H0590-TMA/RECRA

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0590 was composed of eight solid 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. The results were transmitted to BHI via facsimile on January 7, 11, and 12, 2000.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.6 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

BHI requested sample B0WMD3 be analyzed for Isotopic Uranium on January 6, 2000. Sample B0WMD3 was batched with SDG H0562 (7231). All QC samples are in SDG H0562. The sample duplicate was of a sample from SDG H0562. No problems were encountered during the course of the analyses.

2.8 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.9 Americium-241 Analyses

No problems were encountered during the course of the analyses.

JAN 2000
RECEIVED
Data
Log In

2.10 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

SAMPLE SUMMARY

SDG 2257
Contract [illegible]

Client Hanford
Contract [illegible]
Case no [illegible]

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
[illegible]WMD1	200 E Pond	SOLID		N910196-01	P99-078	P99-078-144	10/21/99 10:12
[illegible]WMD2	200 E Pond	SOLID		N910196-02	P99-078	P99-078-144	10/21/99 10:17
[illegible]WMD3	200 E Pond	SOLID		N910196-03	P99-078	P99-078-144	10/21/99 10:47
[illegible]WMD4	200 E Pond	SOLID		N910196-04	P99-078	P99-078-144	10/21/99 11:02
[illegible]WMD5	200 E Pond	SOLID		N910196-05	P99-078	P99-078-144	10/21/99 11:18
[illegible]WMD6	200 E Pond	SOLID		N910196-06	P99-078	P99-078-145	10/21/99 11:30
[illegible]WMD7	200 E Pond	SOLID		N910196-07	P99-078	P99-078-145	10/21/99 11:40
[illegible]WMD8	200 E Pond	SOLID		N910196-08	P99-078	P99-078-145	10/21/99 11:50
Method Blank		SOLID		N910001-16	P99-078		
Method Blank		SOLID		N910196-10	P99-078		
Method Blank		SOLID		N910196-14	P99-078		
Lab Control Sample		SOLID		N910001-15	P99-078		
Lab Control Sample		SOLID		N910196-09	P99-078		
Lab Control Sample		SOLID		N910196-13	P99-078		
Duplicate (N910196-01)	200 E Pond	SOLID		N910196-15	P99-078		10/21/99 10:12
Duplicate (N910196-06)	200 E Pond	SOLID		N910196-11	P99-078		10/21/99 11:30
Spike (N910196-07)	200 E Pond	SOLID		N910196-16	P99-078		10/21/99 11:40
Spike (N910196-08)	200 E Pond	SOLID		N910196-12	P99-078		10/21/99 11:50
Spike (N910196-08)	200 E Pond	SOLID		N910196-17	P99-078		10/21/99 11:50

Lab id TMANC
Protocol Hanford
Version Ver 3.0
Form DVP CS
Version 3.06
Report date 01/12/00

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SAMPLE DELIVERY GROUP H0590

QC SUMMARY

SDG	7257
Contact	[illegible]

Client	Hanford
Contract	[illegible]
Case no	[illegible]

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
7231		Method Blank	SOLID						N910061-16	7231-016
		Lab Control Sample	SOLID						N910061-15	7231-015
7257	B99-078-144	BOWMD1	SOLID	91.7			10/25/99	4	N910196-01	7257-001
		BOWMD2	SOLID	92.4			10/25/99	4	N910196-02	7257-002
		BOWMD3	SOLID	92.3			10/25/99	4	N910196-03	7257-003
		BOWMD4	SOLID	89.4			10/25/99	4	N910196-04	7257-004
		BOWMD5	SOLID	94.6			10/25/99	4	N910196-05	7257-005
	B99-078-145	BOWMD6	SOLID	90.2			10/25/99	4	N910196-06	7257-006
		BOWMD7	SOLID	95.9			10/25/99	4	N910196-07	7257-007
		BOWMD8	SOLID	94.9			10/25/99	4	N910196-08	7257-008
		Method Blank	SOLID						N910196-10	7257-010
		Method Blank	SOLID						N910196-14	7257-014
		Lab Control Sample	SOLID						N910196-09	7257-009
		Lab Control Sample	SOLID						N910196-13	7257-013
		Duplicate (N910196-01)	SOLID				10/25/99	4	N910196-15	7257-015
		Duplicate (N910196-06)	SOLID				10/25/99	4	N910196-11	7257-011
		Spike (N910196-07)	SOLID				10/25/99	4	N910196-16	7257-016
		Spike (N910196-08)	SOLID				10/25/99	4	N910196-12	7257-012
		Spike (N910196-08)	SOLID				10/25/99	4	N910196-17	7257-017

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-QS
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Report date	01/12/00

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SAMPLE DELIVERY GROUP HC590

PREP BATCH SUMMARY

[illegible]	[illegible]
[illegible]	[illegible]

Client	Hanford
Contract	[illegible]
Case no	[illegible]

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	CLIENT	MORE	RE	PLANCHETS ANALYZED PLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6904-172	5.0	8			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6904-172	5.0	8			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6904-172	5.0	8			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6904-075	5.0	1			1	1			
Beta Counting												
SR	SOLID	Total Strontium in Soil	6904-172	10.0	8			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6904-172	10.0	3			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6904-172	15.0	8			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	6904-172	9.0	8			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	6904-172	10.0	3			1	1	1/1	1/1	
NI_L	SOLID	Nickel 63 in Soil	6904-172	10.0	3			1	1	1/1	2/2	

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

Lab id	TMANC
Protocol	Hanford
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Form	DVD-IPS
Version	3.06
Report date	01/12/00

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SAMPLE DELIVERY GROUP H0590

WORK SUMMARY

SDG [illegible]
Contact [illegible]

Client Hanford
Contract [illegible]
Case no [illegible]

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B-WMP1			N910196-01	7257-001	AM		01/06/00	01/11/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/21/99	7257-001	GAM		12/13/99	01/07/00	NJV	Gamma Scan
B99-078-144	B99-078		10/25/99	7257-001	PU		01/03/00	01/07/00	NJV	Plutonium, Isotopic in Solids
				7257-001	SR		12/21/99	01/07/00	NJV	Total Strontium in Soil
				7257-001	TH		01/06/00	01/11/00	MCM	Thorium, Isotopic in Soil
				7257-001	U_T		11/17/99	01/07/00	NJV	Uranium, Total in Soil
B-WMP2			N910196-02	7257-002	AM		01/06/00	01/11/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/21/99	7257-002	GAM		12/13/99	01/07/00	NJV	Gamma Scan
B99-078-144	B99-078		10/25/99	7257-002	PU		01/03/00	01/07/00	NJV	Plutonium, Isotopic in Solids
				7257-002	SR		12/29/99	01/07/00	NJV	Total Strontium in Soil
				7257-002	TH		01/06/00	01/11/00	MCM	Thorium, Isotopic in Soil
				7257-002	U_T		11/17/99	01/07/00	NJV	Uranium, Total in Soil
B-WMP3			N910196-03	7257-003	AM		01/06/00	01/11/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/21/99	7257-003	GAM		12/13/99	01/07/00	NJV	Gamma Scan
B99-078-144	B99-078		10/25/99	7257-003	PU		01/03/00	01/07/00	NJV	Plutonium, Isotopic in Solids
				7257-003	SR		12/21/99	01/07/00	NJV	Total Strontium in Soil
				7257-003	TH		01/06/00	01/11/00	MCM	Thorium, Isotopic in Soil
				7257-003	U		01/05/00	01/11/00	MCM	Uranium, Isotopic in Soil
				7257-003	U_T		11/17/99	01/07/00	NJV	Uranium, Total in Soil
B-WMP4			N910196-04	7257-004	AM		01/06/00	01/11/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/21/99	7257-004	GAM		12/13/99	01/07/00	NJV	Gamma Scan
B99-078-144	B99-078		10/25/99	7257-004	PU		01/03/00	01/07/00	NJV	Plutonium, Isotopic in Solids
				7257-004	SR		12/21/99	01/07/00	NJV	Total Strontium in Soil
				7257-004	TH		01/06/00	01/11/00	MCM	Thorium, Isotopic in Soil
				7257-004	U_T		11/17/99	01/07/00	NJV	Uranium, Total in Soil
B-WMP5			N910196-05	7257-005	AM		01/06/00	01/11/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/21/99	7257-005	GAM		12/13/99	01/07/00	NJV	Gamma Scan
B99-078-144	B99-078		10/25/99	7257-005	PU		01/03/00	01/07/00	NJV	Plutonium, Isotopic in Solids
				7257-005	SR		12/21/99	01/07/00	NJV	Total Strontium in Soil
				7257-005	TH		01/06/00	01/11/00	MCM	Thorium, Isotopic in Soil
				7257-005	U_T		11/17/99	01/07/00	NJV	Uranium, Total in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/12/00

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SAMPLE DELIVERY GROUP H05-90

WORK SUMMARY, cont.

SDG [illegible]
Contract [illegible]

Client Hanford
Contract [illegible]
Case no. [illegible]

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
[illegible]WM6			N910[illegible]-06	[illegible]-006	AM		[illegible]	[illegible]/11/00	MCM	Americium 241 in Soil
[illegible] B Pond		SOLID	10/21/99	[illegible]-006	GAM		[illegible]/99	01/07/00	NJV	Gamma Scan
[illegible]-078-145	[illegible]-078		10/21/99	[illegible]-006	H		[illegible]	[illegible]/12/00	MCM	Tritium in Soil
				[illegible]-006	NI_L		[illegible]/99	01/07/00	NJV	Nickel 63 in Soil
				[illegible]-006	PU		[illegible]	[illegible]/00	NJV	Plutonium, Isotopic in Solids
				[illegible]-006	SR		[illegible]/99	[illegible]/00	NJV	Total Strontium in Soil
				[illegible]-006	TC		[illegible]/99	01/07/00	NJV	Technetium 99 in Soil
				[illegible]-006	TH		[illegible]	[illegible]/00	MCM	Thorium, Isotopic in Soil
				[illegible]-006	U_T		[illegible]	[illegible]/00	NJV	Uranium, Total in Soil
[illegible]WM7			N[illegible]-07	[illegible]-007	AM		[illegible]	[illegible]/11/00	MCM	Americium 241 in Soil
[illegible] B Pond		SOLID	10/21/99	[illegible]-007	GAM		[illegible]/99	01/07/00	NJV	Gamma Scan
[illegible]-078-145	[illegible]-078		10/21/99	[illegible]-007	H		[illegible]	[illegible]/12/00	MCM	Tritium in Soil
				[illegible]-007	NI_L		[illegible]/99	01/07/00	NJV	Nickel 63 in Soil
				[illegible]-007	PU		[illegible]	[illegible]/00	NJV	Plutonium, Isotopic in Solids
				[illegible]-007	SR		[illegible]/99	01/07/00	NJV	Total Strontium in Soil
				[illegible]-007	TC		[illegible]/99	01/07/00	NJV	Technetium 99 in Soil
				[illegible]-007	TH		[illegible]	[illegible]/00	MCM	Thorium, Isotopic in Soil
				[illegible]-007	U_T		[illegible]	[illegible]/00	NJV	Uranium, Total in Soil
[illegible]WM8			N910196-08	[illegible]-008	AM		[illegible]	[illegible]/11/00	MCM	Americium 241 in Soil
[illegible] B Pond		SOLID	10/21/99	[illegible]-008	GAM		[illegible]/99	01/07/00	NJV	Gamma Scan
[illegible]-078-145	[illegible]-078		10/21/99	[illegible]-008	H		[illegible]	[illegible]/12/00	MCM	Tritium in Soil
				[illegible]-008	NI_L		[illegible]/99	01/07/00	NJV	Nickel 63 in Soil
				[illegible]-008	PU		[illegible]	[illegible]/00	NJV	Plutonium, Isotopic in Solids
				[illegible]-008	SR		[illegible]/99	01/07/00	NJV	Total Strontium in Soil
				[illegible]-008	TC		[illegible]/99	01/07/00	NJV	Technetium 99 in Soil
				[illegible]-008	TH		[illegible]	[illegible]/00	MCM	Thorium, Isotopic in Soil
				[illegible]-008	U_T		[illegible]/99	01/07/00	NJV	Uranium, Total in Soil
Method Blank		SOLID	N910061-16	[illegible]-016	U		[illegible]	[illegible]/11/00	MCM	Uranium, Isotopic in Soil
	[illegible]-078									

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form [illegible]
Version [illegible]
Report date [illegible]

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0[illegible]0

WORK SUMMARY, cont.

[illegible]
Contract No [illegible] Version

Client Hanford
Contract [illegible]
Case no [illegible]

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Method Blank			N910196-10	[illegible]-010	AM		[illegible]	01/11/00	MCM	Americium 241 in Soil
		SOLID		[illegible]-010	GAM		[illegible]/99	01/07/00	NJV	Gamma Scan
	B99-078			[illegible]-010	H		[illegible]	01/12/00	MCM	Tritium in Soil
				[illegible]-010	NI_L		[illegible]/99	01/07/00	NJV	Nickel 63 in Soil
				[illegible]-010	PU		[illegible]	01/07/00	NJV	Plutonium, Isotopic in Solids
				[illegible]-010	SR		[illegible]/99	01/07/00	NJV	Total Strontium in Soil
				[illegible]-010	TC		[illegible]/99	01/07/00	NJV	Technetium 99 in Soil
				[illegible]-010	TH		[illegible]	01/11/00	MCM	Thorium, Isotopic in Soil
Method Blank			N910196-14	[illegible]-014	U_T		[illegible]/99	01/07/00	NJV	Uranium, Total in Soil
		SOLID								
	B99-078									
Lab Control Sample			N910061-15	[illegible]-015	U		[illegible]	01/11/00	MCM	Uranium, Isotopic in Soil
		SOLID								
	B99-078									
Lab Control Sample			N910196-09	[illegible]-009	AM		[illegible]/99	01/11/00	MCM	Americium 241 in Soil
		SOLID		[illegible]-009	GAM		[illegible]/99	01/07/00	NJV	Gamma Scan
	B99-078			[illegible]-009	H		[illegible]	01/12/00	MCM	Tritium in Soil
				[illegible]-009	NI_L		[illegible]/99	01/07/00	NJV	Nickel 63 in Soil
				[illegible]-009	PU		[illegible]	01/07/00	NJV	Plutonium, Isotopic in Solids
				[illegible]-009	SR		[illegible]/99	01/07/00	NJV	Total Strontium in Soil
				[illegible]-009	TC		[illegible]/99	01/07/00	NJV	Technetium 99 in Soil
				[illegible]-009	TH		[illegible]	01/11/00	MCM	Thorium, Isotopic in Soil
Lab Control Sample			N910196-13	[illegible]-013	U_T		11/17/99	01/07/00	NJV	Uranium, Total in Soil
		SOLID								
	B99-078									
Duplicate (N910196-01)			N910196-15	[illegible]-015	U_T		11/17/99	01/07/00	NJV	Uranium, Total in Soil
200 B Pond		SOLID	10/21/99							
	B99-078		10/25/99							

Lab id TMANC
Protocol Hanford
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

WORK SUMMARY, cont.

