phosphate by IC	25.9	1.3 u	25.9	99.8	1.0
		Soluble Chromium VI	6.1	1.3	4.1	114.1	1.0
		Insoluble Chromium VI	1270	1.3	1340	95.1	100
		Sulfate by IC	36.8	10	25.9	103.7	1.0
		Nitrate Nitrite	6.0	1.1	5.3	92.0	1.0
		Total Organic Carbon	2300	0.0	2290	100.6	1.0
		Oil & Grease Gravimetr	5250	166	6060	84.0	1.0
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	01LVI084-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.3	1.0
		Insoluble Chromium VI	1400	0.40u	1350	103.6	100
BLANK10	01LN3A58-MB1	Nitrate Nitrite	5.2	0.20u	5.0	104.0	1.0
BLANK10	01LTZ035-MB1	Total Organic Carbon	401	20.0 u	400	100.2	1.0
BLANK10	01LOG037-MB1	Oil & Grease Gravimetr	5040	133 u	5840	86.3	1.0
BLANK10	01LTZA35-MB1	Total Inorganic Carbon	401	20.0 u	400	100.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/09/01

CLIENT: TNUHANFORD B01-113 H1543 LVL LOT #: 0110L105

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
~001REP	B12XD2	% Solids	96.4	96.3	0.11	1.0
		Chloride by IC	5.5	4.9	12.1	1.0
		Fluoride by IC	2.6 u	2.6 u	NC	1.0
		Nitrite by IC	1.30u	1.30u	NC	1.0
		Nitrate by IC	4.69	4.62	1.6	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	1.3	1.5	9.8	1.0
		Sulfate by IC	10	9.3	7.1	1.0
		Nitrate Nitrite	1.1	1.1	3.9	1.0
		Total Organic Carbon	111 u	113 u	NC	1.0
		Oil & Grease Gravimetri	166	180	8.0	1.0

Lionville Laboratory Use Only

0110L105

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TAU-HANFORD SAF 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: 10-16-01 Date Due: 11-15-01

		A	B			C	D		E		F	G				
Refrigerator #		1	6			1	6		6		6	6				
#/Type Container	Liquid	1AG	1AG			1AG	1AG		1AG		1AG	1AG				
	Solid															
Volume	Liquid															
	Solid	250	250			125	60		500		500	125				
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb	TIC TOC	OIL Grease		Metal	CN	IC Anions	Hex Chrom.				
Lionville Laboratory Use Only		0624X	0625X			ITIC IOCT	IOGGR		MET①		INORG①	ICRG				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	B12XD2	✓	✓	S	10-12-01	0050	X	X			X	X		X		X	X				

Special Instructions:

SAF # B01-113

DATE/REVISIONS:

MET① 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, P

INORG① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2

3.

4.

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # SEE BELOW
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. 4.0 °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

4235795480 41

Relinquished by	Received by	Date	Time
FEDEX	[illegible]	10-16-01	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-03	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; 60.0' - 62.5' depth	SAF No.: B01-113	Air Quality ☐
Ice Chest No.: ERC99-046	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A020023	Bill of Lading/Air Bill No.: 4238954-8041	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None 10-15-01	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 10-15-01	
No. of Container(s)	1		1	1	1	1	1	1		
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	100mL	
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										
B12XD2	SOIL	10/12/01	0050	X		X	X	X	X	X	X		B12XP1-A

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By	Date/Time
Relinquished By: Renee Nielson / R. Nielson	10/12/01 0430	Received By: Stored in Ref #2C	10/12/01 0430
Relinquished By: Removed from Ref 2C 3728	10-15-01 0900	Received By: R. Thorer	10-15-01 0900
Relinquished By: R. Thorer ERC	10-15-01 0900	Received By: FEDEX	
Relinquished By: FEDEX	10-16-01 0930	Received By: Carla Henry	10-16-01 0930
Relinquished By		Received By	
Relinquished By		Received By	

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 9/24/01
(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, Europium-152, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 -- Total Sr~~ RT 10.15.01

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: 10-16-01

SDG#: 01L105

Work Order Number: _____ SAF# B01-113

Shipping Container ID: 4235 7954 8041 Chain of Custody # B01-113-03

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 4.0
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 13
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: Carlos Hernandez Date: 10-16-01

Telephoned to: _____ On _____ By _____

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-113
LVL #: 0110L105
SDG/SAF #: H1543/B01-113

W.O. #: 11343-606-001-9999-00
Date Received: 10-16-2001

SEMIVOLATILE

One (1) soil sample was collected on 10-12-2001.

