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1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1414 was composed of one solid (soil) sample designated under SAF No. B01-058 with a Project Designation of: 200-TW-1 & 2 – Soil Sampling.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. SDG H1414 (7032) was batched with SDG H1413 (7031).

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The tritium matrix spike was associated with SDG H1413 (7031). The H3 activity in sample B125X6 (11,752 dpm per aliquot [20 grams]) was approximately five-times greater than the matrix spike (2,244 dpm per aliquot) activity added to the sample. Thus, the matrix spike recovery (72%) is indeterminate. No other problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.5 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.9 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.10 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.11 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.12 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

8/23/01

Date

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

SDG 7032
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1414

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B125X7	T-26/200 W	SOLID		R107049-01	B01-058	B01-058-7	07/09/01 02:00
Method Blank		SOLID		R107027-06	B01-058		
Lab Control Sample		SOLID		R107027-05	B01-058		
Duplicate (R107049-01)	T-26/200 W	SOLID		R107049-02	B01-058		07/09/01 02:00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

SDG 7032
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1414

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
7031		Method Blank	SOLID						R107027-06	7031-006
		Lab Control Sample	SOLID						R107027-05	7031-005
7032	B01-058-7	B125X7	SOLID	97.9	398.4 g		07/10/01	1	R107049-01	7032-001
		Duplicate (R107049-01)	SOLID	97.9	398.4 g		07/10/01	1	R107049-02	7032-002

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

SDG 7032
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1414

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6994-099	5.0	1			1	1	1/1		
NP	SOLID	Neptunium in Soil	6994-099	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6994-099	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6994-099	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6994-099	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6994-099	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6994-099	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6994-099	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	6994-099	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	6994-099	10.0	1			1	1	1/1		
H	SOLID	Tritium in Soil	6994-099	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Soil	6994-099	10.0	1			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
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Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

SDG 7032
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1414

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B125X7			R107049-01	7032-001	AM		07/26/01	08/23/01	MCM	Americium 241 in Soil
T-26/200 W		SOLID	07/09/01	7032-001	C		08/10/01	08/23/01	MCM	Carbon 14 in Soil
B01-058-7	B01-058		07/10/01	7032-001	GAM		07/20/01	08/23/01	MCM	Gamma Scan
				7032-001	H		08/06/01	08/23/01	MCM	Tritium in Soil
				7032-001	NI_L		07/19/01	08/23/01	MCM	Nickel 63 in Soil
				7032-001	NP		07/19/01	08/23/01	MCM	Neptunium in Soil
				7032-001	PU		07/24/01	08/23/01	MCM	Plutonium, Isotopic in Solids
				7032-001	SR		07/19/01	08/23/01	MCM	Total Strontium in Soil
				7032-001	TC		08/01/01	08/23/01	MCM	Technetium 99 in Soil
				7032-001	TH		07/26/01	08/23/01	MCM	Thorium, Isotopic in Soil
				7032-001	U		07/19/01	08/23/01	MCM	Uranium, Isotopic in Soil
				7032-001	U_T		08/08/01	08/23/01	MCM	Uranium, Total in Soil
Method Blank			R107027-06	7031-006	AM		07/26/01	08/16/01	MCM	Americium 241 in Soil
		SOLID		7031-006	C		08/10/01	08/16/01	MCM	Carbon 14 in Soil
	B01-058			7031-006	GAM		07/20/01	08/16/01	MCM	Gamma Scan
				7031-006	H		08/06/01	08/16/01	MCM	Tritium in Soil
				7031-006	NI_L		07/19/01	08/16/01	MCM	Nickel 63 in Soil
				7031-006	NP		07/19/01	08/16/01	MCM	Neptunium in Soil
				7031-006	PU		07/24/01	08/16/01	MCM	Plutonium, Isotopic in Solids
				7031-006	SR		07/19/01	08/16/01	MCM	Total Strontium in Soil
				7031-006	TC		08/01/01	08/16/01	MCM	Technetium 99 in Soil
				7031-006	TH		07/26/01	08/16/01	MCM	Thorium, Isotopic in Soil
				7031-006	U		07/18/01	08/16/01	MCM	Uranium, Isotopic in Soil
				7031-006	U_T		08/08/01	08/16/01	MCM	Uranium, Total in Soil
Lab Control Sample			R107027-05	7031-005	AM		07/26/01	08/16/01	MCM	Americium 241 in Soil
		SOLID		7031-005	C		08/10/01	08/16/01	MCM	Carbon 14 in Soil
	B01-058			7031-005	GAM		07/20/01	08/16/01	MCM	Gamma Scan
				7031-005	H		08/06/01	08/16/01	MCM	Tritium in Soil
				7031-005	NI_L		07/19/01	08/16/01	MCM	Nickel 63 in Soil
				7031-005	NP		07/19/01	08/16/01	MCM	Neptunium in Soil
				7031-005	PU		07/24/01	08/16/01	MCM	Plutonium, Isotopic in Solids
				7031-005	SR		07/19/01	08/16/01	MCM	Total Strontium in Soil
				7031-005	TC		07/31/01	08/16/01	MCM	Technetium 99 in Soil
				7031-005	TH		07/26/01	08/16/01	MCM	Thorium, Isotopic in Soil
				7031-005	U		07/18/01	08/16/01	MCM	Uranium, Isotopic in Soil
				7031-005	U_T		08/08/01	08/16/01	MCM	Uranium, Total in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

SDG 7032
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1414

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R107049-01)			R107049-02	7032-002	AM		07/26/01	08/23/01	MCM	Americium 241 in Soil
T-26/200 W		SOLID	07/09/01	7032-002	C		08/10/01	08/23/01	MCM	Carbon 14 in Soil
	B01-058		07/10/01	7032-002	GAM		07/20/01	08/23/01	MCM	Gamma Scan
				7032-002	H		08/06/01	08/23/01	MCM	Tritium in Soil
				7032-002	NI_L		07/19/01	08/23/01	MCM	Nickel 63 in Soil
				7032-002	NP		07/19/01	08/23/01	MCM	Neptunium in Soil
				7032-002	PU		07/24/01	08/23/01	MCM	Plutonium, Isotopic in Solids
				7032-002	SR		07/19/01	08/23/01	MCM	Total Strontium in Soil
				7032-002	TC		08/01/01	08/23/01	MCM	Technetium 99 in Soil
				7032-002	TH		07/26/01	08/23/01	MCM	Thorium, Isotopic in Soil
				7032-002	U		07/19/01	08/23/01	MCM	Uranium, Isotopic in Soil
				7032-002	U_T		08/08/01	08/23/01	MCM	Uranium, Total in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B01-058	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
C	B01-058	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1	4
GAM	B01-058	Gamma Scan	GAMMA_GS	1			1	1	1	4
H	B01-058	Tritium in Soil	906.0_H3_LSC	1			1	1	1	4
NI_L	B01-058	Nickel 63 in Soil	NI63_LSC	1			1	1	1	4
NP	B01-058	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	B01-058	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	B01-058	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TC	B01-058	Technetium 99 in Soil	TC99_TR_SEP_LSC	1			1	1	1	4
TH	B01-058	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1	4
U	B01-058	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1			1	1	1	4
U_T	B01-058	Uranium, Total in Soil	UTOT_KPA	1			1	1	1	4
TOTALS				12			12	12	12	48

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

SAMPLE DELIVERY GROUP H1414

R107027-06 **Method Blank**

M E T H O D B L A N K

SDG	7032	Client/Case no	Hanford	SDG H1414	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R107027-06	Client sample id	Method Blank		
Dept sample id	7031-006	Material/Matrix		SOLID	
		SAF No	B01-058		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.300	0.17	0.31	400	U	H
Carbon 14	14762-75-5	0.065	3.0	5.0	50	U	C
Nickel 63	13981-37-8	-0.156	1.2	2.1	30	U	NI_L
Total Strontium	SR-RAD	-0.087	0.18	0.24	1.0	U	SR
Americium 241	14596-10-2	-0.062	0.12	0.30	1.0	U	AM
Technetium 99	14133-76-7	-0.063	0.18	0.57	15	U	TC
Thorium 228	14274-82-9	-0.018	0.036	0.091		U	TH
Thorium 230	14269-63-7	0.142	0.15	0.29	1.0	U	TH
Thorium 232	TH-232	0.012	0.035	0.045	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.001	0.002	0.10	U	U_T
Uranium 233	U-233/234	0	0.048	0.18	1.0	U	U
Uranium 235	15117-96-1	0	0.059	0.22	1.0	U	U
Uranium 238	U-238	0	0.048	0.18	1.0	U	U
Neptunium 237	13994-20-2	0	0.10	0.15	1.0	U	NP
Plutonium 238	13981-16-3	-0.041	0.082	0.31	1.0	U	PU
Plutonium 239/240	PU-239/240	0.082	0.082	0.31	1.0	U	PU
Potassium 40	13966-00-2	U		1.1		U	GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Cesium 137	10045-97-3	U		0.043	0.10	U	GAM
Radium 226	13982-63-3	U		0.080	0.10	U	GAM
Radium 228	15262-20-1	U		0.19	0.20	U	GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.066	0.10	U	GAM
Thorium 228	14274-82-9	U		0.049		U	GAM
Thorium 232	TH-232	U		0.19		U	GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Americium 241	14596-10-2	U		0.035		U	GAM

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/23/01

BLANK, cont.