[illegible]	[illegible]
[illegible]	[illegible]

Client	Hanford
Contract	[illegible]
Case no	[illegible]

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (N910196-06)			N910196-11	7257-011	AM		01/07/00	01/11/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/21/99	7257-011	GAM		12/13/99	01/07/00	NJV	Gamma Scan
	B99-078		10/25/99	7257-011	H		01/08/00	01/12/00	MCM	Tritium in Soil
				7257-011	NI_L		12/30/99	01/07/00	NJV	Nickel 63 in Soil
				7257-011	PU		01/03/00	01/07/00	NJV	Plutonium, Isotopic in Solids
				7257-011	SR		12/30/99	01/07/00	NJV	Total Strontium in Soil
				7257-011	TC		12/27/99	01/07/00	NJV	Technetium 99 in Soil
				7257-011	TH		01/07/00	01/11/00	MCM	Thorium, Isotopic in Soil
Spike (N910196-07)			N910196-16	7257-016	NI_L		12/30/99	01/11/00	MCM	Nickel 63 in Soil
200 B Pond		SOLID	10/21/99							
	B99-078		10/25/99							
Spike (N910196-08)			N910196-12	7257-012	H		01/08/00	01/12/00	MCM	Tritium in Soil
200 B Pond		SOLID	10/21/99							
	B99-078		10/25/99							
Spike (N910196-08)			N910196-17	7257-017	NI_L		12/30/99	01/11/00	MCM	Nickel 63 in Soil
200 B Pond		SOLID	10/21/99							
	B99-078		10/25/99							

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	8			1	1	1		11
GAM	B99-078	Gamma Scan	GAMMAHI	8			1	1	1		11
H	B99-078	Tritium in Soil	PLA906.0	3			1	1	1	1	7
NI_L	B99-078	Nickel 63 in Soil	NI63LSC	3			1	1	1	2	8
PU	B99-078	Plutonium, Isotopic in Solids	PUPLATE	8			1	1	1		11
SR	B99-078	Total Strontium in Soil	SRTOTAL	8			1	1	1		11
TC	B99-078	Technetium 99 in Soil	TC99TRLSC	3			1	1	1		6
TH	B99-078	Thorium, Isotopic in Soil	THPLATE	8			1	1	1		11
U	B99-078	Uranium, Isotopic in Soil	UPLATE	1			1	1			3
U_T	B99-078	Uranium, Total in Soil	UKPA	8			1	1	1		11
TOTALS				58			10	10	9	3	90

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVP CWS
Version	3.06
Report date	01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910061-16 Method Blank

METHOD BLANK

SDG [illegible]	Client/Case No Hanford	SDG H0590
Contact Melissa C. Munson	Contract [illegible]	
Lab sample id N910061-16	Client sample id Method Blank	
Lept sample id [illegible]	Material/Matrix	SOLID
	SAF No [illegible]	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U233/234	0.007	0.013	0.020	1.0	U	U
Uranium 235	15117-96-1	-0.002	0.008	0.019	1.0	U	U
Uranium 238	U238	-0.008	0.010	0.024	1.0	U	U

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

QC-BLANK 33027

METHOD BLANKS

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196 10 Method Blank

METHOD BLANK

SDG [illegible]		Client/Case no Hanford	SDG H0590
Contact Melissa C. Mannion		Contract TFP [illegible]	
Lab sample id N910196 10		Client sample id Method Blank	
Dept sample id [illegible]		Material/Matrix	SOLID
		SAF No [illegible]	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.050	0.12	0.20	400	U	H
Technetium 99	14133-76-7	-0.099	0.24	0.72	15	U	TC
Plutonium 238	13981-16-3	-0.003	0.025	0.048	1.0	U	PU
Plutonium 239/240	PU-239/240	0.009	0.031	0.053	1.0	U	PU
Nickel 63	13981-37-8	-1.17	1.3	2.2	30	U	NI_L
Americium 241	14596-10-2	0.022	0.019	0.024	1.0	U	AM
Total Strontium	SR90	-0.037	0.093	0.12	1.0	U	SR
Thorium 228	14274-82-9	0.022	0.13	0.26	1.0	U	TH
Thorium 230	14269-63-7	-0.011	0.11	0.21	1.0	U	TH
Thorium 232	TH-232	0.022	0.044	0.084	1.0	U	TH
Potassium 40	13966-00-2	U		0.86		U	GAM
Cobalt 60	10198-40-0	U		0.050	0.050	U	GAM
Cesium 137	10045-97-3	U		0.047	0.10	U	GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Radium 226	13982-63-3	U		0.079	0.10	U	GAM
Radium 228	15262-20-1	U		0.21	0.20	U	GAM
Thorium 228	14274-82-9	U		0.084		U	GAM
Thorium 232	TH-232	U		0.21		U	GAM
Americium 241	14596-10-2	U		0.37		U	GAM
Uranium 238	U-238	U		5.5		U	GAM
Uranium 235	15117-96-1	U		0.19		U	GAM

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

QC-BLANK 32742

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196-14 Method Blank

METHOD BLANK

SDG 7257	Client/Case no Hanford	SDG H0590	
Contact Melissa C. Mannion	Contract TRP-SRP-207915		
Lab sample id N910196-14	Client sample id Method Blank		
Dept sample id 7257-014	Material/Matrix	SOLID	
	SAF No F99-078		

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	-0.004	0.002	0.005	1.0	U	U_T

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

QC BLANK 32332

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910061 15

Lab Control Sample

LAB CONTROL SAMPLE

SDG 3157

Contact Melissa C. Mannion

Lab sample id N910061-15

Dept sample id 3231-115

Client/Case no Hanford SDG H0590

Case no TRP SRP 2 1125

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No R59 578

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	4.92	0.26	0.12	1.0		U	4.64	0.19	106	87-113	80-120
Uranium 235	3.84	0.23	0.015	1.0		U	3.77	0.15	102	87-113	80-120
Uranium 238	4.93	0.26	0.11	1.0		U	5.04	0.20	98	88-112	80-120

100 Area Soure Chara. - 100 CW-1 OU

QC-LCS 00026

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form LVD LCS

Version 3.06

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196-09 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7157
Contact Melissa C. Mannion

Client/Case no Hanford SDG H0590
Case no [illegible]

Lab sample id N910196-09
Dept sample id [illegible]

Client sample id Lab Control Sample
Material/Matrix [illegible] SOLID
SAF No [illegible]

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	12.1	0.34	0.10	400	J	H	12.2	0.49	99	83-117	80-120
Technetium 99	42.8	1.6	0.16	15		TC	42.7	1.7	100	83-117	80-120
Plutonium 238	12.7	0.93	0.013	1.0		PU	12.5	0.50	102	85-115	80-120
Plutonium 239/240	12.8	0.93	0.013	1.0		PU	13.2	0.53	97	86-114	80-120
Nickel 63	141	3.6	2.3	30		NI_L	134	5.4	105	83-117	
Americium 241	10.2	0.69	0.046	1.0		AM	11.5	0.46	89	87-113	80-120
Total Strontium	13.0	0.23	0.12	1.0		SR	12.4	0.50	105	83-117	
Thorium 228	0.074	0.15	0.27	1.0	U	TH					
Thorium 230	13.3	1.6	0.16	1.0		TH	12.4	0.90	104	85-115	
Thorium 232	0.061	0.074	0.094	1.0	U	TH					
Cobalt 60	1.60	0.16	0.069	0.010		GAM	1.49	0.060	107	70-130	80-120
Cesium 137	1.66	0.12	0.079	0.10		GAM	1.65	0.066	101	74-126	80-120

200 Area Source Chara. - 200 CW-1 OU

QC-LCS 92741

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form LVL LCS
Version 3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196 13 Lab Control Sample

LAB CONTROL SAMPLE

[illegible] 1157	Client/Case no Hanford [illegible]
Contact Melissa C. Mannion	Case no [illegible]
Lab sample id N910196 13	Client sample id Lab Control Sample
Dept sample id [illegible]	Material/Matrix [illegible]
	SAF No [illegible]

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 (µg/g)	[illegible]0.2	4.0	[illegible]	1.0		[illegible]	[illegible]	1.3	[illegible]2	77-123	[illegible]-120

[illegible] Area Source Chara. - [illegible]

[illegible] LCS [illegible]

Lab id	TMANC
Protocol	Hanford
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Form	LVD LCS
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196 15 | HCWMD1

DUPLICATE

SDG [illegible]		Client/Case no Hanford [illegible]
Contact [illegible] C. Mannion		Case no [illegible]
DUPLICATE	ORIGINAL	
Lab sample id [illegible] 15	Lab sample id [illegible]	Client sample id HCWMD1
Dept sample id [illegible]	Dept sample id [illegible]	Location/Matrix [illegible] Pond [illegible]
	Received [illegible]	Collected [illegible]
	% solids 91.7	Custody/SAF No [illegible] 144 [illegible] 178

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 (mg/g)	1.37	0.18	0.005	1.0		U_T	1.33	0.17	0.005		3	33	

[illegible] Area Source Chara. - [illegible] CW-1 OU

QC [illegible]#1 [illegible]33

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Lab id	TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N90196 11 — PGWM06

DUPLICATE

SDG 2917

Contact Melissa C. Marsden

Client/Case no Hanford — SDG H0590

Case no TMA-RICH-2917-5

DUPLICATE	ORIGINAL	
Lab sample id [illegible]	Lab sample id [illegible]	Client sample id PGWM06
Input sample id [illegible]	Input sample id [illegible]	Location/Matrix [illegible] — SOILD
	Received [illegible]	Collected [illegible] 11:30
	% solids [illegible]	Custody/SAF No [illegible] [illegible]

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	REL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT LIMIT
Tritium	0.106	0.061	0.10	400	U	H	-0.048	0.057	0.099	U	-	
Technetium 99	0.230	0.15	0.49	15	U	TC	0.103	0.27	0.62	U	-	
Plutonium 238	0.015	0.010	0.018	1.0	U	PU	0.007	0.007	0.017	U	-	
Plutonium 239,240	0	0.005	0.020	1.0	U	PU	-0.007	0.014	0.039	U	-	
Nickel 63	0.737	1.3	2.2	30	U	NI_L	0.427	1.4	2.3	U	-	
Americium 241	0.007	0.012	0.025	1.0	U	AM	0.037	0.037	0.012	U	-	
Total Strontium	4.26	0.24	0.13	1.0		SR	4.03	0.17	0.090		6	24
Thorium 228	0.979	0.17	0.17	1.0	J	TH	0.778	0.17	0.20	J	46	77
Thorium 230	0.787	0.18	0.17	1.0	J	TH	0.106	0.20	0.23	J	43	63
Thorium 232	0.924	0.12	0.072	1.0	J	TH	0.756	0.13	0.12	J	17	49
Potassium 40	11.8	0.74	0.95			AM	12.4	0.86	0.12		5	45
Cobalt 60	U		0.043	0.010	U	AM	U		0.002	U	-	
Cesium 137	0.186	0.040	0.036	0.10		GAM	0.157	0.018	0.031		17	53
Europium 152	U		0.080	0.10	U	GAM	U		0.057	U	-	
Europium 154	U		0.14	0.10	U	GAM	U		0.079	U	-	
Europium 155	U		0.076	0.10	U	GAM	U		0.093	U	-	
Radium 226	0.564	0.171	0.142	0.10		GAM	0.484	0.148	0.044		15	40
Radium 228	0.697	0.15	0.14	0.10		GAM	0.782	0.10	0.093		11	48
Thorium 228	0.845	0.163	0.060			GAM	0.678	0.034	0.027		12	35
Thorium 232	0.697	0.15	0.14			GAM	0.782	0.10	0.093		11	48
Americium 241	U		0.059		U	GAM	U		0.033	U	-	
Uranium 238	U		4.6		U	GAM	U		2.9	U	-	
Uranium 235	U		0.12		U	GAM	U		0.190	U	-	

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

CC 17186 51743

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form LVD DUP
Version 3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196 16 | P0WMD7

MATRIX SPIKE

SDG [illegible]		Client/Case no Hanford SDG H0590
Contact Melissa C. Mannion		Case no [illegible]
MATRIX SPIKE	ORIGINAL	
Lab sample id N910196 16	Lab sample id N910196 07	Client sample id P0WMD7
Dept sample id [illegible]	Dept sample id [illegible]	Location/Matrix [illegible] Pond [illegible]
	Received [illegible]	Collected [illegible] 11:40
	% solids [illegible]	Custody/SAF No [illegible] 245 [illegible]

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RBL pCi/g	QUALIFIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Nickel 63	113	3.4	2.3	30		NI I	134	5.4	0.688	1.3	81	84 116	

[illegible] Area Source Chara. - [illegible] W 1 CU

LSC,MS #7
QC MS#7 [illegible]

MATRIX SPIKES
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196 12 | PCWMD8

MATRIX SPIKE

SDG [illegible]		Client/Case no Hanford [illegible]
Contact [illegible]		Case no [illegible]
MATRIX SPIKE	ORIGINAL	
Lab sample id [illegible]	Lab sample id [illegible]	Client sample id PCWMD8
Dept sample id [illegible]	Dept sample id [illegible]	Location/Matrix [illegible]
	Received [illegible]	Collected [illegible]
	% [illegible] 14.9	Custody/CAF No [illegible]

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	40.4	0.42	0.10	400	J	H	43.9	1.8	-0.051	0.018	92	85-115	

[illegible] Area Source Charal - [illegible] GW 1 GU

QC MSBR [illegible]144

MATRIX SPIKES
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Lab id	TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP HC590

N910196 17 | [illegible]WMD8

MATRIX SPIKE

[illegible]		Client/Case no Hanford [illegible]
Contact [illegible]		Case no [illegible]
MATRIX SPIKE	ORIGINAL	
Lab sample id [illegible] 17	Lab sample id [illegible]	Client sample id [illegible]
Dept sample id [illegible]	Dept sample id [illegible]	Location/Matrix [illegible]
	Received [illegible]	Collected [illegible]
	% solids 54.9	Custody/SAF No [illegible]

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Nickel 63	88.5	2.9	2.3	30		NI_L	100	4.0	0.613	1.4	[illegible]	[illegible]	

[illegible]

LSC,MS #8
QC-MS#8 [illegible]

MATRIX SPIKES
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Lab id	TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196-01 B0WMD1

DATA SHEET

SDG	7257	Client/Case no	Hanford SDG H0590
Contact	Melissa C. Mannion	Contract	TRP-SRB 207925
Lab sample id	N910196-01	Client sample id	B0WMD1
Dept sample id	7257-001	Location/Matrix	200 B Pond SOLID
Received	10/25/99	Collected	10/21/99 10:12
% solids	91.7	Custody/SAF No	B99-078-144 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	1.33	0.17	0.005	1.0		U_T
Plutonium 238	13981-16-3	0.005	0.011	0.026	1.0	U	PU
Plutonium 239/240	PU-239/240	0.126	0.038	0.030	1.0	J	PU
Americium 241	14596-10-2	0.966	0.15	0.037	1.0	J	AM
Total Strontium	SR90	12100	130	2.8	1.0		SR
Thorium 228	14274-82-9	0.414	0.14	0.13	1.0	J	TH
Thorium 230	14269-63-7	0.458	0.15	0.17	1.0	J	TH
Thorium 232	TH-232	0.428	0.12	0.057	1.0	J	TH
Potassium 40	13966-00-2	13.3	0.78	0.41			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	721	0.80	0.29	0.10		GAM
Europium 152	14683-23-9	U		0.82	0.10	U	GAM
Europium 154	15585-10-1	1.82	0.18	0.19	0.10		GAM
Europium 155	14391-16-3	U		2.5	0.10	U	GAM
Radium 226	13982-63-3	0.650	0.21	0.31	0.10		GAM
Radium 228	15262-20-1	0.718	0.27	0.35	0.20		GAM
Thorium 228	14274-82-9	1.05	0.30	0.45			GAM
Thorium 232	TH-232	0.718	0.27	0.35			GAM
Americium 241	14596-10-2	U		24		U	GAM
Uranium 238	U-238	U		8.3		U	GAM
Uranium 235	15117-96-1	U		1.1		U	GAM

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

Lab id	TMANC
Protocol	Hanford
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Report date	01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196 02 B0WMD2

DATA SHEET

SDG 7257		Client/Case no Hanford	SDG H0590
Contact Melissa C. Mannion		Contract TRP SRB-207925	
Lab sample id N910196-02		Client sample id B0WMD2	
Dept sample id 7257-002		Location/Matrix 200 B Pond	SOLID
Received 10/25/99		Collected 10/21/99 10:17	
% solids 92.4		Custody/SAF No B99-078-144	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	0.160	0.072	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	0.017	0.021	0.038	1.0	U	PU
Plutonium 239/240	PU-239/240	0.114	0.042	0.038	1.0	J	PU
Americium 241	14596-10-2	1.14	0.17	0.045	1.0		AM
Total Strontium	SR90	9950	160	6.7	1.0		SR
Thorium 228	14274-82-9	0.845	0.19	0.14	1.0	J	TH
Thorium 230	14269-63-7	0.861	0.19	0.15	1.0	J	TH
Thorium 232	TH-232	0.684	0.15	0.065	1.0	J	TH
Potassium 40	13966-00-2	13.4	0.72	0.47			GAM
Cobalt 60	10198-40-0	U		0.047	0.050	U	GAM
Cesium 137	10045-97-3	746	1.1	0.38	0.10		GAM
Europium 152	14683-23-9	U		1.1	0.10	U	GAM
Europium 154	15585-10-1	1.87	0.25	0.24	0.10		GAM
Europium 155	14391-16-3	U		2.8	0.10	U	GAM
Radium 226	13982-63-3	0.690	0.33	0.46	0.10		GAM
Radium 228	15262-20-1	0.699	0.33	0.41	0.20		GAM
Thorium 228	14274-82-9	0.819	0.38	0.56			GAM
Thorium 232	TH-232	0.699	0.33	0.41			GAM
Americium 241	14596-10-2	U		3.7		U	GAM
Uranium 238	U-238	U		11		U	GAM
Uranium 235	15117-96-1	U		1.8		U	GAM

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

Lab id	TMANC
Protocol	Hanford
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TMA/RICHMOND

SAMPLE DELIVERY GROUP B0590

N910196-03 B0WMD3

DATA SHEET

SDG 7217 Client/Case no Hanford SDG B0590
Contact Melissa C. Maynign Contract TEP-DEP-107515

