H0588-TMA/RECRA

0052715

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MAR 20 2000
EDMC

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0588 was composed of three solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source Characterization – 200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. Results were transmitted to BHI via facsimile on January 12, 2000. This data report replaces the data report sent to BHI on January 18, 2000.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.3 Total Uranium Analyses

No problems were encountered during the course of the analyses. The Total Uranium results were reported on November 27, 1999 via facsimile.

2.4 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses. BHI requested sample B0WMX1 (7255-01) be analyzed for Isotopic Uranium on January 11, 2000.

2.5 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.6 Americium-241 Analyses

Sample B0WMX3 (7255-03) had a yield of 7%, below the acceptable lower protocol limit of 20%. The sample was reworked, but the yield (3%) on the rework was not improved. The sample was reanalyzed with new QC samples. The sample results for the reanalysis of sample B0WMX3 and its associated QC are reported in this data report. No other problems were encountered during the course of the analyses.

2.7 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

JAN 2000
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Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SAMPLE SUMMARY

SDG 7255
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0WMX1	200 B Pond	SOLID		N910181-01	B99-078	B99-78-144	10/20/99 09:07
B0WMX2	200 B Pond	SOLID		N910181-02	B99-078	B99-78-144	10/20/99 09:12
B0WMX3	200 B Pond	SOLID		N910181-03	B99-078	B99-78-144	10/20/99 09:30
Method Blank		SOLID		N910181-05	B99-078		
Method Blank		SOLID		N910181-08	B99-078		
Method Blank		SOLID		N910181-11	B99-078		
Lab Control Sample		SOLID		N910181-04	B99-078		
Lab Control Sample		SOLID		N910181-07	B99-078		
Lab Control Sample		SOLID		N910181-10	B99-078		
Duplicate (N910181-01)	200 B Pond	SOLID		N910181-06	B99-078		10/20/99 09:07
Duplicate (N910181-01)	200 B Pond	SOLID		N910181-09	B99-078		10/20/99 09:07
Duplicate (N910181-03)	200 B Pond	SOLID		N910181-12	B99-078		10/20/99 09:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SDG 7255
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

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
7255	B99-78-144	B0WMX1	SOLID	90.4			10/22/99	2	N910181-01	7255-001
		B0WMX2	SOLID	95.5			10/22/99	2	N910181-02	7255-002
		B0WMX3	SOLID	94.8			10/22/99	2	N910181-03	7255-003
		Method Blank	SOLID						N910181-05	7255-005
		Method Blank	SOLID						N910181-08	7255-008
		Method Blank	SOLID						N910181-11	7255-011
		Lab Control Sample	SOLID						N910181-04	7255-004
		Lab Control Sample	SOLID						N910181-07	7255-007
		Lab Control Sample	SOLID						N910181-10	7255-010
		Duplicate (N910181-01)	SOLID				10/22/99	2	N910181-06	7255-006
		Duplicate (N910181-01)	SOLID				10/22/99	2	N910181-09	7255-009
		Duplicate (N910181-03)	SOLID				10/22/99	2	N910181-12	7255-012

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SDG 7255
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

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	6904-166	5.0	3			2	2	2/2		
PU	SOLID	Plutonium, Isotopic in Solids	6904-166	5.0	3			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6904-166	5.0	3			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6904-166	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6904-166	10.0	3			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6904-166	15.0	3			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	6904-166	9.0	3			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

WORK SUMMARY

SDG 7255
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0WMX1			N910181-01	7255-001	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-001	GAM		12/08/99	01/12/00	MCM	Gamma Scan
B99-78-144	B99-078		10/22/99	7255-001	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-001	SR		12/16/99	01/12/00	MCM	Total Strontium in Soil
				7255-001	TH		01/04/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-001	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil
				7255-001	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
B0WMX2			N910181-02	7255-002	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-002	GAM		12/08/99	01/12/00	MCM	Gamma Scan
B99-78-144	B99-078		10/22/99	7255-002	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-002	SR		12/20/99	01/12/00	MCM	Total Strontium in Soil
				7255-002	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-002	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
B0WMX3			N910181-03	7255-003	AM	A1	01/23/00	01/28/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-003	GAM		12/08/99	01/12/00	MCM	Gamma Scan
B99-78-144	B99-078		10/22/99	7255-003	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-003	SR		12/16/99	01/12/00	MCM	Total Strontium in Soil
				7255-003	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-003	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
Method Blank			N910181-05	7255-005	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
		SOLID		7255-005	GAM		12/08/99	01/12/00	MCM	Gamma Scan
	B99-078			7255-005	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-005	SR		12/13/99	01/12/00	MCM	Total Strontium in Soil
				7255-005	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-005	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil
Method Blank			N910181-08	7255-008	U_T		12/08/99	01/12/00	MCM	Uranium, Total in Soil
		SOLID								
	B99-078									
Method Blank			N910181-11	7255-011	AM		01/23/00	01/28/00	MCM	Americium 241 in Soil
		SOLID								
	B99-078									

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SDG 7255
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			N910181-04	7255-004	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
		SOLID		7255-004	GAM		12/08/99	01/12/00	MCM	Gamma Scan
	B99-078			7255-004	PU		12/14/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-004	SR		12/13/99	01/12/00	MCM	Total Strontium in Soil
				7255-004	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-004	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil
Lab Control Sample			N910181-07	7255-007	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
		SOLID								
	B99-078									
Lab Control Sample			N910181-10	7255-010	AM		01/25/00	01/28/00	MCM	Americium 241 in Soil
		SOLID								
	B99-078									
Duplicate (N910181-01)			N910181-06	7255-006	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-006	GAM		12/08/99	01/12/00	MCM	Gamma Scan
	B99-078		10/22/99	7255-006	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-006	SR		12/13/99	01/12/00	MCM	Total Strontium in Soil
				7255-006	TH		01/12/00	01/18/00	MCM	Thorium, Isotopic in Soil
				7255-006	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil
Duplicate (N910181-01)			N910181-09	7255-009	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
200 B Pond		SOLID	10/20/99							
	B99-078		10/22/99							
Duplicate (N910181-03)			N910181-12	7255-012	AM		01/23/00	01/28/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99							
	B99-078		10/22/99							

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/28/00

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SAMPLE DELIVERY GROUP H0588

SDG 7255
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-078	Americium 241 in Soil	AM/CMPLATE	3			2	2	2	9
GAM	B99-078	Gamma Scan	GAMMAHI	3			1	1	1	6
PU	B99-078	Plutonium, Isotopic in Solids	PUPLATE	3			1	1	1	6
SR	B99-078	Total Strontium in Soil	SRTOTAL	3			1	1	1	6
TH	B99-078	Thorium, Isotopic in Soil	THPLATE	3			1	1	1	6
U	B99-078	Uranium, Isotopic in Soil	UPLATE	1			1	1	1	4
U_T	B99-078	Uranium, Total in Soil	UKPA	3			1	1	1	6
TOTALS				19			8	8	8	43

Lab id TMANC
Protocol Hanford
Version Ver 1.0
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SAMPLE DELIVERY GROUP H0588

N910181-05 Method Blank

METHOD BLANK

SDG	7255	Client/Case no	Hanford	SDG H0588	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N910181-05	Client sample id	Method Blank		
Dept sample id	7255-005	Material/Matrix		SOLID	
		SAF No	B99-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	-0.006	0.011	0.026	1.0	U	U
Uranium 235	15117-96-1	-0.003	0.007	0.016	1.0	U	U
Uranium 238	U-238	0.001	0.006	0.011	1.0	U	U
Plutonium 238	13981-16-3	-0.004	0.016	0.037	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.016	0.037	1.0	U	PU
Americium 241	14596-10-2	0	0.021	0.051	1.0	U	AM
Total Strontium	SR-RAD	-0.096	0.14	0.19	1.0	U	SR
Thorium 228	14274-82-9	-0.075	0.11	0.29	1.0	U	TH
Thorium 230	14269-63-7	0.056	0.15	0.18	1.0	U	TH
Thorium 232	TH-232	0.019	0.037	0.14	1.0	U	TH
Potassium 40	13966-00-2	U		0.26		U	GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	U		0.016	0.10	U	GAM
Europium 152	14683-23-9	U		0.036	0.10	U	GAM
Europium 154	15585-10-1	U		0.039	0.10	U	GAM
Europium 155	14391-16-3	U		0.047	0.10	U	GAM
Radium 226	13982-63-3	U		0.028	0.10	U	GAM
Radium 228	15262-20-1	U		0.062	0.20	U	GAM
Thorium 228	14274-82-9	U		0.022		U	GAM
Thorium 232	TH-232	U		0.062		U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Uranium 235	15117-96-1	U		0.060		U	GAM

200 Area Source Chara.- 200-CW-1 OU

QC-BLANK 32637

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-08 Method Blank

METHOD BLANK

SDG	7255	Client/Case no	Hanford	SDG H0588
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925	
Lab sample id	N910181-08	Client sample id	Method Blank	
Dept sample id	7255-008	Material/Matrix		SOLID
		SAF No	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	-0.002	0.002	0.004	1.0	U	U_T

200 Area Source Chara.- 200-CW-1 OU

QC-BLANK 32306

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-11 Method Blank

METHOD BLANK

SDG	7255	Client/Case no	Hanford	SDG H0588	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N910181-11	Client sample id	Method Blank		
Dept sample id	7255-011	Material/Matrix		SOLID	
		SAF No	B99-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	0	0.014	0.028	1.0	U	AM

200 Area Source Chara.- 200-CW-1 OU

QC-BLANK 33169

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7255

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0588

Case no TRB-SBB-207925

Lab sample id N910181-04

Dept sample id 7255-004

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B99-078

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
Uranium 233	4.61	0.20	0.093	1.0		U	4.64	0.19	99	88-112	80-120
Uranium 235	3.68	0.18	0.010	1.0		U	3.77	0.15	98	88-112	80-120
Uranium 238	4.81	0.21	0.087	1.0		U	5.04	0.20	95	89-111	80-120
Plutonium 238	9.83	0.57	0.045	1.0		PU	10.0	0.40	98	87-113	80-120
Plutonium 239/240	10.2	0.59	0.027	1.0		PU	10.6	0.42	96	87-113	80-120
Americium 241	7.85	0.63	0.034	1.0		AM	9.58	0.38	82	87-113	80-120
Total Strontium	10.9	0.36	0.16	1.0		SR	11.3	0.45	96	84-116	
Thorium 228	-0.063	0.13	0.27	1.0	U	TH					
Thorium 230	20.9	1.6	0.19	1.0		TH	20.4	0.82	102	85-115	
Thorium 232	0.031	0.063	0.12	1.0	U	TH					
Potassium 40	U		0.11		U	GAM					
Cobalt 60	0.372	0.027	0.010	0.050		GAM	0.412	0.016	90	77-123	80-120
Cesium 137	0.421	0.025	0.018	0.10		GAM	0.432	0.017	97	76-124	80-120
Europium 152	U		0.036	0.10	U	GAM					
Europium 154	U		0.033	0.10	U	GAM					
Europium 155	U		0.023	0.10	U	GAM					
Radium 226	U		0.024	0.10	U	GAM					
Radium 228	U		0.066	0.20	U	GAM					
Thorium 228	U		0.017		U	GAM					
Thorium 232	U		0.066		U	GAM					
Americium 241	U		0.024		U	GAM					
Uranium 238	U		2.1		U	GAM					
Uranium 235	U		0.036		U	GAM					

200 Area Source Chara.- 200-CW-1 OU

QC-LCS 32636

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7255
Contact Melissa C. Mannion

Client/Case no Hanford SDG H0588
Case no TRB-SBB-207925

Lab sample id N910181-07
Dept sample id 7255-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-078

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium (ug/g)	34.6	4.2	0.041	1.0		U_T	37.2	1.5	93	78-122	80-120

200 Area Source Chara.- 200-CW-1 OU

QC-LCS 32305

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-10 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7255
Contact Melissa C. Mannion

Client/Case no Hanford SDG H0588
Case no TRB-SBB-207925

Lab sample id N910181-10
Dept sample id 7255-010

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-078

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
Americium 241	9.10	1.3	0.19	1.0		AM	9.58	0.38	95	78-122	80-120

200 Area Source Chara.- 200-CW-1 OU

QC-LCS 33168

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-06 B0WMX1

DUPLICATE

SDG 7255		Client/Case no Hanford	SDG H0588
Contact Melissa C. Mannion		Case no TRB-SBB-207925	
DUPLICATE	ORIGINAL		
Lab sample id N910181-06	Lab sample id N910181-01	Client sample id B0WMX1	
Dept sample id 7255-006	Dept sample id 7255-001	Location/Matrix 200 B Pond	SOLID
	Received 10/22/99	Collected 10/20/99 09:07	
	% solids 90.4	Custody/SAF No B99-78-144	B99-078

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
Uranium 233	0.638	0.061	0.024	1.0	J	U	0.567	0.054	0.014	J	12	23
Uranium 235	0.033	0.014	0.011	1.0	J	U	0.036	0.014	0.011	J	9	87
Uranium 238	0.585	0.056	0.013	1.0	J	U	0.559	0.054	0.014	J	5	23
Plutonium 238	0	0.014	0.038	1.0	U	PU	-0.004	0.014	0.039	U	-	
Plutonium 239/240	0.044	0.028	0.026	1.0	J	PU	0.085	0.036	0.027	J	64	107
Americium 241	0.077	0.037	0.035	1.0	J	AM	0.075	0.040	0.044	J	3	108
Total Strontium	9.85	0.54	0.24	1.0		SR	9.79	0.53	0.22		1	24
Thorium 228	0.468	0.22	0.26	1.0	J	TH	0.562	0.22	0.24	J	18	91
Thorium 230	0.860	0.25	0.21	1.0	J	TH	0.498	0.19	0.19	J	53	70
Thorium 232	0.568	0.19	0.12	1.0	J	TH	0.581	0.17	0.091	J	2	67
Potassium 40	14.8	0.88	0.27			GAM	15.0	0.90	0.45		1	34
Cobalt 60	U		0.029	0.050	U	GAM	U		0.056	U	-	
Cesium 137	203	0.50	0.11	0.10		GAM	188	0.70	0.17		8	32
Europium 152	U		0.37	0.10	U	GAM	U		0.65	U	-	
Europium 154	U		0.099	0.10	U	GAM	U		0.17	U	-	
Europium 155	U		0.23	0.10	U	GAM	U		0.38	U	-	
Radium 226	0.696	0.11	0.14	0.10		GAM	0.762	0.23	0.28		9	61
Radium 228	0.873	0.13	0.13	0.20		GAM	0.906	0.22	0.22		4	54
Thorium 228	0.820	0.14	0.19			GAM	0.902	0.24	0.31		10	58
Thorium 232	0.873	0.13	0.13			GAM	0.906	0.22	0.22		4	54
Americium 241	U		0.11		U	GAM	U		0.22	U	-	
Uranium 238	U		3.4		U	GAM	U		5.8	U	-	
Uranium 235	U		0.40		U	GAM	U		0.62	U	-	

200 Area Source Chara.- 200-CW-1 OU

QC-DUP#1 32638

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-09 B0WMX1

DUPLICATE

SDG	7255			Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion			Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL			
Lab sample id	N910181-09	Lab sample id	N910181-01	Client sample id	B0WMX1
Dept sample id	7255-009	Dept sample id	7255-001	Location/Matrix	200 B Pond SOLID
		Received	10/22/99	Collected	10/20/99 09:07
		% solids	90.4	Custody/SAF No	B99-78-144 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Total Uranium (ug/g)	1.05	0.12	0.004	1.0		U_T	1.04	0.12	0.004		1	31	

200 Area Source Chara.- 200-CW-1 OU

QC-DUP#1 32307

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-12 B0WMX3

DUPLICATE

SDG	7255			Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion			Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL			
Lab sample id	N910181-12	Lab sample id	N910181-03	Client sample id	B0WMX3
Dept sample id	7255-012	Dept sample id	7255-003	Location/Matrix	200 B Pond SOLID
		Received	10/22/99	Collected	10/20/99 09:30
		% solids	94.8	Custody/SAF No	B99-78-144 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Americium 241	0.011	0.022	0.034	1.0	U	AM	0.028	0.022	0.031	U	-		