The sample and its associated QC samples were extracted on 10-18-2001 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 10-23-2001.

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. A non-target compound was detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. One (1) of twenty-two (22) matrix spike recoveries was outside EPA QC limits.
6. Two (2) of twenty-two (22) blank spike recoveries were outside EPA QC limits.
7. Internal standard area and retention time criteria were met.
8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor
President
Lionville Laboratory Incorporated

11/5/01
Date

som\gorup\data\bna\tnu-hanford-0110-105.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 11 pages.

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

GLOSSARY OF BNA DATA

DATA QUALIFIERS

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

GLOSSARY OF BNA DATA

ABBREVIATIONS

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

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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

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

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

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

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

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

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

Report Date: 10/24/01 12:53

RFW Batch Number: 0110L105 Client: TNUHANFORD B01-113 H1543 Work Order: 11343606001 Page: 1a

	Cust ID:	B12XD2		B12XD2		B12XD2		SBLKID		SBLKID BS		SBLKID BSD	
Sample Information	RFW#:	001		001 MS		001 MSD		01LE1248-MB1		01LE1248-MB1		01LE1248-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	90	%	69	%	85	%	85	%	75	%	82	%
	2-Fluorobiphenyl	80	%	62	%	77	%	81	%	69	%	78	%
	p-Terphenyl-d14	114	%	85	%	106	%	121	%	99	%	112	%
	Phenol-d5	91	%	66	%	77	%	84	%	75	%	82	%
	2-Fluorophenol	81	%	64	%	74	%	77	%	65	%	73	%
	2,4,6-Tribromophenol	93	%	66	%	85	%	87	%	90	%	95	%
			fl		fl		fl		fl		fl		fl
Phenol		350	U	61	%	72	%	330	U	69	%	73	%
bis(2-Chloroethyl)ether		350	U	350	U	350	U	330	U	330	U	330	U
2-Chlorophenol		350	U	63	%	74	%	330	U	69	%	74	%
1,3-Dichlorobenzene		350	U	350	U	350	U	330	U	330	U	330	U
1,4-Dichlorobenzene		350	U	56	%	65	%	330	U	62	%	67	%
1,2-Dichlorobenzene		350	U	350	U	350	U	330	U	330	U	330	U
2-Methylphenol		350	U	350	U	350	U	330	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		350	U	350	U	350	U	330	U	330	U	330	U
4-Methylphenol		350	U	350	U	350	U	330	U	330	U	330	U
N-Nitroso-Di-n-propylamine		350	U	57	%	72	%	330	U	80	%	81	%
Hexachloroethane		350	U	350	U	350	U	330	U	330	U	330	U
Nitrobenzene		350	U	350	U	350	U	330	U	330	U	330	U
Isophorone		350	U	350	U	350	U	330	U	330	U	330	U
2-Nitrophenol		350	U	350	U	350	U	330	U	330	U	330	U
2,4-Dimethylphenol		350	U	350	U	350	U	330	U	330	U	330	U
bis(2-Chloroethoxy)methane		350	U	350	U	350	U	330	U	330	U	330	U
2,4-Dichlorophenol		350	U	350	U	350	U	330	U	330	U	330	U
1,2,4-Trichlorobenzene		350	U	61	%	75	%	330	U	66	%	71	%
Naphthalene		350	U	350	U	350	U	330	U	330	U	330	U
4-Chloroaniline		350	U	350	U	350	U	330	U	330	U	330	U
Hexachlorobutadiene		350	U	350	U	350	U	330	U	330	U	330	U
4-Chloro-3-methylphenol		350	U	67	%	84	%	330	U	86	%	90	%
2-Methylnaphthalene		350	U	350	U	350	U	330	U	330	U	330	U
Hexachlorocyclopentadiene		350	U	350	U	350	U	330	U	330	U	330	U
2,4,6-Trichlorophenol		350	U	350	U	350	U	330	U	330	U	330	U
2,4,5-Trichlorophenol		860	U	860	U	860	U	830	U	830	U	830	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0110L105 Client: TNUHANFORD B01-113 H1543 Work Order: 11343606001 Page: 1b