Lab sample id N910196-03 Client sample id B0WMD3
Lab sample id 7217-003 Location/Matrix 200 E Pond SOLID
Received 10/15/99 Collected 10/21/99 10:47
% solids 92.3 Custody/SAF No B99-078 244 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233	U233/234	0.185	0.059	0.017	1.0	J	U
Uranium 235	15117-96-1	0.040	0.016	0.012	1.0	J	U
Uranium 238	U238	0.164	0.057	0.018	1.0	J	U
Total Uranium (ug/g)	7440-61-1	2.38	0.30	0.005	1.0		U_T
Plutonium 238	13981-16-3	0.003	0.012	0.023	1.0	U	PU
Plutonium 239/240	PU-239/240	0.024	0.018	0.029	1.0	U	PU
Americium 241	14596-10-2	0.337	0.082	0.042	1.0	J	AM
Total Strontium	SR90	1580	61	3.4	1.0		SR
Thorium 228	14274-82-9	0.294	0.31	0.16	1.0	J	TH
Thorium 230	14269-63-7	0.310	0.15	0.16	1.0	J	TH
Thorium 232	TH-232	0.129	0.098	0.062	1.0	J	TH
Potassium 40	13966-00-2	12.5	0.81	0.43			GAM
Cobalt 60	10198-40-0	U		0.044	0.050	U	GAM
Cesium 137	10045-97-3	13.4	0.19	0.11	0.10		GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	0.538	0.20	0.19	0.10		GAM
Europium 155	14391-16-3	U		0.47	0.10	U	GAM
Radium 226	13982-63-3	0.090	0.15	0.16	0.10		GAM
Radium 228	15262-20-1	1.00	0.35	0.22	0.20		GAM
Thorium 228	14274-82-9	0.994	0.17	0.21			GAM
Thorium 232	TH-232	1.00	0.35	0.32			GAM
Americium 241	14596-10-2	U		0.52		U	GAM
Uranium 238	U-238	U		8.7		U	GAM
Uranium 235	15117-96-1	U		0.64		U	GAM

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD DS
Version 3.06
Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196-04 B0WMD4

DATA SHEET

SDG	7257	Client/Case no	Hanford SDG H0590
Contact	Melissa C. Mannion	Contract	TRP-TRP-107925
Lab sample id	N910196-04	Client sample id	B0WMD4
Dept sample id	7257-004	Location/Matrix	200 B Pond SOLID
Received	10/25/99	Collected	10/21/99 11:02
% solids	89.4	Custody/SAF No	B99-078-144 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	0.692	0.089	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	0.009	0.018	0.018	1.0	U	PU
Plutonium 239/240	PU-239/240	0.122	0.042	0.033	1.0	J	PU
Americium 241	14596-10-2	1.32	0.16	0.056	1.0		AM
Total Strontium	SR90	996	36	4.6	1.0		SR
Thorium 228	14274-82-9	0.867	0.19	0.18	1.0	J	TH
Thorium 230	14269-63-7	0.797	0.19	0.15	1.0	J	TH
Thorium 232	TH-232	0.866	0.18	0.083	1.0	J	TH
Potassium 40	13966-00-2	13.3	0.87	0.51			GAM
Cobalt 60	10198-40-0	U		0.047	0.050	U	GAM
Cesium 137	10045-97-3	103	0.50	0.19	0.10		GAM
Europium 152	14683-23-9	U		0.55	0.10	U	GAM
Europium 154	15585-10-1	2.34	0.24	0.21	0.10		GAM
Europium 155	14391-16-3	2.04	0.41	0.59	0.10		GAM
Radium 226	13982-63-3	0.740	0.23	0.31	0.10		GAM
Radium 228	15262-20-1	0.819	0.22	0.26	0.20		GAM
Thorium 228	14274-82-9	0.863	0.20	0.28			GAM
Thorium 232	TH-232	0.819	0.22	0.26			GAM
Americium 241	14596-10-2	U		1.9		U	GAM
Uranium 238	U-238	U		8.3		U	GAM
Uranium 235	15117-96-1	U		0.78		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196-05 B0WMD5

DATA SHEET

SDG 0217 Client/Case no Hanford SDG_H0590

Contact Melissa C. Munson Contract 33P-SRP-10525

Lab sample id N910196-05 Client sample id B0WM15

Client sample id 1217-005 Location/Matrix 200 Pond PONID

Received 10/25/99 Collected 10/21/99 11:18

% solids 94.6 Custody/COC No 199-078-144 199-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Total Uranium (ug/g)	7440-61-1	0.507	0.10	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	0.003	0.011	0.021	1.0	U	PU
Plutonium 239/240	PU-239/240	0.058	0.018	0.027	1.0	J	PU
Americium 241	14596-10-2	0.081	0.067	0.051	1.0	J	AM
Total Strontium	1690	364	1.6	0.10	1.0		SR
Thorium 228	14274-82-9	0.518	0.16	0.18	1.0	J	TH
Thorium 230	14269-63-7	0.536	0.16	0.16	1.0	J	TH
Thorium 232	TH-232	0.552	0.13	0.062	1.0	J	TH
Potassium 40	13966-00-2	11.7	0.55	0.55			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	20.4	0.17	0.060	0.10		GAM
Europium 152	14683-23-9	U		0.28	0.10	U	GAM
Europium 154	15585-10-1	0.301	0.32	0.13	0.10		GAM
Europium 155	14391-16-3	0.141	0.17	0.27	0.10	U	GAM
Radium 226	13982-63-3	0.520	0.084	0.095	0.10		GAM
Radium 228	15262-20-1	0.748	0.13	0.13	0.20		GAM
Thorium 228	14274-82-9	0.608	0.062	0.088			GAM
Thorium 232	TH-232	0.748	0.13	0.13			GAM
Americium 241	14596-10-2	U		0.62		U	GAM
Uranium 238	U-238	U		4.1		U	GAM
Uranium 235	15117-96-1	U		0.30		U	GAM

100 Area Soore Chara. - 200-CW-1 OU

Lab id TMARC
Protocol Hanford
Version Ver 1.0
Form IVD DS
Version 3.06
Report Date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196-06 B0WMD6

DATA SHEET

SDG	H0590	Client/Case no	Hanford
Contact	Melissa C. Marolin	Contract	TRP-SDP 207125
Lab sample id	N910196-06	Client sample id	B0WMD6
Dept sample id	2112.006	Location/Matrix	100 B Pond SOLID
Received	10/11/99	Collected	10/21/99 11:30
% solids	90.2	Custody/SAF No	B99-078 145 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-0.048	0.057	0.099	400	U	H
Technetium 99	14133-76-7	0.101	0.27	0.62	15	U	TC
Total Uranium (ug/g)	7440-61-1	0.284	0.049	0.085	1.0	J	U_T
Plutonium 238	13981-16-3	0.007	0.007	0.027	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.007	0.014	0.039	1.0	U	PU
Nickel 63	13981-37-8	0.427	1.4	2.3	30	U	NI_L
Americium 241	14596-10-2	0.037	0.037	0.052	1.0	U	AM
Total Strontium	SR90	4.03	0.17	0.090	1.0		SR
Thorium 228	14274-82-9	0.378	0.17	0.10	1.0	J	TH
Thorium 230	14269-63-7	0.506	0.20	0.23	1.0	J	TH
Thorium 232	TH-232	0.256	0.13	0.12	1.0	J	TH
Potassium 40	13966-00-2	12.4	0.86	0.12			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	0.157	0.028	0.031	0.10		GAM
Europium 152	14683-23-9	U		0.057	0.10	U	GAM
Europium 154	15585-10-1	U		0.079	0.10	U	GAM
Europium 155	14391-16-3	U		0.093	0.10	U	GAM
Radium 226	13982-63-3	0.484	0.048	0.044	0.10		GAM
Radium 228	15262-20-1	0.782	0.10	0.093	0.20		GAM
Thorium 228	14274-82-9	0.678	0.034	0.027			GAM
Thorium 232	TH-232	0.782	0.10	0.093			GAM
Americium 241	14596-10-2	U		0.033		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	U		0.090		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

N910196 07 B0WMD7

DATA SHEET

SDG	7257	Client/Case no	Hanford SDG H0590
Contact	Melissa C. Mannion	Contract	TRP-SRP 207925
Lab sample id	N910196 07	Client sample id	B0WMD7
Dept sample id	7257-007	Location/Matrix	200 E Pond SOLID
Received	10/25/99	Collected	10/21/99 11:40
% solids	95.9	Custody/SAF No	B99-078 145 B99 078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.026	0.061	0.10	400	U	H
Technetium 99	14133-76-7	0.114	0.31	0.63	15	U	TC
Total Uranium (ug/g)	7440-61-1	0.350	0.046	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	0	0.007	0.026	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.013	0.032	1.0	U	PU
Nickel 63	13981-37-8	0.088	1.3	2.2	30	U	NI_L
Americium 241	14596-10-2	0.013	0.013	0.025	1.0	U	AM
Total Strontium	SR90	4.82	0.25	0.13	1.0		SR
Thorium 228	14274-82-9	0.347	0.17	0.23	1.0	J	TH
Thorium 230	14269-63-7	0.680	0.22	0.18	1.0	J	TH
Thorium 232	TH-232	0.371	0.15	0.095	1.0	J	TH
Potassium 40	13966-00-2	12.8	0.45	0.15			GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	0.472	0.029	0.023	0.10		GAM
Europium 152	14683-23-9	U		0.050	0.10	U	GAM
Europium 154	15585-10-1	U		0.070	0.10	U	GAM
Europium 155	14391-16-3	U		0.051	0.10	U	GAM
Radium 226	13982-63-3	0.369	0.039	0.038	0.10		GAM
Radium 228	15262-20-1	0.606	0.090	0.083	0.20		GAM
Thorium 228	14274-82-9	0.541	0.027	0.026			GAM
Thorium 232	TH-232	0.606	0.090	0.083			GAM
Americium 241	14596-10-2	U		0.064		U	GAM
Uranium 238	U-238	U		2.4		U	GAM
Uranium 235	15117-96-1	U		0.074		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/12/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP R0590

N910196-08 R0WMD8

DATA SHEET

SDG	7217	Client/Case no	Hanford SDG R0590
Contact	Melissa C. Madden	Contract	DE-AC-06-97RL13725
Lab sample id	N910196-08	Client sample id	R0WMD8
Dept sample id	7217-008	Location/Matrix	200 E Pond SOILD
Received	10/21/99	Collected	10/21/99 23:50
% solids	84.9	Custody/SAF No	R99-078 145 R99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.051	0.018	0.10	400	U	H
Technetium 99	14133-76-7	-0.123	0.18	0.53	15	U	TC
Total Uranium (ug/g)	7440-61-1	0.326	0.042	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	0.003	0.006	0.021	1.0	U	PU
Plutonium 239/240	PU-239/240	0.019	0.017	0.021	1.0	U	PU
Nickel 63	13981-37-8	0.033	1.4	2.3	30	U	NI_L
Americium 241	14596-10-2	0.015	0.022	0.028	1.0	U	AM
Total Strontium	7440	0.656	0.12	0.13	1.0	J	SR
Thorium 228	14274-82-9	0.386	0.17	0.21	1.0	J	TH
Thorium 230	14269-63-7	0.150	0.13	0.20	1.0	U	TH
Thorium 232	TH-232	0.246	0.11	0.12	1.0	J	TH
Potassium 40	13966-00-2	13.4	0.77	0.19			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	0.075	0.020	0.025	0.10	J	GAM
Europium 152	14683-23-9	U		0.048	0.10	U	GAM
Europium 154	15585-10-1	U		0.071	0.10	U	GAM
Europium 155	14391-16-3	U		0.050	0.10	U	GAM
Radium 226	13982-63-3	0.452	0.045	0.043	0.10		GAM
Radium 228	15262-20-1	0.697	0.11	0.10	0.20		GAM
Thorium 228	14274-82-9	0.653	0.031	0.024			GAM
Thorium 232	TH-232	0.697	0.11	0.10			GAM
Americium 241	14596-10-2	U		0.028		U	GAM
Uranium 238	U-238	U		2.4		U	GAM
Uranium 235	15117-96-1	U		0.081		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H[illegible]

Test AM Matrix [illegible]
[illegible]
[illegible]

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract [illegible]
Ware no [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6904-172					
R-WMD1	N910196-01			7257-001	0.966 J
R-WMD2	N910196-02			7257-002	1.14
R-WMD3	N910196-03			7257-003	0.337 J
R-WMD4	N910196-04			7257-004	1.32
R-WMD5	N910196-05			7257-005	0.481 J
R-WMD6	N910196-06			7257-006	U
R-WMD7	N910196-07			7257-007	U
R-WMD8	N910196-08			7257-008	U
BLK (QC ID 32742)	N910196-10			7257-010	U
LCS (QC ID 32741)	N910196-09			7257-009	ok
Duplicate (N910196-06)	N910196-11			7257-011	- U

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

200 Area Soure 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	BRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-172 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 172																
R-WMD1	N910196-01			0.037	0.500			60		806			77	12/22/99	01/06	SS-013
R-WMD2	N910196-02			0.045	0.500			66		806			77	12/22/99	01/06	SS-015
R-WMD3	N910196-03			0.042	0.500			70		806			77	12/22/99	01/06	SS-016
R-WMD4	N910196-04			0.056	0.500			82		760			77	12/22/99	01/06	SS-063
R-WMD5	N910196-05			0.051	0.500			80		760			77	12/22/99	01/06	SS-064
R-WMD6	N910196-06			0.052	0.500			54		896			78	12/22/99	01/07	SS-010
R-WMD7	N910196-07			0.025	0.500			85		896			78	12/22/99	01/07	SS-011
R-WMD8	N910196-08			0.028	0.500			75		896			78	12/22/99	01/07	SS-012
BLK (QC ID 32742)	N910196-10			0.024	0.500			83		896				01/07/00	01/07	SS-013
LCS (QC ID 32741)	N910196-09			0.046	0.500			88		765				12/22/99	12/31	SS-059
Duplicate (N910196-06) (QC ID 32743)	N910196-11			0.035	0.500			77		896			78	12/22/99	01/07	SS-015
Nominal values and limits from method				1.0	0.500			20 105		700	100		180			

METHOD SUMMARIES
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SUMMARY DATA SECTION
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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

Test AM Matrix [illegible]	Client Hanford
[illegible]	Contract [illegible]
Contact [illegible]	Case no. [illegible]

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

PROCEDURES	REFERENCE	AM/CMPLATE
	HP-060	Soil Preparation, rev 0
	HP-070	Soil Dissolution, rev 0
	HP-540	Plutonium Purification, rev 0
	HP-560	Americium-Curium Purification, rev 0
	HP-[illegible]8	Heavy Elements Electroplating, rev 0

AVERAGES + 2 SD	MDA [illegible]	+ [illegible]
FOR 11 SAMPLES	YIELD [illegible]	+ [illegible]

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD CMS
Version	3.06
Report date	01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP B0590

Test PU Matrix [illegible]
[illegible] 1197
Contact [illegible]

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract [illegible]
Case no. [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 6904-172						
B0WMD1	N910196-01			7257-001	U	0.116 J
B0WMD2	N910196-02			7257-002	U	0.114 J
B0WMD3	N910196-03			7257-003	U	U
B0WMD4	N910196-04			7257-004	U	0.112 J
B0WMD5	N910196-05			7257-005	U	0.[illegible]8 J
B0WMD6	N910196-06			7257-006	U	U
B0WMD7	N910196-07			7257-007	U	U
B0WMD8	N910196-08			7257-008	U	U
BLK (QC ID=32742)	N910196-10			7257-010	U	U
LCS (QC ID=32741)	N910196-09			7257-009	ok	ok
Duplicate (N910196-06)	N910196-11			7257-011	- U	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0

200 Area Soure 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 6904-172	2σ prep error 5.0 %			Reference Lab Notebook 6904 pg. 172												
B0WMD1	N910196-01			0.030	0.500			83		1068			74	12/31/99	01/03	SS-[illegible]
B0WMD2	N910196-02			0.038	0.500			63		1099			74	12/31/99	01/03	SS-[illegible]
B0WMD3	N910196-03			0.029	0.500			70		1099			74	12/31/99	01/03	SS-[illegible]
B0WMD4	N910196-04			0.033	0.500			74		1099			74	12/31/99	01/03	SS-[illegible]
B0WMD5	N910196-05			0.027	0.500			82		1068			74	12/31/99	01/03	SS-[illegible]
B0WMD6	N910196-06			0.039	0.500			67		1068			74	12/31/99	01/03	SS-011
B0WMD7	N910196-07			0.032	0.500			69		1068			74	12/31/99	01/03	SS-012
B0WMD8	N910196-08			0.021	0.500			78		1098			74	12/31/99	01/03	SS-013
BLK (QC ID=32742)	N910196-10			0.053	0.500			70		1098				12/22/99	01/03	SS-014
LCS (QC ID=32741)	N910196-09			0.053	0.500			60		1067				12/22/99	01/03	SS-[illegible]
Duplicate (N910196-06) (QC ID=32743)	N910196-11			0.028	0.500			89		1098			74	12/31/99	01/03	SS-015
Nominal values and limits from method				1.0	0.500			20 105		10	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form LVD CMS
Version 3.06
Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP HC590

METHOD SUMMARY, cont.