SDG	7032	Client/Case no	Hanford	SDG H1414	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R107027-06	Client sample id	Method Blank		
Dept sample id	7031-006	Material/Matrix		SOLID	
		SAF No	B01-058		

QC-BLANK 39189

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

R107027-05 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7032
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1414
Case no No. 630

Lab sample id R107027-05
Dept sample id 7031-005

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-058

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
Tritium	23.5	0.54	0.31	400	J	H	24.0	0.96	98	84-116	80-120
Carbon 14	10400	210	31	50		C	11300	450	92	85-115	80-120
Nickel 63	222	4.7	2.4	30		NI_L	232	9.3	96	84-116	80-120
Total Strontium	23.3	0.58	0.21	1.0		SR	22.0	0.88	106	83-117	80-120
Americium 241	19.2	1.9	0.18	1.0		AM	19.1	0.76	100	82-118	80-120
Technetium 99	117	2.2	0.52	15		TC	118	4.7	99	84-116	80-120
Thorium 230	42.2	2.6	0.36	1.0		TH	40.8	1.6	103	86-114	80-120
Total Uranium (ug/g)	13.7	1.6	0.022	0.10		U_T	14.4	0.58	95	78-122	80-120
Uranium 233	19.8	2.3	1.1	1.0		U	18.6	0.74	106	79-121	80-120
Uranium 235	14.8	1.9	0.29	1.0		U	15.1	0.60	98	79-121	80-120
Uranium 238	20.7	2.3	1.0	1.0		U	20.2	0.81	102	80-120	80-120
Neptunium 237	20.1	2.2	0.18	1.0		NP	21.2	0.85	95	82-118	80-120
Plutonium 238	23.7	2.6	0.25	1.0		PU	24.8	0.99	96	82-118	80-120
Plutonium 239/240	26.0	2.8	0.25	1.0		PU	26.4	1.1	98	81-119	80-120
Cobalt 60	1.30	0.066	0.027	0.050		GAM	1.31	0.052	99	76-124	80-120
Cesium 137	1.31	0.058	0.038	0.10		GAM	1.36	0.054	96	77-123	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS 39188

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

R107049-02 B125X7

DUPLICATE

SDG	7032			Client/Case no	Hanford SDG H1414
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R107049-02	Lab sample id	R107049-01	Client sample id	B125X7
Dept sample id	7032-002	Dept sample id	7032-001	Location/Matrix	T-26/200 W SOLID
		Received	07/10/01	Collected/Weight	07/09/01 02:00 398.4 g
% solids	97.9	% solids	97.9	Custody/SAF No	B01-058-7 B01-058

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
Tritium	0.065	0.12	0.20	400	U	H	-0.031	0.060	0.10	U	-	
Carbon 14	1.31	2.6	4.3	50	U	C	-0.298	2.5	4.3	U	-	
Nickel 63	0.251	1.4	2.3	30	U	NI_L	0.154	1.4	2.3	U	-	
Total Strontium	0.044	0.11	0.22	1.0	U	SR	0.092	0.11	0.20	U	-	
Americium 241	0.059	0.12	0.23	1.0	U	AM	0	0.20	0.37	U	-	
Technetium 99	2.39	0.30	0.43	15	J	TC	2.36	0.30	0.45	J	1	34
Thorium 228	0.726	0.37	0.41			TH	0.943	0.43	0.44		26	102
Thorium 230	0.181	0.30	0.40	1.0	U	TH	0.030	0.24	0.41	U	-	
Thorium 232	0.453	0.24	0.23	1.0	J	TH	0.425	0.24	0.23	J	6	116
Total Uranium (ug/g)	1.82	0.25	0.22	0.10		U_T	1.83	0.25	0.22		1	35
Uranium 233	0.500	0.23	0.17	1.0	J	U	0.298	0.20	0.19	J	51	115
Uranium 235	0	0.055	0.21	1.0	U	U	0	0.060	0.23	U	-	
Uranium 238	0.273	0.14	0.17	1.0	J	U	0.372	0.20	0.19	J	31	114
Neptunium 237	0.021	0.021	0.016	1.0	J	NP	0.013	0.025	0.049	U	47	288
Plutonium 238	0	0.052	0.20	1.0	U	PU	0.031	0.12	0.24	U	-	
Plutonium 239/240	0.052	0.053	0.20	1.0	U	PU	0.062	0.062	0.24	U	-	
Potassium 40	9.90	0.64	0.41			GAM	8.08	0.63	0.31		20	35
Cobalt 60	U		0.036	0.050	U	GAM	U		0.037	U	-	
Cesium 137	U		0.028	0.10	U	GAM	U		0.035	U	-	
Radium 226	0.305	0.060	0.065	0.10		GAM	0.345	0.071	0.068		12	53
Radium 228	0.624	0.16	0.15	0.20		GAM	0.405	0.13	0.14		43	68
Europium 152	U		0.074	0.10	U	GAM	U		0.084	U	-	
Europium 154	U		0.10	0.10	U	GAM	U		0.11	U	-	
Europium 155	U		0.070	0.10	U	GAM	U		0.082	U	-	
Thorium 228	0.489	0.036	0.035			GAM	0.379	0.035	0.039		25	36
Thorium 232	0.624	0.16	0.15			GAM	0.405	0.13	0.14		43	68
Uranium 235	U		0.11		U	GAM	U		0.12	U	-	
Uranium 238	U		3.9		U	GAM	U		4.0	U	-	

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

R107049-02 B125X7

DUPLICATE, cont.

SDG	7032			Client/Case no	Hanford SDG H1414
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R107049-02	Lab sample id	R107049-01	Client sample id	B125X7
Dept sample id	7032-002	Dept sample id	7032-001	Location/Matrix	T-26/200 W SOLID
		Received	07/10/01	Collected/Weight	07/09/01 02:00 398.4 g
% solids	97.9	% solids	97.9	Custody/SAF No	B01-058-7 B01-058

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
Americium 241	U		0.076		U	GAM	U		0.13	U	-	

200-TW-1 & 2 - Soil Sampling

QC-DUP#1 39224

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

R107049-01 B125X7

DATA SHEET

SDG	7032	Client/Case no	Hanford	SDG_H1414	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R107049-01	Client sample id	B125X7		
Dept sample id	7032-001	Location/Matrix	T-26/200 W	SOLID	
Received	07/10/01	Collected/Weight	07/09/01 02:00	398.4 g	
% solids	97.9	Custody/SAF No	B01-058-7	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.031	0.060	0.10	400	U	H
Carbon 14	14762-75-5	-0.298	2.5	4.3	50	U	C
Nickel 63	13981-37-8	0.154	1.4	2.3	30	U	NI_L
Total Strontium	SR-RAD	0.092	0.11	0.20	1.0	U	SR
Americium 241	14596-10-2	0	0.20	0.37	1.0	U	AM
Technetium 99	14133-76-7	2.36	0.30	0.45	15	J	TC
Thorium 228	14274-82-9	0.943	0.43	0.44			TH
Thorium 230	14269-63-7	0.030	0.24	0.41	1.0	U	TH
Thorium 232	TH-232	0.425	0.24	0.23	1.0	J	TH
Total Uranium (ug/g)	7440-61-1	1.83	0.25	0.22	0.10		U_T
Uranium 233	U-233/234	0.298	0.20	0.19	1.0	J	U
Uranium 235	15117-96-1	0	0.060	0.23	1.0	U	U
Uranium 238	U-238	0.372	0.20	0.19	1.0	J	U
Neptunium 237	13994-20-2	0.013	0.025	0.049	1.0	U	NP
Plutonium 238	13981-16-3	0.031	0.12	0.24	1.0	U	PU
Plutonium 239/240	PU-239/240	0.062	0.062	0.24	1.0	U	PU
Potassium 40	13966-00-2	8.08	0.63	0.31			GAM
Cobalt 60	10198-40-0	U		0.037	0.050	U	GAM
Cesium 137	10045-97-3	U		0.035	0.10	U	GAM
Radium 226	13982-63-3	0.345	0.071	0.068	0.10		GAM
Radium 228	15262-20-1	0.405	0.13	0.14	0.20		GAM
Europium 152	14683-23-9	U		0.084	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.082	0.10	U	GAM
Thorium 228	14274-82-9	0.379	0.035	0.039			GAM
Thorium 232	TH-232	0.405	0.13	0.14			GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		4.0		U	GAM

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

R107049-01 B125X7

DATA SHEET, cont

SDG	7032	Client/Case no	Hanford	SDG H1414	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R107049-01	Client sample id	B125X7		
Dept sample id	7032-001	Location/Matrix	T-26/200 W	SOLID	
Received	07/10/01	Collected/Weight	07/09/01 02:00	398.4 g	
% solids	97.9	Custody/SAF No	B01-058-7	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		0.13		U	GAM