Cust ID:	B12XD2		B12XD2		B12XD2		SBLKID		SBLKID BS		SBLKID BSD	
RFW#:	001		001 MS		001 MSD		01LE1248-MB1		01LE1248-MB1		01LE1248-MB1	
2-Chloronaphthalene	350	U	350	U	350	U	330	U	330	U	330	U
2-Nitroaniline	860	U	860	U	860	U	830	U	830	U	830	U
Dimethylphthalate	350	U	350	U	350	U	330	U	330	U	330	U
Acenaphthylene	350	U	350	U	350	U	330	U	330	U	330	U
2,6-Dinitrotoluene	350	U	350	U	350	U	330	U	330	U	330	U
3-Nitroaniline	860	U	860	U	860	U	830	U	830	U	830	U
Acenaphthene	350	U	63	%	79	%	330	U	72	%	80	%
2,4-Dinitrophenol	860	U	860	U	860	U	830	U	830	U	830	U
4-Nitrophenol	860	U	72	%	91	%	830	U	100	%	103	%
Dibenzofuran	350	U	350	U	350	U	330	U	330	U	330	U
2,4-Dinitrotoluene	350	U	73	%	91 *	%	330	U	95 *	%	100 *	%
Diethylphthalate	350	U	350	U	350	U	330	U	330	U	330	U
4-Chlorophenyl-phenylether	350	U	350	U	350	U	330	U	330	U	330	U
Fluorene	350	U	350	U	350	U	330	U	330	U	330	U
4-Nitroaniline	860	U	860	U	860	U	830	U	830	U	830	U
4,6-Dinitro-2-methylphenol	860	U	860	U	860	U	830	U	830	U	830	U
N-Nitrosodiphenylamine (1)	350	U	350	U	350	U	330	U	330	U	330	U
4-Bromophenyl-phenylether	350	U	350	U	350	U	330	U	330	U	330	U
Hexachlorobenzene	350	U	350	U	350	U	330	U	330	U	330	U
Pentachlorophenol	860	U	65	%	82	%	830	U	87	%	94	%
Phenanthrene	350	U	350	U	350	U	330	U	330	U	330	U
Anthracene	350	U	350	U	350	U	330	U	330	U	330	U
Carbazole	350	U	350	U	350	U	330	U	330	U	330	U
Di-n-Butylphthalate	350	U	350	U	350	U	330	U	330	U	330	U
Fluoranthene	350	U	350	U	350	U	330	U	330	U	330	U
Pyrene	350	U	74	%	94	%	330	U	89	%	99	%
Butylbenzylphthalate	350	U	350	U	350	U	330	U	330	U	330	U
3,3'-Dichlorobenzidine	350	U	350	U	350	U	330	U	330	U	330	U
Benzo(a)anthracene	350	U	350	U	350	U	330	U	330	U	330	U
Chrysene	350	U	350	U	350	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	350	U	350	U	350	U	330	U	330	U	330	U
Di-n-Octyl phthalate	350	U	350	U	350	U	330	U	330	U	330	U
Benzo(b)fluoranthene	350	U	350	U	350	U	330	U	330	U	330	U
Benzo(k)fluoranthene	350	U	350	U	350	U	330	U	330	U	330	U
Benzo(a)pyrene	350	U	350	U	350	U	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	350	U	350	U	350	U	330	U	330	U	330	U
Dibenzo(a,h)anthracene	350	U	350	U	350	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	350	U	350	U	350	U	330	U	330	U	330	U
Tributylphosphate	350	U	350	U	350	U	330	U	330	U	330	U