200 Area Source Chara.- 200-CW-1 OU

QC-DUP#3A1 33170

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-01 B0WMX1

DATA SHEET

SDG	7255	Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N910181-01	Client sample id	B0WMX1
Dept sample id	7255-001	Location/Matrix	200 B Pond SOLID
Received	10/22/99	Collected	10/20/99 09:07
% solids	90.4	Custody/SAF No	B99-78-144 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	0.567	0.054	0.014	1.0	J	U
Uranium 235	15117-96-1	0.036	0.014	0.011	1.0	J	U
Uranium 238	U-238	0.559	0.054	0.014	1.0	J	U
Total Uranium (ug/g)	7440-61-1	1.04	0.12	0.004	1.0		U_T
Plutonium 238	13981-16-3	-0.004	0.014	0.039	1.0	U	PU
Plutonium 239/240	PU-239/240	0.085	0.036	0.027	1.0	J	PU
Americium 241	14596-10-2	0.075	0.040	0.044	1.0	J	AM
Total Strontium	SR-RAD	9.79	0.53	0.22	1.0		SR
Thorium 228	14274-82-9	0.562	0.22	0.24	1.0	J	TH
Thorium 230	14269-63-7	0.498	0.19	0.19	1.0	J	TH
Thorium 232	TH-232	0.581	0.17	0.091	1.0	J	TH
Potassium 40	13966-00-2	15.0	0.90	0.45			GAM
Cobalt 60	10198-40-0	U		0.056	0.050	U	GAM
Cesium 137	10045-97-3	188	0.70	0.17	0.10		GAM
Europium 152	14683-23-9	U		0.65	0.10	U	GAM
Europium 154	15585-10-1	U		0.17	0.10	U	GAM
Europium 155	14391-16-3	U		0.38	0.10	U	GAM
Radium 226	13982-63-3	0.762	0.23	0.28	0.10		GAM
Radium 228	15262-20-1	0.906	0.22	0.22	0.20		GAM
Thorium 228	14274-82-9	0.902	0.24	0.31			GAM
Thorium 232	TH-232	0.906	0.22	0.22			GAM
Americium 241	14596-10-2	U		0.22		U	GAM
Uranium 238	U-238	U		5.8		U	GAM
Uranium 235	15117-96-1	U		0.62		U	GAM

200 Area Source Chara.- 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-02 B0WMX2

DATA SHEET

SDG	7255	Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N910181-02	Client sample id	B0WMX2
Dept sample id	7255-002	Location/Matrix	200 B Pond SOLID
Received	10/22/99	Collected	10/20/99 09:12
% solids	95.5	Custody/SAF No	B99-78-144 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	0.589	0.068	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	-0.004	0.023	0.046	1.0	U	PU
Plutonium 239/240	PU-239/240	0.015	0.023	0.036	1.0	U	PU
Americium 241	14596-10-2	0.021	0.032	0.041	1.0	U	AM
Total Strontium	SR-RAD	0.524	0.099	0.11	1.0	J	SR
Thorium 228	14274-82-9	0.669	0.28	0.32	1.0	J	TH
Thorium 230	14269-63-7	0.548	0.24	0.22	1.0	J	TH
Thorium 232	TH-232	0.548	0.20	0.15	1.0	J	TH
Potassium 40	13966-00-2	14.4	0.88	0.44			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	31.7	0.29	0.11	0.10		GAM
Europium 152	14683-23-9	U		0.29	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Radium 226	13982-63-3	0.645	0.14	0.17	0.10		GAM
Radium 228	15262-20-1	0.904	0.17	0.17	0.20		GAM
Thorium 228	14274-82-9	1.10	0.15	0.17			GAM
Thorium 232	TH-232	0.904	0.17	0.17			GAM
Americium 241	14596-10-2	U		0.29		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Uranium 235	15117-96-1	U		0.31		U	GAM

200 Area Source Chara.- 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-03 B0WMX3

DATA SHEET

SDG	7255	Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N910181-03	Client sample id	B0WMX3
Dept sample id	7255-003	Location/Matrix	200 B Pond SOLID
Received	10/22/99	Collected	10/20/99 09:30
% solids	94.8	Custody/SAF No	B99-78-144 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	0.654	0.076	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	0.004	0.017	0.041	1.0	U	PU
Plutonium 239/240	PU-239/240	0.013	0.017	0.033	1.0	U	PU
Americium 241	14596-10-2	0.028	0.022	0.031	1.0	U	AM
Total Strontium	SR-RAD	0.727	0.13	0.15	1.0	J	SR
Thorium 228	14274-82-9	0.468	0.24	0.30	1.0	J	TH
Thorium 230	14269-63-7	0.570	0.21	0.18	1.0	J	TH
Thorium 232	TH-232	0.435	0.15	0.11	1.0	J	TH
Potassium 40	13966-00-2	13.8	0.53	0.22			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	20.2	0.14	0.041	0.10		GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.079	0.10	U	GAM
Europium 155	14391-16-3	U		0.097	0.10	U	GAM
Radium 226	13982-63-3	0.561	0.064	0.070	0.10		GAM
Radium 228	15262-20-1	0.872	0.096	0.090	0.20		GAM
Thorium 228	14274-82-9	0.767	0.048	0.064			GAM
Thorium 232	TH-232	0.872	0.096	0.090			GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

200 Area Source Chara.- 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test AM Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 6904-166						
B0WMX1	N910181-01			7255-001	0.075	J
B0WMX2	N910181-02			7255-002	U	
B0WMX3	N910181-03		A1	7255-003	U	
BLK (QC ID=32637)	N910181-05			7255-005	U	
BLK (QC ID=33169)	N910181-11			7255-011	U	
LCS (QC ID=32636)	N910181-04			7255-004	LOW	
LCS (QC ID=33168)	N910181-10			7255-010	ok	
Duplicate (N910181-01)	N910181-06			7255-006	ok	J
Duplicate (N910181-03)	N910181-12			7255-012	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200 Area Source Chara.- 200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 166																
B0WMX1	N910181-01			0.044	0.500			79		762			56	12/15/99	12/15	SS-008
B0WMX2	N910181-02			0.041	0.500			59		760			56	12/15/99	12/15	SS-009
B0WMX3	N910181-03		A1	0.031	0.500			56		1625			95	01/22/00	01/23	SS-001
BLK (QC ID=32637)	N910181-05			0.051	0.500			58		760				12/15/99	12/15	SS-011
BLK (QC ID=33169)	N910181-11			0.028	0.500			68		1625				01/22/00	01/23	SS-015
LCS (QC ID=32636)	N910181-04			0.034	0.500			68		762				12/15/99	12/15	SS-005
LCS (QC ID=33168)	N910181-10			0.19	0.500			75		2078				01/22/00	01/25	SS-051
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.035	0.500			85		760			56	12/15/99	12/15	SS-012
Duplicate (N910181-03) (QC ID=33170)	N910181-12			0.034	0.500			55		1625			95	01/22/00	01/23	SS-016
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test AM	Matrix SOLID
SDG 7255	
Contact Melissa C. Mannion	

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0588	

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	0.054	±	0.10
FOR 9 SAMPLES	YIELD	67	±	22

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test PU Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6904-166								
B0WMX1	N910181-01			7255-001	U		0.085	J
B0WMX2	N910181-02			7255-002	U		U	
B0WMX3	N910181-03			7255-003	U		U	
BLK (QC ID=32637)	N910181-05			7255-005	U		U	
LCS (QC ID=32636)	N910181-04			7255-004	ok		ok	
Duplicate (N910181-01)	N910181-06			7255-006	-	U	ok	J
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200 Area Source Chara.- 200-CW-1 OU								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 5.0 %			Reference Lab Notebook 6904 pg. 166												
B0WMX1	N910181-01			0.039	0.500			89		760			56	12/14/99	12/15	SS-013
B0WMX2	N910181-02			0.046	0.500			82		760			56	12/14/99	12/15	SS-014
B0WMX3	N910181-03			0.041	0.500			75		760			56	12/14/99	12/15	SS-015
BLK (QC ID=32637)	N910181-05			0.037	0.500			81		760				12/14/99	12/15	SS-016
LCS (QC ID=32636)	N910181-04			0.045	0.500			100		1066				12/14/99	12/14	SS-044
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.038	0.500			97		726			56	12/14/99	12/15	SS-058
Nominal values and limits from method				1.0	0.500			20-105		10	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.041 ± 0.007
YIELD 87 ± 20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test TH Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6904-166							
B0WMX1	N910181-01			7255-001	0.562 J	0.498 J	0.581 J
B0WMX2	N910181-02			7255-002	0.669 J	0.548 J	0.548 J
B0WMX3	N910181-03			7255-003	0.468 J	0.570 J	0.435 J
BLK (QC ID=32637)	N910181-05			7255-005	U	U	U
LCS (QC ID=32636)	N910181-04			7255-004	No data U	ok	No data U
Duplicate (N910181-01)	N910181-06			7255-006	ok J	ok J	ok J
Nominal values and limits from method			RDLs (pCi/g)		1.0	1.0	1.0
200 Area Source Chara.- 200-CW-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 5.0 %			Reference Lab Notebook 6904 pg. 166												
B0WMX1	N910181-01			0.24	0.250			58		665			76	12/30/99	01/04	SS-032
B0WMX2	N910181-02			0.32	0.250			55		431			75	12/30/99	01/03	SS-032
B0WMX3	N910181-03			0.30	0.250			72		431			75	12/30/99	01/03	SS-033
BLK (QC ID=32637)	N910181-05			0.29	0.250			59		442				12/18/99	01/03	SS-027
LCS (QC ID=32636)	N910181-04			0.27	0.250			69		431				12/18/99	01/03	SS-034
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.26	0.250			55		573			84	12/30/99	01/12	SS-027
Nominal values and limits from method				1.0	0.250			20-105		200			180			

PROCEDURES	REFERENCE	THPLATE
	EP-000	Data Entry and Document Preparation, rev 0
	EP-001	Q.C. Preparation, rev 0
	EP-003	Tracing, rev 0
	EP-008	Heavy Elements Electroplating, rev 0
	EP-070	Soil Dissolution, rev 0
	RP-901	Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.28 ± 0.058
YIELD 61 ± 15

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test U Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

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 6904-166											
B0WMX1	N910181-01			7255-001	0.567 J	0.036 J	0.559 J	101	14	6	3
BLK (QC ID=32637)	N910181-05			7255-005	U	U	U				
LCS (QC ID=32636)	N910181-04			7255-004	ok	ok	ok				
Duplicate (N910181-01)	N910181-06			7255-006	ok J	ok J	ok J	109	15	6	2
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200 Area Source Chara.- 200-CW-1 OU							Averages	105		6	

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 6904-166 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 166																
B0WMX1	N910181-01			0.014	1.00			101		1049			88	01/13/00	01/16	SS-027
BLK (QC ID=32637)	N910181-05			0.026	1.00			77		1048				01/14/00	01/16	SS-031
LCS (QC ID=32636)	N910181-04			0.093	1.00			102		1049				01/14/00	01/16	SS-029
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.024	1.00			92		1048			88	01/13/00	01/16	SS-032
Nominal values and limits from method				1.0	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Uranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.039 ± 0.072
YIELD 93 ± 23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test SR	Matrix SOLID
SDG 7255	
Contact Melissa C. Mannion	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0588	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6904-166					
B0WMX1	N910181-01			7255-001	9.79
B0WMX2	N910181-02			7255-002	0.524 J
B0WMX3	N910181-03			7255-003	0.727 J
BLK (QC ID=32637)	N910181-05			7255-005	U
LCS (QC ID=32636)	N910181-04			7255-004	ok
Duplicate (N910181-01)	N910181-06			7255-006	ok

Nominal values and limits from method RDLs (pCi/g) 1.0

200 Area Source Chara.- 200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 166															
B0WMX1	N910181-01			0.22	1.00			99		400			57	12/14/99	12/16	GRB-221
B0WMX2	N910181-02			0.11	1.00			102		200			61	12/14/99	12/20	GRB-230
B0WMX3	N910181-03			0.15	1.00			98		200			57	12/14/99	12/16	GRB-231
BLK (QC ID=32637)	N910181-05			0.19	1.00			82		400				12/10/99	12/13	GRB-201
LCS (QC ID=32636)	N910181-04			0.16	1.00			90		400				12/13/99	12/13	GRB-224
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.24	1.00			94		400			54	12/10/99	12/13	GRB-202
Nominal values and limits from method				1.0	1.00					100			180			

PROCEDURES	REFERENCE	SRTOTAL
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD	MDA	0.18	± 0.096
FOR 6 SAMPLES	YIELD	94	± 15

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test GAM Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6904-166						
B0WMX1	N910181-01			7255-001	U	188
B0WMX2	N910181-02			7255-002	U	31.7
B0WMX3	N910181-03			7255-003	U	20.2
BLK (QC ID=32637)	N910181-05			7255-005	U	U
LCS (QC ID=32636)	N910181-04			7255-004	ok	ok
Duplicate (N910181-01)	N910181-06			7255-006	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.10
200 Area Source Chara.- 200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 166															
B0WMX1	N910181-01			0.15	597					212			49	11/29/99	12/08	02,01,00
B0WMX2	N910181-02			0.12	570					213			49	11/28/99	12/08	02,03,00
B0WMX3	N910181-03			0.067	633					213			49	11/28/99	12/08	02,04,00
BLK (QC ID=32637)	N910181-05			0.029	597					206				11/27/99	12/08	MB,05,00
LCS (QC ID=32636)	N910181-04			0.036	597					206				11/27/99	12/08	01,04,00
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.075	597					204			49	11/18/99	12/08	MB,07,00
Nominal values and limits from method				0.050	597					100			180			

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.080 ± 0.095
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/28/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test	U T
Matrix	SOLID
SDG	7255
Contact	Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN SOIL

KINETIC PHOSPHORIMETRY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 6904-166					
B0WMX1	N910181-01			7255-001	1.04
B0WMX2	N910181-02			7255-002	0.589 J
B0WMX3	N910181-03			7255-003	0.654 J
BLK (QC ID=32306)	N910181-08			7255-008	U
LCS (QC ID=32305)	N910181-07			7255-007	ok
Duplicate (N910181-01)	N910181-09			7255-009	ok
Nominal values and limits from method				RDLs (ug/g)	1.0
200 Area Source Chara.- 200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166 2σ prep error 9.0 % Reference Lab Notebook 6904 pg. 166																
B0WMX1	N910181-01			0.004	0.0500								19	11/05/99	11/08	KPA-001
B0WMX2	N910181-02			0.004	0.0500								19	11/05/99	11/08	KPA-001
B0WMX3	N910181-03			0.004	0.0500								19	11/05/99	11/08	KPA-001
BLK (QC ID=32306)	N910181-08			0.004	0.0500									12/05/99	12/08	KPA-001
LCS (QC ID=32305)	N910181-07			0.041	0.0500									11/05/99	11/08	KPA-001
Duplicate (N910181-01) (QC ID=32307)	N910181-09			0.004	0.0500								19	11/05/99	11/08	KPA-001
Nominal values and limits from method				1.0	0.0500								180			

PROCEDURES	REFERENCE	UKPA
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-044	Preparation of Total Uranium by Kinetic Phosphorimetry, rev 1
	EP-928	Total Uranium by Kinetic Phosphorimetry, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES				
MDA	0.010	±	0.030
YIELD		±	

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/28/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: Shipping van 96.006	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA/RECRA~~ TMA B78 10-20-99	Offsite Property No.: A00001		Bill of Lading/Air Bill No.: 42357953 0874
			COA: B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
	Type of Container	aG	aG	aG	aG	aG	aG	aG			
	No. of Container(s)	1	1	1	1	1	1	1			
Special Handling and/or Storage	Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS		Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
BOWMX1	Soil	10/20/99	0907	X						X			BOW8C2
BOWMX2	Soil	10/20/99	0912	X						X			BOW8C2
BOWMX3	Soil	10/20/99	0930	X						X			BOW8C2

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Chris Cearlock	Date/Time: 10/20/99 1230	Received By: Ref 3A	Date/Time: 10/20/99 1230
Relinquished By: REF 3A	Date/Time: 10-21-99/0830	Received By: RThoren/Rikki Thoren	Date/Time: 10-21-99 0830
Relinquished By: RThoren/Rikki Thoren	Date/Time: 10-21-99 1430	Received By: FED EX	Date/Time: 10-21-99
Relinquished By: Fed Ex	Date/Time: 10-22-99 10:00	Received By: [illegible]	Date/Time: 10:00 10-22-99

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 – Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 10-22-99 10:00

CoC No. B99-078-144, B99-005-062

Container I.D. No. 96-006 Requested TAT (Days) ~~45~~ 15 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: 12
7. Number of containers per sample: _____ (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 J. Corso Date: 10-22-99 Time: 10:00

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

JAN 2000
RECEIVED
Data
Log In

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0588 was composed of three solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source Characterization – 200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. Most of the results were transmitted to BHI via facsimile on January 12, 2000. This hard copy is a complete data report for SDG H0588.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.3 Total Uranium Analyses

No problems were encountered during the course of the analyses. The Total Uranium results were reported on November 27, 1999 via facsimile.