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test AM Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 6994-099						
B125X7	R107049-01			7032-001	U	
BLK (QC ID=39189)	R107027-06			7031-006	U	
LCS (QC ID=39188)	R107027-05			7031-005	ok	
Duplicate (R107049-01)	R107049-02			7032-002	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6994-099 2σ prep error 5.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.37	0.500			67		103			17	07/26/01	07/26	SS-041
BLK (QC ID=39189)	R107027-06			0.30	0.500			73		103				07/26/01	07/26	SS-033
LCS (QC ID=39188)	R107027-05			0.18	0.500			93		103				07/26/01	07/26	SS-032
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.23	0.500			77		103			17	07/26/01	07/26	SS-042
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 0.27 ± 0.17
YIELD 78 ± 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test NP Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 6994-099						
B125X7	R107049-01			7032-001	U	
BLK (QC ID=39189)	R107027-06			7031-006	U	
LCS (QC ID=39188)	R107027-05			7031-005	ok	
Duplicate (R107049-01)	R107049-02			7032-002	ok	J
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6994-099 2σ prep error 5.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.049	0.500			55		665			10	07/18/01	07/19	SS-043
BLK (QC ID=39189)	R107027-06			0.15	0.500			43		101				07/18/01	07/19	SS-032
LCS (QC ID=39188)	R107027-05			0.18	0.500			38		101				07/18/01	07/19	SS-031
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.016	0.500			64		655			10	07/18/01	07/19	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 4 SAMPLES
MDA 0.099 ± 0.16
YIELD 50 ± 23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test PU Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6994-099								
B125X7	R107049-01			7032-001	U		U	
BLK (QC ID=39189)	R107027-06			7031-006	U		U	
LCS (QC ID=39188)	R107027-05			7031-005	ok		ok	
Duplicate (R107049-01)	R107049-02			7032-002	-	U	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				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 6994-099 2σ prep error 5.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.24	0.500			76		100			15	07/24/01	07/24	SS-029
BLK (QC ID=39189)	R107027-06			0.31	0.500			59		100				07/24/01	07/24	SS-027
LCS (QC ID=39188)	R107027-05			0.25	0.500			71		101				07/24/01	07/24	SS-042
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.20	0.500			87		101			15	07/24/01	07/24	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 ± 0.091
YIELD 73 ± 23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test TH Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6994-099							
B125X7	R107049-01			7032-001	0.943	U	0.425 J
BLK (QC ID=39189)	R107027-06			7031-006	U	U	U
LCS (QC ID=39188)	R107027-05			7031-005		ok	
Duplicate (R107049-01)	R107049-02			7032-002	ok	- U	ok J
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				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 6994-099	2σ prep error 5.0 %				Reference Lab Notebook 6994 pg. 099											
B125X7	R107049-01			0.41	0.250			96		234			17	07/24/01	07/26	SS-022
BLK (QC ID=39189)	R107027-06			0.29	0.250			86		890				07/24/01	07/26	SS-044
LCS (QC ID=39188)	R107027-05			0.36	0.250			94		226				07/24/01	07/26	SS-044
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.40	0.250			92		235			17	07/24/01	07/26	SS-024
Nominal values and limits from method				1.0	0.250			20-105		150			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.36	±	0.11
	YIELD	92	±	9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test U Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 6994-099											
B125X7	R107049-01			7032-001	0.298 J	U	0.372 J	80	69	0	16
BLK (QC ID=39189)	R107027-06			7031-006	U	U	U				
LCS (QC ID=39188)	R107027-05			7031-005	ok	ok	ok				
Duplicate (R107049-01)	R107049-02			7032-002	ok J	- U	ok J	183	126	0	20
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200-TW-1 & 2 - Soil Sampling								Averages 132		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 6994-099	2σ prep error 5.0 %				Reference Lab Notebook 6994 pg. 099											
B125X7	R107049-01			0.23	0.500			78		124			10	07/18/01	07/19	SS-029
BLK (QC ID=39189)	R107027-06			0.22	0.500			93		100				07/18/01	07/18	SS-034
LCS (QC ID=39188)	R107027-05			1.1	0.500			92		110				07/18/01	07/18	SS-024
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.21	0.500			80		124			10	07/18/01	07/19	SS-031
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.44 ± 0.88
YIELD 86 ± 16

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test SR Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6994-099						
B125X7	R107049-01			7032-001	U	
BLK (QC ID=39189)	R107027-06			7031-006	U	
LCS (QC ID=39188)	R107027-05			7031-005	ok	
Duplicate (R107049-01)	R107049-02			7032-002	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6994-099 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.20	1.00			94		111			10	07/19/01	07/19	GRB-205
BLK (QC ID=39189)	R107027-06			0.24	1.00			74		400				07/19/01	07/19	GRB-229
LCS (QC ID=39188)	R107027-05			0.21	1.00			80		400				07/19/01	07/19	GRB-223
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.22	1.00			92		111			10	07/19/01	07/19	GRB-206
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 0.22 ± 0.034
YIELD 85 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test TC Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6994-099						
B125X7	R107049-01			7032-001	2.36	J
BLK (QC ID=39189)	R107027-06			7031-006	U	
LCS (QC ID=39188)	R107027-05			7031-005	ok	
Duplicate (R107049-01)	R107049-02			7032-002	ok	J
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	15	

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 6994-099 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.45	1.00			79		100			23	07/26/01	08/01	GRB-219
BLK (QC ID=39189)	R107027-06			0.57	1.00			91		50				07/26/01	08/01	GRB-219
LCS (QC ID=39188)	R107027-05			0.52	1.00			99		50				07/26/01	07/31	GRB-224
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.43	1.01			80		100			23	07/26/01	08/01	GRB-220
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-060	Soil Preparation, rev 3
	CP-021	Preparation of Tc-99m Tracer, rev 1
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	0.49	±	0.13
YIELD	87	±	19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test GAM Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 6994-099								
B125X7	R107049-01			7032-001	U		U	
BLK (QC ID=39189)	R107027-06			7031-006	U		U	
LCS (QC ID=39188)	R107027-05			7031-005	ok		ok	
Duplicate (R107049-01)	R107049-02			7032-002	-	U	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	0.050		0.10	

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 6994-099 2σ prep error 15.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.079	217					435			11	07/18/01	07/20	JR,05,00
BLK (QC ID=39189)	R107027-06			0.087	178					411				07/18/01	07/20	JR,07,00
LCS (QC ID=39188)	R107027-05			0.027	178					412				07/18/01	07/20	JR,04,00
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.070	217					935			11	07/18/01	07/20	JR,03,00
Nominal values and limits from method				0.050	178					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 0.066 ± 0.054
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test U T Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium (ug/g)
Preparation batch 6994-099					
B125X7	R107049-01			7032-001	1.83
BLK (QC ID=39189)	R107027-06			7031-006	U
LCS (QC ID=39188)	R107027-05			7031-005	ok
Duplicate (R107049-01)	R107049-02			7032-002	ok
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (ug/g)	0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6994-099 2σ prep error 9.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.22	0.100								30	08/07/01	08/08	KPA-001
BLK (QC ID=39189)	R107027-06			0.002	0.100									08/07/01	08/08	KPA-001
LCS (QC ID=39188)	R107027-05			0.022	0.100									08/07/01	08/08	KPA-001
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.22	0.100								30	08/07/01	08/08	KPA-001
Nominal values and limits from method				0.10	0.100								180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.12 ± 0.24
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test C Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6994-099						
B125X7	R107049-01			7032-001	U	
BLK (QC ID=39189)	R107027-06			7031-006	U	
LCS (QC ID=39188)	R107027-05			7031-005	ok	
Duplicate (R107049-01)	R107049-02			7032-002	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	50	

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 6994-099	2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 099															
B125X7	R107049-01			4.3	0.200			100		100			32	08/09/01	08/10	LSC-007
BLK (QC ID=39189)	R107027-06			5.0	0.200			100		100				08/09/01	08/10	LSC-004
LCS (QC ID=39188)	R107027-05			31	0.200			100		3				08/09/01	08/10	LSC-004
Duplicate (R107049-01) (QC ID=39224)	R107049-02			4.3	0.204			100		100			32	08/09/01	08/10	LSC-007
Nominal values and limits from method				50	0.200					50			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 11 ± 26
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test H Matrix SOLID
SDG 7032
Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1414

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6994-099						
B125X7	R107049-01			7032-001	U	
BLK (QC ID=39189)	R107027-06			7031-006	U	
LCS (QC ID=39188)	R107027-05			7031-005	ok	J
Duplicate (R107049-01)	R107049-02			7032-002	-	U

Nominal values and limits from method RDLs (pCi/g) 400
200-TW-1 & 2 - Soil Sampling

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 6994-099 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 099																
B125X7	R107049-01			0.10	20.0			100		120			28	08/06/01	08/06	LSC-004
BLK (QC ID=39189)	R107027-06			0.31	20.0			33		120				08/06/01	08/06	LSC-004
LCS (QC ID=39188)	R107027-05			0.31	20.0			33		120				08/06/01	08/06	LSC-004
Duplicate (R107049-01) (QC ID=39224)	R107049-02			0.20	20.2			52		120			28	08/06/01	08/06	LSC-004
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES	REFERENCE	906.0_H3_LSC
	CP-060	Soil Preparation, rev 3
	CP-216	Tritium in Solid Samples by Azeotropic Distillation, rev 4

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.23 ± 0.20
YIELD 54 ± 63

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/23/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1414

Test NI L	Matrix SOLID
SDG 7032	
Contact Melissa C. Mannion	

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford	
Contract No. 630	
Contract SDG H1414	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 6994-099						
B125X7	R107049-01			7032-001	U	
BLK (QC ID=39189)	R107027-06			7031-006	U	
LCS (QC ID=39188)	R107027-05			7031-005	ok	
Duplicate (R107049-01)	R107049-02			7032-002	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	30	

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 6994-099	2σ prep error 10.0 %				Reference Lab Notebook 6994 pg. 099											
B125X7	R107049-01			2.3	0.500			87		100			10	07/19/01	07/19	LSC-004
BLK (QC ID=39189)	R107027-06			2.1	0.500			96		100				07/19/01	07/19	LSC-004
LCS (QC ID=39188)	R107027-05			2.4	0.500			96		74				07/19/01	07/19	LSC-004
Duplicate (R107049-01) (QC ID=39224)	R107049-02			2.3	0.500			87		100			10	07/19/01	07/19	LSC-004
Nominal values and limits from method				30	0.500			30-105		50			180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 3
	RP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	2.3	±	0.25
YIELD	92	±	10

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	08/23/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-7	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: ✓ T-26/200 W H1414 (7032)	SAF No.: B01-058	
Ice Chest No.: ERC 01-018	Field Logbook No.: EL-1518	COA: B20TW1A44C	Method of Shipment: pJW 07-09-01 ~~Government Vehicle~~/Fed EX
Shipped To: ND 7901 TMA ~~Severn Trent Incorporated~~	Offsite Property No.: A010267		Bill of Lading/Air Bill No.: 423579545590

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive SPLIT SPOON COUNTS ≤ BKGD. ~~pJW~~ DOSE < 0.5 mR/hr pJW 07-09-01

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions	See item (5) in Special Instructions.	Activity Scan		
Sample No.	Matrix *	Sample Date	Sample Time							
B125X7	SOIL	07/09/01	0200	X	X	X	X	X		X	X	~~B125X7~~ 7/9/01

Tie To B12637

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 7/9/01. Collector not available to relinquish samples on 7/9/01 for shipment.