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test [illegible] Matrix [illegible]
[illegible]
Contact [illegible]

Client Hanford
Contract [illegible]
Case no [illegible]

PROCEDURES	REFERENCE	PULLATE
	[illegible]	Soil Preparation, rev 0
	[illegible]	Soil Dissolution, rev 0
	[illegible]	Plutonium Purification, rev 0
	[illegible]	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 11 SAMPLES

MDA [illegible] ± [illegible]
YIELD [illegible] ± [illegible]

METHOD SUMMARIES
Page 4
SUMMARY DATA SECTION
Page 32

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form LVD-CMS
Version 3.06
Report date [illegible]/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP B0190

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test SOP Matrix SOIL

Client Matrix Soil

Method Blank

Client Spike

Client Dup. HB 1.2016

Date Rec'd 12/12/96

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	BLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6904-172							
B-WMD1	N910196-01			7157-001	0.414 J	0.438 J	0.428 J
B-WMD2	N910196-02			7157-002	0.845 J	0.861 J	0.884 J
B-WMD3	N910196-03			7157-003	0.104 J	0.110 J	0.129 J
B-WMD4	N910196-04			7157-004	0.867 J	0.797 J	0.866 J
B-WMD5	N910196-05			7157-005	0.128 J	0.136 J	0.152 J
B-WMD6	N910196-06			7157-006	0.178 J	0.116 J	0.136 J
B-WMD7	N910196-07			7157-007	0.147 J	0.140 J	0.171 J
B-WMD8	N910196-08			7157-008	0.186 J	U	0.146 J
MBK (QC II-1742)	N910196-10			7157-010	U	U	U
LCS (QC II-1741)	N910196-09			7157-009	No Data U	ok	No Data U
Duplicate (N910196-06)	N910196-11			7157-011	ok J	ok J	ok J
Nominal values and limits from method		MDLs (pCi/g)			1.0	1.0	1.0
200 Area Soure Chara.	200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MEA pCi/g	ALIQ g	PREP FAC	FILU TION	YIELD %	EFF %	COUNT min	PWHM keV	SHIFT keV	DAYS HELD	DAYS RELEASED	ANAL-YZED	DETECTOR
Preparation batch 6904-172 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 172																
B-WMD1	N910196-01			0.17	0.150			96		678			77	11/11/99	01/06	SS-027
B-WMD2	N910196-02			0.15	0.110			82		678			77	11/11/99	01/06	SS-029
B-WMD3	N910196-03			0.16	0.150			83		678			77	11/11/99	01/06	SS-032
B-WMD4	N910196-04			0.18	0.150			80		678			77	11/11/99	01/06	SS-033
B-WMD5	N910196-05			0.18	0.150			85		678			77	11/11/99	01/06	SS-034
B-WMD6	N910196-06			0.23	0.150			67		678			77	11/11/99	01/06	SS-035
B-WMD7	N910196-07			0.23	0.250			58		678			77	11/11/99	01/06	SS-036
B-WMD8	N910196-08			0.21	0.250			68		678			77	11/11/99	01/06	SS-038
MBK (QC II-1742)	N910196-10			0.26	0.150			62		679				01/06/00	01/06	SS-040
LCS (QC II-1741)	N910196-09			0.27	0.250			55		679				01/06/00	01/06	SS-039
Duplicate (N910196-06) (QC II-1743)	N910196-11			0.17	0.250			71		677			78	11/11/99	01/07	SS-033
Nominal values and limits from method				1.0	0.250			20-105		200			180			

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form LVD-CMS

Version 3.06

Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

METHOD SUMMARY, cont.

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test TH Matrix SOLID
[illegible]
Contact [illegible]

Client Hanford
Contract [illegible]
Case no [illegible]

PROCEDURES	REFERENCE	TITLE
	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
	EP-901	Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD FOR 11 SAMPLES

MEA [illegible] ± [illegible]
YIELD 73 ± 16

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

Test U Matrix [illegible]
SDG [illegible]
Contract [illegible]

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract [illegible]
Case no SDG H0590

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 075											
[illegible]WMD3	N910196-03			7257-003	0.[illegible]85 J	0.[illegible]40 J	0.[illegible]64 J	104	15	7	[illegible]
BLK (QC ID [illegible])	N910061-16			7231-016	U	U	U				
LCS (QC ID=[illegible])	N910061-15			7231-015	ok	ok	ok				
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200 Area Soure Chara. - 200-CW 1 OU								Averages 104		7	

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 075 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 075																
[illegible]WMD3	N910196-03			0.018	1.00			91		1004			80	01/08/00	01/09	SS-041
BLK (QC ID=[illegible])	N910061-16			0.024	1.00			76		1005				01/08/00	01/09	SS-[illegible]
LCS (QC ID=[illegible])	N910061-15			0.12	1.00			73		1005				01/08/00	01/09	SS-[illegible]
Nominal values and limits from method				1.0	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPDATE
	FP-660	Soil Preparation, rev 0
	FP-670	Soil Dissolution, rev 0
	FP-910	Uranium Purification, rev 0
	FP-808	Heavy Elements Electroplating, rev 0

AVERAGES + 2 SD FOR 3 SAMPLES
MDA 0.[illegible]4 ± 0.11
YIELD 80 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form LVD-CMS
Version 3.06
Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

Test [illegible] Matrix [illegible]
[illegible]
Contact [illegible]

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford
Contract [illegible]
Case no [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6904-172					
B0WMD1	N910196-01			7257-001	12100
B0WMD2	N910196-02			7257-002	9950
B0WMD3	N910196-03			7257-003	1580
B0WMD4	N910196-04			7257-004	996
B0WMD5	N910196-05			7257-005	364
B0WMD6	N910196-06			7257-006	4.03
B0WMD7	N910196-07			7257-007	4.82
B0WMD8	N910196-08			7257-008	0.656 J
BLK (QC ID=32742)	N910196-10			7257-010	U
LCS (QC ID=32741)	N910196-09			7257-009	ok
Duplicate (N910196-06)	N910196-11			7257-011	ok

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

200 Area Soure 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 6904-172 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 172																
B0WMD1	N910196-01			2.8	1.00			89		3			61	12/20/99	12/21	GRB-220
B0WMD2	N910196-02			6.7	1.00			88		400			69	12/22/99	12/29	GRB-223
B0WMD3	N910196-03			3.4	1.00			90		400			61	12/20/99	12/21	GRB-224
B0WMD4	N910196-04			4.6	1.00			87		400			61	12/20/99	12/21	GRB-228
B0WMD5	N910196-05			0.10	1.00			85		400			61	12/20/99	12/21	GRB-231
B0WMD6	N910196-06			0.090	1.00			88		400			61	12/20/99	12/21	GRB-220
B0WMD7	N910196-07			0.13	1.00			89		400			61	12/20/99	12/21	GRB-202
B0WMD8	N910196-08			0.13	1.00			86		400			61	12/20/99	12/21	GRB-203
BLK (QC ID=32742)	N910196-10			0.12	1.00			72		400				12/20/99	12/21	GRB-208
LCS (QC ID=32741)	N910196-09			0.12	1.00			74		400				12/20/99	12/21	GRB-204
Duplicate (N910196-06) (QC ID=32743)	N910196-11			0.13	1.00			84		200			70	12/22/99	12/30	GRB-202
Nominal values and limits from method				1.0	1.00					100			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD CMS
Version 3.06
Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP EC590

METHOD SUMMARY, cont.

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Test SR Matrix SOLID
[illegible]
Contact [illegible]

Client Hanford
Contract [illegible]
Use [illegible]

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

AVERAGES + 2 SD	MDA	1.7	±	4.7
FOR 11 SAMPLES	YIELD	85	±	12

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form LVL CMS
Version 3.06
Report date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0190

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Test SC Matrix SOLID
SDG 7157
Project Multiple C. Mixed S.

Client Hanford
Contract DOE-EM-[illegible]
Work Order [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	FLANCHET	Technetium 99	
Preparation Batch 6904-172						
B-WM06	N910196-06			7157-006	U	
B-WM07	N910196-07			7157-007	U	
B-WM08	N910196-08			7157-008	U	
BLK (QC ID-32742)	N910196-10			7157-010	U	
LCS (QC ID-32741)	N910196-09			7157-009	ok	
Duplicate (N910196-06)	N910196-11			7157-011	-	U

Nominal values and limits from method RDLs (pCi/g) 15
200 Area Soure 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	DAYS RELEASED	ANAL-YZED	DETECTOR
Preparation Batch 6904-172 2σ prep error 10.0 % Reference Lab Notebook C904 pg. 172																
B-WM06	N910196-06			0.42	1.04			56		101			48	11/19/99	11/18	GBP 119
B-WM07	N910196-07			0.63	1.04			52		101			48	11/19/99	11/18	GBP 120
B-WM08	N910196-08			0.93	1.01			67		101			67	11/21/99	11/27	GBP 121
BLK (QC ID-32742)	N910196-10			0.32	1.02			47		101				12/20/99	12/18	GBP 132
LCS (QC ID-32741)	N910196-09			0.56	1.02			59		101				12/20/99	12/27	GBP 122
Duplicate (N910196-06) (QC ID-32743)	N910196-11			0.49	1.04			67		101			67	11/21/99	11/27	GBP 124
Nominal values and limits from method				15	1.02			20-105		50			180			

PROCEDURES REFERENCE TCP99PISC
IP-760 Soil Preparation, rev 0
IP-610 Sample Leach For Technetium-99, rev 0
IP-540 Technetium 99 Purification, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.59 ± 0.26
YIELD 58 ± 16

Lab Id TMANC
Protocol Hanford
Version Ver 1.0
Form LVP CMS
Version 3.06
Report Date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP RG90

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix [illegible]
SDG [illegible]
Project Multiple C.P.[illegible]

Client Bechtel
Contract [illegible]
Case No [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	FILAMENT	Cobalt 60	Cesium 137
Preparation batch 6904 172						
B-WM01	N910196-01			7217-001	U	721
B-WM02	N910196-02			7217-002	U	746
B-WM03	N910196-03			7217-003	U	13.4
B-WM04	N910196-04			7217-004	U	103
B-WM05	N910196-05			7217-005	U	20.4
B-WM06	N910196-06			7217-006	U	0.157
B-WM07	N910196-07			7217-007	U	0.072
B-WM08	N910196-08			7217-008	U	0.101 J
BLK (QC ID=12742)	N910196-10			7217-010	U	U
LCS (QC ID=12741)	N910196-09			7217-009	ok	ok
Duplicate (N910196-10)	N910196-11			7217-011	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.10

100 Area Soure Chara. - 200 CW 1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MEA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	LIF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	DATE ANALYZED	ANAL-YZED	DETECTOR
Preparation batch 6904 172 2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 172																
B-WM01	N910196-01			0.15 ± 47						193			68	11/02/99	11/18	MP,17,
B-WM02	N910196-02			0.17 ± 37						190			53	11/02/99	11/13	MP,15,
B-WM03	N910196-03			0.14 ± 87						118			53	11/02/99	11/13	12,11,[illegible]
B-WM04	N910196-04			0.14 ± 42						119			53	11/02/99	11/13	11,[illegible],07
B-WM05	N910196-05			0.177 ± 24						129			53	11/02/99	11/13	MP,11,[illegible]
B-WM06	N910196-06			0.002 ± 97						130			53	11/02/99	11/13	MP,09,[illegible]
B-WM07	N910196-07			0.017 ± 02						103			53	11/02/99	11/13	12,04,[illegible]
B-WM08	N910196-08			0.158 ± 82						136			53	11/02/99	11/13	MP,07,[illegible]
BLK (QC ID=12742)	N910196-10			0.042 ± 71						135				11/02/99	11/13	MP,11,
LCS (QC ID=12741)	N910196-09			0.009 ± 71						135				11/02/99	11/13	01,13,
Duplicate (N910196-10) (QC ID=12743)	N910196-11			0.12 ± 97						134			53	11/02/99	11/13	12,11,[illegible]
Nominal values and limits from method				0.050 ± 71						100			180			

Lab Id TMANC
Protocol Hanford
Version Ver 1.0
Form LVL-GMS
Version 3.96
Report date 11/22/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

METHOD SUMMARY, cont.

GAMMA SCAN

GAMMA SPECTROSCOPY

Test	[illegible]
[illegible]	[illegible]
Contact	[illegible]

Client	Hanford
Contract	[illegible]
Case no	[illegible]

PROCEDURES	REFERENCE	GAMMAHI
	[illegible]	Soil Preparation, rev 0
	[illegible]	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD	MDA	[illegible]	± [illegible]
FOR 11 SAMPLES	YIELD		±

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	LVD CMS
Version	3.06
Report date	01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP [illegible]

METHOD SUMMARY

URANIUM, TOTAL IN SOIL

KINETIC PHOSPHORIMETRY

Test [illegible] Matrix SOIL

[illegible] 1.17

Analyst Melissa C. Martin

Client Fernald

Project [illegible]

Date [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation Batch 6904 172					
FWM1	N9[illegible]196-01			7157-001	1.33
FWM2	N9[illegible]196-02			7157-002	0.560 J
FWM3	N9[illegible]196-03			7157-003	2.38
FWM4	N9[illegible]196-04			7157-004	0.692 J
FWM5	N9[illegible]196-05			7157-005	0.597 J
FWM6	N9[illegible]196-06			7157-006	0.594 J
FWM7	N9[illegible]196-07			7157-007	[illegible] J
FWM8	N9[illegible]196-08			7157-008	0.[illegible]6 J
BLK (QC II-[illegible])	N9[illegible]196-14			7157-014	U
LCS (QC II-[illegible])	N9[illegible]196-13			7157-013	ok
Duplicate (N9[illegible] (1))	N9[illegible]196-15			7157-015	ok
Nominal values and limits from method				MDLs (ug/g)	1.0

210 Area Score Chara. - 200 CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MEA ug/g	ALIQ g	DILU FAC	DILUTION	YIELD %	EFF %	COUNT min	PWHM keV	LKPT keV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation Batch 6904 172 2σ prep error 9.0 % Reference Lab Notebook 6904 pg. 172																
FWM1	N9[illegible]196-01			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
FWM2	N9[illegible]196-02			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
FWM3	N9[illegible]196-03			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
FWM4	N9[illegible]196-04			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
FWM5	N9[illegible]196-05			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
FWM6	N9[illegible]196-06			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
FWM7	N9[illegible]196-07			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
FWM8	N9[illegible]196-08			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
BLK (QC II-[illegible])	N9[illegible]196-14			0.005	0.0500									11/[illegible]/99	11/17	FIA-101
LCS (QC II-[illegible])	N9[illegible]196-13			0.050	0.0500									11/[illegible]/99	11/17	FIA-101
Duplicate (N9[illegible] (1)) (QC II-[illegible])	N9[illegible]196-15			0.005	0.0500								27	11/[illegible]/99	11/17	FIA-101
Nominal values and limits from method				1.0	0.0500								180			

Lab Id TMANC

Protocol Fernald

Version Vol 1.0

Form IVD-TMS

Version 1.06

Report date 11/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

METHOD SUMMARY, cont.