2.4 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses. BHI requested sample B0WMX1 (7255-01) be analyzed for Isotopic Uranium on January 11, 2000.

2.5 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.6 Americium-241 Analyses

Sample B0WMX3 (7255-03) had a yield of 7%, below the acceptable lower protocol limit of 20%. The sample was reworked and recounted by the lab, but the yield (3%) on the rework was not improved. The original sample data has been reported. Thermo Retec is reanalyzing sample B0WMX3. No other problems were encountered during the course of the analyses.

2.7 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SAMPLE SUMMARY

SDG 7255
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0WMX1	200 B Pond	SOLID		N910181-01	B99-078	B99-78-144	10/20/99 09:07
B0WMX2	200 B Pond	SOLID		N910181-02	B99-078	B99-78-144	10/20/99 09:12
B0WMX3	200 B Pond	SOLID		N910181-03	B99-078	B99-78-144	10/20/99 09:30
Method Blank		SOLID		N910181-05	B99-078		
Method Blank		SOLID		N910181-08	B99-078		
Lab Control Sample		SOLID		N910181-04	B99-078		
Lab Control Sample		SOLID		N910181-07	B99-078		
Duplicate (N910181-01)	200 B Pond	SOLID		N910181-06	B99-078		10/20/99 09:07
Duplicate (N910181-01)	200 B Pond	SOLID		N910181-09	B99-078		10/20/99 09:07

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SDG 7255
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

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
7255	B99-78-144	B0WMX1	SOLID	90.4			10/22/99	2	N910181-01	7255-001
		B0WMX2	SOLID	95.5			10/22/99	2	N910181-02	7255-002
		B0WMX3	SOLID	94.8			10/22/99	2	N910181-03	7255-003
		Method Blank	SOLID						N910181-05	7255-005
		Method Blank	SOLID						N910181-08	7255-008
		Lab Control Sample	SOLID						N910181-04	7255-004
		Lab Control Sample	SOLID						N910181-07	7255-007
		Duplicate (N910181-01)	SOLID				10/22/99	2	N910181-06	7255-006
		Duplicate (N910181-01)	SOLID				10/22/99	2	N910181-09	7255-009

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SDG 7255
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6904-166	5.0	3			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6904-166	5.0	3			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6904-166	5.0	3			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6904-166	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6904-166	10.0	3			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6904-166	15.0	3			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	6904-166	9.0	3			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

WORK SUMMARY

SDG 7255
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0WMX1			N910181-01	7255-001	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-001	GAM		12/08/99	01/12/00	MCM	Gamma Scan
B99-78-144	B99-078		10/22/99	7255-001	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-001	SR		12/16/99	01/12/00	MCM	Total Strontium in Soil
				7255-001	TH		01/04/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-001	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil
				7255-001	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
B0WMX2			N910181-02	7255-002	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-002	GAM		12/08/99	01/12/00	MCM	Gamma Scan
B99-78-144	B99-078		10/22/99	7255-002	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-002	SR		12/20/99	01/12/00	MCM	Total Strontium in Soil
				7255-002	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-002	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
B0WMX3			N910181-03	7255-003	AM		12/15/99	01/18/00	NJV	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-003	GAM		12/08/99	01/12/00	MCM	Gamma Scan
B99-78-144	B99-078		10/22/99	7255-003	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-003	SR		12/16/99	01/12/00	MCM	Total Strontium in Soil
				7255-003	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-003	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
Method Blank			N910181-05	7255-005	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
		SOLID		7255-005	GAM		12/08/99	01/12/00	MCM	Gamma Scan
	B99-078			7255-005	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-005	SR		12/13/99	01/12/00	MCM	Total Strontium in Soil
				7255-005	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-005	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil
Method Blank			N910181-08	7255-008	U_T		12/08/99	01/12/00	MCM	Uranium, Total in Soil
		SOLID								
	B99-078									
Lab Control Sample			N910181-04	7255-004	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
		SOLID		7255-004	GAM		12/08/99	01/12/00	MCM	Gamma Scan
	B99-078			7255-004	PU		12/14/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-004	SR		12/13/99	01/12/00	MCM	Total Strontium in Soil
				7255-004	TH		01/03/00	01/12/00	MCM	Thorium, Isotopic in Soil
				7255-004	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

SDG 7255
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample	B99-078	SOLID	N910181-07	7255-007	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
Duplicate (N910181-01)			N910181-06	7255-006	AM		12/15/99	01/12/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/20/99	7255-006	GAM		12/08/99	01/12/00	MCM	Gamma Scan
	B99-078		10/22/99	7255-006	PU		12/15/99	01/12/00	MCM	Plutonium, Isotopic in Solids
				7255-006	SR		12/13/99	01/12/00	MCM	Total Strontium in Soil
				7255-006	TH		01/12/00	01/18/00	MCM	Thorium, Isotopic in Soil
				7255-006	U		01/16/00	01/18/00	MCM	Uranium, Isotopic in Soil
Duplicate (N910181-01)			N910181-09	7255-009	U_T		11/08/99	01/12/00	MCM	Uranium, Total in Soil
200 B Pond		SOLID	10/20/99							
	B99-078		10/22/99							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-078	Americium 241 in Soil	AM/CMPLATE	3			1	1	1	6
GAM	B99-078	Gamma Scan	GAMMAHI	3			1	1	1	6
PU	B99-078	Plutonium, Isotopic in Solids	PUPLATE	3			1	1	1	6
SR	B99-078	Total Strontium in Soil	SRTOTAL	3			1	1	1	6
TH	B99-078	Thorium, Isotopic in Soil	THPLATE	3			1	1	1	6
U	B99-078	Uranium, Isotopic in Soil	UPLATE	1			1	1	1	4
U_T	B99-078	Uranium, Total in Soil	UKPA	3			1	1	1	6
TOTALS				19			7	7	7	40

Lab id TMANC
Protocol Hanford
Version Ver 1.0
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-05 Method Blank

METHOD BLANK

SDG	7255	Client/Case no	Hanford	SDG H0588	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N910181-05	Client sample id	Method Blank		
Dept sample id	7255-005	Material/Matrix		SOLID	
		SAF No	B99-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	-0.006	0.011	0.026	1.0	U	U
Uranium 235	15117-96-1	-0.003	0.007	0.016	1.0	U	U
Uranium 238	U-238	0.001	0.006	0.011	1.0	U	U
Plutonium 238	13981-16-3	-0.004	0.016	0.037	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.016	0.037	1.0	U	PU
Americium 241	14596-10-2	0	0.021	0.051	1.0	U	AM
Total Strontium	SR-RAD	-0.096	0.14	0.19	1.0	U	SR
Thorium 228	14274-82-9	-0.075	0.11	0.29	1.0	U	TH
Thorium 230	14269-63-7	0.056	0.15	0.18	1.0	U	TH
Thorium 232	TH-232	0.019	0.037	0.14	1.0	U	TH
Potassium 40	13966-00-2	U		0.91		U	GAM
Cobalt 60	10198-40-0	U		0.054	0.050	U	GAM
Cesium 137	10045-97-3	U		0.056	0.10	U	GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Radium 226	13982-63-3	U		0.099	0.10	U	GAM
Radium 228	15262-20-1	U		0.22	0.20	U	GAM
Thorium 228	14274-82-9	U		0.076		U	GAM
Thorium 232	TH-232	U		0.22		U	GAM
Americium 241	14596-10-2	U		0.42		U	GAM
Uranium 238	U-238	U		7.0		U	GAM
Uranium 235	15117-96-1	U		0.21		U	GAM

200 Area Source Chara.- 200-CW-1 OU

QC-BLANK 32637

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-08 Method Blank

METHOD BLANK

SDG	7255	Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N910181-08	Client sample id	Method Blank
Dept sample id	7255-008	Material/Matrix	SOLID
		SAF No	B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	-0.002	0.002	0.004	1.0	U	U_T

200 Area Source Chara.- 200-CW-1 OU

QC-BLANK 32306

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7255

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0588

Case no TRB-SBB-207925

Lab sample id N910181-04

Dept sample id 7255-004

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B99-078

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
Uranium 233	4.61	0.20	0.093	1.0		U	4.64	0.19	99	88-112	80-120
Uranium 235	3.68	0.18	0.010	1.0		U	3.77	0.15	98	88-112	80-120
Uranium 238	4.81	0.21	0.087	1.0		U	5.04	0.20	95	89-111	80-120
Plutonium 238	9.83	0.57	0.045	1.0		PU	10.0	0.40	98	87-113	80-120
Plutonium 239/240	10.2	0.59	0.027	1.0		PU	10.6	0.42	96	87-113	80-120
Americium 241	7.85	0.63	0.034	1.0		AM	9.58	0.38	82	87-113	80-120
Total Strontium	10.9	0.36	0.16	1.0		SR	11.3	0.45	96	84-116	
Thorium 228	-0.063	0.13	0.27	1.0	U	TH					
Thorium 230	20.9	1.6	0.19	1.0		TH	20.4	0.82	102	85-115	
Thorium 232	0.031	0.063	0.12	1.0	U	TH					
Cobalt 60	1.30	0.093	0.034	0.050		GAM	1.44	0.058	90	77-123	80-120
Cesium 137	1.47	0.088	0.062	0.10		GAM	1.51	0.060	97	76-124	80-120

200 Area Source Chara.- 200-CW-1 OU

QC-LCS 32636

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7255

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0588

Case no TRB-SBB-207925

Lab sample id N910181-07

Dept sample id 7255-007

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B99-078

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium (ug/g)	34.6	4.2	0.041	1.0		U_T	37.2	1.5	93	78-122	80-120

200 Area Source Chara.- 200-CW-1 OU

QC-LCS 32305

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-06 B0WMX1

DUPLICATE

SDG	7255	Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion	Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL	
Lab sample id	N910181-06	Lab sample id	N910181-01
Dept sample id	7255-006	Dept sample id	7255-001
		Received	10/22/99
		% solids	90.4
		Client sample id	B0WMX1
		Location/Matrix	200 B Pond SOLID
		Collected	10/20/99 09:07
		Custody/SAF No	B99-78-144 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Uranium 233	0.638	0.061	0.024	1.0	J	U	0.567	0.054	0.014	J	12	23	
Uranium 235	0.033	0.014	0.011	1.0	J	U	0.036	0.014	0.011	J	9	87	
Uranium 238	0.585	0.056	0.013	1.0	J	U	0.559	0.054	0.014	J	5	23	
Plutonium 238	0	0.014	0.038	1.0	U	PU	-0.004	0.014	0.039	U	-		
Plutonium 239/240	0.044	0.028	0.026	1.0	J	PU	0.085	0.036	0.027	J	64	107	
Americium 241	0.077	0.037	0.035	1.0	J	AM	0.075	0.040	0.044	J	3	108	
Total Strontium	9.85	0.54	0.24	1.0		SR	9.79	0.53	0.22		1	24	
Thorium 228	0.468	0.22	0.26	1.0	J	TH	0.562	0.22	0.24	J	18	91	
Thorium 230	0.860	0.25	0.21	1.0	J	TH	0.498	0.19	0.19	J	53	70	
Thorium 232	0.568	0.19	0.12	1.0	J	TH	0.581	0.17	0.091	J	2	67	
Potassium 40	14.8	0.88	0.27			GAM	15.0	0.90	0.45		1	34	
Cobalt 60	U		0.029	0.050	U	GAM	U		0.056	U	-		
Cesium 137	203	0.50	0.11	0.10		GAM	188	0.70	0.17		8	32	
Europium 152	U		0.37	0.10	U	GAM	U		0.65	U	-		
Europium 154	U		0.099	0.10	U	GAM	U		0.17	U	-		
Europium 155	U		0.23	0.10	U	GAM	U		0.38	U	-		
Radium 226	0.696	0.11	0.14	0.10		GAM	0.762	0.23	0.28		9	61	
Radium 228	0.873	0.13	0.13	0.20		GAM	0.906	0.22	0.22		4	54	
Thorium 228	0.820	0.14	0.19			GAM	0.902	0.24	0.31		10	58	
Thorium 232	0.873	0.13	0.13			GAM	0.906	0.22	0.22		4	54	
Americium 241	U		0.11		U	GAM	U		0.22	U	-		
Uranium 238	U		3.4		U	GAM	U		5.8	U	-		
Uranium 235	U		0.40		U	GAM	U		0.62	U	-		

200 Area Source Chara.- 200-CW-1 OU

QC-DUP#1 32638

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-09

B0WMX1

DUPLICATE

SDG	7255			Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion			Case no	TRB-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	N910181-09	Lab sample id	N910181-01	Client sample id	B0WMX1
Dept sample id	7255-009	Dept sample id	7255-001	Location/Matrix	200 B Pond SOLID
		Received	10/22/99	Collected	10/20/99 09:07
		% solids	90.4	Custody/SAF No	B99-78-144 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Total Uranium (ug/g)	1.05	0.12	0.004	1.0		U_T	1.04	0.12	0.004		1	31	

200 Area Source Chara.- 200-CW-1 OU

QC-DUP#1 32307

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-01 B0WMX1

DATA SHEET

SDG	7255	Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N910181-01	Client sample id	B0WMX1
Dept sample id	7255-001	Location/Matrix	200 B Pond SOLID
Received	10/22/99	Collected	10/20/99 09:07
% solids	90.4	Custody/SAF No	B99-78-144 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	0.567	0.054	0.014	1.0	J	U
Uranium 235	15117-96-1	0.036	0.014	0.011	1.0	J	U
Uranium 238	U-238	0.559	0.054	0.014	1.0	J	U
Total Uranium (ug/g)	7440-61-1	1.04	0.12	0.004	1.0		U_T
Plutonium 238	13981-16-3	-0.004	0.014	0.039	1.0	U	PU
Plutonium 239/240	PU-239/240	0.085	0.036	0.027	1.0	J	PU
Americium 241	14596-10-2	0.075	0.040	0.044	1.0	J	AM
Total Strontium	SR-RAD	9.79	0.53	0.22	1.0		SR
Thorium 228	14274-82-9	0.562	0.22	0.24	1.0	J	TH
Thorium 230	14269-63-7	0.498	0.19	0.19	1.0	J	TH
Thorium 232	TH-232	0.581	0.17	0.091	1.0	J	TH
Potassium 40	13966-00-2	15.0	0.90	0.45			GAM
Cobalt 60	10198-40-0	U		0.056	0.050	U	GAM
Cesium 137	10045-97-3	188	0.70	0.17	0.10		GAM
Europium 152	14683-23-9	U		0.65	0.10	U	GAM
Europium 154	15585-10-1	U		0.17	0.10	U	GAM
Europium 155	14391-16-3	U		0.38	0.10	U	GAM
Radium 226	13982-63-3	0.762	0.23	0.28	0.10		GAM
Radium 228	15262-20-1	0.906	0.22	0.22	0.20		GAM
Thorium 228	14274-82-9	0.902	0.24	0.31			GAM
Thorium 232	TH-232	0.906	0.22	0.22			GAM
Americium 241	14596-10-2	U		0.22		U	GAM
Uranium 238	U-238	U		5.8		U	GAM
Uranium 235	15117-96-1	U		0.62		U	GAM

200 Area Source Chara.- 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-02 B0WMX2

DATA SHEET

SDG	7255	Client/Case no	Hanford SDG H0588
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N910181-02	Client sample id	B0WMX2
Dept sample id	7255-002	Location/Matrix	200 B Pond SOLID
Received	10/22/99	Collected	10/20/99 09:12
% solids	95.5	Custody/SAF No	B99-78-144 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	0.589	0.068	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	-0.004	0.023	0.046	1.0	U	PU
Plutonium 239/240	PU-239/240	0.015	0.023	0.036	1.0	U	PU
Americium 241	14596-10-2	0.021	0.032	0.041	1.0	U	AM
Total Strontium	SR-RAD	0.524	0.099	0.11	1.0	J	SR
Thorium 228	14274-82-9	0.669	0.28	0.32	1.0	J	TH
Thorium 230	14269-63-7	0.548	0.24	0.22	1.0	J	TH
Thorium 232	TH-232	0.548	0.20	0.15	1.0	J	TH
Potassium 40	13966-00-2	14.4	0.88	0.44			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	31.7	0.29	0.11	0.10		GAM
Europium 152	14683-23-9	U		0.29	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Radium 226	13982-63-3	0.645	0.14	0.17	0.10		GAM
Radium 228	15262-20-1	0.904	0.17	0.17	0.20		GAM
Thorium 228	14274-82-9	1.10	0.15	0.17			GAM
Thorium 232	TH-232	0.904	0.17	0.17			GAM
Americium 241	14596-10-2	U		0.29		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Uranium 235	15117-96-1	U		0.31		U	GAM