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Greg Thomas Greg Thomas	7/9/01 0345	Received By/Stored In: Ref 1A	7/9/01 0345
Relinquished By/Removed From: Ref #1A	7/9/01 0940	Received By/Stored In: R. Nielson / R. Nielson	7/9/01 0940
Relinquished By/Removed From: R. Nielson / R. Nielson	7/9/01 1025	Received By/Stored In: Federal Express	
Relinquished By/Removed From: Fed EX	7-10-01	Received By/Stored In: James Lind	7-10-01 0900
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ~~ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

DT 7/9/01

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: Hanford Date/Time received 7-10-01 0900

CoC No. B01-058-7

Container I.D. No. ERC 01-08 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1
7. Number of containers per sample: 1 (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 James Lind Date: 7-10-01 Time: 0900

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

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1414

DATE RECEIVED: 07/10/01 LVL LOT # :0107L260

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B125X7						
% SOLIDS	001	S	01L%S085	07/09/01	07/11/01	07/12/01
% SOLIDS	001 REP	S	01L%S085	07/09/01	07/11/01	07/12/01
CHLORIDE BY IC	001	S	01LICD48	07/09/01	07/24/01	07/24/01
CHLORIDE BY IC	001 REP	S	01LICD48	07/09/01	07/24/01	07/24/01
CHLORIDE BY IC	001 MS	S	01LICD48	07/09/01	07/24/01	07/24/01
FLUORIDE BY IC	001	S	01LICC48	07/09/01	07/24/01	07/24/01
FLUORIDE BY IC	001 REP	S	01LICC48	07/09/01	07/24/01	07/24/01
FLUORIDE BY IC	001 MS	S	01LICC48	07/09/01	07/24/01	07/24/01
NITRITE BY IC	001	S	01LICE48	07/09/01	07/24/01	07/24/01
NITRITE BY IC	001 REP	S	01LICE48	07/09/01	07/24/01	07/24/01
NITRITE BY IC	001 MS	S	01LICE48	07/09/01	07/24/01	07/24/01
NITRATE BY IC	001	S	01LIC049	07/09/01	07/30/01	07/30/01
NITRATE BY IC	001 REP	S	01LIC049	07/09/01	07/30/01	07/30/01
NITRATE BY IC	001 MS	S	01LIC049	07/09/01	07/30/01	07/30/01
TOTAL CYANIDE	001	S	01LC068	07/09/01	07/11/01	07/11/01
TOTAL CYANIDE	001 REP	S	01LC068	07/09/01	07/11/01	07/11/01
TOTAL CYANIDE	001 MS	S	01LC068	07/09/01	07/11/01	07/11/01
PHOSPHATE BY IC	001	S	01LICD48	07/09/01	07/24/01	07/24/01
PHOSPHATE BY IC	001 REP	S	01LICD48	07/09/01	07/24/01	07/24/01
PHOSPHATE BY IC	001 MS	S	01LICD48	07/09/01	07/24/01	07/24/01
CHROMIUM VI	001	S	01LVI062	07/09/01	07/24/01	07/24/01
CHROMIUM VI	001 REP	S	01LVI062	07/09/01	07/24/01	07/24/01
CHROMIUM VI	001 MS	S	01LVI062	07/09/01	07/24/01	07/24/01
CHROMIUM VI	001 MSD	S	01LVI062	07/09/01	07/24/01	07/24/01
SULFATE BY IC	001	S	01LICD48	07/09/01	07/24/01	07/24/01
SULFATE BY IC	001 REP	S	01LICD48	07/09/01	07/24/01	07/24/01
SULFATE BY IC	001 MS	S	01LICD48	07/09/01	07/24/01	07/24/01
NITRATE NITRITE	001	S	01LN3A41	07/09/01	07/31/01	07/31/01
NITRATE NITRITE	001 REP	S	01LN3A41	07/09/01	07/31/01	07/31/01
NITRATE NITRITE	001 MS	S	01LN3A41	07/09/01	07/31/01	07/31/01
AMMONIA	001	S	01LAM038	07/09/01	07/30/01	07/31/01
AMMONIA	001 REP	S	01LAM038	07/09/01	07/30/01	07/31/01
AMMONIA	001 MS	S	01LAM038	07/09/01	07/30/01	07/31/01
TOTAL ORGANIC CARBON	001	S	01LTZ020	07/09/01	07/24/01	07/25/01
TOTAL ORGANIC CARBON	001 REP	S	01LTZ020	07/09/01	07/24/01	07/25/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1414

DATE RECEIVED: 07/10/01 LVL LOT # :0107L260

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
TOTAL ORGANIC CARBON	001 MS	S	01LTZ020	07/09/01	07/24/01	07/25/01
PH	001	S	01LPH050	07/09/01	07/19/01	07/19/01
PH	001 REP	S	01LPH050	07/09/01	07/19/01	07/19/01

LAB QC:

CHLORIDE BY IC	MB1	S	01LICD48	N/A	07/24/01	07/24/01
CHLORIDE BY IC	MB1 BS	S	01LICD48	N/A	07/24/01	07/24/01
FLUORIDE BY IC	MB1	S	01LICC48	N/A	07/24/01	07/24/01
FLUORIDE BY IC	MB1 BS	S	01LICC48	N/A	07/24/01	07/24/01
NITRITE BY IC	MB1	S	01LICE48	N/A	07/24/01	07/24/01
NITRITE BY IC	MB1 BS	S	01LICE48	N/A	07/24/01	07/24/01
NITRATE BY IC	MB1	W	01LIC049	N/A	07/30/01	07/30/01
NITRATE BY IC	MB1 BS	W	01LIC049	N/A	07/30/01	07/30/01
TOTAL CYANIDE	LCS L	S	01LC068	N/A	07/11/01	07/11/01
TOTAL CYANIDE	LCS L	S	01LC068	N/A	07/11/01	07/11/01
TOTAL CYANIDE	MB1	S	01LC068	N/A	07/11/01	07/11/01
PHOSPHATE BY IC	MB1	S	01LICD48	N/A	07/24/01	07/24/01
PHOSPHATE BY IC	MB1 BS	S	01LICD48	N/A	07/24/01	07/24/01
CHROMIUM VI	MB1	S	01LVI062	N/A	07/24/01	07/24/01
CHROMIUM VI	MB1 BS	S	01LVI062	N/A	07/24/01	07/24/01
CHROMIUM VI	MB1 BSD	S	01LVI062	N/A	07/24/01	07/24/01
SULFATE BY IC	MB1	S	01LICD48	N/A	07/24/01	07/24/01
SULFATE BY IC	MB1 BS	S	01LICD48	N/A	07/24/01	07/24/01
NITRATE NITRITE	MB1	S	01LN3A41	N/A	07/31/01	07/31/01
NITRATE NITRITE	MB1 BS	S	01LN3A41	N/A	07/31/01	07/31/01
AMMONIA	MB1	W	01LAM038	N/A	07/30/01	07/31/01
AMMONIA	MB1 BS	W	01LAM038	N/A	07/30/01	07/31/01
AMMONIA	MB1 BSD	W	01LAM038	N/A	07/30/01	07/31/01
TOTAL ORGANIC CARBON	MB1	S	01LTZ020	N/A	07/24/01	07/25/01
TOTAL ORGANIC CARBON	MB1 BS	S	01LTZ020	N/A	07/24/01	07/25/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-058 H1414
LVL#: 0107L260

W.O.#: 11343-606-001-9999-00
Date Received: 07-10-01

INORGANIC NARRATIVE

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

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

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

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

5. The method blanks were within the method criteria.

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

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

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

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

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

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

08-07-01
Date

njp\i07-260

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 • Exton, PA 19341-1313 • (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 /9014	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		✓ 9060	✓ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

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

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

Nitrate Nitrite EPA 353.2(mod.)

Ammonia EPA 350.3(mod.)

L-WI-034/B-01/01

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/06/01

CLIENT: TNUHANFORD B01-058 H1414

LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B125X7	% Solids	97.6	%	0.01	1.0
		Chloride by IC	8.6	MG/KG	1.3	1.0
		Fluoride by IC	2.7	MG/KG	2.6	1.0
		Nitrite by IC	1.28 u	MG/KG	1.28	1.0
		Nitrate by IC	659	MG/KG	64.1	50.0
		Cyanide, Total	0.44 u	MG/KG	0.44	1.0
		Phosphate by IC	1.3 u	MG/KG	1.3	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
		Sulfate by IC	28.7	MG/KG	1.3	1.0
		Nitrate Nitrite	151	MG/KG	7.9	20.0
		Ammonia, as N	5.1 u	MG/KG	5.1	1.0
		Total Organic Carbon	204 u	MG/KG	204	1.0
		pH	8.3	SOIL PH	0.01	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/06/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LICD48-MB1	Chloride by IC	1.2	u	MG/KG	1.2	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	01LICC48-MB1	Fluoride by IC	2.5	u	MG/KG	2.5	1.0
BLANK10	01LICE48-MB1	Nitrite by IC	1.25	u	MG/KG	1.25	1.0
BLANK10	01LIC049-MB1	Nitrate by IC	1.25	u	MG/KG	1.25	1.0
BLANK1	01LC068-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	01LVI062-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	01LN3A41-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	01LAM038-MB1	Ammonia, as N	5.0	u	MG/KG	5.0	1.0
BLANK10	01LTZ020-MB1	Total Organic Carbon	20.0	u	MG/KG	20.0	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 08/06/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B125X7	Chloride by IC	61.3	8.6	51.3	102.8	2.0
		Fluoride by IC	118	2.7	103	112.8	2.0
		Nitrite by IC	54.8	1.28u	51.3	106.9	2.0
		Nitrate by IC	1990	659	1280	103.5	50.0
		Cyanide, Total	4.27	0.44u	4.99	85.5	1.0
		Phosphate by IC	48.0	1.3 u	51.3	93.6	2.0
		Soluble Chromium VI	4.3	0.35	4.1	97.6	1.0
		Insoluble Chromium VI	1470	0.35	1190	123.7	100
		Sulfate by IC	82.7	28.7	51.3	105.2	2.0
		Nitrate Nitrite	347	151	197	99.8	20.0
		Ammonia, as N	207	5.1 u	204	101.2	1.0
		Total Organic Carbon	4130	124	4120	97.0	1.0
BLANK10	01LICD48-MB1	Chloride by IC	23.3	1.2 u	25.0	93.2	1.0
		Phosphate by IC	26.0	1.2 u	25.0	104.0	1.0
		Sulfate by IC	24.1	1.2 u	25.0	96.5	1.0
BLANK10	01LICC48-MB1	Fluoride by IC	54.8	2.5 u	50.0	109.7	1.0
BLANK10	01LICE48-MB1	Nitrite by IC	23.8	1.25u	25.0	95.3	1.0
BLANK10	01LIC049-MB1	Nitrate by IC	25.0	1.25u	25.0	100.1	1.0
BLANK10	01LVI062-MB1	Soluble Chromium VI	4.4	0.40u	4.0	109.6	1.0
		Insoluble Chromium VI	1110	0.40u	1220	90.6	100
BLANK10	01LN3A41-MB1	Nitrate Nitrite	5.1	0.20u	5.0	102.6	1.0
BLANK10	01LAM038-MB1	Ammonia, as N	104	5.0 u	100	103.5	1.0
		Ammonia, as N MSD	103	5.0 u	100	103.0	1.0
BLANK10	01LTZ020-MB1	Total Organic Carbon	405	20.0 u	400	101.2	1.0