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B12XD2

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

Client: TNUHANFORD B01-113 H1543

Matrix: (soil/water) SOIL

Lab Sample ID: 0110L105-001

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

Lab File ID: D102310

Level: (low/med) LOW

Date Received: 10/16/01

% Moisture: 4 decanted: (Y/N)__

Date Extracted: 10/18/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 10/23/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.077	400	JB

8

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKID

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

Client: TNUHANFORD B01-113 H1543

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE1248-MB1

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

Lab File ID: D102307

Level: (low/med) LOW

Date Received: 10/18/01

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

Date Extracted: 10/18/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 10/23/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: _____

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.085	400	J

9

Lionville Laboratory Use Only

0110L105

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD SAF 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: 10-16-01 Date Due: 11-15-01

		A	B			C	D		E		F	G				
Refrigerator #		1	6			1	6		6		6	6				
#/Type Container	Liquid	1AG	1AG			1AG	1AG		1AG		1AG	1AG				
	Solid															
Volume	Liquid															
	Solid	250	250			125	60		500		500	125				
Preservatives																
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb	TIC TOC	OIL GREASE		INORG: Metal	CN	I.C. Anions	HEX Chrom.				
Lionville Laboratory Use Only		0624X	0625X			ITIC IOLT	IOGGR		MET①		INORG①	ICRL				

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			ITIC IOLT	IOGGR		MET①		INORG①	ICRL				
001	B12XD2	✓	✓	S	10-12-01	0050	X	X			X	X		X		X	X				

Special Instructions:

SAF # B01-113

DATE/REVISIONS:

1. MET① Cd, Ca, Cr, Fe, Mg, Ni, Na, P
2. INORG① ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2
3.
4.
5.
6.

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Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # See Below
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. 4.0 °C

Relinquished by	Received by	Date	Time
FEDEX	[signature]	10-16-01	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

4275795 4 8041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-03	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; 60.0' - 62.5' depth	SAF No.: B01-113	
Ice Chest No.: ERC99-046	Field Logbook No.: EL-1562	COA: T20ZP1D722	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A020023	Bill of Lading/Air Bill No.: 42357954-8041	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None RJN 10/15/01	Cool 4C	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	aG RJN 10/15/01	
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										
B12XD2	SOIL	10/12/01	0050	X		X	X	X	X	X	X		B12XD1-4

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Renee Nielson / R. Nielson	Date/Time: 10/12/01 0430	Received By: Stored in Ref #2C	Date/Time: 10/12/01 0430
Relinquished By: Removed from Ref 2C 3728	Date/Time: 10-15-01 0900	Received By: R Thorer	Date/Time: 10-15-01 0900
Relinquished By: R Thorer ERC	Date/Time: 10-15-01 0900	Received By: FEDEX	Date/Time:
Relinquished By: FEDEX	Date/Time: 10-16-01 0930	Received By: Carl Hemp	Date/Time: 10-16-01 0930
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, Europium-154, Europium-155, Ruthenium-106); Americium-241, Neptunium-237, Isotopic Plutonium, Strontium-89,90 -- Total Sr~~ RT 10/15/01

Matrix *

S=Soil
SB=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 #: 0110L105
SDG/SAF #: H1543/B01-113

W.O. #: 11343-606-001-9999-00
Date Received: 10-16-2001

GC/MS VOLATILE

One (1) soil sample was collected on 10-12-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for 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. The sample was analyzed within required holding time.
3. Non-target compounds were not detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. 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\0110-105.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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

GLOSSARY OF VOA DATA

ABBREVIATIONS

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

LIONVILLE LABORATORY INC.

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.

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TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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

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

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

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

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

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

Lionville Laboratory, Inc.