200 Area Source Chara.- 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

N910181-03 B0WMX3

DATA SHEET

SDG	7255	Client/Case no	Hanford	SDG H0588	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N910181-03	Client sample id	B0WMX3		
Dept sample id	7255-003	Location/Matrix	200 B Pond	SOLID	
Received	10/22/99	Collected	10/20/99 09:30		
% solids	94.8	Custody/SAF No	B99-78-144	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	0.654	0.076	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	0.004	0.017	0.041	1.0	U	PU
Plutonium 239/240	PU-239/240	0.013	0.017	0.033	1.0	U	PU
Americium 241	14596-10-2	-0.046	0.28	0.56	1.0	U	AM
Total Strontium	SR-RAD	0.727	0.13	0.15	1.0	J	SR
Thorium 228	14274-82-9	0.468	0.24	0.30	1.0	J	TH
Thorium 230	14269-63-7	0.570	0.21	0.18	1.0	J	TH
Thorium 232	TH-232	0.435	0.15	0.11	1.0	J	TH
Potassium 40	13966-00-2	13.8	0.53	0.22			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	20.2	0.14	0.041	0.10		GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.079	0.10	U	GAM
Europium 155	14391-16-3	U		0.097	0.10	U	GAM
Radium 226	13982-63-3	0.561	0.064	0.070	0.10		GAM
Radium 228	15262-20-1	0.872	0.096	0.090	0.20		GAM
Thorium 228	14274-82-9	0.767	0.048	0.064			GAM
Thorium 232	TH-232	0.872	0.096	0.090			GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

200 Area Source Chara.- 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test	AM
Matrix	SOLID
SDG	7255
Contact	Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6904-166					
B0WMX1	N910181-01			7255-001	0.075 J
B0WMX2	N910181-02			7255-002	U
B0WMX3	N910181-03			7255-003	U
BLK (QC ID=32637)	N910181-05			7255-005	U
LCS (QC ID=32636)	N910181-04			7255-004	LOW
Duplicate (N910181-01)	N910181-06			7255-006	ok J

Nominal values and limits from method RDLs (pCi/g) 1.0

200 Area Source Chara.- 200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 166																
B0WMX1	N910181-01			0.044	0.500			79		762			56	12/15/99	12/15	SS-008
B0WMX2	N910181-02			0.041	0.500			59		760			56	12/15/99	12/15	SS-009
B0WMX3	N910181-03			0.56	0.500			7		760			56	12/15/99	12/15	SS-010
BLK (QC ID=32637)	N910181-05			0.051	0.500			58		760				12/15/99	12/15	SS-011
LCS (QC ID=32636)	N910181-04			0.034	0.500			68		762				12/15/99	12/15	SS-005
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.035	0.500			85		760			56	12/15/99	12/15	SS-012
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES				
MDA	0.13	±	0.42
YIELD	59	±	56

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test PU Matrix SOLID	Client Hanford
SDG 7255	Contract TRB-SBB-207925
Contact Melissa C. Mannion	Case no SDG H0588

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6904-166								
B0WMX1	N910181-01			7255-001	U		0.085	J
B0WMX2	N910181-02			7255-002	U		U	
B0WMX3	N910181-03			7255-003	U		U	
BLK (QC ID=32637)	N910181-05			7255-005	U		U	
LCS (QC ID=32636)	N910181-04			7255-004	ok		ok	
Duplicate (N910181-01)	N910181-06			7255-006	-	U	ok	J
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200 Area Source Chara.- 200-CW-1 OU								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 5.0 %				Reference Lab Notebook 6904 pg. 166											
B0WMX1	N910181-01			0.039	0.500			89		760			56	12/14/99	12/15	SS-013
B0WMX2	N910181-02			0.046	0.500			82		760			56	12/14/99	12/15	SS-014
B0WMX3	N910181-03			0.041	0.500			75		760			56	12/14/99	12/15	SS-015
BLK (QC ID=32637)	N910181-05			0.037	0.500			81		760				12/14/99	12/15	SS-016
LCS (QC ID=32636)	N910181-04			0.045	0.500			100		1066				12/14/99	12/14	SS-044
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.038	0.500			97		726			56	12/14/99	12/15	SS-058
Nominal values and limits from method				1.0	0.500			20-105		10	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	0.041	± 0.007
FOR 6 SAMPLES	YIELD	87	± 20

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test TH Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6904-166							
B0WMX1	N910181-01			7255-001	0.562 J	0.498 J	0.581 J
B0WMX2	N910181-02			7255-002	0.669 J	0.548 J	0.548 J
B0WMX3	N910181-03			7255-003	0.468 J	0.570 J	0.435 J
BLK (QC ID=32637)	N910181-05			7255-005	U	U	U
LCS (QC ID=32636)	N910181-04			7255-004	No data U	ok	No data U
Duplicate (N910181-01)	N910181-06			7255-006	ok J	ok J	ok J
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0
200 Area Source Chara.- 200-CW-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 5.0 %				Reference Lab Notebook 6904 pg. 166											
B0WMX1	N910181-01			0.24	0.250			58		665			76	12/30/99	01/04	SS-032
B0WMX2	N910181-02			0.32	0.250			55		431			75	12/30/99	01/03	SS-032
B0WMX3	N910181-03			0.30	0.250			72		431			75	12/30/99	01/03	SS-033
BLK (QC ID=32637)	N910181-05			0.29	0.250			59		442				12/18/99	01/03	SS-027
LCS (QC ID=32636)	N910181-04			0.27	0.250			69		431				12/18/99	01/03	SS-034
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.26	0.250			55		573			84	12/30/99	01/12	SS-027
Nominal values and limits from method				1.0	0.250			20-105		200			180			

PROCEDURES	REFERENCE	THPLATE
	EP-000	Data Entry and Document Preparation, rev 0
	EP-001	Q.C. Preparation, rev 0
	EP-003	Tracing, rev 0
	EP-008	Heavy Elements Electroplating, rev 0
	EP-070	Soil Dissolution, rev 0
	RP-901	Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD	MDA	0.28	± 0.058
FOR 6 SAMPLES	YIELD	61	± 15

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test U Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

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 6904-166											
B0WMX1	N910181-01			7255-001	0.567 J	0.036 J	0.559 J	101	14	6	3
BLK (QC ID=32637)	N910181-05			7255-005	U	U	U				
LCS (QC ID=32636)	N910181-04			7255-004	ok	ok	ok				
Duplicate (N910181-01)	N910181-06			7255-006	ok J	ok J	ok J	109	15	6	2
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200 Area Source Chara.- 200-CW-1 OU							Averages	105		6	

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 6904-166 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 166																
B0WMX1	N910181-01			0.014	1.00			101		1049			88	01/13/00	01/16	SS-027
BLK (QC ID=32637)	N910181-05			0.026	1.00			77		1048				01/14/00	01/16	SS-031
LCS (QC ID=32636)	N910181-04			0.093	1.00			102		1049				01/14/00	01/16	SS-029
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.024	1.00			92		1048			88	01/13/00	01/16	SS-032
Nominal values and limits from method				1.0	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Uranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.039 ± 0.072
YIELD 93 ± 23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test	SR
Matrix	SOLID
SDG	7255
Contact	Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6904-166					
B0WMX1	N910181-01			7255-001	9.79
B0WMX2	N910181-02			7255-002	0.524 J
B0WMX3	N910181-03			7255-003	0.727 J
BLK (QC ID=32637)	N910181-05			7255-005	U
LCS (QC ID=32636)	N910181-04			7255-004	ok
Duplicate (N910181-01)	N910181-06			7255-006	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara.- 200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 166															
B0WMX1	N910181-01			0.22	1.00			99		400			57	12/14/99	12/16	GRB-221
B0WMX2	N910181-02			0.11	1.00			102		200			61	12/14/99	12/20	GRB-230
B0WMX3	N910181-03			0.15	1.00			98		200			57	12/14/99	12/16	GRB-231
BLK (QC ID=32637)	N910181-05			0.19	1.00			82		400				12/10/99	12/13	GRB-201
LCS (QC ID=32636)	N910181-04			0.16	1.00			90		400				12/13/99	12/13	GRB-224
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.24	1.00			94		400			54	12/10/99	12/13	GRB-202
Nominal values and limits from method				1.0	1.00					100			180			

PROCEDURES	REFERENCE	SRTOTAL
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES				
MDA	0.18	±	0.096
YIELD	94	±	15

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test GAM Matrix SOLID
SDG 7255
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0588

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6904-166						
B0WMX1	N910181-01			7255-001	U	188
B0WMX2	N910181-02			7255-002	U	31.7
B0WMX3	N910181-03			7255-003	U	20.2
BLK (QC ID=32637)	N910181-05			7255-005	U	U
LCS (QC ID=32636)	N910181-04			7255-004	ok	ok
Duplicate (N910181-01)	N910181-06			7255-006	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.10
200 Area Source Chara.- 200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166	2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 166															
B0WMX1	N910181-01			0.15	597					212			49	11/29/99	12/08	02,01,00
B0WMX2	N910181-02			0.12	570					213			49	11/28/99	12/08	02,03,00
B0WMX3	N910181-03			0.067	633					213			49	11/28/99	12/08	02,04,00
BLK (QC ID=32637)	N910181-05			0.10	171					206				11/28/99	12/08	MB,05,00
LCS (QC ID=32636)	N910181-04			0.034	171					206				11/28/99	12/08	01,04,00
Duplicate (N910181-01) (QC ID=32638)	N910181-06			0.075	597					204			49	11/18/99	12/08	MB,07,00
Nominal values and limits from method				0.050	171					100			180			

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.091 ± 0.082
YIELD _____ ± _____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/18/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0588

Test U T Matrix SOLID	Client Hanford
SDG 7255	Contract TRB-SBB-207925
Contact Melissa C. Mannion	Case no SDG H0588

METHOD SUMMARY

URANIUM, TOTAL IN SOIL

KINETIC PHOSPHORIMETRY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 6904-166					
B0WMX1	N910181-01			7255-001	1.04
B0WMX2	N910181-02			7255-002	0.589 J
B0WMX3	N910181-03			7255-003	0.654 J
BLK (QC ID=32306)	N910181-08			7255-008	U
LCS (QC ID=32305)	N910181-07			7255-007	ok
Duplicate (N910181-01)	N910181-09			7255-009	ok
Nominal values and limits from method				RDLs (ug/g)	1.0
200 Area Source Chara.- 200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-166 2σ prep error 9.0 % Reference Lab Notebook 6904 pg. 166																
B0WMX1	N910181-01			0.004	0.0500								19	11/05/99	11/08	KPA-001
B0WMX2	N910181-02			0.004	0.0500								19	11/05/99	11/08	KPA-001
B0WMX3	N910181-03			0.004	0.0500								19	11/05/99	11/08	KPA-001
BLK (QC ID=32306)	N910181-08			0.004	0.0500									12/05/99	12/08	KPA-001
LCS (QC ID=32305)	N910181-07			0.041	0.0500									11/05/99	11/08	KPA-001
Duplicate (N910181-01) (QC ID=32307)	N910181-09			0.004	0.0500								19	11/05/99	11/08	KPA-001
Nominal values and limits from method				1.0	0.0500								180			

PROCEDURES	REFERENCE	UKPA
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-044	Preparation of Total Uranium by Kinetic Phosphorimetry, rev 1
	EP-928	Total Uranium by Kinetic Phosphorimetry, rev 0

AVERAGES ± 2 SD	MDA 0.010	± 0.030
FOR 6 SAMPLES	YIELD	±

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/18/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: Shipping van 96.0006	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA/RECRA~~ TMA 10-20-99	Offsite Property No.: A000001		Bill of Lading/Air Bill No.: 42357953 0874
			COA: B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS	Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
BOWMX1	Soil	10/20/99	0907	X						X			BOW8C2
BOWMX2	Soil	10/20/99	0912	X						X			BOW8C2
BOWMX3	Soil	10/20/99	0930	X						X			BOW8C2

PM 97L 7 CJ 10/21/99 2 3E

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [illegible]	Date/Time: 10/20/99 1230	Received By: Ref 3A	Date/Time: 10/20/99 1230
Relinquished By: REF 3A	Date/Time: 10-21-99/0830	Received By: R Thoren/Rikki Thoren	Date/Time: 10-21-99 0830
Relinquished By: R Thoren/Rikki Thoren	Date/Time: 10-21-99 1430	Received By: FED EX	Date/Time: 10-21-99
Relinquished By: Fed Ex	Date/Time: 10-22-99 10:00	Received By: [illegible]	Date/Time: 10:00 10-22-99

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 10-22-99 10:00

CoC No. B99-078-144, B99-005-062

Container I.D. No. 96-006 Requested TAT (Days) ~~45~~ 15 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: 12
7. Number of containers per sample: _____ (Or see CoC ✓)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [✓] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by [signature] Date: 10-22-99 Time: 10:00

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

DEC 1999
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9910L475
SDG# : H0588
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 10-22-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 3 soil samples.

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

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

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

5. The method blanks were within method criteria.

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

7. The matrix spike recoveries were within the 75-125% control limits with the exception of Nitrate Nitrite which was above the control limits and may be attributed to a low spike level.

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

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-6-99
Date

njp\i10-475

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 15 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	__		✓ ILMO4.0 (e)
% Volatile Soilids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		✓ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3	
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)
Oxygne Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3	
Sulfide		✓ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Prpearation Leach		__ 1312	
Paint Filter		9095A	

Other: Nitrate Nitrite **Method:** EPA ~~350.1~~ 12-2-99 353.2

Other: Ammonia **Method** EPA 350.3

Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate } EPA 300.0

L-WI-034/B-06/99

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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.

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INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0WMX1	% Solids	88.8	%	0.01	1.0
		Chloride by IC	11.9	MG/KG	1.4	1.0
		Fluoride by IC	2.8 u	MG/KG	2.8	1.0
		Nitrite by IC	1.4 u	MG/KG	1.4	1.0
		Nitrate by IC	150	MG/KG	14	10
		Cyanide, Total	0.56 u	MG/KG	0.56	1.0
		Phosphate by IC	2.4	MG/KG	1.4	1.0
		Chromium VI	0.45 u	MG/KG	0.45	1.0
		Sulfate by IC	269	MG/KG	14.1	10.0
		Nitrate Nitrite	33.8	MG/KG	2.2	10.0
		Ammonia, as N	2.5	MG/KG	1.4	1.0
		pH	7.6	SOIL PH	0.01	1.0
		Sulfide	4.1	MG/KG	2.3	1.0
-002	B0WMX2	% Solids	92.8	%	0.01	1.0
		Chloride by IC	5.3	MG/KG	1.3	1.0
		Fluoride by IC	2.7 u	MG/KG	2.7	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	52	MG/KG	6.7	5.0
		Cyanide, Total	0.54 u	MG/KG	0.54	1.0
		Phosphate by IC	4.3	MG/KG	1.3	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	82.8	MG/KG	6.7	5.0
		Nitrate Nitrite	13.8	MG/KG	1.0	5.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		pH	8.4	SOIL PH	0.01	1.0
		Sulfide	4.0	MG/KG	2.2	1.0
-003	B0WMX3	% Solids	93.0	%	0.01	1.0
		Chloride by IC	3.9	MG/KG	1.3	1.0
		Fluoride by IC	2.7 u	MG/KG	2.7	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	39	MG/KG	1.3	1.0
		Cyanide, Total	0.54 u	MG/KG	0.54	1.0
		Phosphate by IC	2.8	MG/KG	1.3	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	60.8	MG/KG	6.7	5.0
		Nitrate Nitrite	8.4	MG/KG	0.20	1.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		pH	8.6	SOIL PH	0.01	1.0

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INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B0WMX3	Sulfide	2.2 u	MG/KG	2.2	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/06/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC097-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate 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	99LIC098-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate 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
BLANK1	99LC122-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	99LVI079-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	99LN3054-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	99LAM043-MB1	Ammonia, as N	1.2	u	MG/KG	1.2	1.0
BLANK10	99LSD062-MB1	Sulfide	2.0	u	MG/KG	2.0	1.0