Lionville Lababoratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 08/06/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	01LAM038-MB1	Ammonia, as N	103.5	103.0	0.48

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 08/06/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B125X7	% Solids	97.6	97.6	0.082	1.0
		Chloride by IC	8.6	8.9	2.6	1.0
		Fluoride by IC	2.7	3.0	8.9	1.0
		Nitrite by IC	1.28u	1.28u	NC	1.0
		Nitrate by IC	659	654	0.76	50.0
		Cyanide, Total	0.44u	0.46u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	0.41u	0.51	NC	1.0
		Sulfate by IC	28.7	30.1	4.6	1.0
		Nitrate Nitrite	151	157	3.9	20.0
		Ammonia, as N	5.1 u	5.1 u	NC	1.0
		Total Organic Carbon	204 u	195 u	NC	1.0
		pH	8.3	8.4	0.5	1.0

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 08/06/01

CLIENT: TNUHANFORD B01-058 H1414

LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	01LC068-LCS1	Cyanide, Total LCS	1.97	2.0	MG/KG	98.6
LCSS2	01LC068-LCS2	Cyanide, Total LCS	9.76	10.0	MG/KG	97.6

Lionville Laboratory Use Only

0107L260

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVL2 LIONVILLE LABORATORY INC

Client: TNU-Hanford B01-059

Est. Final Proj. Sampling Date:

Project #: 11343 C0010-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-10-01 Date Due: 8-9-01

		A	B						C		D	E				
Refrigerator #		1	S						S		S	S				
#/Type Container	Liquid															
	Solid	1AG	1AG						1AG		1AG	1AG				
Volume	Liquid								125							
	Solid	125	250						250		250	125				
Preservatives		–	–						–		–	–				
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				TCLP Metal	CN	TC Anions	Sample Spec.				
		Lionville Laboratory Use Only														
		8021H	8025X 8DRO						Mrt 1		Inorg 1	ICAL				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8021H	8025X 8DRO					Mrt 1		Inorg 1	ICAL				
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate Wt - Wipe X - Other F - Fish	001	B125X7	✓	✓	S	7-9-01	0200	X	X					X		X	X				

Special Instructions: SAF B01-059

DATE/REVISIONS:

Mrt 1 1. Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg

Inorg 1 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

1 3. IONH3N, IO3NO2, ICNTO, IOCT, IPH

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. 6 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	7-10-01	9:30

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 5588

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-7	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: T-26/200 W	SAF No.: B01-058	
Ice Chest No.: ERC-01-017	Field Logbook No.: EL-1518	COA: B20TW1A44C	Method of Shipment: pJW 07-09-01 ~~Government Vehicle~~/Fed EX
Shipped To: ND 7901 RECRA ~~Severn Trent Incorporated~~	Offsite Property No.: A010312		Bill of Lading/Air Bill No.: 423579545580

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive SPLIT SPOON COUNTS ≤ BKGD. ~~Alpha~~ DOSE < 0.5 mR/hr DJW 07-09-01

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions. ✓	Chromium Hex - 7196 ✓	See item (2) in Special Instructions. ✓	VOA - 8260A (TCL) ✓	See item (3) in Special Instructions. ✓	See item (4) in Special Instructions DJT 7/9/01	See item (5) in Special Instructions. ✓	Activity Scan ✓	Tie To	

Sample No.	Matrix *	Sample Date	Sample Time									
B125X7	SOIL	07/09/01	0200	X	X	X	X	X		X	X	B12BF7

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 7/9/01. Collector not available to relinquish samples on 7/9/01 for shipment.

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Greg Thomas	7/9/01 0345	Received By/Stored In: Ref 1A	7/9/01 0345
Relinquished By/Removed From: Ref # 1A	7/9/01 0940	Received By/Stored In: Ronald Nielson / R. Nielson	7/9/01 0940
Relinquished By/Removed From: Ronald Nielson / R. Nielson	7/9/01 1025	Received By/Stored In: Federal Express	
Relinquished By/Removed From: FEDEX	7-10-01 9:30	Received By/Stored In: Carla Henry	7-10-01 9:30
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D DJT 7/9/01
(4) ~~ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 7-10-01 9:30

SDG#: _____

Work Order Number: _____ SAF# B01-059

Shipping Container ID: _____ Chain of Custody # 01076260

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 6
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 6
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 _____

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1414

DATE RECEIVED: 07/10/01 LVL LOT # :0107L260

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B125X7						
SILVER, TOTAL	001	S	01L0426	07/09/01	07/14/01	07/23/01
SILVER, TOTAL	001 REP	S	01L0426	07/09/01	07/14/01	07/23/01
SILVER, TOTAL	001 MS	S	01L0426	07/09/01	07/14/01	07/23/01
CADMIUM, TOTAL	001	S	01L0426	07/09/01	07/14/01	07/23/01
CADMIUM, TOTAL	001 REP	S	01L0426	07/09/01	07/14/01	07/23/01
CADMIUM, TOTAL	001 MS	S	01L0426	07/09/01	07/14/01	07/23/01
CHROMIUM, TOTAL	001	S	01L0426	07/09/01	07/14/01	07/23/01
CHROMIUM, TOTAL	001 REP	S	01L0426	07/09/01	07/14/01	07/23/01
CHROMIUM, TOTAL	001 MS	S	01L0426	07/09/01	07/14/01	07/23/01
COPPER, TOTAL	001	S	01L0426	07/09/01	07/14/01	07/23/01
COPPER, TOTAL	001 REP	S	01L0426	07/09/01	07/14/01	07/23/01
COPPER, TOTAL	001 MS	S	01L0426	07/09/01	07/14/01	07/23/01
MERCURY, TOTAL	001	S	01C0232	07/09/01	07/30/01	07/31/01
MERCURY, TOTAL	001 REP	S	01C0232	07/09/01	07/30/01	07/31/01
MERCURY, TOTAL	001 MS	S	01C0232	07/09/01	07/30/01	07/31/01
NICKEL, TOTAL	001	S	01L0426	07/09/01	07/14/01	07/23/01
NICKEL, TOTAL	001 REP	S	01L0426	07/09/01	07/14/01	07/23/01
NICKEL, TOTAL	001 MS	S	01L0426	07/09/01	07/14/01	07/23/01
LEAD, TOTAL	001	S	01L0426	07/09/01	07/14/01	07/23/01
LEAD, TOTAL	001 REP	S	01L0426	07/09/01	07/14/01	07/23/01
LEAD, TOTAL	001 MS	S	01L0426	07/09/01	07/14/01	07/23/01

LAB QC:

SILVER LABORATORY	LC1 BS	S	01L0426	N/A	07/14/01	07/23/01
SILVER, TOTAL	MB1	S	01L0426	N/A	07/14/01	07/23/01
CADMIUM LABORATORY	LC1 BS	S	01L0426	N/A	07/14/01	07/23/01
CADMIUM, TOTAL	MB1	S	01L0426	N/A	07/14/01	07/23/01
CHROMIUM LABORATORY	LC1 BS	S	01L0426	N/A	07/14/01	07/23/01
CHROMIUM, TOTAL	MB1	S	01L0426	N/A	07/14/01	07/23/01
COPPER LABORATORY	LC1 BS	S	01L0426	N/A	07/14/01	07/23/01
COPPER, TOTAL	MB1	S	01L0426	N/A	07/14/01	07/23/01
MERCURY LABORATORY	LC1 BS	S	01C0232	N/A	07/30/01	07/30/01
MERCURY, TOTAL	MB1	S	01C0232	N/A	07/30/01	07/30/01
NICKEL LABORATORY	LC1 BS	S	01L0426	N/A	07/14/01	07/23/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1414

DATE RECEIVED: 07/10/01 LVL LOT # :0107L260

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NICKEL, TOTAL	MB1	S	01L0426	N/A	07/14/01	07/23/01
LEAD LABORATORY	LC1 BS	S	01L0426	N/A	07/14/01	07/23/01
LEAD, TOTAL	MB1	S	01L0426	N/A	07/14/01	07/23/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-059
LVL#: 0107L260
SDG/SAF#: H1414/B01-059

W.O.#: 11343-606-001-9999-00
Date Received: 07-10-01

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 with the exeption of CCV1 through CCV3 in file HG073011 which were high for Mercury. All samples were rerun in file HG073111. The method blank and laboratory control blank were reported from the original file as they were both in control.