URANIUM, TOTAL IN SOIL

KINETIC PHOSPHORIMETRY

Test U.T. Matrix [illegible]	
[illegible]	
Contact [illegible]	

Client	Hanford
Contract	[illegible]
Case no	[illegible]

PROCEDURES	REFERENCE	UFPA
	[illegible]	Soil Preparation, rev 0
	[illegible]	Soil Dissolution, rev 0
	[illegible]	Preparation of Total Uranium by Kinetic Phosphorimetry, rev 1
	[illegible]	Total Uranium by Kinetic Phosphorimetry, rev 0

AVERAGES + 2 SD	MDA	[illegible] ± [illegible]
FOR 11 SAMPLES	YIELD	±

METHOD SUMMARIES
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Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	LVD-CMS
Version	3.06
Report date	01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP [illegible]

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Test [illegible] Matrix [illegible]
SDG [illegible]
Contract [illegible]

Client [illegible]
Contract [illegible]
Date of [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6504-172						
[illegible]WM06	N9[illegible]06			[illegible]06	U	
[illegible]WM07	N9[illegible]07			[illegible]07	U	
[illegible]WM08	N9[illegible]08			[illegible]08	U	
[illegible] (LC [illegible])	N9[illegible]10			[illegible]10	U	
[illegible] (LC [illegible])	N9[illegible]09			[illegible]09	ok	J
Duplicate (N9[illegible])	N9[illegible]11			[illegible]11	-	U
Spike (N9[illegible])	N9[illegible]12			[illegible]12	ok	J

Nominal values and limits from method RPDs (pCi/g) 400
200 Area Score Chart. - 200 CW 1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	DEP FAC	DILU TION	YIELD %	EFF %	COUNT min	BKGM keV	SHIFT keV	DAYS HELD	DAYS RELEASED	ANAL-YZED	DETECTOR
Preparation batch 6504-172 In prep error 10.0 % Reference Lab Notebook 6504 pg. 172																
[illegible]WM06	N9[illegible]06			0.[illegible]	[illegible].8			[illegible]		[illegible]			99	[illegible]	[illegible]	[illegible]
[illegible]WM07	N9[illegible]07			[illegible]	[illegible].2			[illegible]		[illegible]			99	[illegible]	[illegible]	[illegible]
[illegible]WM08	N9[illegible]08			0.10	[illegible].3			[illegible]		[illegible]			99	[illegible]	[illegible]	[illegible]
[illegible] (LC [illegible])	N9[illegible]10			0.20	[illegible].5			[illegible]		[illegible]				[illegible]	[illegible]	[illegible]
[illegible] (LC [illegible])	N9[illegible]09			0.20	[illegible].5			[illegible]		[illegible]				[illegible]	[illegible]	[illegible]
Duplicate (N9[illegible]) (LC [illegible])	N9[illegible]11			0.10	[illegible].4			[illegible]		[illegible]			99	[illegible]	[illegible]	[illegible]
Spike (N9[illegible]) (LC [illegible])	N9[illegible]12			0.10	[illegible].5			[illegible]		[illegible]			99	[illegible]	[illegible]	[illegible]
Nominal values and limits from method				400	20.5					25			180			

PROCEDURES REFERENCE
RA906.0
PP-160 Soil Preparation, rev 0
TI 131 Tritium in Solid Samples by Azeotropic Distillation, rev 0

AVERAGES + 2 SD MDA [illegible] + [illegible]
FOR 7 SAMPLES YIELD [illegible] + [illegible]

Lab id [illegible]
Protocol [illegible]
Version [illegible]
Form [illegible]
Version [illegible]
Report date [illegible]

TMA/RICHMOND

SAMPLE DELIVERY GROUP [illegible]

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client [illegible]
Contract [illegible]
Date [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation Batch 6904-172						
B-WM06	N9[illegible]-06			[illegible]-06	U	
B-WM07	N9[illegible]-07			[illegible]-07	U	
B-WM08	N9[illegible]-08			[illegible]-08	U	
BLK (QC ID=[illegible])	N9[illegible]-10			[illegible]-010	U	
LCS (QC ID=[illegible])	N9[illegible]-09			[illegible]-009	ok	
Duplicate (N9[illegible])	N9[illegible]-11			[illegible]-011	-	U
Spike (N9[illegible])	N9[illegible]-16			[illegible]-016	ok	
Spike (N9[illegible])	N9[illegible]-17			[illegible]-017	ok	
Nominal values and limits from method				RDL (pCi/g)	30	
100 Area Soil Chara.	100 CW 1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	TIME-TION	YIELD %	LFE %	COUNT min	IWEM keV	IEFT keV	DAYS HELD	DATE/TIME	ANAL-YZED	INSTRUMENT
Preparation Batch 6904-172 2σ prep error 30.0 % Reference Lab Notebook 6904 pg. 172																
B-WM06	N9[illegible]-06			2.3	0.100			100		100			70	12/18/99	12/30	LSC-004
B-WM07	N9[illegible]-07			2.2	0.100			100		100			70	12/18/99	12/30	LSC-004
B-WM08	N9[illegible]-08			2.3	0.100			100		100			70	12/18/99	12/30	LSC-004
BLK (QC ID=[illegible])	N9[illegible]-10			2.2	0.100			100		100				12/18/99	12/30	LSC-004
LCS (QC ID=[illegible])	N9[illegible]-09			2.3	0.100			100		100				12/18/99	12/30	LSC-004
Duplicate (N9[illegible]) (QC ID=[illegible])	N9[illegible]-11			2.2	0.100			100		100			70	12/18/99	12/30	LSC-004
Spike (N9[illegible]) (QC ID=[illegible])	N9[illegible]-16			2.3	0.100			100		100			70	12/18/99	12/30	LSC-004
Spike (N9[illegible]) (QC ID=[illegible])	N9[illegible]-17			2.3	0.100			100		100			70	12/18/99	12/30	LSC-004
Nominal values and limits from method				30	0.100					10			180			

Lab Id TMANC
Protocol Hanford
Version Ver 1.0
Form INT-/MS
Version 3.06
Report Date 01/12/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0590

METHOD SUMMARY, cont.

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test	NI-I Matrix SOLID
[illegible]	[illegible]
Subset	[illegible]

Client	Hanford
Contract	[illegible]
Case no.	[illegible] H0590

PROCEDURES	REFERENCE	NI-LSC
	PP 160	Soil Preparation, rev 0
	PP 431	Nickel-63 Purification, rev 0

AVERAGES + 2 SD	MDA	2.3 + 0.10
FOR 8 SAMPLES	YIELD	100 + 0

METHOD SUMMARIES

Page 17

SUMMARY DATA SECTION

Page 45

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/[illegible]/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.: ERC 96040	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: TMA/RECRA 8 KB 10-21-99	Offsite Property No.: A00 0 004	Bill of Lading/Air Bill No.: 42357953 0988	
		COA: B20CW1671C	

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.			

CPM	Sample No.	Matrix *	Sample Date	Sample Time										
00kV	BOWMD1	Soil	10-21-99	1012	X						X	BOW9T9		8 10-21-99
82kV	BOWMD2	soil	10-21-99	1017	X						X	BOW9~~WO~~T9		
14kV	BOWMD3	soil	10-21-99	1047	X						X	BOW9WO		
7kV	BOWMD4	soil	10-21-99	1102	X						X	BOW9WO		
1800	~~BOWMD5~~	~~soil~~	~~10-21-99~~	~~1118~~	~~X~~						~~X~~	~~BOWMD9~~		

RT 10.22.99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C — Date/Time: 10-22-99 0800	Received By: Rikki Thoren — Date/Time: R Thoren 10-22-99 0800		
Relinquished By: Rikki Thoren — Date/Time: R Thoren 10-22-99/1430	Received By: FED EX — Date/Time: 10-22-99		
Relinquished By: Fed Ex — Date/Time: 10-22-99 12:00	Received By: [signature] J R Cross — Date/Time: 9:00 10-25-99		

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

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.: SML 357	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: TMA/RECRA RTB 10-21-99	Offsite Property No.: A000004	Bill of Lading/Air Bill No.: 42357953 0977	
		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.			

CPM	Sample No.	Matrix *	Sample Date	Sample Time									
50k	BOWMD1	Soil	10-21-99	1012	X						X	BOW9T9	
82k	BOWMD2	Soil	10-21-99	1017	X						X	BOW9WO T9	
14k	BOWMD3	Soil	10-21-99	1047	X						X	BOW9WO	
7k	BOWMD4	Soil	10-21-99	1102	X						X	BOW9WO	
1800	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9	

RT 10-22-99

RT 10-22-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C — Date/Time: 10-22-99/0800	Received By: RThoren/Rikki Thoren — Date/Time: 10-22-99 0800		
Relinquished By: RThoren/Rikki Thoren — Date/Time: 10-22-99 1430	Received By: FED EX — Date/Time: 10/22/99		
Relinquished By: FedEx — Date/Time: 10/23/99 12:00	Received By: TNU M. Goldenberg — Date/Time: 10/25/99 9:00		

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

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-145	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. SML 357	Field Logbook No. EL-1511	Method of Shipment FED EX	
Shipped To TMA/~~RECRA~~ DJB 10-21-99	Offsite Property No. A00 0004	Bill of Lading/Air Bill No. 42357953 0977	
		COA B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage	Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS		Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	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.

cpm	Sample No.	Matrix *	Sample Date	Sample Time										
595	BOWMD6	Soil	10-21-99	1130	X	X	X	X						X
179	BOWMD7	Soil	10-21-99	1140	X	X	X	X						X
160	BOWMD8	Soil	10-21-99	1150	X	X	X	X						X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers	Date/Time 10-21-99/1400	Received By Ref 3C	Date/Time 10-21-99/1400
Relinquished By Ref 3C	Date/Time 10-22-99/0800	Received By Rthoren/Rikki Thoren	Date/Time 10-22-99 0800
Relinquished By Rikki Thoren Rthoren	Date/Time 10-22-99/1430	Received By FED EX	Date/Time 10/22/99
Relinquished By FedEx	Date/Time 10/23/99 12:00	Received By TNU McGoldenberg	Date/Time 10/25/99 9:00

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

use BOW8C1 as T.A. to ship

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 Inc Date/Time received 10-~~25~~ 23-99 ~~9:30~~ 12:00

CoC No. B99-078-144, 145

Container I.D. No. _____ Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [ ]
6. Number of samples in shipping container: 4
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 M. Goldenberg Date: 10-25-99 Time: 9:00

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

Form SCP-01.2, 11-06-98 "50 years of quality nuclear services"

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 10-23-99 12:4

CoC No. B99-078-141

Container I.D. No. ERC 96-140 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 4
7. Number of containers per sample: 2 (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: 10-25-99 Time: 9:00

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

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9910L501
SDG# : H0590
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 10-23-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 8 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 temperatures were 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.

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\110-501

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 22 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 353.2

Other: Ammonia **Method** EPA 350.3

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

L-WI-034/B-06/99

Recra LabNet Philadelphia
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.

Fecra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD E99-078 FECRA LOT #: 99101501

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	EOWMD1	% Solids	92.2		%	0.01	1.0
		Chloride by IC	5.4		MG/KG	1.4	1.0
		Fluoride by IC	2.7	u	MG/KG	2.7	1.0
		Nitrite by IC	1.4	u	MG/KG	1.4	1.0
		Nitrate by IC	170		MG/KG	6.8	5.0
		Cyanide, Total	0.54	u	MG/KG	0.54	1.0
		Phosphate by IC	2.2		MG/KG	1.4	1.0
		Chromium VI	0.43	u	MG/KG	0.43	1.0
		Sulfate by IC	88.1		MG/KG	6.8	5.0
		Nitrate Nitrite	37.5		MG/KG	2.1	10.0
		Ammonia, as N	1.5		MG/KG	1.3	1.0
		pH	8.0		SOIL PH	0.01	1.0
		Sulfide	4.2		MG/KG	2.2	1.0
-002	EOWMD2	% Solids	92.6		%	0.01	1.0
		Chloride by IC	5.8		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	180		MG/KG	6.7	5.0
		Cyanide, Total	0.54	u	MG/KG	0.54	1.0
		Phosphate by IC	2.1		MG/KG	1.3	1.0
		Chromium VI	0.43	u	MG/KG	0.43	1.0
		Sulfate by IC	107		MG/KG	6.7	5.0
		Nitrate Nitrite	35.8		MG/KG	2.1	10.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.0		SOIL PH	0.01	1.0
		Sulfide	4.2		MG/KG	2.2	1.0
-003	EOWMD3	% Solids	92.0		%	0.01	1.0
		Chloride by IC	3.5		MG/KG	1.4	1.0
		Fluoride by IC	2.7	u	MG/KG	2.7	1.0
		Nitrite by IC	1.4	u	MG/KG	1.4	1.0
		Nitrate by IC	140		MG/KG	6.8	5.0
		Cyanide, Total	0.54	u	MG/KG	0.54	1.0
		Phosphate by IC	2.7		MG/KG	1.4	1.0
		Chromium VI	0.65	u	MG/KG	0.65	1.0
		Sulfate by IC	84.7		MG/KG	6.8	5.0
		Nitrate Nitrite	22.0		MG/KG	2.2	10.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.1		SOIL PH	0.01	1.0

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INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD E99-078 RECRA LOT #: 99101601

WORK ORDER: 10585-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	BCWMD3	Sulfide	4.2		MG/KG	2.2	1.0
-004	BCWMD4	% Solids	89.5		%	0.01	1.0
		Chloride by IC	8.3		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	330		MG/KG	28	20
		Cyanide, Total	0.56	u	MG/KG	0.56	1.0
		Phosphate by IC	1.4	u	MG/KG	1.4	1.0
		Chromium VI	0.45	u	MG/KG	0.45	1.0
		Sulfate by IC	678		MG/KG	27.9	20.0
		Nitrate Nitrite	70.7		MG/KG	5.5	25.0
		Ammonia, as N	2.1		MG/KG	1.4	1.0
		pH	7.5		SOIL PH	0.01	1.0
		Sulfide	4.2		MG/KG	2.2	1.0
-005	BCWMD5	% Solids	54.6		%	0.01	1.0
		Chloride by IC	3.0		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	85		MG/KG	6.6	5.0
		Cyanide, Total	0.53	u	MG/KG	0.53	1.0
		Phosphate by IC	1.9		MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	105		MG/KG	6.6	5.0
		Nitrate Nitrite	20.9		MG/KG	2.0	10.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.8		SOIL PH	0.01	1.0
		Sulfide	2.1	u	MG/KG	2.1	1.0
-006	BCWMD6	% Solids	91.9		%	0.01	1.0
		Chloride by IC	3.1		MG/KG	1.4	1.0
		Fluoride by IC	2.7	u	MG/KG	2.7	1.0
		Nitrite by IC	1.4	u	MG/KG	1.4	1.0
		Nitrate by IC	39		MG/KG	1.4	1.0
		Cyanide, Total	0.54	u	MG/KG	0.54	1.0
		Phosphate by IC	1.8		MG/KG	1.4	1.0
		Chromium VI	0.44	u	MG/KG	0.44	1.0
		Sulfate by IC	9.5		MG/KG	1.4	1.0
		Nitrate Nitrite	8.6		MG/KG	0.21	1.0

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INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD E99-078 PECRA LOT #: 99101501

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	ECWMD6	Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.5		SOIL PH	0.01	1.0
		Sulfide	2.2	u	MG/KG	2.2	1.0
-007	ECWMD7	% Solids	96.2		%	0.01	1.0
		Chloride by IC	2.6		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	8.8		MG/KG	1.3	1.0
		Cyanide, Total	0.52	u	MG/KG	0.52	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	4.8		MG/KG	1.3	1.0
		Nitrate Nitrite	2.0		MG/KG	0.20	1.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.7		SOIL PH	0.01	1.0
		Sulfide	2.1	u	MG/KG	2.1	1.0
-008	ECWMD8	% Solids	95.9		%	0.01	1.0
		Chloride by IC	2.4		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	1.6		MG/KG	1.3	1.0
		Cyanide, Total	0.52	u	MG/KG	0.52	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	2.8		MG/KG	1.3	1.0
		Nitrate Nitrite	0.31		MG/KG	0.21	1.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.6		SOIL PH	0.01	1.0
		Sulfide	3.9		MG/KG	2.1	1.0

Fecra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/06/99

CLIENT: TNU-HANFORD E99-078 FECRA LOT #: 9910L501

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	99LV1080-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
BLANK10	99LSD063-MB1	Sulfide	2.0	u	MG/KG	2.0	1.0

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INORGANICS ACCURACY REPORT 12/06/99

CLIENT: TNU-HANFORD E99-078 FECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	ECWMD1	Nitrate Nitrite	43.6	37.5	5.4	113.5*	10.0
		Ammonia, as N	64.2	1.5	64.5	97.1	1.0
-002	ECWMD2	Cyanide, Total	5.7	0.54u	5.4	104.8	1.0
-007	ECWMD7	Chloride by IC	27.1	2.6	26.0	94.4	1.0
		Fluoride by IC	54.6	0.0	52.0	105.0	1.0
		Nitrite by IC	25	1.3 u	26	97.6	1.0
		Nitrate by IC	34	8.8	26	98.9	1.0
		Phosphate by IC	27.4	1.3 u	26.0	105.5	1.0
		Sulfate by IC	30.9	4.8	26.0	100.4	1.0
-008	ECWMD8	Soluble Chromium VI	4.3	0.42u	4.2	104.0	1.0
		Insoluble Chromium VI	1220	0.42u	1180	103.9	100
		Sulfide	322	3.9	363	87.6	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	99LVIC080-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.9	1.0
		Insoluble Chromium VI	1170	0.40u	1160	100.3	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 ACCURACY REPORT 12/06/99

CLIENT: DOE-HANFORD E99-078 PECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
BLANK10	99LSD063-MB1	Sulfide	9.5	2.0 u	10.0	95.0	1.0

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INORGANICS DUPLICATE SPIKE REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 99101501

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 11/06/99

CLIENT: TNU-HANFORD ES9-078 PECRA LOT #: 99101501

WORK ORDER: 10985-C01-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	ECWMD1	% Solids	92.2	91.7	0.62	1.0
		Nitrate Nitrite	37.5	33.5	11.3	10.0
		Ammonia, as N	1.5	1.3 u	NC	1.0
		pH	8.0	8.0	0.1	1.0
-002REP	ECWMD2	Cyanide, Total	0.54u	0.54u	NC	1.0
-007REP	ECWMD7	Chloride by IC	2.6	2.1	19.5	1.0
		Fluoride by IC	2.6 u	2.6 u	NC	1.0
		Nitrite by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	8.8	8.5	3.4	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Sulfate by IC	4.8	4.8	1.2	1.0
-008REP	ECWMD8	Chromium VI	0.42u	0.42u	NC	1.0
		Sulfide	3.9	2.1 u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/06/99