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INORGANICS ACCURACY REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0WMX1	Chloride by IC	39.7	11.9	28.2	98.6	1.0
		Fluoride by IC	60.2	1.5	56.3	104.2	1.0
		Nitrite by IC	27	1.4 u	28	97.6	1.0
		Nitrate by IC	710	150	560	99.1	20
		Cyanide, Total	5.9	0.56u	5.6	104.8	1.0
		Phosphate by IC	29.3	2.4	28.2	95.6	1.0
		Sulfate by IC	830	269	563	99.5	20.0
		Nitrate Nitrite	42.2	33.8	5.6	150.0*	10.0
		Ammonia, as N	87.9	2.5	86.0	99.3	1.0
-003	B0WMX3	Soluble Chromium VI	4.6	0.14	4.3	103.6	1.0
		Sulfide	385	0.0	423	91.0	1.0
BLANK10	99LIC097-MB1	Chloride by IC	23.8	1.2 u	25.0	95.1	1.0
		Fluoride by IC	52.4	2.5 u	50.0	104.8	1.0
		Nitrite by IC	24	1.2 u	25	96.8	1.0
		Nitrate by IC	24	1.2 u	25	97.3	1.0
		Phosphate by IC	25.6	1.2 u	25.0	102.3	1.0
		Sulfate by IC	23.9	1.2 u	25.0	95.6	1.0
BLANK10	99LIC098-MB1	Chloride by IC	23.5	1.2 u	25.0	94.0	1.0
		Fluoride by IC	48.7	2.5 u	50.0	97.3	1.0
		Nitrite by IC	24	1.2 u	25	96.1	1.0
		Nitrate by IC	24	1.2 u	25	94.6	1.0
		Phosphate by IC	25.3	1.2 u	25.0	101.2	1.0
		Sulfate by IC	23.9	1.2 u	25.0	95.5	1.0
BLANK10	99LVI079-MB1	Soluble Chromium VI	4.2	0.40u	4.0	105.6	1.0
		Insoluble Chromium VI	1120	0.40u	1160	96.2	100
BLANK10	99LN3054-MB1	Nitrate Nitrite	5.0	0.20u	5.0	99.6	1.0
		Nitrate Nitrite MSD	4.8	0.20u	5.0	97.0	1.0
BLANK10	99LAM043-MB1	Ammonia, as N	50.0	1.2 u	50.0	100	1.0
		Ammonia, as N MSD	48.0	1.2 u	50.0	96.0	1.0
BLANK10	99LSD062-MB1	Sulfide	10.0	2.0 u	10.0	100	1.0

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INORGANICS DUPLICATE SPIKE REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	99LN3054-MB1	Nitrate Nitrite	99.6	97.0	2.6
BLANK10	99LAM043-MB1	Ammonia, as N	100	96.0	4.1

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INORGANICS PRECISION REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0WMX1	% Solids	88.8	89.7	1.1	1.0
		Chloride by IC	11.9	12.9	7.5	1.0
		Fluoride by IC	2.8 u	2.8 u	NC	1.0
		Nitrite by IC	1.4 u	1.4 u	NC	1.0
		Nitrate by IC	150	160	8.8	10
		Cyanide, Total	0.56u	0.56u	NC	1.0
		Phosphate by IC	2.4	2.5	3.7	1.0
		Sulfate by IC	269	280	3.8	10.0
		Nitrate Nitrite	33.8	33.7	0.47	10.0
		Ammonia, as N	2.5	2.4	6.0	1.0
		pH	7.6	7.6	0.0	1.0
-003REP	B0WMX3	Chromium VI	0.43u	0.43u	NC	1.0
		Sulfide	2.2 u	2.2 u	NC	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99LC122-LC1	Cyanide, Total LCS	1.6	2.0	MG/KG	82.3
LCS2	99LC122-LC2	Cyanide, Total LCS	9.3	10	MG/KG	93.2

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMX1						
% SOLIDS	001	S	99LSS142	10/20/99	10/26/99	10/27/99
% SOLIDS	001 REP	S	99LSS142	10/20/99	10/26/99	10/27/99
CHLORIDE BY IC	001	S	99LIC097	10/20/99	11/16/99	11/16/99
CHLORIDE BY IC	001 REP	S	99LIC097	10/20/99	11/16/99	11/16/99
CHLORIDE BY IC	001 MS	S	99LIC098	10/20/99	11/17/99	11/17/99
FLUORIDE BY IC	001	S	99LIC097	10/20/99	11/16/99	11/16/99
FLUORIDE BY IC	001 REP	S	99LIC097	10/20/99	11/16/99	11/16/99
FLUORIDE BY IC	001 MS	S	99LIC098	10/20/99	11/17/99	11/17/99
NITRITE BY IC	001	S	99LIC097	10/20/99	11/16/99	11/16/99
NITRITE BY IC	001 REP	S	99LIC097	10/20/99	11/16/99	11/16/99
NITRITE BY IC	001 MS	S	99LIC098	10/20/99	11/17/99	11/17/99
NITRATE BY IC	001	S	99LIC098	10/20/99	11/17/99	11/17/99
NITRATE BY IC	001 REP	S	99LIC098	10/20/99	11/17/99	11/17/99
NITRATE BY IC	001 MS	S	99LIC098	10/20/99	11/17/99	11/17/99
TOTAL CYANIDE	001	S	99LC122	10/20/99	11/01/99	11/01/99
TOTAL CYANIDE	001 REP	S	99LC122	10/20/99	11/01/99	11/01/99
TOTAL CYANIDE	001 MS	S	99LC122	10/20/99	11/01/99	11/01/99
PHOSPHATE BY IC	001	S	99LIC097	10/20/99	11/16/99	11/16/99
PHOSPHATE BY IC	001 REP	S	99LIC097	10/20/99	11/16/99	11/16/99
PHOSPHATE BY IC	001 MS	S	99LIC098	10/20/99	11/17/99	11/17/99
CHROMIUM VI	001	S	99LVI079	10/20/99	11/02/99	11/02/99
SULFATE BY IC	001	S	99LIC098	10/20/99	11/17/99	11/17/99
SULFATE BY IC	001 REP	S	99LIC098	10/20/99	11/17/99	11/17/99
SULFATE BY IC	001 MS	S	99LIC098	10/20/99	11/17/99	11/17/99
NITRATE NITRITE	001	S	99LN3054	10/20/99	11/09/99	11/11/99
NITRATE NITRITE	001 REP	S	99LN3054	10/20/99	11/09/99	11/11/99
NITRATE NITRITE	001 MS	S	99LN3054	10/20/99	11/09/99	11/11/99
AMMONIA	001	S	99LAM043	10/20/99	11/08/99	11/08/99
AMMONIA	001 REP	S	99LAM043	10/20/99	11/08/99	11/08/99
AMMONIA	001 MS	S	99LAM043	10/20/99	11/08/99	11/08/99
PH	001	S	99LPH116	10/20/99	10/27/99	10/27/99
PH	001 REP	S	99LPH116	10/20/99	10/27/99	10/27/99
SULFIDE	001	S	99LSD062	10/20/99	10/26/99	10/26/99
B0WMX2						
% SOLIDS	002	S	99LSS142	10/20/99	10/26/99	10/27/99

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	002	S	99LIC097	10/20/99	11/16/99	11/16/99
FLUORIDE BY IC	002	S	99LIC097	10/20/99	11/16/99	11/16/99
NITRITE BY IC	002	S	99LIC097	10/20/99	11/16/99	11/16/99
NITRATE BY IC	002	S	99LIC098	10/20/99	11/17/99	11/17/99
TOTAL CYANIDE	002	S	99LC122	10/20/99	11/01/99	11/01/99
PHOSPHATE BY IC	002	S	99LIC097	10/20/99	11/16/99	11/16/99
CHROMIUM VI	002	S	99LVI079	10/20/99	11/02/99	11/02/99
SULFATE BY IC	002	S	99LIC098	10/20/99	11/17/99	11/17/99
NITRATE NITRITE	002	S	99LN3054	10/20/99	11/09/99	11/11/99
AMMONIA	002	S	99LAM043	10/20/99	11/08/99	11/08/99
PH	002	S	99LPH116	10/20/99	10/27/99	10/27/99
SULFIDE	002	S	99LSD062	10/20/99	10/26/99	10/26/99
B0WMX3						
% SOLIDS	003	S	99LSS142	10/20/99	10/26/99	10/27/99
CHLORIDE BY IC	003	S	99LIC097	10/20/99	11/16/99	11/16/99
FLUORIDE BY IC	003	S	99LIC097	10/20/99	11/16/99	11/16/99
NITRITE BY IC	003	S	99LIC097	10/20/99	11/16/99	11/16/99
NITRATE BY IC	003	S	99LIC097	10/20/99	11/16/99	11/16/99
TOTAL CYANIDE	003	S	99LC122	10/20/99	11/01/99	11/01/99
PHOSPHATE BY IC	003	S	99LIC097	10/20/99	11/16/99	11/16/99
CHROMIUM VI	003	S	99LVI079	10/20/99	11/02/99	11/02/99
CHROMIUM VI	003 REP	S	99LVI079	10/20/99	11/02/99	11/02/99
CHROMIUM VI	003 MS	S	99LVI079	10/20/99	11/02/99	11/02/99
SULFATE BY IC	003	S	99LIC098	10/20/99	11/17/99	11/17/99
NITRATE NITRITE	003	S	99LN3054	10/20/99	11/09/99	11/11/99
AMMONIA	003	S	99LAM043	10/20/99	11/08/99	11/08/99
PH	003	S	99LPH116	10/20/99	10/27/99	10/27/99
SULFIDE	003	S	99LSD062	10/20/99	10/26/99	10/26/99
SULFIDE	003 REP	S	99LSD062	10/20/99	10/26/99	10/26/99
SULFIDE	003 MS	S	99LSD062	10/20/99	10/26/99	10/26/99

LAB QC:

CHLORIDE BY IC	MB1	S	99LIC097	N/A	11/16/99	11/16/99
CHLORIDE BY IC	MB1 BS	S	99LIC097	N/A	11/16/99	11/16/99
CHLORIDE BY IC	MB1	S	99LIC098	N/A	11/17/99	11/17/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	MB1 BS	S	99LIC098	N/A	11/17/99	11/17/99
FLUORIDE BY IC	MB1	S	99LIC097	N/A	11/16/99	11/16/99
FLUORIDE BY IC	MB1 BS	S	99LIC097	N/A	11/16/99	11/16/99
FLUORIDE BY IC	MB1	S	99LIC098	N/A	11/17/99	11/17/99
FLUORIDE BY IC	MB1 BS	S	99LIC098	N/A	11/17/99	11/17/99
NITRITE BY IC	MB1	S	99LIC097	N/A	11/16/99	11/16/99
NITRITE BY IC	MB1 BS	S	99LIC097	N/A	11/16/99	11/16/99
NITRATE BY IC	MB1	S	99LIC097	N/A	11/16/99	11/16/99
NITRATE BY IC	MB1 BS	S	99LIC097	N/A	11/16/99	11/16/99
NITRITE BY IC	MB1	S	99LIC098	N/A	11/17/99	11/17/99
NITRITE BY IC	MB1 BS	S	99LIC098	N/A	11/17/99	11/17/99
NITRATE BY IC	MB1	S	99LIC098	N/A	11/17/99	11/17/99
NITRATE BY IC	MB1 BS	S	99LIC098	N/A	11/17/99	11/17/99
TOTAL CYANIDE	LC1 L	S	99LC122	N/A	11/01/99	11/01/99
TOTAL CYANIDE	LC2 L	S	99LC122	N/A	11/01/99	11/01/99
TOTAL CYANIDE	MB1	S	99LC122	N/A	11/01/99	11/01/99
PHOSPHATE BY IC	MB1	S	99LIC097	N/A	11/16/99	11/16/99
PHOSPHATE BY IC	MB1 BS	S	99LIC097	N/A	11/16/99	11/16/99
PHOSPHATE BY IC	MB1	S	99LIC098	N/A	11/17/99	11/17/99
PHOSPHATE BY IC	MB1 BS	S	99LIC098	N/A	11/17/99	11/17/99
CHROMIUM VI	MB1	S	99LVI079	N/A	11/02/99	11/02/99
CHROMIUM VI	MB1 BS	S	99LVI079	N/A	11/02/99	11/02/99
CHROMIUM VI	MB1 BSD	S	99LVI079	N/A	11/02/99	11/02/99
SULFATE BY IC	MB1	S	99LIC098	N/A	11/17/99	11/17/99
SULFATE BY IC	MB1 BS	S	99LIC098	N/A	11/17/99	11/17/99
NITRATE NITRITE	MB1	S	99LN3054	N/A	11/09/99	11/11/99
NITRATE NITRITE	MB1 BS	S	99LN3054	N/A	11/09/99	11/11/99
NITRATE NITRITE	MB1 BSD	S	99LN3054	N/A	11/09/99	11/11/99
AMMONIA	MB1	S	99LAM043	N/A	11/08/99	11/08/99
AMMONIA	MB1 BS	S	99LAM043	N/A	11/08/99	11/08/99
AMMONIA	MB1 BSD	S	99LAM043	N/A	11/08/99	11/08/99
SULFIDE	MB1	S	99LSD062	N/A	10/26/99	10/26/99
SULFIDE	MB1 BS	S	99LSD062	N/A	10/26/99	10/26/99

RECRA LabNet Use Only: 9910L475

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

014

Client: TNU-HANFORD B99-078
Est. Final Proj. Sampling Date:
Project #: 109185-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 10/22/99 Date Due: 11/21/99
Account #:

Refrigerator #		1	2								1					
#/Type Container	Liquid															
	Solid	1AG	1AG				1AG		1AG		1AG					
Volume	Liquid															
	Solid	250	250				250		500		1LT					
Preservatives		–					–		–		–					
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	TPH		PH		Metal	CN	IC Anions					
RECRA LabNet Use Only		0024H 05X5C	0625H 8T 8 w/ 1 lag	0PCB	0DRO		1PH		MetO	ICNTO	AngO					

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	BOW MX1			S	10/20/99	0907	1	1	✓	✓		1		1	1	1		
002	1 2			1	1	0912	1	1	✓	✓		1		1	1	1		
003	1 3			1	1	0930	1	1	✓	✓		1		1	1	1		

Special Instructions:
Daf# B99-078

COMPOSITE WASTE

DATE/REVISIONS:
1. Met(1) = As, Ba, Be, Cd, Cr, Cu, Pb, Ni,
2. Se, Ag, V, Zn, Hg
3. Ang(1) = IN3N2, ICCL, ICFL, ICSO4, ICNO2,
4. ICNO3, ICPO4, ISFD, INH3N, ICR6
5.
6. Run matrix QC

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.3

Relinquished by	Received by	Date	Time
[signature]	[signature]	10-22-99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
4235 79530896

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: ERC 46 033	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA/RECRA~~ RECRA 0 70 10-20-99	Offsite Property No.: A00 0 003		Bill of Lading/Air Bill No.: 42357953 0896
			COA: B20 CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
	Type of Container	aG	aG	aG	aG	aG	aG	aG			
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1			
	Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS		Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol}	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.			

	Sample No.	Matrix *	Sample Date	Sample Time										
PM 797	BOW MX1	Soil	10/20/99	0907		X	X	X	X	X				B0W8C1
~~252~~ 235	BOW MX2	Soil	10/20/99	0912		X	X	X	X	X				B0W8C2
236	BOW MX3	Soil	10/20/99	0930		X	X	X	X	X				B0W8C2

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	Catherine Mc	10/20/99 1230	Received By	Rel 3A 10/20/99 1230
Relinquished By	Rel 3A	10.20.99/0900	Received By RIKKI THOREN	R. Thoren / 10.21.99 0900
Relinquished By R. Thoren	RIKKI THOREN	10.21.99/1430	Received By	FEDEX
Relinquished By	Fed Ex	10/22/99 0930	Received By	10.22.99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on *SAF B99-078*.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - {CV}; *Chromium Hex - 7196*
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- *Total Sr*; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Tem 5-3

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9910L475
SDG/SAF# : H0588/B99-078

W.O.# : 10985-001-001-9999-00
Date Received: 10-22-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 3 soil samples.