Volatiles By GC/MS, Special List

Report Date: 11/03/01 09:26

RFW Batch Number: **0110L105** Client: **TNUHANFORD B01-113 H1543** Work Order: 11343606001 Page: 1a

	Cust ID:	B12XD2		B12XD2		B12XD2		VBLKWV		VBLKWV BS	
Sample Information	RFW#:	001		001 MS		001 MSD		01LVX455-MB1		01LVX455-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	0.926		0.980		0.943		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	107	%	96	%	93	%	94	%	92	%
	Bromofluorobenzene	118	%	108	%	108	%	116	%	100	%
	1,2-Dichloroethane-d4	109	%	99	%	102	%	94	%	87	%
Chloromethane		10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U
Methylene Chloride		6		5	U	2	J	5	U	5	U
Acetone		10	U	3	JB	10	U	1	J	1	JB
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	98	%	94	%	5	U	90	%
1,1-Dichloroethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	5	U	5	U
Chloroform		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U	5	U	5	U
Bromodichloromethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	106	%	98	%	5	U	99	%
Dibromochloromethane		5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Benzene		5	U	97	%	93	%	5	U	92	%
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	5	U	5	U
Toluene		5	U	96	%	91	%	5	U	89	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0110L105** Client: **TNUHANFORD B01-113 H1543** Work Order: 11343606001 Page: 1b

Cust ID:	B12XD2	B12XD2	B12XD2	VBLKWV	VBLKWV BS
RFW#:	001	001 MS	001 MSD	01LVX455-MB1	01LVX455-MB1
Chlorobenzene	5 U	99 %	97 %	5 U	94 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U
N-butylbenzene	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

0110L105

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TAIU-HANFORD SAF 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: 10-16-01 Date Due: 11-15-01

		A	B			C	D		E		F	G				
Refrigerator #		1	6			1	6		6		6	6				
#/Type Container	Liquid	1AG	1AG			1AG	1AG		1AG		1AG	1AG				
	Solid															
Volume	Liquid															
	Solid	250	250			125	60		500		500	125				
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb	TIC TOC	OIL GREASE		Metal	CN	I.C Anions	HEX Chrom.				
Lionville Laboratory Use Only		0624X	0625X			ITIC IOCT	IOGGR		MET①		INREG①	ICRL				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	B12XD2	✓	✓	S	10-12-01	0050	X	X			X	X		X		X	X				

Special Instructions:

SAF # B01-113

DATE/REVISIONS:

MET① 1. Cd, Ca, Cr, Fe, Mg, Ni, Na P

INORG① 2. ICCL, ICFL, ICNO3 ICNO2, ICPO4, ICSO4, IN3N2

3.

4.

5.

6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # SEE BELOW
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. 4.0 °C

Relinquished by	Received by	Date	Time
FEDEX	[illegible]	10-16-01	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

4237795 4 8041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-03	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; 60.0' - 62.5' depth	SAF No.: B01-113		
Ice Chest No.: ERC99-046	Field Logbook No.: EV-1562; COA: T20ZP1D722	Method of Shipment: Federal Express		
Shipped To: TMA/RECRA	Offsite Property No.: A020023	Bill of Lading/Air Bill No.: 4238795 4-8041		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None RN 10.15.01	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG	sG RN 10.15.01		
No. of Container(s)	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								
B12XD2	SOIL	10/12/01	0050	X		X	X	X	X	X	X	B12XD1

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Renee Nielson / R. Nielson	10/12/01 0430	Stored in Ref #2C	10/12/01 0430
Removed from Ref 2C 3728	10-15-01 0900	R Thorer	10-15-01 0900
R Thorer ERC	10-15-01 0900	FEDEX	
FEDEX	10-16-01 0930	Carla Bennett	10-16-01 0930

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 9/24/01

(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 10.15.01

Matrix *: S=Soil; SB=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.

Analytical Report

Client: TNU-HANFORD B01-113
LVL#: 0110L105
SDG/SAF#: H1543/B01-113

W.O.#: 11343-606-001-9999-00
Date Received: 10-16-01

METALS CASE NARRATIVE

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

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

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) recovery for 1 analyte was 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
B12XD2	Iron	20,000	85.1

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 13 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/m10-105