CLIENT: INU-HANFORD E99-078 RECRA LOT #: 99101E01

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

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWMD1						
% SOLIDS	001	S	99LSS142	10/21/99	10/26/99	10/27/99
% SOLIDS	001 REP	S	99LSS142	10/21/99	10/26/99	10/27/99
CHLORIDE BY IC	001	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	001	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	001	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	001	S	99LIC098	10/21/99	11/17/99	11/17/99
TOTAL CYANIDE	001	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	001	S	99LIC097	10/21/99	11/16/99	11/16/99
CHROMIUM VI	001	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	001	S	99LIC098	10/21/99	11/17/99	11/17/99
NITRATE NITRITE	001	S	99LN3054	10/21/99	11/09/99	11/11/99
NITRATE NITRITE	001 REP	S	99LN3054	10/21/99	11/09/99	11/11/99
NITRATE NITRITE	001 MS	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	001	S	99LAM043	10/21/99	11/08/99	11/08/99
AMMONIA	001 REP	S	99LAM043	10/21/99	11/08/99	11/08/99
AMMONIA	001 MS	S	99LAM043	10/21/99	11/08/99	11/08/99
PH	001	S	99LPH116	10/21/99	10/27/99	10/27/99
PH	001 REP	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	001	S	99LSD062	10/21/99	10/26/99	10/26/99
BOWMD2						
% SOLIDS	002	S	99LSS142	10/21/99	10/26/99	10/27/99
CHLORIDE BY IC	002	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	002	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	002	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	002	S	99LIC098	10/21/99	11/17/99	11/17/99
TOTAL CYANIDE	002	S	99LC122	10/21/99	11/01/99	11/01/99
TOTAL CYANIDE	002 REP	S	99LC122	10/21/99	11/01/99	11/01/99
TOTAL CYANIDE	002 MS	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	002	S	99LIC097	10/21/99	11/16/99	11/16/99
CHROMIUM VI	002	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	002	S	99LIC098	10/21/99	11/17/99	11/17/99
NITRATE NITRITE	002	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	002	S	99LAM043	10/21/99	11/08/99	11/08/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD E99-078

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PH	002	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	002	S	99LSD062	10/21/99	10/26/99	10/26/99
BOWMD3						
% SOLIDS	003	S	99LSS142	10/21/99	10/26/99	10/27/99
CHLORIDE BY IC	003	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	003	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	003	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	003	S	99LIC098	10/21/99	11/17/99	11/17/99
TOTAL CYANIDE	003	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	003	S	99LIC097	10/21/99	11/16/99	11/16/99
CHROMIUM VI	003	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	003	S	99LIC098	10/21/99	11/17/99	11/17/99
NITRATE NITRITE	003	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	003	S	99LAM043	10/21/99	11/08/99	11/08/99
PH	003	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	003	S	99LSD063	10/21/99	10/27/99	10/27/99
BOWMD4						
% SOLIDS	004	S	99LSS142	10/21/99	10/26/99	10/27/99
CHLORIDE BY IC	004	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	004	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	004	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	004	S	99LIC098	10/21/99	11/17/99	11/17/99
TOTAL CYANIDE	004	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	004	S	99LIC097	10/21/99	11/16/99	11/16/99
CHROMIUM VI	004	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	004	S	99LIC098	10/21/99	11/17/99	11/17/99
NITRATE NITRITE	004	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	004	S	99LAM043	10/21/99	11/08/99	11/08/99
PH	004	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	004	S	99LSD063	10/21/99	10/27/99	10/27/99
BOWMD5						
% SOLIDS	005	S	99LSS142	10/21/99	10/26/99	10/27/99

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	005	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	005	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	005	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	005	S	99LIC098	10/21/99	11/17/99	11/17/99
TOTAL CYANIDE	005	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	005	S	99LIC097	10/21/99	11/16/99	11/16/99
CHROMIUM VI	005	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	005	S	99LIC098	10/21/99	11/17/99	11/17/99
NITRATE NITRITE	005	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	005	S	99LAM043	10/21/99	11/08/99	11/08/99
PH	005	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	005	S	99LSD063	10/21/99	10/27/99	10/27/99
BOWMD6						
% SOLIDS	006	S	99LSS142	10/21/99	10/26/99	10/27/99
CHLORIDE BY IC	006	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	006	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	006	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	006	S	99LIC097	10/21/99	11/16/99	11/16/99
TOTAL CYANIDE	006	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	006	S	99LIC097	10/21/99	11/16/99	11/16/99
CHROMIUM VI	006	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	006	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE NITRITE	006	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	006	S	99LAM043	10/21/99	11/08/99	11/08/99
PH	006	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	006	S	99LSD063	10/21/99	10/27/99	10/27/99
BOWMD7						
% SOLIDS	007	S	99LSS142	10/21/99	10/26/99	10/27/99
CHLORIDE BY IC	007	S	99LIC097	10/21/99	11/16/99	11/16/99
CHLORIDE BY IC	007 REP	S	99LIC097	10/21/99	11/16/99	11/16/99
CHLORIDE BY IC	007 MS	S	99LIC098	10/21/99	11/17/99	11/17/99
FLUORIDE BY IC	007	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	007 REP	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	007 MS	S	99LIC098	10/21/99	11/17/99	11/17/99

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRITE BY IC	007	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	007 REP	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	007 MS	S	99LIC098	10/21/99	11/17/99	11/17/99
NITRATE BY IC	007	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	007 REP	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	007 MS	S	99LIC098	10/21/99	11/17/99	11/17/99
TOTAL CYANIDE	007	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	007	S	99LIC097	10/21/99	11/16/99	11/16/99
PHOSPHATE BY IC	007 REP	S	99LIC097	10/21/99	11/16/99	11/16/99
PHOSPHATE BY IC	007 MS	S	99LIC098	10/21/99	11/17/99	11/17/99
CHROMIUM VI	007	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	007	S	99LIC097	10/21/99	11/16/99	11/16/99
SULFATE BY IC	007 REP	S	99LIC097	10/21/99	11/16/99	11/16/99
SULFATE BY IC	007 MS	S	99LIC098	10/21/99	11/17/99	11/17/99
NITRATE NITRITE	007	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	007	S	99LAM043	10/21/99	11/08/99	11/08/99
PH	007	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	007	S	99LSD063	10/21/99	10/27/99	10/27/99
BOWMD8						
% SOLIDS	008	S	99LSS142	10/21/99	10/26/99	10/27/99
CHLORIDE BY IC	008	S	99LIC097	10/21/99	11/16/99	11/16/99
FLUORIDE BY IC	008	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRITE BY IC	008	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE BY IC	008	S	99LIC097	10/21/99	11/16/99	11/16/99
TOTAL CYANIDE	008	S	99LC122	10/21/99	11/01/99	11/01/99
PHOSPHATE BY IC	008	S	99LIC097	10/21/99	11/16/99	11/16/99
CHROMIUM VI	008	S	99LVI080	10/21/99	11/05/99	11/05/99
CHROMIUM VI	008 REP	S	99LVI080	10/21/99	11/05/99	11/05/99
CHROMIUM VI	008 MS	S	99LVI080	10/21/99	11/05/99	11/05/99
CHROMIUM VI	008 MSD	S	99LVI080	10/21/99	11/05/99	11/05/99
SULFATE BY IC	008	S	99LIC097	10/21/99	11/16/99	11/16/99
NITRATE NITRITE	008	S	99LN3054	10/21/99	11/09/99	11/11/99
AMMONIA	008	S	99LAM043	10/21/99	11/08/99	11/08/99
PH	008	S	99LPH116	10/21/99	10/27/99	10/27/99
SULFIDE	008	S	99LSD063	10/21/99	10/27/99	10/27/99
SULFIDE	008 REP	S	99LSD063	10/21/99	10/27/99	10/27/99

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	008 MS	S	99LSD063	10/21/99	10/27/99	10/27/99

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
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
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
CHROMIUM VI	MB1	S	99LVI080	N/A	11/05/99	11/05/99
CHROMIUM VI	MB1 BS	S	99LVI080	N/A	11/05/99	11/05/99
CHROMIUM VI	MB1 BSD	S	99LVI080	N/A	11/05/99	11/05/99
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
SULFIDE	MB1	S	99LSD063	N/A	10/27/99	10/27/99
SULFIDE	MB1 BS	S	99LSD063	N/A	10/27/99	10/27/99
SULFATE BY IC	MB1	S	99LIC097	N/A	11/16/99	11/16/99
SULFATE BY IC	MB1 BS	S	99LIC097	N/A	11/16/99	11/16/99

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	MB1	S	99LIC098	N/A	11/17/99	11/17/99
CHLORIDE BY IC	MB1 BS	S	99LIC098	N/A	11/17/99	11/17/99
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
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

RECRA LabNet Use Only: 9910L501

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) perrone wet lab

RECRA LabNet

019

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 days

Date Rec'd: 10/23/99 Date Due: 11/22/99

Account #:

Refrigerator #		1	2
#/Type Container	Liquid		
	Solid	1AG 1AG	1AG 1AG 1AG
Volume	Liquid		
	Solid	250 500	500 1LT 250
Preservatives		— —	— — —

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; TC, Rad/Gas; PH

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	VOA 24H	BNA CC/SC	PESTH CDRD	CPCB	SPECD	ICAN12	INN2N2	INHEN	ICCL	ICFC	ICSO4	ICNO2	ICNO3	ICPO4	ICPG	ISFD	IPH
001	BOWMD1			S	10-21-99	1012	1	1	✓		1	✓	1	✓	✓	✓	✓	1					
002	2					1017	1	1	✓		1	✓	1	✓	✓	✓	✓	1					
003	3					1047	1	1	✓		1	✓	1	✓	✓	✓	✓	1					
004	4					1102	1	1	✓		1	✓	1	✓	✓	✓	✓	1					
005	5					1118	1	1	✓		1	✓	1	✓	✓	✓	✓	1					
006	6					1130	1	1	✓		1	✓	1	✓	✓	✓	✓	1					
007	7					1140	1	1	✓		1	✓	1	✓	✓	✓	✓	1					
008	8					1150	1	1	✓		1	✓	1	✓	✓	✓	✓	1					

Special Instructions:

Saf# B99-078

met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg.

COMPOSITE WASTE

DATE/REVISIONS:

005 1. Samples Rec'd on Original COC They
2. were crossed off. Rec'd COC for
3. ID BOWMD5 for Isotopic
4. uranium but not the sample.
5. Run Matrix QC
10/27/99 6. CN added to COC until review

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill Fed Ex Label; 2) Ambient or Chilled; 3) Received in Good Condition ✓ or N; 4) Labels indicate Properly Preserved ✓ 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 ✓ or N

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 8146 1372 4170 PH, NO2, NO3 and PO4 Rec'd at

*Cooler Temp. 3.1 °C

Relinquished by	Received by	Date	Time
Fed Ex	V. Hemd	102399	1000

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

423579530966

*2.9°C

MPS 8125 9553 5317

*3.4°C

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 99 012 / ERC99 023	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: ~~IMA~~/RECRA DZB 10-21-99	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: B20CW1671C	

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										
00k	BOWMD1	Soil	10-21-99	1012		X	X	X	X	X		BOW9T9		
82k	BOWMD2	Soil	10-21-99	1017		X	X	X	X	X		BOW9T9		
14k	BOWMD3	Soil	10-21-99	1047		X	X	X	X	X		BOW9W0		
7k	BOWMD4	Soil	10-21-99	1102		X	X	X	X	X		BOW9W0		
1800	~~BOWMD5~~	~~Soil~~	~~10-21-99~~	~~1118~~	RF	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		~~BOWMD9~~	Rec'd samples	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C - 10-22-99 0800	Received By: R Fahlberg / R Fahlberg — Date/Time: 10-22-99 0800		
Relinquished By: R Fahlberg / R Fahlberg — Date/Time: 10-22-99 1330	Received By: Fed Ex — Date/Time:		
Relinquished By: Fed Ex — Date/Time: 10/23/99 1000	Received By: [signature] — Date/Time: 10-23-99 1000		

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

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-145	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 96.025	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA RTO 10-21-99	Offsite Property No.: A00 0005	Bill of Lading/Air Bill No.: 42357953 0966	
		COA: B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage	Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS		Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	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.

pm	Sample No.	Matrix *	Sample Date	Sample Time										
95	Bow M D6	Soil	10-21-99	1130					X	X	X	X	X	
179	Bow M D7	Soil	10-21-99	1170					X	X	X	X	X	
160	Bow M D8	Soil	10-21-99	1150					X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Bowers Bowers — Date/Time: Bowers 10-21-99/1403	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C — Date/Time: 10-22-99/0800	Received By: R. Thoren/Rikki Thoren — Date/Time: 10-22-99/0800		
Relinquished By: Rikki Thoren — Date/Time: 10-22-99 R Thoren 1430	Received By: FED EX — Date/Time:		
Relinquished By: Fed Ex — Date/Time: 10-23-99 1000	Received By: [illegible] — Date/Time: 10-23-99 1000		

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

use BOW 8C1 as T.A. to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
		9910L501	

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

021

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 96-025	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: TMA/RECRA 8 TB 10-21-99	Offsite Property No.: A000005	Bill of Lading/Air Bill No.: 42357953 0966	
		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			

CPM	Sample No.	Matrix *	Sample Date	Sample Time									
60K	BOWMD1	Soil	10-21-99	1012	X						X	BOWYT9	
82K	BOWMD2	Soil	10-21-99	1017	X						X	BOWGWO T9	
14K	BOWMD3	Soil	10-21-99	1047	X						X	BOWGWO	
7K	BOWMD4	Soil	10-21-99	1102	X						X	BOWGWO	
1800	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9	

RT 10-22-99

RT 10-22-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C — Date/Time: 10-22-99/0800	Received By: Rikki Thorer — Date/Time: R. Thorer 10-22-99/0800		
Relinquished By: Rikki Thorer — Date/Time: R. Thorer 10-22-99/1430	Received By: FED EX — Date/Time:		
Relinquished By: FedEx — Date/Time: 10-23-99 1000	Received By: [signature] Conty Co — Date/Time: 10-23-99 1000		

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# : 9910L501
SDG/SAF# : H0590 B99-078

W.O.# : 10985-001-001-9999-00
Date Received: 10-23-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 8 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) with the exception of the CCV following the last three samples for Cadmium (112.6%), Nickel (110.9%) and Lead (110.8%). All Cadmium results are non-detect so there is no significant bias to the results. The Nickel and Lead recoveries are just slightly outside the control limits so there should be no significant impact to the data.

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) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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 22 pages.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
BOWMD1	Antimony	500	104.4
	Lead	500	112.3
	Silver	500	102.2
	Zinc	500	106.2

12. The duplicate analyses for 7 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

11-22-99
Date

mld/m10-501

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 99101L501

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 11/18/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	ECWMD1	Silver, Total	8.4	MG/KG	0.08	1.0
		Arsenic, Total	3.2	MG/KG	0.28	1.0
		Barium, Total	108	MG/KG	0.02	1.0
		Beryllium, Total	0.31	MG/KG	0.03	1.0
		Cadmium, Total	0.47	MG/KG	0.04	1.0
		Chromium, Total	11.9	MG/KG	0.07	1.0
		Copper, Total	18.5	MG/KG	0.05	1.0
		Mercury, Total	0.98	MG/KG	0.02	1.0
		Nickel, Total	9.3	MG/KG	0.11	1.0
		Lead, Total	139	MG/KG	0.22	1.0
		Antimony, Total	0.72	MG/KG	0.22	1.0
		Selenium, Total	0.43 u	MG/KG	0.43	1.0
		Thallium, Total	0.45 u	MG/KG	0.45	1.0
		Vanadium, Total	52.0	MG/KG	0.06	1.0
		Zinc, Total	127	MG/KG	0.05	1.0
-002	ECWMD2	Silver, Total	7.6	MG/KG	0.09	1.0
		Arsenic, Total	3.0	MG/KG	0.29	1.0
		Barium, Total	79.0	MG/KG	0.02	1.0
		Beryllium, Total	0.30	MG/KG	0.03	1.0
		Cadmium, Total	0.26	MG/KG	0.04	1.0
		Chromium, Total	13.7	MG/KG	0.07	1.0
		Copper, Total	16.2	MG/KG	0.05	1.0
		Mercury, Total	0.53	MG/KG	0.02	1.0
		Nickel, Total	11.3	MG/KG	0.11	1.0
		Lead, Total	163	MG/KG	0.22	1.0
		Antimony, Total	0.22 u	MG/KG	0.22	1.0
		Selenium, Total	0.44 u	MG/KG	0.44	1.0
		Thallium, Total	0.74	MG/KG	0.46	1.0
		Vanadium, Total	55.9	MG/KG	0.06	1.0
		Zinc, Total	123	MG/KG	0.05	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/18/99

CLIENT: TNU-HANFORD E99-078 RECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	POWMD3	Silver, Total	0.13	MG/KG	0.08	1.0
		Arsenic, Total	5.5	MG/KG	0.26	1.0
		Barium, Total	67.6	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	12.1	MG/KG	0.07	1.0
		Copper, Total	13.9	MG/KG	0.05	1.0
		Mercury, Total	0.08	MG/KG	0.01	1.0
		Nickel, Total	44.8	MG/KG	0.1	1.0
		Lead, Total	14.4	MG/KG	0.20	1.0
		Antimony, Total	0.20 u	MG/KG	0.20	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Thallium, Total	0.68	MG/KG	0.41	1.0
		Vanadium, Total	67.4	MG/KG	0.06	1.0
		Zinc, Total	57.2	MG/KG	0.05	1.0
-004	POWMD4	Silver, Total	0.27	MG/KG	0.09	1.0
		Arsenic, Total	4.7	MG/KG	0.29	1.0
		Barium, Total	84.2	MG/KG	0.02	1.0
		Beryllium, Total	0.31	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.6	MG/KG	0.08	1.0
		Copper, Total	16.7	MG/KG	0.05	1.0
		Mercury, Total	0.27	MG/KG	0.02	1.0
		Nickel, Total	9.7	MG/KG	0.11	1.0
		Lead, Total	22.2	MG/KG	0.23	1.0
		Antimony, Total	0.30	MG/KG	0.23	1.0
		Selenium, Total	0.44 u	MG/KG	0.44	1.0
		Thallium, Total	0.59	MG/KG	0.47	1.0
		Vanadium, Total	58.7	MG/KG	0.07	1.0
		Zinc, Total	71.2	MG/KG	0.05	1.0