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

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

4. All cooler temperatures have been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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) 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 laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B0WMX1	Antimony	100	99.0

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

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12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-17-95
Date

mld/m10-475

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9910L475

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

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

Other:_____ Method:_____

L-WI-033/M-11/99

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/16/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0WMX1	Silver, Total	0.79	MG/KG	0.08	1.0
		Arsenic, Total	5.0	MG/KG	0.28	1.0
		Barium, Total	65.7	MG/KG	0.02	1.0
		Beryllium, Total	0.30	MG/KG	0.03	1.0
		Cadmium, Total	0.21	MG/KG	0.04	1.0
		Chromium, Total	9.6	MG/KG	0.07	1.0
		Copper, Total	12.8	MG/KG	0.05	1.0
		Mercury, Total	0.16	MG/KG	0.02	1.0
		Nickel, Total	9.4	MG/KG	0.11	1.0
		Lead, Total	15.3	MG/KG	0.22	1.0
		Antimony, Total	0.22 u	MG/KG	0.22	1.0
		Selenium, Total	0.51	MG/KG	0.43	1.0
		Thallium, Total	1.3	MG/KG	0.45	1.0
		Vanadium, Total	51.3	MG/KG	0.06	1.0
		Zinc, Total	86.6	MG/KG	0.05	1.0
-002	B0WMX2	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	7.8	MG/KG	0.29	1.0
		Barium, Total	79.9	MG/KG	0.02	1.0
		Beryllium, Total	0.32	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	8.8	MG/KG	0.07	1.0
		Copper, Total	14.1	MG/KG	0.05	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Nickel, Total	10.1	MG/KG	0.11	1.0
		Lead, Total	79.9	MG/KG	0.22	1.0
		Antimony, Total	0.22 u	MG/KG	0.22	1.0
		Selenium, Total	0.86	MG/KG	0.44	1.0
		Thallium, Total	1.4	MG/KG	0.46	1.0
		Vanadium, Total	58.6	MG/KG	0.06	1.0
		Zinc, Total	59.7	MG/KG	0.05	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/16/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B0WMX3	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Arsenic, Total	6.0	MG/KG	0.20	1.0
		Barium, Total	72.5	MG/KG	0.02	1.0
		Beryllium, Total	0.28	MG/KG	0.02	1.0
		Cadmium, Total	0.1	MG/KG	0.03	1.0
		Chromium, Total	8.4	MG/KG	0.05	1.0
		Copper, Total	13.2	MG/KG	0.04	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	8.9	MG/KG	0.08	1.0
		Lead, Total	7.3	MG/KG	0.16	1.0
		Antimony, Total	0.16 u	MG/KG	0.16	1.0
		Selenium, Total	0.90	MG/KG	0.31	1.0
		Thallium, Total	1.3	MG/KG	0.32	1.0
		Vanadium, Total	53.2	MG/KG	0.05	1.0
		Zinc, Total	52.2	MG/KG	0.04	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0740-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.05	MG/KG	0.02	1.0
		Beryllium, Total	0.03 u	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.07 u	MG/KG	0.07	1.0
		Copper, Total	0.05 u	MG/KG	0.05	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.21 u	MG/KG	0.21	1.0
		Antimony, Total	0.21 u	MG/KG	0.21	1.0
		Selenium, Total	0.41 u	MG/KG	0.41	1.0
		Thallium, Total	0.43 u	MG/KG	0.43	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	99C0318-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/16/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0WMX1	Silver, Total	5.2	0.79	5.1	86.5	1.0
		Arsenic, Total	198	5.0	203	94.9	1.0
		Barium, Total	244	65.7	203	87.6	1.0
		Beryllium, Total	4.6	0.30	5.1	84.3	1.0
		Cadmium, Total	4.9	0.21	5.1	92.0	1.0
		Chromium, Total	30.7	9.6	20.3	103.9	1.0
		Copper, Total	35.2	12.8	25.4	88.2	1.0
		Mercury, Total	0.38	0.16	0.18	120.3	1.0
		Nickel, Total	57.3	9.4	50.7	94.5	1.0
		Lead, Total	63.2	15.3	50.7	94.5	1.0
		Antimony, Total	19.7	0.22u	50.7	38.9	1.0
		Selenium, Total	194	0.51	203	95.2	1.0
		Thallium, Total	194	1.3	203	94.7	1.0
		Vanadium, Total	102	51.3	50.7	100.2	1.0
		Zinc, Total	131	86.6	50.7	86.8	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/16/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0WMX1	Silver, Total	0.79	0.82	3.1	1.0
		Arsenic, Total	5.0	6.1	19.8	1.0
		Barium, Total	65.7	71.0	7.8	1.0
		Beryllium, Total	0.30	0.30	0.63	1.0
		Cadmium, Total	0.21	0.22	7.4	1.0
		Chromium, Total	9.6	11.4	17.1	1.0
		Copper, Total	12.8	14.2	10.4	1.0
		Mercury, Total	0.16	0.13	16.6	1.0
		Nickel, Total	9.4	9.8	4.2	1.0
		Lead, Total	15.3	21.1	31.9	1.0
		Antimony, Total	0.22u	0.22u	NC	1.0
		Selenium, Total	0.51	1.0	65.4	1.0
		Thallium, Total	1.3	1.1	16.7	1.0
		Vanadium, Total	51.3	52.7	2.7	1.0
		Zinc, Total	86.6	94.9	9.1	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/16/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L475

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0740-LC1	Silver, LCS	48.1	50.0	MG/KG	96.2
		Arsenic, LCS	960	1000	MG/KG	96.0
		Barium, LCS	488	500	MG/KG	97.6
		Beryllium, LCS	24.4	25.0	MG/KG	97.5
		Cadmium, LCS	24.4	25.0	MG/KG	97.6
		Chromium, LCS	49.8	50.0	MG/KG	99.6
		Copper, LCS	122	125	MG/KG	97.8
		Nickel, LCS	195	200	MG/KG	97.4
		Lead, LCS	244	250	MG/KG	97.4
		Antimony, LCS	288	300	MG/KG	96.0
		Selenium, LCS	931	1000	MG/KG	93.1
		Thallium, LCS	978	1000	MG/KG	97.8
		Vanadium, LCS	253	250	MG/KG	101.2
		Zinc, LCS	95.5	100	MG/KG	95.5
LCS1	99C0318-LC1	Mercury, LCS	1.0	1.0	MG/KG	104.3

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMX1						
SILVER, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
SILVER, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
SILVER, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
ARSENIC, TOTAL	001	S	99L0740	10/20/99	10/30/99	11/01/99
ARSENIC, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	11/01/99
ARSENIC, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	11/01/99
BARIUM, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
BARIUM, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
BARIUM, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
BERYLLIUM, TOTAL	001	S	99L0740	10/20/99	10/30/99	11/01/99
BERYLLIUM, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	11/01/99
BERYLLIUM, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	11/01/99
CADMIUM, TOTAL	001	S	99L0740	10/20/99	10/30/99	11/01/99
CADMIUM, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	11/01/99
CADMIUM, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	11/01/99
CHROMIUM, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
CHROMIUM, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
CHROMIUM, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
COPPER, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
COPPER, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
COPPER, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
MERCURY, TOTAL	001	S	99C0318	10/20/99	10/28/99	10/29/99
MERCURY, TOTAL	001 REP	S	99C0318	10/20/99	10/28/99	10/29/99
MERCURY, TOTAL	001 MS	S	99C0318	10/20/99	10/28/99	10/29/99
NICKEL, TOTAL	001	S	99L0740	10/20/99	10/30/99	11/01/99
NICKEL, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	11/01/99
NICKEL, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	11/01/99
LEAD, TOTAL	001	S	99L0740	10/20/99	10/30/99	11/01/99
LEAD, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	11/01/99
LEAD, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	11/01/99
ANTIMONY, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
ANTIMONY, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
ANTIMONY, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
SELENIUM, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
SELENIUM, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
THALLIUM, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
THALLIUM, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
THALLIUM, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
VANADIUM, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
VANADIUM, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
VANADIUM, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
ZINC, TOTAL	001	S	99L0740	10/20/99	10/30/99	10/31/99
ZINC, TOTAL	001 REP	S	99L0740	10/20/99	10/30/99	10/31/99
ZINC, TOTAL	001 MS	S	99L0740	10/20/99	10/30/99	10/31/99
B0WMX2						
SILVER, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
ARSENIC, TOTAL	002	S	99L0740	10/20/99	10/30/99	11/01/99
BARIUM, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
BERYLLIUM, TOTAL	002	S	99L0740	10/20/99	10/30/99	11/01/99
CADMIUM, TOTAL	002	S	99L0740	10/20/99	10/30/99	11/01/99
CHROMIUM, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
COPPER, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
MERCURY, TOTAL	002	S	99C0318	10/20/99	10/28/99	10/29/99
NICKEL, TOTAL	002	S	99L0740	10/20/99	10/30/99	11/01/99
LEAD, TOTAL	002	S	99L0740	10/20/99	10/30/99	11/01/99
ANTIMONY, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
SELENIUM, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
THALLIUM, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
VANADIUM, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
ZINC, TOTAL	002	S	99L0740	10/20/99	10/30/99	10/31/99
B0WMX3						
SILVER, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99
ARSENIC, TOTAL	003	S	99L0740	10/20/99	10/30/99	11/03/99
BARIUM, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99
BERYLLIUM, TOTAL	003	S	99L0740	10/20/99	10/30/99	11/01/99
CADMIUM, TOTAL	003	S	99L0740	10/20/99	10/30/99	11/03/99
CHROMIUM, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99
COPPER, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	003	S	99C0318	10/20/99	10/28/99	10/29/99
NICKEL, TOTAL	003	S	99L0740	10/20/99	10/30/99	11/03/99
LEAD, TOTAL	003	S	99L0740	10/20/99	10/30/99	11/03/99
ANTIMONY, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99
SELENIUM, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99
THALLIUM, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99
VANADIUM, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99
ZINC, TOTAL	003	S	99L0740	10/20/99	10/30/99	10/31/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
SILVER, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
ARSENIC LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
ARSENIC, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
BARIUM LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
BARIUM, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
BERYLLIUM LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
BERYLLIUM, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
CADMIUM LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
CADMIUM, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
CHROMIUM LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
CHROMIUM, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
COPPER LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
COPPER, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
MERCURY LABORATORY	LC1 BS	S	99C0318	N/A	10/28/99	10/29/99
MERCURY, TOTAL	MB1	S	99C0318	N/A	10/28/99	10/29/99
NICKEL LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
NICKEL, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
LEAD LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
LEAD, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
ANTIMONY LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
ANTIMONY, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
SELENIUM LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
SELENIUM, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
THALLIUM LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
THALLIUM, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
VANADIUM LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99
ZINC LABORATORY	LC1 BS	S	99L0740	N/A	10/30/99	10/31/99
ZINC, TOTAL	MB1	S	99L0740	N/A	10/30/99	10/31/99

RECRA LabNet Use Only: 9910L475

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(9) metals

RECRA LabNet

Client: TNU-HANFORD B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 10/22/99 Date Due: 11/21/99
Account #:

Refrigerator #		1	2	—	—	—	—	—	—	—	1					
#/Type Container	Liquid															
	Solid	1AG	1AG	—	—	—	1AG	—	—	1AG	1	1AG				
Volume	Liquid															
	Solid	250	500	—	—	—	250	—	—	500	1	1LT				
Preservatives		—	—	—	—	—	—	—	—	—		—				
ANALYSES REQUESTED	ORGANIC: VOA	BNA	~~Pest~~ PCB	~~TPH~~			pH		INORG: ~~ICP~~ Metal	CN	IC Anions					

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H 0SCSC	0625H ~~BNA~~	0PCB	0DRO	1PH		MetD	ICNTD	AngD
001	BOW MX1			S	10/20/99	0907	1	1	✓	✓	1		1	1	1
002	2					0912	1	1	✓	✓	1		1	1	1
003	3					0930	1	1	✓	✓	1		1	1	1

RECRA LabNet Use Only

11/3/99
SB and TL added to all metals samples per client

Special Instructions:
Daf# B99-078

COMPOSITE WASTE

DATE/REVISIONS:
Met(1) = As, Ba, Be, Cd, Cr, Cu, Pb, Ni,
2. Se, Ag, V, Zn, Hg
Ang(1) = 1N3N2, 1CCL, 1CFL, 1CS04, 1CN02,
4. 1CN03, 1CP04, 1SFD, 1NH3N, 1CR6
5.
6. Run matrix QC

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package ✓ or N
2) Unbroken on Outer Package ✓ or N
3) Present on Sample ✓ or N
4) Unbroken on Sample ✓ or N
COC Record Present Upon Sample Rec't ✓ or N
Cooler Temp. 5.3 °C

Relinquished by	Received by	Date	Time
[signature]	[signature]	10/22/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7953 0896

015

extra

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: ERC 96 033	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA/RECRA~~ RECRA 870 10-20-99	Offsite Property No.: A00003		Bill of Lading/Air Bill No.: 42357953 08946
			COA: B20 CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
	Type of Container	aG	aG	aG	aG	aG	aG	aG			
	No. of Container(s)	1	1	1	1	1	1	1			
Special Handling and/or Storage	Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS		Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.			

	Sample No.	Matrix *	Sample Date	Sample Time										
797	BOW MX1	Soil	10/20/99	0907		X	X	X	X	X				BOW8C2
852 10-20-99	BOW MX2	Soil	10/20/99	0912		X	X	X	X	X				BOW8C2
236	BOW MX3	Soil	10/20/99	0930		X	X	X	X	X				BOW8C2

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
Catherine Hugo	10/20/99 1230	Ref 3A	10/20/99 1230
Relinquished By	Date/Time	Received By	Date/Time
Ref 3A	10-20-99/0900	R Thoren	10-21-99 0900
Relinquished By	Date/Time	Received By	Date/Time
R Thoren	10-21-99/1430	FEDEX	
Relinquished By	Date/Time	Received By	Date/Time
Fed Ex	10/22/99 0930	V Hemenway	10-22-99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Form 5.7

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD B99-078
RFW #: 9910L475
SDG/SAF#: H0588/B99-078

W.O. #: #: 10985-001-001-9999-00
Date Received: 10-22-99

GC SCAN

The set of samples consisted of three (3) soil samples collected on 10-20-99.

The samples and their associated QC samples were prepared on 10-25-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 10-30-99.

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 samples were packaged and stored as specified in the method protocol; the cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The required holding time for analysis was met.

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

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

5. Surrogates were not used for this analysis.

6. All blank spike recoveries were within advisory control limits of 50%-150%.

7. All matrix spike recoveries were outside advisory control limits of 50%-150%. The extracts were originally analyzed on a different GC system on 10-27-99 with recoveries of 118% and 107% for the MS and MSD, respectively. The data from this original analysis were rejected because there was a laboratory contaminant which interfered with the measurement of Ethanol. It should be noted that the samples were spiked with a non-target analyte (Methanol) which was not affected the way 1-Propanol was during the time between the first and second analyses. A copy of the Sample Discrepancy Report (SDR) has been enclosed in the data package.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-15-99
Date

DEC 1999
RECEIVED
Data
Loc Ic

r:\share\lc\gcscan\10-475.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

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

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

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

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

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

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 99LC056

Initiator: C. Schnell
Date: 11/2/99
Client: INV. Hanford

RFW Batch: 9910L420 001-004 9910L441-001-003 9910L453 001-007
Samples: 9910L475 001-003
Method: SW846/MCAWW/CLP/

Parameter: OGCSC
Matrix: Soil
Prep Batch: _____

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

1-propanol recoveries low in matrix spikes.

2. Known or Probable Causes(s)

Sample extracts were originally analyzed on the day of preparation with acceptable 1-propanol recovery but the data was rejected due to the presence of a laboratory contaminant which interfered with another target analyte (Ethanol). Re-analysis one week later yielded reduced 1-propanol recoveries.

3. Discussion and Proposed Action

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

Other Description: Options:

1. Report 1-propanol from the first GC run on 10/26,27/99 and ethanol from second GC run on 10/30/99, with the constraint that LIMS can handle only one analysis date. Narrate analysis dates.
2. Re-extract and reanalyze.
3. Report all from 2nd run and narrate 1-propanol results from first run.