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#: 01 10 L1 05

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

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 H1543

LVL LOT #: 0110L105

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12XD2	Calcium, Total	9100	MG/KG	0.91	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	10.2	MG/KG	0.06	1.0
		Iron, Total	17400	MG/KG	1.8	1.0
		Magnesium, Total	5090	MG/KG	0.42	1.0
		Sodium, Total	225	MG/KG	0.37	1.0
		Nickel, Total	9.0	MG/KG	0.10	1.0
		Phosphorus, Total	469	MG/KG	0.51	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/02/01

CLIENT: TNUHANFORD B01-113 H1543

LVL LOT #: 0110L105

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 H1543

LVL LOT #: 0110L105

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12XD2	Calcium, Total	11800	9100	2570	105.2	1.0
		Cadmium, Total	4.6	0.03u	5.1	90.2	1.0
		Chromium, Total	28.9	10.2	20.5	91.2	1.0
		Iron, Total	17500	17400	103	144.6*	1.0
		Magnesium, Total	7470	5090	2570	92.7	1.0
		Sodium, Total	2780	225	2570	99.3	1.0
		Nickel, Total	55.0	9.0	51.3	89.7	1.0
		Phosphorus, Total	909	469	514	85.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/02/01

CLIENT: TNUHANFORD B01-113 H1543 LVL LOT #: 0110L105

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12XD2	Calcium, Total	9100	8940	1.8	1.0
		Cadmium, Total	0.03u	0.03u	NC	1.0
		Chromium, Total	10.2	10.7	4.8	1.0
		Iron, Total	17400	17800	2.6	1.0
		Magnesium, Total	5090	5180	1.6	1.0
		Sodium, Total	225	221	1.9	1.0
		Nickel, Total	9.0	8.8	2.2	1.0
		Phosphorus, Total	469	425	9.8	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/02/01

CLIENT: TNUHANFORD B01-113 H1543 LVL LOT #: 0110L105

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

0110L105

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI Lionville Laboratory, Inc.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TAIV-HANFORD SAF 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: 10-16-01 Date Due: 11-15-01

		A	B			C	D		E		F	G				
Refrigerator #		1	6			1	6		6		6	6				
#/Type Container	Liquid	1AG	1AG			1AG	1AG		1AG		1AG	1AG				
	Solid															
Volume	Liquid															
	Solid	250	250			125	60		500		500	125				
Preservatives																
ANALYSES REQUESTED →		ORGANIC: VOA	ORGANIC: BNA	ORGANIC: Pest/PCB	ORGANIC: Herb	TIC TOC	OIL GREASE		INORG: Metal	INORG: CN	I.C Anions	HEX Chrom.				
Lionville Laboratory Use Only		0624X	0625X			ITIC IOCT	IOGGR		MET①		INORG①	ICRG				

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			ITIC IOCT	IOGGR		MET①		INORG①	ICRG				
001	B12XD2	✓	✓	S	10-12-01	0050	X	X			X	X		X		X	X				

Special Instructions:

SAF # B01-113

DATE/REVISIONS:

MET① 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, P

INORG① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2

3.

4.

5.

6.

Relinquished by	Received by	Date	Time
FedEx	[illegible]	10-16-01	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 4035795480 41

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # SEE BELOW
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. 4.0 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-113-03	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; 60.0' - 62.5' depth	SAF No.: B01-113	
Ice Chest No.: ERC99-046	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A020023	Bill of Lading/Air Bill No.: 4235795 4-8041	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None R 10.15.01	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None		
Type of Container	aG	10	aG	aG	aG	aG	aG	aG	R 10.15.01		
No. of Container(s)	1		1	1	1	1	1	1			
Volume	60mL	60mL	120mL	120mL	250mL	250mL	500mL	500mL	100mL		
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								
B12XD2	SOIL	10/12/01	0050	X		X	X	X	X	X	X	B12XD1-A

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Renee Nielson / R. Nielson	10/12/01 0430	Stored in Ref #2C	10/12/01 0430
Removed from Ref 2C 3728	10-15-01 0900	R Thorer	10-15-01 0900
R Thorer ERC	10-15-01 0900	FEDEX	
FEDEX	10-16-01 0930	Carla Bennett	10-16-01 0930

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, Europium-154, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 -- Total Sr~~ RT 10.15.01

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

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

BHFEE-011 (10/99)