Pecra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/18/99

CLIENT: TNU-HANFORD E99-078 PECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	PCWMD5	Silver, Total	0.18	MG/KG	0.07	1.0
		Arsenic, Total	2.7	MG/KG	0.25	1.0
		Barium, Total	61.5	MG/KG	0.02	1.0
		Beryllium, Total	0.26	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	6.6	MG/KG	0.06	1.0
		Copper, Total	12.8	MG/KG	0.05	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Nickel, Total	6.9	MG/KG	0.09	1.0
		Lead, Total	14.9	MG/KG	0.19	1.0
		Antimony, Total	0.19 u	MG/KG	0.19	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Thallium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	54.5	MG/KG	0.05	1.0
		Zinc, Total	47.7	MG/KG	0.05	1.0
-006	PCWMD6	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.0	MG/KG	0.29	1.0
		Barium, Total	101	MG/KG	0.02	1.0
		Beryllium, Total	0.40	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	6.3	MG/KG	0.07	1.0
		Copper, Total	15.2	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	8.7	MG/KG	0.11	1.0
		Lead, Total	3.7	MG/KG	0.22	1.0
		Antimony, Total	0.22 u	MG/KG	0.22	1.0
		Selenium, Total	0.43 u	MG/KG	0.43	1.0
		Thallium, Total	0.71	MG/KG	0.45	1.0
		Vanadium, Total	89.5	MG/KG	0.06	1.0
		Zinc, Total	54.7	MG/KG	0.05	1.0

Pecra Lab Net - Lionville

INORGANICS DATA SUMMARY REPORT 11/18/99

CLIENT: TNU-HANFORD E99-078 PECRA LOT #: 991CL501

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	ECWMD7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.2	MG/KG	0.22	1.0
		Barium, Total	130	MG/KG	0.02	1.0
		Beryllium, Total	0.24	MG/KG	0.02	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	5.5	MG/KG	0.06	1.0
		Copper, Total	10.6	MG/KG	0.04	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	8.2	MG/KG	0.08	1.0
		Lead, Total	3.0	MG/KG	0.17	1.0
		Antimony, Total	0.17 u	MG/KG	0.17	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0
		Thallium, Total	0.53	MG/KG	0.35	1.0
		Vanadium, Total	58.2	MG/KG	0.05	1.0
		Zinc, Total	39.0	MG/KG	0.04	1.0
-008	ECWMD8	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.8	MG/KG	0.27	1.0
		Barium, Total	70.3	MG/KG	0.02	1.0
		Beryllium, Total	0.28	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	7.5	MG/KG	0.07	1.0
		Copper, Total	10.4	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	8.2	MG/KG	0.10	1.0
		Lead, Total	3.4	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	0.75	MG/KG	0.44	1.0
		Vanadium, Total	67.3	MG/KG	0.06	1.0
		Zinc, Total	44.5	MG/KG	0.05	1.0

Pecra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/18/99

CLIENT: TNU-HANFORD E99-078 PECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0763-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	0.24	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	0.13	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	99C0310-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Pecra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/18/99

CLIENT: TNU-HANFORD E99-078 PECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	POWMD1	Silver, Total	10.2	8.4	5.3	34.0	1.0
		Arsenic, Total	200	3.2	211	93.7	1.0
		Barium, Total	180	108	211	81.8	1.0
		Beryllium, Total	4.9	0.31	5.3	86.6	1.0
		Cadmium, Total	5.1	0.47	5.3	87.3	1.0
		Chromium, Total	32.0	11.9	21.1	95.3	1.0
		Copper, Total	41.2	18.5	26.3	86.3	1.0
		Mercury, Total	0.76	0.98	0.18	-120. *	1.0
		Nickel, Total	59.8	9.3	52.7	95.8	1.0
		Lead, Total	141	139	52.7	4.7	1.0
		Antimony, Total	21.0	0.72	52.7	38.5	1.0
		Selenium, Total	194	0.43u	211	92.3	1.0
		Thallium, Total	189	0.45u	211	89.9	1.0
		Vanadium, Total	109	52.0	52.7	108.5	1.0
		Zinc, Total	145	127	52.7	34.0	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/18/99

CLIENT: TNU-HANFORD F99-078 RECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
·001REP	BCWMD1	Silver, Total	8.4	5.9	35.0	1.0
		Arsenic, Total	3.2	2.5	24.6	1.0
		Barium, Total	108	79.4	30.2	1.0
		Beryllium, Total	0.31	0.30	2.7	1.0
		Cadmium, Total	0.47	0.26	59.7	1.0
		Chromium, Total	11.9	13.4	11.9	1.0
		Copper, Total	18.5	15.5	17.6	1.0
		Mercury, Total	0.98	1.0	4.6	1.0
		Nickel, Total	9.3	10.5	12.1	1.0
		Lead, Total	139	89.3	43.4	1.0
		Antimony, Total	0.72	0.22u	~~NC~~ 200	1.0
		Selenium, Total	0.43u	0.43u	NC	1.0
		Thallium, Total	0.45u	0.45u	NC	1.0
		Vanadium, Total	52.0	55.6	6.7	1.0
		Zinc, Total	127	98.6	25.4	1.0

Corrections
AD 11/15/99

Pecra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/16/99

CLIENT: TNC-HANFORD E99-078 PECRA LOT #: 9910L501

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	9910762-LC1	Silver, LCS	48.4	50.0	MG/KG	96.8
		Arsenic, LCS	951	1000	MG/KG	95.1
		Barium, LCS	491	500	MG/KG	98.1
		Beryllium, LCS	22.1	25.0	MG/KG	88.4
		Cadmium, LCS	24.1	25.0	MG/KG	96.4
		Chromium, LCS	49.4	50.0	MG/KG	98.8
		Copper, LCS	123	125	MG/KG	98.2
		Nickel, LCS	195	200	MG/KG	97.4
		Lead, LCS	240	250	MG/KG	96.1
		Antimony, LCS	290	300	MG/KG	96.6
		Selenium, LCS	930	1000	MG/KG	93.0
		Thallium, LCS	940	1000	MG/KG	94.0
		Vanadium, LCS	255	250	MG/KG	101.8
		Zinc, LCS	94.6	100	MG/KG	94.6
LCS1	9900320-LC1	Mercury, LCS	1.1	1.0	MG/KG	106.7

Berra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
INU-HANFORD B99-078

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWMD1						
SILVER, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
SILVER, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
SILVER, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
MERCURY, TOTAL	001	S	99C0320	10/21/99	11/01/99	11/03/99
MERCURY, TOTAL	001 REP	S	99C0320	10/21/99	11/01/99	11/03/99
MERCURY, TOTAL	001 MS	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
NICKEL, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
NICKEL, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	001	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	001 REP	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	001 MS	S	99L0763	10/21/99	11/09/99	11/09/99
BOWMD2						
SILVER, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
MERCURY, TOTAL	002	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	002	S	99L0763	10/21/99	11/09/99	11/09/99
BOWMD3						
SILVER, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD E99-078

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	003	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	003	S	99L0763	10/21/99	11/09/99	11/09/99
BOWMD4						
SILVER, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
MERCURY, TOTAL	004	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	004	S	99L0763	10/21/99	11/09/99	11/09/99
BOWMD5						
SILVER, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
MERCURY, TOTAL	005	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99

Pecra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD E99-078

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	005	S	99L0763	10/21/99	11/09/99	11/09/99
BOWMD6						
SILVER, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
MERCURY, TOTAL	006	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	006	S	99L0763	10/21/99	11/09/99	11/09/99
BOWMD7						
SILVER, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
MERCURY, TOTAL	007	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	007	S	99L0763	10/21/99	11/09/99	11/09/99
BOWMD8						
SILVER, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
ARSENIC, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
BARIUM, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
CADMIUM, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
CHROMIUM, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
COPPER, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
MERCURY, TOTAL	008	S	99C0320	10/21/99	11/01/99	11/03/99
NICKEL, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
LEAD, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
ANTIMONY, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
SELENIUM, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
THALLIUM, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
VANADIUM, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99
ZINC, TOTAL	008	S	99L0763	10/21/99	11/09/99	11/09/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
SILVER, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
ARSENIC LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
ARSENIC, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
BARIUM LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
BARIUM, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
BERYLLIUM LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
BERYLLIUM, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
CADMIUM LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
CADMIUM, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
CHROMIUM LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
CHROMIUM, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
COPPER LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD E99-078

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COPPER, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
MERCURY LABORATORY	LC1 BS	S	99C0320	N/A	11/01/99	11/03/99
MERCURY, TOTAL	MB1	S	99C0320	N/A	11/01/99	11/03/99
NICKEL LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
NICKEL, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
LEAD LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
LEAD, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
ANTIMONY LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
ANTIMONY, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
SELENIUM LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
SELENIUM, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
THALLIUM LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
THALLIUM, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
VANADIUM LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
VANADIUM, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99
ZINC LABORATORY	LC1 BS	S	99L0763	N/A	11/09/99	11/09/99
ZINC, TOTAL	MB1	S	99L0763	N/A	11/09/99	11/09/99

RECRA LabNet Use Only

9910L501

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(3) ~~perform wet lab~~ metals

Client: TNU-HANFORD B99-078

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OT

QC: Spec Del: std TAT: 30 days

Date Rec'd: 10/23/99 Date Due: 11/22/99

Account #:

Refrigerator #: 2

#/Type Container											
Liquid											
Solid	1AG	1AG						1AG	1AG		1AG
Volume											
Liquid											
Solid	250	500						500	1LT		250
Preservatives	—	—						—	—		—

ANALYSES REQUESTED →

ORGANIC				INORG			
VOA	BNA	Pest/PCB	Herb	15 Metal	CN	TC Pb/Cd	pH

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8270 SH	8260 SH	8270 SH	8260	Metal	ICNTD	NH3N2	NH3N	TOC	TOC	ICP02	ICP03	ICP04	ICP6	15Metals	pH
001	BOWMD 1			S	10-21-99	1012	1	1		✓	1	✓	1	✓	✓	✓	✓	1				
002	2					1017	1	1		✓	1	✓	1	✓	✓	✓	✓	1				
003	3					1047	1	1		✓	1	✓	1	✓	✓	✓	✓	1				
004	4					1102	1	1		✓	1	✓	1	✓	✓	✓	✓	1				
005	5					1118	1	1		✓	1	✓	1	✓	✓	✓	✓	1				
006	6					1130	1	1		✓	1	✓	1	✓	✓	✓	✓	1				
007	7					1140	1	1		✓	1	✓	1	✓	✓	✓	✓	1				
008	8					1150	1	1		✓	1	✓	1	✓	✓	✓	✓	1				

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

Special Instructions:

Saf# B99-078
met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg.

COMPOSITE WASTE

DATE/REVISIONS:

005 1. Samples Rec'd on Original COC Thus
2. were crossed off. Recd COC for
3. ID BOWMD5 for Isotopic
4. uranium but not the sample.
5. Run Matrix QC
10/27/99 6. CN acidied to COC unit reviewed

RECRA LabNet Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___
Airbill ~~Fed Ex~~ Bulard
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. 31 °C

Relinquished by	Received by	Date	Time
Fed Ex	V. Henry	10-23-99	1000

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 8146 1372 4170

423579530966

2.9

MPS 8125 9553 5317

3.4

2)

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 99 012 / ERC99023	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA~~/RECRA SB 10-21-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B20CW1671C

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								
100k	BOWMD1	Soil	10-21-99	1012		X	X	X	X	X		BOW979
82k	BOWMD2	Soil	10-21-99	1017		X	X	X	X	X		BOW979
14k	BOWMD3	Soil	10-21-99	1047		X	X	X	X	X		BOW980
7k	BOWMD4	Soil	10-21-99	1102		X	X	X	X	X		BOW980
1800	BOWMD5	Soil	10-21-99	1118	RF	X	X	X	X	X		BOW979 Rec sample

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	10-21-99/1400	Ref 3C	10-21-99/1400
Ref 3C	10-22-99 0800	[signature]	10-22-99 0800
[signature]	1330	Fed Ex	
Fed Ex	10/23/99 1000	[signature]	10-23-99 1000

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

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-145	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 96.025	Field Logbook No. EL-1511	Method of Shipment FED EX	
Shipped To TMA/RECRA DTD 10-21-99	Offsite Property No. A00 0005	Bill of Lading/Air Bill No. 42357953 0966	
		COA B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage	Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS		Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	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.

pm	Sample No.	Matrix *	Sample Date	Sample Time										
195	BOWM D6	Soil	10-21-99	1130					X	X	X	X	X	
179	BOWM D7	Soil	10-21-99	1140					X	X	X	X	X	
160	BOWM D8	Soil	10-21-99	1150					X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers	Date/Time 10-21-99/1400	Received By Ref 3C	Date/Time 10-21-99/1400
Relinquished By Ref 3C	Date/Time 10-22-99/0800	Received By R. Thoren/Rikki Thoren	Date/Time 10-22-99/0800
Relinquished By R. Thoren / Rikki Thoren	Date/Time 10-22-99 1430	Received By FED EX	Date/Time
Relinquished By Fed Ex	Date/Time 10-23-99 1000	Received By [illegible]	Date/Time 10-23-99 1000

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

use BOW8C1 as TA to ship

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
		9910L501	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

21

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 96-025	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: TMA/RECRA RTB 10-21-99	Offsite Property No.: A000005	Bill of Lading/Air Bill No.: 42357953 0966	
		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.			

CPM	Sample No.	Matrix *	Sample Date	Sample Time									
00k	BOWMD1	Soil	10-21-99	1012	X						X	BOW9T9	
82k	BOWMD2	Soil	10-21-99	1017	X						X	BOW9WO T9	
14k	BOWMD3	Soil	10-21-99	1047	X						X	BOW9WO	
7k	BOWMD4	Soil	10-21-99	1102	X						X	BOW9WO	
1800	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9	

RT 10-22-99

RT 10-22-99

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers (Doug Bowers)	10-21-99/1400	Ref 3C	10-21-99/1400
Ref 3C	10-22-99/0800	Rikki Thorer (R. Thorer)	10-22-99/0800
Rikki Thorer (R. Thorer)	10-22-99/1430	FED EX	
FedEx	10-23-99 1000	[signature] only COC	10-23-99 1000

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 : TNC-HANFORD B99-078
RFW# : 9910L501
SDG/SAF#: H0590/B99-078

W.O #: 10985-001-001-9999-00
Date Received: 10-23-99

DIESEL RANGE ORGANICS

The set of samples consisted of eight (8) soil samples collected on 10-21-99.

The sample and its associated QC samples were prepared on 10-28-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-11,12-99. 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 obtainable surrogate recoveries were within acceptance criteria.

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. Sample BOWMD4 required a ten-fold instrument dilution due to the presence of high levels of target analytes.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-22-99
Date

R:\SHARE\LC\GCSCAN\10501d.doc

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

01

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 [illegible] Report Date: 11/18/99 08:53

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: 10985-001-001-9999-00 Page: 1

	Cust ID:	BOWMD1	BOWMD1	BOWMD1	BOWMD2	BOWMD3	BOWMD4
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	10.0
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate:	p-Terphenyl	65 %	62 %	50 %	66 %	80 %	D %
		fl	fl	fl	fl	fl	fl
Diesel Range Organics		6.5	101 %	92 %	4.3 U	4.4 U	45 U
Motor Oil		78	130	85	131	47 U	1100

	Cust ID:	BOWMD5	BOWMD6	BOWMD7	BOWMD8	BLK	BLK BS
Sample Information	RFW#:	005	006	007	008	99LE1311-MB1	99LE1311-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	77 %	87 %	77 %	80 %	93 %	94 %
		fl	fl	fl	fl	fl	fl
Diesel Range Organics		4.2 U	4.4 U	4.2 U	4.2 U	4.0 U	93 %
Motor Oil		39 J	47 U	45 U	45 U	42 U	42 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.