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 levels for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B125X7	Chromium	500	91.5
	Nickel	500	94.1

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

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

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

08-03-07
Date

gmb/m07-260

LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0107L260

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

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

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/01/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B125X7	Silver, Total	0.34	MG/KG	0.28	1.0
		Cadmium, Total	0.43 u	MG/KG	0.43	1.0
		Chromium, Total	37.8	MG/KG	0.39	1.0
		Copper, Total	17.3	MG/KG	0.24	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	22.1	MG/KG	1.1	1.0
		Lead, Total	7.8	MG/KG	3.1	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/01/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0426-MB1	Silver, Total	0.28 u	MG/KG	0.28	1.0
		Cadmium, Total	0.43 u	MG/KG	0.43	1.0
		Chromium, Total	0.39 u	MG/KG	0.39	1.0
		Copper, Total	0.24 u	MG/KG	0.24	1.0
		Nickel, Total	1.1 u	MG/KG	1.1	1.0
		Lead, Total	3.1 u	MG/KG	3.1	1.0
BLANK1	01C0232-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 08/01/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B125X7	Silver, Total	5.2	0.34	5.0	97.3	1.0
		Cadmium, Total	4.1	0.43u	5.0	82.0	1.0
		Chromium, Total	91.3	37.8	20.1	266.2	1.0
		Copper, Total	40.3	17.3	25.1	91.6	1.0
		Mercury, Total	0.17	0.02u	0.16	105.6	1.0
		Nickel, Total	86.8	22.1	50.2	128.9	1.0
		Lead, Total	51.4	7.8	50.2	86.9	1.0

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 08/01/01

CLIENT: TNUHANFORD B01-058 H1414

LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B125X7	Silver, Total	0.34	0.58	53.6	1.0
		Cadmium, Total	0.43u	0.43u	NC	1.0
		Chromium, Total	37.8	37.8	0.00	1.0
		Copper, Total	17.3	17.5	1.1	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Nickel, Total	22.1	22.6	2.2	1.0
		Lead, Total	7.8	8.3	6.2	1.0

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 08/01/01

CLIENT: TNUHANFORD B01-058 H1414 LVL LOT #: 0107L260

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0426-LC1	Silver, LCS	47.0	50.0	MG/KG	94.0
		Cadmium, LCS	23.8	25.0	MG/KG	95.2
		Chromium, LCS	49.4	50.0	MG/KG	98.8
		Copper, LCS	117	125	MG/KG	93.8
		Nickel, LCS	196	200	MG/KG	98.2
		Lead, LCS	241	250	MG/KG	96.4
LCS1	01C0232-LC1	Mercury, LCS	3.0	2.5	MG/KG	119.9

Lionville Laboratory Use Only: 0107L260

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) met Dig

Client: TNU-Hanford B01-059
Est. Final Proj. Sampling Date:
Project #: 113N3 C0010-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 7-10-01 Date Due: 8-9-01

		A	B						C		D	E				
Refrigerator #		1	5						5		5	5				
#/Type Container	Liquid															
	Solid	1AG	1AG						1AG		1AG	1AG				
Volume	Liquid								125							
	Solid	125	250						250		250	125				
Preservatives		–	–						–		–	–				
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				TCP Metal	CN	TC Anions	Corrosivity Spec				
		Lionville Laboratory Use Only														
		0C24H	0C25X 0DRO						Mrt (1)		Inorg (1)	ICAP				

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 OC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0C24H	0C25X 0DRO						Mrt (1)		Inorg (1)	ICAP				
001	B125X7	✓	✓	S	7-9-01	0200	X	X						X		X	X				

Special Instructions: SAF B01-059

DATE/REVISIONS:
Mrt (1) 1. Cd, Cr, Cu, Ni, Ag, ~~Bi~~ Pb, Hg 7-16-01
Inorg (1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
L 3. INH3N, IN3N2, ICNTO, IOCT, IPH
7-16-01 4. Bi consulted
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. 6 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	7-10-01	9:30

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 5588

12

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-7	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: T-26/200 W	SAF No.: B01-058	
Ice Chest No.: ERC-01-017	Field Logbook No.: EL-1518	COA: B20TW1A44C	Method of Shipment: PJW 07-09-01 ~~Government Vehicle~~/Fed EX
Shipped To: ND 7901 RECRA ~~Severn Trent Incorporated~~	Offsite Property No.: A010312		Bill of Lading/Air Bill No.: 423579545580

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive SPLIT SPOON COUNTS ≤ BKGD. ~~Auto~~ DOSE < 0.5 mR/hr PJW 07-09-01

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions. ✓	Chromium Hex - 7196 ✓	See item (2) in Special Instructions. ✓	VOA - 8260A (TCL) ✓	See item (3) in Special Instructions. ✓	See item (4) in Special Instructions. DT 7/9/01	See item (5) in Special Instructions. ✓	Activity Scan ✓	TIC To	
Sample No.	Matrix *	Sample Date	Sample Time							
B125X7	SOIL	07/09/01	0200	X	X	X	X	X	X	B12BF7

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 71901. Collector not available to relinquish samples on 71901 for shipment.

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: Greg Thomas Greg Thomas 7/9/01	0345	Received By/Stored In: Ref 1A	0345 7/9/01
Relinquished By/Removed From: Ref # 1A	7/9/01 0940	Received By/Stored In: Ronald Nielson / R. Nielson	0940 7/9/01
Relinquished By/Removed From: Ronald Nielson / R. Nielson	7/9/01 1025	Received By/Stored In: Federal Express	
Relinquished By/Removed From: FEDEX	7-10-01 9:30	Received By/Stored In: Carla Henry	7-10-01 9:30
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D DT 7/9/01
(4) ~~ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

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

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

BHI-EE-011 (10/99)

3

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1414

AUG 2001
RECEIVED

RFW LOT # :01071260

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B125X7	001	S	01LE0816	07/09/01	07/10/01	07/12/01	07/26/01
B125X7	001 MS	S	01LE0816	07/09/01	07/10/01	07/12/01	07/26/01
B125X7	001 MSD	S	01LE0816	07/09/01	07/10/01	07/12/01	07/26/01
LAB QC:							
BLK	MB1	S	01LE0816	N/A	N/A	07/12/01	07/25/01
BLK	MB1 BS	S	01LE0816	N/A	N/A	07/12/01	07/26/01

ck 7-30-01

LIONVILLE LABORATORY INC.

Analytical Report

Client : TNU HANFORD B01-059
LVL# : 0107L260
SDG/SAF#: H1414/B01-059

W.O #: 11343-606-001-9999-00
Date Received: 07-10-01

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 07-09-01.

The sample and it's associated QC samples were prepared on 07-12-01 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 07-25, 26-01. The analysis met the intent of method WTPH-D.

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

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

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

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

5. All surrogate recoveries were within acceptance criteria. .

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

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

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

7/31/01
Date

R:\share\dro\07-260.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

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7/31/01

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike reagent grade water spiked with the matrix spiking solution. Spike recoveries are reported.

BSD = Indicates a blank spike duplicate.

MS = Indicates a matrix spike.

MSD = Indicates a matrix spike duplicate.

NA = Not Applicable.

NS = Not spiked.

DF = Dilution factor.

NR = Not required.

SP = Indicates a spiked compound.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 07/30/01 10:42

RFW Batch Number: **0107L310** Client: **TNUHANFORD B01-058 H1424** Work Order: 11343606001 Page: 1

	Cust ID:	B12CR8	B12CR8	B12CR8	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	01LE0850-MB1	01LE0850-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	p-Terphenyl	82 %	69 %	74 %	76 %	91 %
Diesel Range Organics		12.2 U	68 %	72 %	12.0 U	73 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

0107L260

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) Met Dig

Client: TNU-Hanford B01-059

Est. Final Proj. Sampling Date:

Project #: 11343 code-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-10-01 Date Due: 8-9-01

		A	B						C		D	E				
Refrigerator #		1	5						5		5	5				
#/Type Container	Liquid															
	Solid	1AG	1AG						1AG		1AG	1AG				
Volume	Liquid								125							
	Solid	125	250						250		250	125				
Preservatives		-	-						-		-	-				
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				TCP Metal	CN	TC Anions	Cyanide Total				
		Lionville Laboratory Use Only														
		8260 24H	8270 SX 8270						Met (1)		Inorg (1)	ICP/MS				

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	B125X7	✓	✓	S	7-9-01	0200	X	X						X		X	X			

Special Instructions: Saf B01-059

DATE/REVISIONS:

Met (1) 1. Cd, Cr, Cu, Ni, Ag, ~~Bi~~ Pb, Hg 7-16-01

Inorg (1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

1 3. IONH3N, IN3N2, ICOTO, IOCT, IPH

7-16-01 4. Bi consulted

5.

6.

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	7-10-01	9:30

Relinquished by	Received by	Date	Time

COMPOSITE WASTE

ORIGINAL REWRITTEN

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

NOTES:

4235 7954 5580

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/C
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. 6 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-7	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E. — Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days+
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: T-26/200 W	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: ERC-01-017	Field Logbook No.: EL-1518 — COA: B20TW1A44C	Method of Shipment: PJW 07-09-01 ~~Government Vehicle~~/Fed EX	
Shipped To: ~~Seven Trent Incorporated~~ NS 7901 RECRA	Offsite Property No.: A01 0312	Bill of Lading/Air Bill No.: 423579545580	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive SPLIT SPOON COUNTS ≤ BKGD. ~~AJW~~ PJW 07-09-01 DOSE < 0.5 mR/hr

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions. ✓	Chromium Hex - 7196 ✓	See item (2) in Special Instructions. ✓	VOA - 8260A (TCL) ✓	See item (3) in Special Instructions. ✓	See item (4) in Special Instructions ✓ 7/9/01	See item (5) in Special Instructions. ✓	Activity Scan ✓	TIC To	
Sample No.	Matrix *	Sample Date	Sample Time							
B125X7	SOIL	07/09/01	0200	X	X	X	X	X	X	B12BP7

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 71901. Collector not available to relinquish samples on 71901 for shipment.