4. Project Manager Instructions...signature/date: [signature] 11/2/99

✓ Concur with Proposed Action option 3
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: [signature] 11/11/99

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
2	X Initiator	__	__ Metals: Doughty
	X Lab Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Carey/Schrenkel/Johnson	__	__ GC/LC: Schnell
	X Section Mgr: Wesson/Daniels	__	__ MS: LeMin/Taylor
4	X QA (file): Racioppi	__	__ Log-in: Toder
3	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Schnell/Doughty/Kauffman	__	__ Other: _____

L-WI-006/E-03/99

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 11/04/99 16:06

RFW Batch Number: **9910L475** Client: **TNU-HANFORD B99-078** Work Order: **10985-001-001-9999-00** Page: 1

004

	Cust ID:	B0WMX1	B0WMX1	B0WMX1	B0WMX2	B0WMX3	BLK
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	99LLC163-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
n-Propyl Alcohol		5.5 U	10 * %	14 * %	5.5 U	5.5 U	5.0 U
Ethanol		5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.0 U

	Cust ID:	BLK BS
Sample Information	RFW#:	99LLC163-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	mg/kg
n-Propyl Alcohol		121 %
Ethanol		5.0 U

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

Elatlss

Recra LabNet - Lionville Laboratory
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMX1	001	S	99LLC163	10/20/99	10/25/99	10/30/99
B0WMX1	001 MS	S	99LLC163	10/20/99	10/25/99	10/30/99
B0WMX1	001 MSD	S	99LLC163	10/20/99	10/25/99	10/30/99
B0WMX2	002	S	99LLC163	10/20/99	10/25/99	10/30/99
B0WMX3	003	S	99LLC163	10/20/99	10/25/99	10/30/99

LAB QC:

BLK	MB1	S	99LLC163	N/A	10/25/99	10/30/99
BLK	MB1 BS	S	99LLC163	N/A	10/25/99	10/30/99

RECRA LabNet Use Only

9910L475 A11

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-HANFORD B99-078

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 10/22/99 Date Due: 11/21/99

Account #:

Refrigerator #		1	2								1					
#/Type Container	Liquid															
	Solid	1AG	1AG				1AG		1AG		1AG					
Volume	Liquid															
	Solid	250	500				250		500		1LT					
Preservatives		—					—		—		—					
ANALYSES REQUESTED	ORGANIC: VOA	BNA	PESTI PCB TPH Herb				pH		INORG: TCP Metal	CN	IC Anions					
RECRA LabNet Use Only		0024H 0605C	0625H 8270 Hg	OPCB	ODRG		1PH		MetO	ICNUTO	AngO					

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	PCB	TPH	pH	Metal	CN	Anions
001	BOW MX1			S	10-20-99	0907	1	1	✓	✓	1	1	1	1
002	2					0912	1	1	✓	✓	1	1	1	1
003	3					0930	1	1	✓	✓	1	1	1	1

Special Instructions:

Daf# B99-078

COMPOSITE WASTE

DATE/REVISIONS:

Met(1) = As, Ba, Be, Cd, Cr, Cu, Pb, Ni,
2. Se, Ag, V, Zn, Hg
Ang(1) = 1N3N2, 1CCL, 1CFL, 1CSO4, 1CNO2,
4. 1CNO3, 1CPO4, 1SFD, 1NH3N, 1CR6
5.
6. Run matrix QC

RECRA LabNet 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) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'd Y or N
Cooler Temp. 5.3

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 4235 7953 0896

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10-22-99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector Bowers/Trice	**Company Contact** Chris Cearlock	**Telephone No.** 372-9574	**Project Coordinator** TRENT, SJ
Price Code 8N	**Data Turnaround** 45 Days		
Project Designation 200 Area Source characterization - 200-CW-1 OU	**Sampling Location** 200 B pond		**SAF No.** B99-078
Ice Chest No. ERC 46 033	**Field Logbook No.** EL-1511		**Method of Shipment** FED EX
Shipped To ~~TMA/RECRA~~ RECRA 070 10-20-99	**Offsite Property No.** A00003		**Bill of Lading/Air Bill No.** 42357953 0896
			COA B20 CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
	Type of Container	aG	aG	aG	aG	aG	aG	aG			
	No. of Container(s)	1	1	1	1	1	1	1			
Special Handling and/or Storage	**Volume**	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS		Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol}	pH (Soil) - 9045	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions	See item (3) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
BOW MX1	Soil	10/20/99	0907		X	X	X	X	X				BOW8C1
BOW MX2	Soil	10/20/99	0912		X	X	X	X	X				BOW8C2
BOW MX3	Soil	10/20/99	0930		X	X	X	X	X				BOW8C3

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
Catherine Gro	10/20/99 1230	Ref 3A	10/20/99 1230
Relinquished By	Date/Time	Received By	Date/Time
Ref 3A	10.20.99/0900	RIKKI THoren	10.21.99 0900
Relinquished By	Date/Time	Received By	Date/Time
RIKKI THoren	10.21.99/1430	FEDEX	
Relinquished By	Date/Time	Received By	Date/Time
Fed Ex	10/22/99 0930	V. Kennedy	10.22.99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on *SAF B99-078*.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9910L475
SDG/SAF#: H0588/B99-078

W.O #: 10985-001-001-9999-00
Date Received: 10-22-99

DIESEL RANGE ORGANICS

The set of samples consisted of three (3) soil samples collected on 10-20-99.

The sample and its associated QC samples were prepared on 10-25-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-13,16,17-99. 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.

DEC 1999
Data Log In

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-22-99
Date

R:\SHARE\LC\GCSCAN\10-475d.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 6 pages.

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

GLOSSARY OF DIESEL DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

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

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

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

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet - Lionville Laboratory

DIESEL RANGE ORGANICS BY GC

Report Date: 11/18/99 08:52

RFW Batch Number: **9910L475** Client: **TNU-HANFORD B99-078** Work Order: **10985-001-001-9999-00** Page: 1

03

	Cust ID:	B0WMX1	B0WMX1	B0WMX1	B0WMX2	B0WMX3	BLK
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	99LE1294-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate:	p-Terphenyl	83 %	83 %	90 %	54 %	53 %	74 %
Diesel Range Organics		4.5 U	76 %	84 %	4.3 U	4.3 U	4.0 U

	Cust ID:	BLK BS
Sample Information	RFW#:	99LE1294-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	mg/kg
Surrogate:	p-Terphenyl	77 %
Diesel Range Organics		96 %

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

11/18/99

Recra LabNet - Lionville Laboratory
DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMX1	001	S	99LE1294	10/20/99	10/25/99	11/17/99
B0WMX1	001 MS	S	99LE1294	10/20/99	10/25/99	11/17/99
B0WMX1	001 MSD	S	99LE1294	10/20/99	10/25/99	11/17/99
B0WMX2	002	S	99LE1294	10/20/99	10/25/99	11/13/99
B0WMX3	003	S	99LE1294	10/20/99	10/25/99	11/13/99

LAB QC:

BLK	MB1	S	99LE1294	N/A	10/25/99	11/16/99
BLK	MB1 BS	S	99LE1294	N/A	10/25/99	11/16/99

RECRA LabNet Use Only: 9910L475

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals

RECRA LabNet

Client: TNU-HANFORD B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 10/22/99 Date Due: 11/21/99
Account #:

Refrigerator #		1	2	—	—						1					
#/Type Container	Liquid															
	Solid	1AG	1AG	—	1		1AG		1AG	1	1AG					
Volume	Liquid															
	Solid	250	250	—	1		250		500	1	1LT					
Preservatives		—	—	—	1		—		—		—					
ANALYSES REQUESTED →	ORGANIC: VOA	BNA	Pest PCB TPH				PH		INORG: Total Metal	CN	IC Anions					
RECRA LabNet Use Only		0024H 0625C	0625H 8270	OPCB	ODRO		IPH		Met①	ICNTO	Ang①					

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	0024H 0625C	0625H 8270	OPCB	ODRO		IPH		Met①	ICNTO	Ang①					
001	BOW MX1			S	10/20/99	0907	1	1	✓	✓		1		1	1	1					
002	1 2			1	1	0912	1	1	✓	✓		1		1	1	1					
003	1 3			1	1	0930	1	1	✓	✓		1		1	1	1					

11/3/99
SB and TL added to all metals samples per client

Special Instructions:
Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:
Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni,
2. Se, Ag, V, Zn, Hg
Ang① = 1N3N2, 1CCL, 1CFL, 1CSO4, 1CNO2,
4. 1CNO3, 1CPO4, 1SFD, 1NH3N, 1CR6
5.
6. Run matrix QC

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 5.3 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 4235 79530896

Relinquished by	Received by	Date	Time
[signature]	[signature]	10-22-99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

extra

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: ERC 96 033	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA/RECRA~~ RECRA BZO 10-20-99	Offsite Property No.: A00003		Bill of Lading/Air Bill No.: 42357953 0896
			COA: B20 CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
	Type of Container	aG	aG	aG	aG	aG	aG	aG			
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1			
	Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS		Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol}	pH (Soil) - 9045	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions	See item (3) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
BOW MX1	Soil	10/20/99	0907		X	X	X	X	X				BOW802
BOW MX2	Soil	10/20/99	0912		X	X	X	X	X				BOW802
BOW MX3	Soil	10/20/99	0930		X	X	X	X	X				BOW802

PM 797 1215 10-20-99 236

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Catherine Hugo	Date/Time: 10/20/99 1230	Received By: Ref 3A	Date/Time: 10/20/99 1230
Relinquished By: Ref 3A	Date/Time: 10.20.99/0900	Received By: RIKKI THOREN / R Thoren	Date/Time: 10.21.99 0900
Relinquished By: RIKKI THOREN / R Thoren	Date/Time: 10.21.99/1430	Received By: FEDEX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10/22/99 0930	Received By: V. Hennessy	Date/Time: 10.22.99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-078
RFW#: 9910L475
SDG/SAF#: H0588/B99-078

W.O.#: 10985-001-001-9999-00
Date Received: 10-22-99

PCB

The set of samples consisted of three (3) soil samples collected on 10-20-99.

The samples and their associated QC samples were extracted on 10-28-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 11-12,13-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. One (1) of eight (8) surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
6. The blank spike recovery was within acceptance criteria.
7. Matrix spike recoveries were unobtainable due to the high concentration of analytes.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

By J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-22-99
Date

DEC 1999
RECEIVED
Data
Log In

pef\r:\group\data\pest\10L-475.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

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

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

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

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 11/16/99 17:46

RFW Batch Number: **9910L475** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1

	Cust ID:	B0WMX1	B0WMX1	B0WMX1	B0WMX2	B0WMX3	PBLKYI
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	99LE1310-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	5.00	5.00	5.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		D %	D %	D %	115 %	118 %	110 %
Decachlorobiphenyl		D %	D %	D %	117 %	126 * %	81 %
Aroclor-1016		190 U	190 U	190 U	36 U	36 U	33 U
Aroclor-1221		380 U	380 U	380 U	72 U	72 U	67 U
Aroclor-1232		190 U	190 U	190 U	36 U	36 U	33 U
Aroclor-1242		190 U	190 U	190 U	36 U	36 U	33 U
Aroclor-1248		190 U	190 U	190 U	36 U	36 U	33 U
Aroclor-1254		190 U	D %	D %	36 U	36 U	33 U
Aroclor-1260		440	510	450	110	120	33 U

	Cust ID:	PBLKYI BS
Sample Information	RFW#:	99LE1310-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG
Surrogate: Tetrachloro-m-xylene		112 %
Decachlorobiphenyl		88 %
Aroclor-1016		33 U
Aroclor-1221		67 U
Aroclor-1232		33 U
Aroclor-1242		33 U
Aroclor-1248		33 U
Aroclor-1254		103 %
Aroclor-1260		33 U

gwl 11-17-99

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

04

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMX1	001	S	99LE1310	10/20/99	10/28/99	11/13/99
B0WMX1	001 MS	S	99LE1310	10/20/99	10/28/99	11/13/99
B0WMX1	001 MSD	S	99LE1310	10/20/99	10/28/99	11/13/99
B0WMX2	002	S	99LE1310	10/20/99	10/28/99	11/12/99
B0WMX3	003	S	99LE1310	10/20/99	10/28/99	11/13/99

LAB QC:

PBLKYI	MB1	S	99LE1310	N/A	10/28/99	11/12/99
PBLKYI	MB1 BS	S	99LE1310	N/A	10/28/99	11/12/99

gw 11-17-99

RECRA LabNet Use Only

9910L475

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals

RECRA LabNet

Client: TNU-HANFORD B99-078

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 10/22/99 Date Due: 11/21/99

Account #:

Refrigerator #		1	2	—	—						1				
#/Type Container	Liquid														
	Solid	1AG	1AG	—	1		1AG		1AG	1	1AG				
Volume	Liquid														
	Solid	250	500	—	1		250		500	1	1LT				
Preservatives		—	1		1		—		—		—				
ANALYSES REQUESTED	ORGANIC	VOA	BNA	~~PESTICIDE~~ PCB	~~TPH~~		pH		INORG						
									TCP Metal	CN	IC Anions				
									RECRA LabNet Use Only						
		0624H 0625C	0625H 8270	OPCB	ODRO		1PH		MetO	ICNTO	AnOO				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H 0625C	0625H 8270	OPCB	ODRO		1PH		MetO	ICNTO	AnOO				
001	BOW MX1			S	10/20/99	0907	1	1	✓	✓		1		1	1	1				
002	2					0912	1	1	✓	✓		1		1	1	1				
003	3					0930	1	1	✓	✓		1		1	1	1				

11/3/99
SB and TL added to all metals samples per client

Special Instructions:
Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:
Met(1) = As, Ba, Be, Cd, Cr, Cu, Pb, Ni,
2. Se, Ag, V, Zn, Hg
Ang(1) = IN3N2, ICCL, ICFL, ICSO4, ICNO2,
4. ICNO3, ICPO4, ISFD, INH3N, ICR6
5.
6. Run matrix QC

RECRA LabNet 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) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.3 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
4235 7953 0896

Relinquished by	Received by	Date	Time
[signature]	[signature]	10-22-99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

extra

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector Bowers/Trice	**Company Contact** Chris Cearlock	**Telephone No.** 372-9574	**Project Coordinator** TRENT, SJ
Price Code 8N	**Data Turnaround** 45 Days		
Project Designation 200 Area Source characterization - 200-CW-1 OU	**Sampling Location** 200 B pond		**SAF No.** B99-078
Ice Chest No. ERC 46 033	**Field Logbook No.** EL-1511		**Method of Shipment** FED EX
Shipped To ~~TMA/RECRA~~ RERA 0 ZJ 10-20-99	**Offsite Property No.** A00003		**Bill of Lading/Air Bill No.** 42357953 0896
			COA B20 CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS	Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
BOW MX1	Soil	10/20/99	0907		X	X	X	X	X				BOW802
BOW MX2	Soil	10/20/99	0912		X	X	X	X	X				BOW802
BOW MX3	Soil	10/20/99	0930		X	X	X	X	X				BOW802

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

Relinquished By	Date/Time	Received By	Date/Time
Catherine Arco	10/20/99 1230	Ref 3A	10/20/99 1230
Ref 3A	10.20.99/0900	RIKKI Thoren	10.21.99 0900
R. Thoren / RIKKI Thoren	10.21.99/1430	FEDEX	
Fed Ex	10/22/99 0930	Hennessy	10.22.99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report
****REVISION****

Client : TNU-HANFORD B99-078
RFW # : 9910L475
SDG/SAF #: H0588/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 10-22-99

SEMIVOLATILE

This narrative was corrected to add the TIC search for Tributylphosphate.

Three (3) soil samples were collected on 10-20-99.

The samples and their associated QC samples were extracted on 10-28-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 11-03-99.

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 required holding times for extraction and analysis were met.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The samples were spectrally searched for Butylated Hydroxytoluene and Tributylphosphate; however, they were not identified in the samples.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-17-00
Date

som\group\data\bna\tnu10475.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 14 pages.