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas Greg Thomas	7/9/01 0345	Ref 1A	7/9/01 0345
Ref # 1A	7/9/01 0940	Ronald Nielson / R. Nielson	7/9/01 0940
Ronald Nielson / R. Nielson	7/9/01 1025	Federal Express	
Fed Ex	7-10-01 9:30	Carla Henry	7-10-01 9:30

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ~~ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, Wp=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: 7-10-01 9:30

SDG#: _____

Work Order Number: _____ SAF# B01-059

Shipping Container ID: _____ Chain of Custody # 01076260

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 6
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 6
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 _____

8

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1414

DATE RECEIVED: 07/10/01 LVL LOT # :0107L260

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B125X7	001	S	01LE0819	07/09/01	07/11/01	07/18/01
B125X7	001 MS	S	01LE0819	07/09/01	07/11/01	07/18/01
B125X7	001 MSD	S	01LE0819	07/09/01	07/11/01	07/18/01

LAB QC:

SBLKBW	MB1	S	01LE0819	N/A	07/11/01	07/17/01
SBLKBW	MB1 BS	S	01LE0819	N/A	07/11/01	07/17/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-059
RFW #: 0107L260
SDG/SAF #: H1414/B01-059

W.O. #: 11343-606-001-9999-00
Date Received: 07-10-01

SEMIVOLATILE

One (1) soil sample was collected on 07-09-01.

The sample and its associated QC samples were extracted on 07-11-01 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 07-17,18-01.

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

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

2. The sample was extracted and analyzed within required holding times.

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

8/6/01
Date

pef\gorup\data\bna\tnu-hanford-0107-260.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 12 pages.

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: 07/30/01 08:28

RFW Batch Number: **0107L260** Client: **TNUHANFORD B01-058 H1414** Work Order: 11343606001 Page: 1a

9

	Cust ID:	B125X7		B125X7		B125X7		SBLKBW		SBLKBW BS	
Sample Information	RFW#:	001		001 MS		001 MSD		01LE0819-MB1		01LE0819-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	75	%	77	%	74	%	72	%	76	%
	2-Fluorobiphenyl	73	%	78	%	76	%	72	%	80	%
	p-Terphenyl-d14	105	%	102	%	106	%	92	%	104	%
	Phenol-d5	84	%	82	%	83	%	83	%	84	%
	2-Fluorophenol	70	%	74	%	71	%	72	%	77	%
	2,4,6-Tribromophenol	73	%	86	%	86	%	75	%	86	%
Phenol		340	U	84	%	79	%	330	U	82	%
bis(2-Chloroethyl)ether		340	U	340	U	340	U	330	U	330	U
2-Chlorophenol		340	U	74	%	73	%	330	U	77	%
1,3-Dichlorobenzene		340	U	340	U	340	U	330	U	330	U
1,4-Dichlorobenzene		340	U	67	%	64	%	330	U	69	%
1,2-Dichlorobenzene		340	U	340	U	340	U	330	U	330	U
2-Methylphenol		340	U	340	U	340	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		340	U	340	U	340	U	330	U	330	U
4-Methylphenol		340	U	340	U	340	U	330	U	330	U
N-Nitroso-Di-n-propylamine		340	U	103	%	106	%	330	U	99	%
Hexachloroethane		340	U	340	U	340	U	330	U	330	U
Nitrobenzene		340	U	340	U	340	U	330	U	330	U
Isophorone		340	U	340	U	340	U	330	U	330	U
2-Nitrophenol		340	U	340	U	340	U	330	U	330	U
2,4-Dimethylphenol		340	U	340	U	340	U	330	U	330	U
bis(2-Chloroethoxy)methane		340	U	340	U	340	U	330	U	330	U
2,4-Dichlorophenol		340	U	340	U	340	U	330	U	330	U
1,2,4-Trichlorobenzene		340	U	74	%	70	%	330	U	76	%
Naphthalene		340	U	340	U	340	U	330	U	330	U
4-Chloroaniline		340	U	340	U	340	U	330	U	330	U
Hexachlorobutadiene		340	U	340	U	340	U	330	U	330	U
4-Chloro-3-methylphenol		340	U	83	%	81	%	330	U	78	%
2-Methylnaphthalene		340	U	340	U	340	U	330	U	330	U
Hexachlorocyclopentadiene		340	U	340	U	340	U	330	U	330	U
2,4,6-Trichlorophenol		340	U	340	U	340	U	330	U	330	U
2,4,5-Trichlorophenol		850	U	850	U	840	U	830	U	830	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0107L260 Client: TNUHANFORD B01-058 H1414 Work Order: 11343606001 Page: 1b

Cust ID:	B125X7		B125X7		B125X7		SBLKBW		SBLKBW BS	
RFW#:	001		001 MS		001 MSD		01LE0819-MB1		01LE0819-MB1	
2-Chloronaphthalene	340	U	340	U	340	U	330	U	330	U
2-Nitroaniline	850	U	850	U	840	U	830	U	830	U
Dimethylphthalate	340	U	340	U	340	U	330	U	330	U
Acenaphthylene	340	U	340	U	340	U	330	U	330	U
2,6-Dinitrotoluene	340	U	340	U	340	U	330	U	330	U
3-Nitroaniline	850	U	850	U	840	U	830	U	830	U
Acenaphthene	340	U	77	%	77	%	330	U	77	%
2,4-Dinitrophenol	850	U	850	U	840	U	830	U	830	U
4-Nitrophenol	850	U	66	%	59	%	830	U	61	%
Dibenzofuran	340	U	340	U	340	U	330	U	330	U
2,4-Dinitrotoluene	340	U	79	%	78	%	330	U	73	%
Diethylphthalate	340	U	340	U	340	U	330	U	330	U
4-Chlorophenyl-phenylether	340	U	340	U	340	U	330	U	330	U
Fluorene	340	U	340	U	340	U	330	U	330	U
4-Nitroaniline	850	U	850	U	840	U	830	U	830	U
4,6-Dinitro-2-methylphenol	850	U	850	U	840	U	830	U	830	U
N-Nitrosodiphenylamine (1)	340	U	340	U	340	U	330	U	330	U
4-Bromophenyl-phenylether	340	U	340	U	340	U	330	U	330	U
Hexachlorobenzene	340	U	340	U	340	U	330	U	330	U
Pentachlorophenol	850	U	91	%	90	%	830	U	87	%
Phenanthrene	340	U	340	U	340	U	330	U	330	U
Anthracene	340	U	340	U	340	U	330	U	330	U
Carbazole	340	U	340	U	340	U	330	U	330	U
Di-n-Butylphthalate	340	U	340	U	340	U	330	U	330	U
Fluoranthene	340	U	340	U	340	U	330	U	330	U
Pyrene	340	U	98	%	100	%	330	U	92	%
Butylbenzylphthalate	340	U	340	U	340	U	330	U	330	U
3,3'-Dichlorobenzidine	340	U	340	U	340	U	330	U	330	U
Benzo(a)anthracene	340	U	340	U	340	U	330	U	330	U
Chrysene	340	U	340	U	340	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	340	U	340	U	340	U	330	U	330	U
Di-n-Octyl phthalate	340	U	340	U	340	U	330	U	330	U
Benzo(b)fluoranthene	340	U	340	U	340	U	330	U	330	U
Benzo(k)fluoranthene	340	U	340	U	340	U	330	U	330	U
Benzo(a)pyrene	340	U	340	U	340	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	340	U	340	U	340	U	330	U	330	U
Dibenzo(a,h)anthracene	340	U	340	U	340	U	330	U	330	U
Benzo(g,h,i)perylene	340	U	340	U	340	U	330	U	330	U
Tributylphosphate	340	U	340	U	340	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.

B125X7

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

Client: TNUHANFORD B01-058 H1414

Matrix: (soil/water) SOIL

Lab Sample ID: 0107L260-001

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

Lab File ID: A071804

Level: (low/med) LOW

Date Received: 07/10/01

% Moisture: 2 decanted: (Y/N)__

Date Extracted: 07/11/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 07/18/01

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	7.697	100	JB

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKBW

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

Client: TNUHANFORD B01-058 H1414

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE0819-MB1

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

Lab File ID: A071706

Level: (low/med) LOW

Date Received: 07/11/01

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

Date Extracted: 07/11/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 07/17/01

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	7.685	200	J

Lionville Laboratory Use Only

0107L260

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) met Dig

Client: TNU-Hanford B01-059

Est. Final Proj. Sampling Date:

Project #: 11343 code-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-10-01 Date Due: 8-9-01

		A	B						C		D	E				
Refrigerator #		1	S						S		S	S				
#/Type Container	Liquid															
	Solid	1AG	1AG						1AG		1AG	1AG				
Volume	Liquid								125							
	Solid	125	250						250		250	125				
Preservatives		–	–						–		–	–				
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				TCP Metal	CN	TC Anions	Corrosivity Spec				
		Lionville Laboratory Use Only														
		8021HL	8021SX 8DRO						Met (1)		Inorg (1)	ICAP				

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	8021HL	8021SX 8DRO						Met (1)		Inorg (1)	ICAP				
001	B125X7	✓	✓	S	7-9-01	0200	X	X						X		X	X				

Special Instructions: Saf B01-059

DATE/REVISIONS:

Met (1) 1. Cd, Cr, Cu, Ni, Ag, ~~Bi~~ Pb, Hg TC 7-16-01

Inorg (1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,

1 3. INH3N, IN3N2, ICNTO, IOCT, IPH

7-16-01 4. Bi consulted

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. 6 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	7-10-01	9:30

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 5580

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-7	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: T-26/200 W	SAF No.: B01-058	
Ice Chest No.: ERC-01-017	Field Logbook No.: EL-1518	COA: B20TW1A44C	Method of Shipment: pJW 07-09-01 ~~Government Vehicle~~/Fed EX
Shipped To: NO 7901 RECRA ~~Seventh Trust Incorporated~~	Offsite Property No.: A01 0312		Bill of Lading/Air Bill No.: 423579545580

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive SPLIT SPOON COUNTS ≤ BKGD. ~~NO~~ DOSE < 0.5 mR/hr DJW 07-09-01

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions. ✓	Chromium Hex - 7196 ✓	See item (2) in Special Instructions. ✓	VOA - 8260A (TCL) ✓	See item (3) in Special Instructions. ✓	See item (4) in Special Instructions. ✓	See item (5) in Special Instructions. ✓	Activity Scan ✓		TIC To
Sample No.	Matrix *	Sample Date	Sample Time							
B125X7	SOIL	07/09/01	0200	X	X	X	X	X		X	B12BP7

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 7/9/01. Collector not available to relinquish samples on 7/9/01 for shipment.

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From	Date/Time 0345	Received By/Stored In	Date/Time 0345
Greg Thomas Greg Thomas 7/9/01		Ref 1A 7/9/01	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 0940
Ref # 1A 7/9/01 0940		Robert Nielson / R. Nielson 7/9/01	
Relinquished By/Removed From	Date/Time 1025	Received By/Stored In	Date/Time
Robert Nielson / R. Nielson 7/9/01		Federal Express	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FEDEX 7-10-01 9:30		Carla Henry 7-10-01 9:30	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D 7/9/01
(4) ~~ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 7-10-01 9:30

SDG#: _____

Work Order Number: _____ SAF# B01-059

Shipping Container ID: _____ Chain of Custody # 01070260

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 6
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 6
7. Sample holding times exceeded? Yes [ ] No [✓]

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

9. Samples are:
   - ✓ in good condition
   - ____ broken
   - ____ leaking
   - ____ 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 _____

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1414

RFW LOT # :0107L260

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B125X7	001	S	01LVX230	07/09/01	07/10/01	N/A	07/12/01
B125X7	001 MS	S	01LVX230	07/09/01	07/10/01	N/A	07/12/01
B125X7	001 MSD	S	01LVX230	07/09/01	07/10/01	N/A	07/12/01
LAB QC:							
VBLKHR	MB1	S	01LVX230	N/A	N/A	N/A	07/12/01
VBLKHR	MB1 BS	S	01LVX230	N/A	N/A	N/A	07/12/01

gl 07-27-01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-058
RFW #: 0107L260
SDG/SAF #: H1414/B01-058

W.O. #: 11343-606-001-9999-00
Date Received: 07-10-2001

GC/MS VOLATILE

One (1) soil sample was collected on 07-09-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 07-12-2001.

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. One (1) of fifteen (15) surrogate recoveries was outside EPA QC limits. The analysis of matrix spike duplicate fulfills the reanalysis requirement of sample B125X7 MS.

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

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

7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.

8. Internal standard area 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

7/30/01
Date

som\group\data\voa\tnu-hanford\0107-260.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 • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF VOA DATA

DATA QUALIFIERS

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

VLI
LIONVILLE LABORATORY INC

GLOSSARY OF VOA DATA

ABBREVIATIONS

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

VLI
LIONVILLE LABORATORY INC

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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

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

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

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

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

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

Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 07/26/01 14:46

RFW Batch Number: **0107L260** Client: **TNUHANFORD B01-058 H1414** Work Order: 11343606001 Page: 1a

	Cust ID:	B125X7	B125X7	B125X7	VBLKHR	VBLKHR BS
Sample Information	RFW#:	001	001 MS	001 MSD	01LVX230-MB1	01LVX230-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	0.877	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	107 %	124 %	110 %	102 %	104 %
	Bromofluorobenzene	108 %	124 * %	110 %	101 %	104 %
	1,2-Dichloroethane-d4	100 %	118 %	106 %	92 %	92 %
Chloromethane		10 U	9 U	10 U	10 U	10 U
Bromomethane		10 U	9 U	10 U	10 U	10 U
Vinyl Chloride		10 U	9 U	10 U	10 U	10 U
Chloroethane		10 U	9 U	10 U	10 U	10 U
Methylene Chloride		14 B	11 B	11 B	4 J	7 B
Acetone		10 U	9 U	10 U	10 U	10 U
Carbon Disulfide		5 U	4 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	102 %	90 %	5 U	95 %
1,1-Dichloroethane		5 U	4 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	4 U	5 U	5 U	5 U
Chloroform		5 U	4 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	4 U	5 U	5 U	5 U
2-Butanone		10 U	9 U	10 U	10 U	10 U
1,1,1-Trichloroethane		5 U	4 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	4 U	5 U	5 U	5 U
Bromodichloromethane		5 U	4 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	4 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	4 U	5 U	5 U	5 U
Trichloroethene		5 U	110 %	101 %	5 U	100 %
Dibromochloromethane		5 U	4 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	4 U	5 U	5 U	5 U
Benzene		5 U	113 %	104 %	5 U	101 %
Trans-1,3-Dichloropropene		5 U	4 U	5 U	5 U	5 U
Bromoform		5 U	4 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	9 U	10 U	10 U	10 U
2-Hexanone		10 U	9 U	10 U	10 U	10 U
Tetrachloroethene		5 U	4 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	4 U	5 U	5 U	5 U
Toluene		5 U	111 %	103 %	5 U	105 %

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0107L260** Client: **TNUHANFORD B01-058 H1414** Work Order: 11343606001 Page: 1b

Cust ID:	**B125X7**		**B125X7**		**B125X7**		**VBLKHR**		**VBLKHR BS**	
RFW#:	**001**		**001 MS**		**001 MSD**		**01LVX230-MB1**		**01LVX230-MB1**	
Chlorobenzene	5	U	109	%	101	%	5	U	101	%
Ethylbenzene	5	U	4	U	5	U	5	U	5	U
Styrene	5	U	4	U	5	U	5	U	5	U
Xylene (total)	5	U	4	U	5	U	5	U	5	U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

0107L260

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) Mrt Dig

Client: TNU-Hanford B01-058

Est. Final Proj. Sampling Date:

Project #: 11343 C006-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-10-01 Date Due: 8-9-01

		A	B						C		D	E				
Refrigerator #		1	5						5		5	5				
#Type Container	Liquid															
	Solid	1AG	1AG						1AG		1AG	1AG				
Volume	Liquid								125							
	Solid	125	250						250		250	125				
Preservatives		–	–						–		–	–				
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				TCLP Metal	CN	TC Anions	Corrosivity Spec				
		Lionville Laboratory Use Only														
		8260/4H	8260SX 8270						Mrt (1)		Inorg (1)	ICAP				

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	8260/4H	8260SX 8270						Mrt (1)		Inorg (1)	ICAP				
001	B125X7	✓	✓	S	7-9-01	0200	X	X						X		X	X				

Special Instructions: SAF B01-059

DATE/REVISIONS:

Mrt (1) 1. Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg (7-16-01)

Inorg (1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPON, ICSON,

1 3. INH3N, IN3N2, ICNTO, IOCT, IPH

7-16-01 4. Bi consulted

5.

6.

Relinquished by	Received by	Date	Time
Fed Ex	Carl Berg	7-10-01	9:30

Relinquished by	Received by	Date	Time

COMPOSITE WASTE

ORIGINAL REWRITTEN

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

NOTES:

4235 7954 5580

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. 6 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-7	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: T-26/200 W	SAF No.: B01-058	
Ice Chest No.: ERC-01-017	Field Logbook No.: EL-1518	COA: B20TW1A44C	Method of Shipment: pJW 07-09-01 ~~Government Vehicle~~/Fed EX
Shipped To: ~~Seven Trail Incorporated~~ NS 7901 RECRA	Offsite Property No.: A01D312		Bill of Lading/Air Bill No.: 4235795455580

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive SPLIT SPOON COUNTS ≤ BKGD. ~~AJW~~ pJW 07-09-01 DOSE < 0.5 mR/hr

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions. ✓	Chromium Hex - 7196 ✓	See item (2) in Special Instructions. ✓	VOA - 8260A (TCL) ✓	See item (3) in Special Instructions. ✓	See item (4) in Special Instructions. DT 7/9/01	See item (5) in Special Instructions. ✓	Activity Scan ✓	TIC To	

Sample No.	Matrix *	Sample Date	Sample Time									
B125X7	SOIL	07/09/01	0200	X	X	X	X	X		X	X	B12BF7

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 7/9/01. Collector not available to relinquish samples on 7/9/01 for shipment.

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas Greg Thomas	7/9/01 0345	Ref 1A	7/9/01 0345
Ref # 1A	7/9/01 0940	Ronald Nielson / R. Nielson	7/9/01 0940
Ronald Nielson / R. Nielson	7/9/01 1025	Federal Express	
FEDEX	7-10-01 9:30	Carla Henry	7-10-01 9:30

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D DT 7/9/01
(4) ~~ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

Matrix *
S=Soil
SB=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)

ORIGINAL Dayer

SDR # B01-087
Revision #: 0
Date Initiated: 07/10/01

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200 TW 1&2
Task ID: 1
Sampling Event: 200-TW-1 & 2 – Soil

Laboratory: TMA/RECRA

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 6
ID Numbers: B125X3, B125X5, B125X6, B125X7, B125Y3, B125Y9
Matrix: Soil
Collection Date: 06/25/01 – 07/09/01

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Other

Description: Laboratory Instructed to Not Report Bismuth Results

Disposition:

Description: For the listed samples, bismuth was incorrectly identified as a constituent to report from the 6010A metals analysis. The laboratory was subsequently instructed to not report bismuth results for the listed samples. The SAF/FSR has been revised to remove bismuth from the standard 6010A TAL analysis list for this project.

Justification: Bismuth is not a contaminant of concern for characterization.

Approval Signatures:

S. J. Trent — 7/16/01
Project Coordinator (Print/Sign Name) — Date

M. E. Todd — 7/20/01
Task Manager (Print/Sign Name) — Date