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

GLOSSARY OF BNA DATA

DATA QUALIFIERS

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

mmz\10-94\gloss.bna

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.

mmz\10-94\gloss.bna

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

RFW Batch Number: **9910L475** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Report Date: 11/22/99 15:01 Page: 1a

	Cust ID:	B0WMX1		B0WMX1		B0WMX1		B0WMX2		B0WMX3		SBLKFK	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		99LE1313-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Nitrobenzene-d5	77	%	66	%	68	%	73	%	74	%	71	%
	2-Fluorobiphenyl	85	%	73	%	77	%	79	%	81	%	78	%
	Terphenyl-d14	88	%	73	%	76	%	80	%	77	%	77	%
	Phenol-d5	66	%	58	%	58	%	58	%	64	%	56	%
	2-Fluorophenol	70	%	62	%	62	%	65	%	69	%	59	%
	2,4,6-Tribromophenol	74	%	72	%	79	%	66	%	68	%	62	%
			fl		fl		fl		fl		fl		fl
Phenol		380	U	60	%	56	%	360	U	350	U	330	U
bis(2-Chloroethyl)ether		380	U	370	U	380	U	360	U	350	U	330	U
2-Chlorophenol		380	U	67	%	63	%	360	U	350	U	330	U
1,3-Dichlorobenzene		380	U	370	U	380	U	360	U	350	U	330	U
1,4-Dichlorobenzene		380	U	67	%	66	%	360	U	350	U	330	U
1,2-Dichlorobenzene		380	U	370	U	380	U	360	U	350	U	330	U
2-Methylphenol		380	U	370	U	380	U	360	U	350	U	330	U
2,2'-oxybis(1-Chloropropane)		380	U	370	U	380	U	360	U	350	U	330	U
4-Methylphenol		380	U	370	U	380	U	360	U	350	U	330	U
N-Nitroso-di-n-propylamine		380	U	68	%	69	%	360	U	350	U	330	U
Hexachloroethane		380	U	370	U	380	U	360	U	350	U	330	U
Nitrobenzene		380	U	370	U	380	U	360	U	350	U	330	U
Isophorone		380	U	370	U	380	U	360	U	350	U	330	U
2-Nitrophenol		380	U	370	U	380	U	360	U	350	U	330	U
2,4-Dimethylphenol		380	U	370	U	380	U	360	U	350	U	330	U
bis(2-Chloroethoxy)methane		380	U	370	U	380	U	360	U	350	U	330	U
2,4-Dichlorophenol		380	U	370	U	380	U	360	U	350	U	330	U
1,2,4-Trichlorobenzene		380	U	76	%	76	%	360	U	350	U	330	U
Naphthalene		380	U	370	U	380	U	360	U	350	U	330	U
4-Chloroaniline		380	U	370	U	380	U	360	U	350	U	330	U
Hexachlorobutadiene		380	U	370	U	380	U	360	U	350	U	330	U
4-Chloro-3-methylphenol		380	U	67	%	63	%	360	U	350	U	330	U
2-Methylnaphthalene		380	U	370	U	380	U	360	U	350	U	330	U
Hexachlorocyclopentadiene		380	U	370	U	380	U	360	U	350	U	330	U
2,4,6-Trichlorophenol		380	U	370	U	380	U	360	U	350	U	330	U
2,4,5-Trichlorophenol		960	U	940	U	940	U	900	U	880	U	840	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9910L475 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1b

Cust ID:	B0WMX1		B0WMX1		B0WMX1		B0WMX2		B0WMX3		SBLKFK	
RFW#:	001		001 MS		001 MSD		002		003		99LE1313-MB1	
2-Chloronaphthalene	380	U	370	U	380	U	360	U	350	U	330	U
2-Nitroaniline	960	U	940	U	940	U	900	U	880	U	840	U
Dimethylphthalate	380	U	370	U	380	U	360	U	350	U	330	U
Acenaphthylene	380	U	370	U	380	U	360	U	350	U	330	U
2,6-Dinitrotoluene	380	U	370	U	380	U	360	U	350	U	330	U
3-Nitroaniline	960	U	940	U	940	U	900	U	880	U	840	U
Acenaphthene	380	U	75	%	75	%	360	U	350	U	330	U
2,4-Dinitrophenol	960	U	940	U	940	U	900	U	880	U	840	U
4-Nitrophenol	960	U	74	%	71	%	900	U	880	U	840	U
Dibenzofuran	380	U	370	U	380	U	360	U	350	U	330	U
2,4-Dinitrotoluene	380	U	71	%	69	%	360	U	350	U	330	U
Diethylphthalate	380	U	370	U	380	U	360	U	350	U	330	U
4-Chlorophenyl-phenylether	380	U	370	U	380	U	360	U	350	U	330	U
Fluorene	380	U	370	U	380	U	360	U	350	U	330	U
4-Nitroaniline	960	U	940	U	940	U	900	U	880	U	840	U
4,6-Dinitro-2-methylphenol	960	U	940	U	940	U	900	U	880	U	840	U
N-Nitrosodiphenylamine (1)	380	U	370	U	380	U	360	U	350	U	330	U
4-Bromophenyl-phenylether	380	U	370	U	380	U	360	U	350	U	330	U
Hexachlorobenzene	380	U	370	U	380	U	360	U	350	U	330	U
Pentachlorophenol	960	U	79	%	78	%	900	U	880	U	840	U
Phenanthrene	21	J	28	J	36	J	360	U	28	J	330	U
Anthracene	380	U	370	U	380	U	360	U	350	U	330	U
Carbazole	380	U	370	U	380	U	360	U	350	U	330	U
Di-n-butylphthalate	39	J	28	J	380	U	360	U	350	U	330	U
Fluoranthene	64	J	81	J	170	J	360	U	79	J	330	U
Pyrene	73	J	77	%	81	%	360	U	75	J	330	U
Butylbenzylphthalate	380	U	370	U	380	U	360	U	350	U	330	U
3,3'-Dichlorobenzidine	380	U	370	U	380	U	360	U	350	U	330	U
Benzo(a)anthracene	26	J	30	J	81	J	360	U	30	J	330	U
Chrysene	49	J	57	J	130	J	360	U	51	J	330	U
bis(2-Ethylhexyl)phthalate	380	U	50	J	26	J	360	U	23	J	330	U
Di-n-octyl phthalate	380	U	370	U	380	U	360	U	350	U	330	U
Benzo(b)fluoranthene	41	J	48	J	91	J	360	U	40	J	330	U
Benzo(k)fluoranthene	38	J	51	J	110	J	360	U	44	J	330	U
Benzo(a)pyrene	37	J	51	J	110	J	360	U	45	J	330	U
Indeno(1,2,3-cd)pyrene	29	J	42	J	68	J	360	U	26	J	330	U
Dibenz(a,h)anthracene	380	U	370	U	19	J	360	U	350	U	330	U
Benzo(g,h,i)perylene	36	J	49	J	65	J	360	U	29	J	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.

B0WMX1

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L475-001

Sample wt/vol: 29.3 (g/mL) G Lab File ID: D110307

Level: (low/med) LOW Date Received: 10/22/99

% Moisture: 11 decanted: (Y/N) Date Extracted: 10/28/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/03/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

Number TICs found: 7

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.00	100	JB
2.	ALDOL CONDENSATE	8.54	300	JA
3.	UNKNOWN	20.80	200	J
4.	HEXADECANOIC ACID	21.24	80	J
5.	UNKNOWN	24.57	200	J
6.	UNKNOWN	24.62	200	J
7.	ALKANE	28.57	200	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WMX2

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L475-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110310

Level: (low/med) LOW Date Received: 10/22/99

% Moisture: 7 decanted: (Y/N) Date Extracted: 10/28/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/03/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.99	100	JB
2.	ALDOL CONDENSATE	8.54	100	JA
3.	ALDOL CONDENSATE	9.33	100	JA
4.	PHTHALATE	20.79	90	J
5.	ALKANE	28.60	100	J
6.	ALKANE	32.07	90	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WMX3

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L475-003

Sample wt/vol: 30.3 (g/mL) G Lab File ID: D110311

Level: (low/med) LOW Date Received: 10/22/99

% Moisture: 7 decanted: (Y/N) Date Extracted: 10/28/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/03/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.99	90	JB
2.	ALDOL CONDENSATE	8.54	200	JA
3.	ALDOL CONDENSATE	9.32	70	JA
4.	UNKNOWN	10.47	80	J
5.	UNKNOWN	24.57	100	J
6.	ALKANE	28.57	70	J

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMX1	001	S	99LE1313	10/20/99	10/28/99	11/03/99
B0WMX1	001 MS	S	99LE1313	10/20/99	10/28/99	11/03/99
B0WMX1	001 MSD	S	99LE1313	10/20/99	10/28/99	11/03/99
B0WMX2	002	S	99LE1313	10/20/99	10/28/99	11/03/99
B0WMX3	003	S	99LE1313	10/20/99	10/28/99	11/03/99

LAB QC:

SBLKFK	MB1	S	99LE1313	N/A	10/28/99	11/03/99
SBLKFK	MB1 BS	S	99LE1313	N/A	10/28/99	11/03/99

RECRA LabNet Use Only: 9910L475

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-HANFORD B99-078

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 10/22/99 Date Due: 11/21/99

Account #:

Refrigerator #		1	2								1					
#/Type Container	Liquid															
	Solid	1AG	1AG				1AG		1AG		1AG					
Volume	Liquid															
	Solid	250	500				250		500		1LT					
Preservatives		—					—		—		—					
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest PCB	TPH Hcl			PH		INORG: Total Metal	CN	IC Anions					

RECRA LabNet Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H 0625C	0628H BT X8 Ethylbenz	OPCB	ODRO	IPH	MetD	ICNTO	AngD
001	BOW MX1			S	102099	0907	1	1	✓	✓	1	1	1	1
002	1 2			1	1	0912	1	1	✓	✓	1	1	1	1
003	1 3			1	1	0930	1	1	✓	✓	1	1	1	1

Special Instructions:

Daf# B99-078

COMPOSITE WASTE

DATE/REVISIONS:

Met(1) = As, Ba, Be, Cd, Cr, Cu, Pb, Ni,
2. Se, Ag, V, Zn, Hg
Ang(1) = 1N3N2, 1CCL, 1CFL, 1CSO4, 1CNO2,
4. 1CNO3, 1CPO4, 1SFD, 1NH3N, 1CR6
5.
6. Run matrix QC

RECRA LabNet 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) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.3

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 4235 7953 0896

Relinquished by	Received by	Date	Time
[signature]	[signature]	10-22-99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: ERC 96 033	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA/RECRA~~ RECRA 0 ZQ 10-20-99	Offsite Property No.: A00003		Bill of Lading/Air Bill No.: 42357953 0896
			COA: B20 CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None			
	Type of Container	aG	aG	aG	aG	aG	aG	aG			
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1			
	Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS		Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol}	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
BOW MX1	Soil	10/20/99	0907		X	X	X	X	X				BOW8C2
BOW MX2	Soil	10/20/99	0912		X	X	X	X	X				BOW8C2
BOW MX3	Soil	10/20/99	0930		X	X	X	X	X				BOW8C2

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Catherine Sue 10/20/99 1230	Received By: Rel 3A 10/20/99 1230		
Relinquished By: Rel 3A 10.20.99/0900	Received By: RIKKI Thoren / L Thoren 10.21.99 0900		
Relinquished By: L Thoren RIKKI THoren 10.21.99/1430	Received By: FEDEX		
Relinquished By: Fed Ex 10/22/99 0930	Received By: V Hennessy 10.22.99 0930		

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW # : 9910L475
SDG/SAF #: H0588/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 10-22-99

GC/MS VOLATILE

Three (3) soil samples were collected on 10-20-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 10-31-99 and 11-01-99.

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 required holding time for analysis was met.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blanks contained the common laboratory contaminants Methylene Chloride and/or Acetone at levels less than 2x the CRQL. The method blank 99LVH505-MB1 also contained the target compound 2-Hexanone at a level less than the CRQL.

DEC 1999
RECEIVED
Data
Log In

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-08-99
Date

som\group\data\voa\tnu10475.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 10 pages.

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

GLOSSARY OF VOA DATA

DATA QUALIFIERS

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

mmz\10-94\gloss.voa

GLOSSARY OF VOA DATA

ABBREVIATIONS

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

mmz\10-94\gloss.voa

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 12/06/99 20:54

RFW Batch Number: **9910L475** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1a

	Cust ID:	B0WMX1	B0WMX2	B0WMX3	B0WMX3	B0WMX3	VBLKAE
Sample Information	RFW#:	001	002	003	003 MS	003 MSD	99LVH503-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.06	1.00	0.926	0.909	0.926	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	Toluene-d8	106 %	99 %	98 %	102 %	102 %	99 %
	Bromofluorobenzene	86 %	87 %	92 %	95 %	88 %	96 %
	1,2-Dichloroethane-d4	108 %	99 %	99 %	104 %	105 %	99 %
Chloromethane		12 U	11 U	10 U	10 U	10 U	10 U
Bromomethane		12 U	11 U	10 U	10 U	10 U	10 U
Vinyl Chloride		12 U	11 U	10 U	10 U	10 U	10 U
Chloroethane		12 U	11 U	10 U	10 U	10 U	10 U
Methylene Chloride		11 B	6 B	6 B	6 B	8 B	6
Acetone		12 U	11 U	10 U	10 U	10 U	10 U
Carbon Disulfide		6 U	6 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		6 U	6 U	5 U	94 %	88 %	5 U
1,1-Dichloroethane		6 U	6 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		6 U	6 U	5 U	5 U	5 U	5 U
Chloroform		6 U	6 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		6 U	6 U	5 U	5 U	5 U	5 U
2-Butanone		12 U	11 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		6 U	6 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		6 U	6 U	5 U	5 U	5 U	5 U
Bromodichloromethane		6 U	6 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		6 U	6 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	6 U	5 U	5 U	5 U	5 U
Trichloroethene		6 U	6 U	5 U	97 %	93 %	5 U
Dibromochloromethane		6 U	6 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		6 U	6 U	5 U	5 U	5 U	5 U
Benzene		6 U	6 U	5 U	102 %	102 %	5 U
Trans-1,3-Dichloropropene		6 U	6 U	5 U	5 U	5 U	5 U
Bromoform		6 U	6 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		12 U	11 U	10 U	10 U	10 U	10 U
2-Hexanone		12 U	11 U	10 U	10 U	10 U	10 U
Tetrachloroethene		6 U	6 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	6 U	5 U	5 U	5 U	5 U
Toluene		6 U	6 U	5 U	104 %	104 %	5 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: **9910L475** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1b

Cust ID:	B0WMX1	B0WMX2	B0WMX3	B0WMX3	B0WMX3	VBLKAE
RFW#:	001	002	003	003 MS	003 MSD	99LVH503-MB1
Chlorobenzene	6 U	6 U	5 U	104 %	100 %	5 U
Ethylbenzene	6 U	6 U	5 U	5 U	5 U	5 U
Styrene	6 U	6 U	5 U	5 U	5 U	5 U
Xylene (total)	6 U	6 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/22/99 RFW LOT # :9910L475

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMX1	001	S	99LVH503	10/20/99	N/A	10/31/99
B0WMX2	002	S	99LVH503	10/20/99	N/A	10/31/99
B0WMX3	003	S	99LVH503	10/20/99	N/A	10/31/99
B0WMX3	003 MS	S	99LVH505	10/20/99	N/A	11/01/99
B0WMX3	003 MSD	S	99LVH505	10/20/99	N/A	11/01/99

LAB QC:

VBLKAE	MB1	S	99LVH503	N/A	N/A	10/31/99
VBLKAI	MB1	S	99LVH505	N/A	N/A	11/01/99
VBLKAI	MB1 BS	S	99LVH505	N/A	N/A	11/01/99

12-07-99

RECRA LabNet Use Only: 9910L475

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals

RECRA LabNet

Client: TNU-HANFORD B99-078

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 10/22/99 Date Due: 11/21/99

Account #:

Refrigerator #		1	2								1					
#/Type Container	Liquid															
	Solid	1AG	1AG				1AG		1AG		1AG					
Volume	Liquid															
	Solid	250	250				250		500		1LT					
Preservatives		–					–		–		–					
ANALYSES REQUESTED	ORGANIC	VOA	BNA	Pest PCB	TPH ~~Metals~~		PH		INORG TCP Metal	CN	Ic Anions					
RECRA LabNet Use Only		0624 H 0625C	0625H	OPCB	ODRO		1PH		Met①	1CNTO	Ang①					

MATRIX CODES:
S - Soil
SE - Sediment
SQ - 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	0624 H 0625C	0625H	OPCB	ODRO	1PH	Met①	1CNTO	Ang①
001	BOW MX1			S	10/20/99	0907	1	1	1	1	1	1	1	1
002	1 2			1	1	0912	1	1	1	1	1	1	1	1
003	1 3			1	1	0930	1	1	1	1	1	1	1	1

11/3/99
SB and TL added to all metals samples per client

Special Instructions:
Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:
Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni,
2. Se, Ag, V, Zn, Hg
Ang① = 1N3N2, 1CCL, 1CFL, 1CSO4, 1CNO2,
4. 1CNO3, 1CPO4, 1SFD, 1NH3N, 1CR6
5.
6. Run matrix QC

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.3 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/22/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 4235 7953 0896

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-144	Page 1 of 1

Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ
Price Code 8N	Data Turnaround 45 Days		
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond		SAF No. B99-078
Ice Chest No. ERC 96 033	Field Logbook No. EL-1511		Method of Shipment FED EX
Shipped To ~~TMA/RECRA~~ RECRA BZD 10-20-99	Offsite Property No. A 000 003		Bill of Lading/Air Bill No. 42357953 0896
			COA B20 CW1 0711C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL				
SAMPLE ANALYSIS	Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	pH (Soil) - 9045	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions	See item (3) in Special Instructions				

Sample No.	Matrix *	Sample Date	Sample Time										
BOW MX1	Soil	10/20/99	0907		X	X	X	X	X				BOW8C1
BOW MX2	Soil	10/20/99	0912		X	X	X	X	X				BOW8C7
BOW MX3	Soil	10/20/99	0930		X	X	X	X	X				BOW8C2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Catherine Trice	10/20/99 1230	Ref 3A	10/20/99 1230
Ref 3A	10.20.99/0900	R Thoren	10.21.99 0900
R Thoren	10.21.99/1430	FEDEX	
FedEx	10/22/99 0930	V Hennessy	10.22.99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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