[illegible] 11/18/99

Pecora LabNet - Lionville Laboratory
PRO ANALYTICAL DATA PACKAGE FOR
TNU HANFORD B99-078

DATE RECEIVED: 10/23/99 RPW LOT # :9910L501

CLIENT ID	RPW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PCWMD1	001	S	99LE1311	10/21/99	10/28/99	11/11/99
PCWMD1	001 MS	S	99LE1311	10/21/99	10/28/99	11/11/99
PCWMD1	001 MSD	S	99LE1311	10/21/99	10/28/99	11/12/99
PCWMD2	002	S	99LE1311	10/21/99	10/28/99	11/12/99
PCWMD3	003	S	99LE1311	10/21/99	10/28/99	11/12/99
PCWMD4	004	S	99LE1311	10/21/99	10/28/99	11/12/99
PCWMD5	005	S	99LE1311	10/21/99	10/28/99	11/12/99
PCWMD6	006	S	99LE1311	10/21/99	10/28/99	11/12/99
PCWMD7	007	S	99LE1311	10/21/99	10/28/99	11/12/99
PCWMD8	008	S	99LE1311	10/21/99	10/28/99	11/12/99

LAB QC:

BLK	MB1	S	99LE1311	N/A	10/28/99	11/11/99
BLK	MB1 BS	S	99LE1311	N/A	10/28/99	11/11/99

11/18/99

RECRA LabNet Use Only: 9910L501

Custody Transfer Record/Lab Work Request

Page 1 of 1

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) ~~percent wet lab~~ 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: 10/23/99 Date Due: 11/22/99

Account #:

Retrigerator #: 1 2

#/Type Container — Solid: 1AG 1AG ... 1AG 1AG ... 1AG

Volume — Solid: 250 500 ... 500 1LT ... 250

Preservatives: — — — — —

ANALYSES REQUESTED: ORGANIC (VOA, BNA, Pest/PCB, Herb); INORG (Metal, CN, IC Anions); pH

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	GC24H GC15C GC25H CDRO	GPCB	MET1	IC NT2	IN3N2	INH3N ICCL	ICFL	ICSO4	ICNO2 ICNO3 ICPO4	ICPL 1SFD	IPH
001	BOWMD1			S	10-21-99	1012	1 1	✓	1	✓	1	✓	✓	✓		✓	1
002	2					1017	1 1	✓	1	✓	1	✓	✓	✓		✓	1
003	3					1047	1 1	✓	1	✓	1	✓	✓	✓		✓	1
004	4					1102	1 1	✓	1	✓	1	✓	✓	✓		✓	1
005	5					1118	1 1	✓	1	✓	1	✓	✓	✓		✓	1
006	6					1130	1 1	✓	1	✓	1	✓	✓	✓		✓	1
007	7					1140	1 1	✓	1	✓	1	✓	✓	✓		✓	1
008	8					1150	1 1	✓	1	✓	1	✓	✓	✓		✓	1

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

Special Instructions:
SAF # B99-078
Met 1 = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg.

COMPOSITE WASTE

DATE/REVISIONS:
005 1. Samples Rec'd on Original COC They
2. were crossed off. Rec'd COC for
3. ID BOWMD5 for Isotopic
4. uranium but not the sample.
5. Run Matrix QC
10/27/99 6. CN added to COC unit review

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill Fed Ex 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. 3.1 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	[signature]	10-23-99	1000		ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
8146 1372 4170

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 99 012 / ERC99023	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: ~~LMA~~/RECRA DJB 10-21-99	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: B20CW1671C	

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										
ok	BOWMD1	Soil	10-21-99	1012		X	X	X	X	X		BOW9T9		
2k	BOWMD2	Soil	10-21-99	1017		X	X	X	X	X		BOW9T9		
4h	BOWMD3	Soil	10-21-99	1047		X	X	X	X	X		BOW9WO		
7h	BOWMD4	Soil	10-21-99	1102		X	X	X	X	X		BOW9WO		
800	~~BOWMD5~~	~~Soil~~	~~10-21-99~~	~~1118~~	RF	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		~~BOWMD9~~	Rec'd samples	

10-22-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C - 10-22-99 0800	Received By: RFahlberg — Date/Time: RFahlberg 10-22-99 0800		
Relinquished By: RFahlberg — Date/Time: RFahlberg 10-22-99 1330	Received By: Fed Ex — Date/Time:		
Relinquished By: Fed Ex — Date/Time: 10/23/99 1000	Received By: [signature] — Date/Time: 10-23-99 1000		

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-145	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 96.025	Field Logbook No. EL-1511	Method of Shipment FED EX	
Shipped To ~~TMA~~/RECRA 270 10-21-99	Offsite Property No. A00 0005	Bill of Lading/Air Bill No. 42357953 0966	
		COA B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage	Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS		Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	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										
BOWM D6	Soil	10-21-99	1130					X	X	X	X	X	
BOWM D7	Soil	10-21-99	1140					X	X	X	X	X	
BOWM D8	Soil	10-21-99	1150					X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Bob Bowers Bob Bowers 10-21-99/1400	Received By Ref 3C 10-21-99/1400	Date/Time	
Relinquished By Ref 3C 10-22-99/0800	Received By R. Thoren/Rikki Thoren 10-22-99/0800	Date/Time	
Relinquished By Rikki Thoren 10-22-99 R Thoren 1430	Received By FED EX	Date/Time	
Relinquished By Fed Ex 10-23-99 1000	Received By [illegible] 10-23-99 1000	Date/Time	

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

use BOW 8C1 as T.A. to ship

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Time	Date/Time
		991CL501	

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

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 96-025	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: TMA/RECRA RTB 10-21-99	Offsite Property No.: A000005	Bill of Lading/Air Bill No.: 42357953 0966	
		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			

PM	Sample No.	Matrix *	Sample Date	Sample Time										
10K	BOWMD1	Soil	10-21-99	1012	X						X	BOW9T9		
12K	BOWMD2	Soil	10-21-99	1017	X						X	BOW9WO	T9	
14K	BOWMD3	Soil	10-21-99	1047	X						X	BOW9WO		
7K	BOWMD4	Soil	10-21-99	1102	X					RK	X	BOW9WO		
900	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9		

RT 10-20-99

RK 10-20-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished by: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received by: Rof 3C — Date/Time: 10-21-99/1400		
Relinquished by: Rof 3C — Date/Time: 10-22-99/0800	Received by: Rikki Thorer — Date/Time: R. Thorer 10-22-99/0800		
Relinquished by: Rikki Thorer — Date/Time: R. Thorer 10-22-99/1430	Received by: FEDEX — Date/Time:		
Relinquished by: FedEx — Date/Time: 10-23-99 1000	Received by: [signature] Conty Coc — Date/Time: 10-23-99 1000		

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 #: 9910L501
SDG/SAF#: H0590/B99-078

W.O. #: #: 10985-001-001-9999-00
Date Received: 10-23-99

GC SCAN

The set of samples consisted of eight (8) soil samples collected on 10-21-99.

The samples and their associated QC samples were prepared on 11-03-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 11-04-99.

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 within advisory control limits of 50%-150%.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-22-99
Date

r:\hare\c\gescan\10-501.doc

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

GLOSSARY OF 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 - Lionville Laboratory

GC SCAN

Report Date: 11/16/99 17:08

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: 10985-001-001-9999-00 Page: 1

03

	Cust ID:	BOWMD1	BOWMD1	BOWMD1	BOWMD2	BOWMD3	BOWMD4
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	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		5.0 U	93 %	1[illegible] %	5.0 U	5.5 U	5.0 U
Ethanol		5.0 U	5.0 U	5.0 U	5.0 U	5.5 U	5.0 U

	Cust ID:	BOWMD5	BOWMD6	BOWMD7	BOWMD8	BLK	BLK BS
Sample Information	RFW#:	005	006	007	008	99LLC168-MB1	99LLC168-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		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	131 %
Ethanol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	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.

11/16/99

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

DATE RECEIVED: 10/23/99 RFW LOT # :99101501

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BCWMD1	001	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD1	001 MS	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD1	001 MSD	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD2	002	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD3	003	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD4	004	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD5	005	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD6	006	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD7	007	S	99LLC168	10/21/99	11/03/99	11/04/99
BCWMD8	008	S	99LLC168	10/21/99	11/03/99	11/04/99

LAB QC:

BLK	MB1	S	99LLC168	N/A	11/03/99	11/04/99
BLK	MB1 BS	S	99LLC168	N/A	11/03/99	11/04/99

11/16/99

RECRA LabNet Use Only: 9910L501

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(3) ~~permanent wet lab~~ 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 days
Date Rec'd: 10/23/99 Date Due: 11/22/99
Account #:

Refrigerator #		1	2														
#/Type Container	Liquid																
	Solid	VAG	VAG							VAG	VAG						VAG
Volume	Liquid																
	Solid	250	500							500	1LT						250
Preservatives		—	—							—	—						—
ANALYSES REQUESTED	ORGANIC	VOA	BNA	Pest/PCB	Herb				INORG	Metal	CN	TC Rj/Ag					PH

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix OC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8240	8250	8270	8080	Metal	ICP/TD	INH3N2	INH3V	ICC	ICF-	IC504	IC002	IC003	ICP07	ICP6	ISE	IPH
001	BOWMD 1			S	10-21-99	1012	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			
002	2					1017	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			
003	3					1047	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			
004	4					1102	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			
005	5					1118	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			
006	6					1130	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			
007	7					1140	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			
008	8					1150	1	1	✓		1	✓	1	✓	✓	✓	✓	✓	✓	1			

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

Special Instructions:
Saf # B99-078
met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg.

COMPOSITE WASTE

DATE/REVISIONS:
005 1. Samples Rec'd on Original COC that were crossed off Rec'd COC for
2.
3. ID BOWMD5 for Isotopic
4. uranium but not the sample
5. Run Matrix QC
10/27/99 CN added to COC unit review

RECRA LabNet Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___
Airbill ~~Fed Ex~~ Bolted
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. 3L C

Relinquished by	Received by	Date	Time
Fed Ex	[illegible]	10-23-99	1000

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 8146 1372 4170

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
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: ERC 99 012 / ERC99023	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA~~/RECRA DAB 10-21-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA B20CW1 671C

Price Code: 8N

Data Turnaround: 45 Days

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										
0k	BOWMD1	Soil	10-21-99	1012		X	X	X	X	X		BOW9T9		
82k	BOWMD2	Soil	10-21-99	1017		X	X	X	X	X		BOW9T9		
14h	BOWMD3	Soil	10-21-99	1047		X	X	X	X	X		BOW9WO		
7h	BOWMD4	Soil	10-21-99	1102		X	X	X	X	X		BOW9WO		
1800	~~BOWMD5~~	~~Soil~~	~~10-21-99~~	~~1118~~	RF	X	X	X	X	X		~~BOW9T9~~	Rec'd Samples	

CHAIN OF POSSESSION

Sign/Print Names 10-22-99

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	10-21-99/1400	Ref 3C	10-21-99/1400
Ref 3C	10-22-99 0800	Rfahlberg	10-22-99 0800
Rfahlberg	10-22-99 1330	Fed Ex	
Fed Ex	10/23/99 1000	[illegible]	10-23-99 1000

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-145	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 96.025	Field Logbook No.: FL-1513		Method of Shipment: FED EX
Shipped To: TMA/RECRA B70 10-21-99	Offsite Property No.: A00 0005		Bill of Lading/Air Bill No.: 4235795 3 0966
			COA B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS												
			Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
			Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
			No. of Container(s)	1	1	1	1	1	1	1	1	1	1
			Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
				Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	VOA - 8260A (TCL), VOA - 8260A (Add-On) [i-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										
BOWMD6	Soil	10-21-99	1130					X	X	X	X	X	
BOWMD7	Soil	10-21-99	1140					X	X	X	X	X	
BOWMD8	Soil	10-21-99	1150					X	X	X	X	X	

PM 95 179 160

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By (Dave Bowers) Date/Time	Received By Date/Time	
Dave Bowers 10-21-99/1403	RCF 3C 10-21-99/1400	
Relinquished By Date/Time	Received By Date/Time	
RCF 3C 10-22-99/0800	R. Thoren/Rikki Thoren 10-22-99 0800	
Relinquished By Rikki Thoren Date/Time 10-22-99	Received By Date/Time	
R. Thoren 1430	FEDEX	
Relinquished By Date/Time	Received By Date/Time	
Fed Ex 10-23-99 1000	[illegible] 10-23-99 1000	

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

use Bowers as TA to ship

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
		99ICL501	

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

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
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: ERC 96-025	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: TMA/RECRA DB 10-21-99	Offsite Property No.: A000005		Bill of Lading/Air Bill No.: 42357953 0966
			COA: B20CW1 671C

Price Code: 8N

Data Turnaround: 45 Days

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			

CPM	Sample No.	Matrix *	Sample Date	Sample Time										
50k	BOWMD1	Soil	10-21-99	1012	X						X	BOW9T9		
82k	BOWMD2	Soil	10-21-99	1017	X						X	BOW9WO	T9	
14k	BOWMD3	Soil	10-21-99	1047	X						X	BOW9WO		
7k	BOWMD4	Soil	10-21-99	1102	X						X	BOW9WO		
1800	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9		

RT 10.22.99

RX 10.26.99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 10-21-99/1400	Received By: Ref 3C	Date/Time: 10-21-99/1400
Relinquished By: Ref 3C	Date/Time: 10.22.99/0800	Received By: RIKKI Thoren	Date/Time: 10.22.99/0800
Relinquished By: RIKKI Thoren	Date/Time: 10.22.99/1430	Received By: FEDEX	Date/Time:
Relinquished By: FedEx	Date/Time: 10.23.99 1000	Received By: Cody Coc	Date/Time: 10.23.99 1000

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 LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-078
RFW#: 9910L501
SDG/SAF#: H0590 B99-078

W.O.#: 10985-001-001-9999-00
Date Received: 10-23-99

PCB

The set of samples consisted of eight (8) soil samples collected on 10-21-99.

The samples and their associated QC samples were extracted on 10-26-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 11-18,19,20,22-99. 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 and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. Most samples required instrument dilutions due to high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Pw [signature] D Weber

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-30-99
Date

pcf:\group\data\pest 10L501.pcb

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

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

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

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

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

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

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for 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 8082 Report Date: 11/24/99 15:26

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: 1098500100 Page: 1

004

	Cust ID:	BOWMD1	BOWMD1	BOWMD1	BOWMD2	BOWMD3	BOWMD4
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	100	100	100	100	20.0	200
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		D %	D %	D %	D %	D %	D %
Decachlorobiphenyl		D %	D %	D %	D %	D %	D %
Aroclor-1016		3600 U	3600 U	3600 U	3600 U	720 U	7400 U
Aroclor-1221		7200 U	7200 U	7200 U	7200 U	1400 U	15000 U
Aroclor-1232		3600 U	3600 U	3600 U	3600 U	720 U	7400 U
Aroclor-1242		3600 U	3600 U	3600 U	3600 U	720 U	7400 U
Aroclor-1248		3600 U	3600 U	3600 U	3600 U	720 U	7400 U
Aroclor-1254		3600 U	D %	D %	3600 U	720 U	7400 U
Aroclor-1260		9100	9000	8600	7700	1300	33000

	Cust ID:	BOWMD5	BOWMD6	BOWMD7	BOWMD8	PBLKYH	PBLKYH BS
Sample Information	RFW#:	005	006	007	008	99LE1303-MB1	99LE1303-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	20.0	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		D %	92 %	92 %	102 %	92 %	95 %
Decachlorobiphenyl		D %	97 %	98 %	101 %	101 %	100 %
Aroclor-1016		700 U	36 U	34 U	35 U	33 U	33 U
Aroclor-1221		1400 U	72 U	68 U	69 U	67 U	67 U
Aroclor-1232		700 U	36 U	34 U	35 U	33 U	33 U
Aroclor-1242		700 U	36 U	34 U	35 U	33 U	33 U
Aroclor-1248		700 U	36 U	34 U	35 U	33 U	33 U
Aroclor-1254		700 U	36 U	34 U	35 U	33 U	82 %
Aroclor-1260		2100	36 U	34 U	35 U	33 U	33 U

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

11-26-99

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

DATE RECEIVED: 10/23/99 RFW LOT # :9910L501

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BCWMD1	001	S	99LE1303	10/21/99	10/26/99	11/19/99
BCWMD1	001 MS	S	99LE1303	10/21/99	10/26/99	11/19/99
BCWMD1	001 MSD	S	99LE1303	10/21/99	10/26/99	11/19/99
BCWMD2	002	S	99LE1303	10/21/99	10/26/99	11/19/99
BCWMD3	003	S	99LE1303	10/21/99	10/26/99	11/20/99
BCWMD4	004	S	99LE1303	10/21/99	10/26/99	11/22/99
BCWMD5	005	S	99LE1303	10/21/99	10/26/99	11/19/99
BCWMD6	006	S	99LE1303	10/21/99	10/26/99	11/22/99
BCWMD7	007	S	99LE1303	10/21/99	10/26/99	11/22/99
BCWMD8	008	S	99LE1303	10/21/99	10/26/99	11/22/99

LAB QC:

LPLKYH	MB1	S	99LE1303	N/A	10/26/99	11/18/99
LPLKYH	MB1 BS	S	99LE1303	N/A	10/26/99	11/18/99

11-26-99

RECRA LabNet Use Only

9910L501

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) ~~perform wet lab~~ 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 days

Date Rec'd: 10/23/99 Date Due: 11/22/99

Account #:

Refrigerator #		1	2																						
#/Type Container	Liquid																								
	Solid	1AG	1AG																		1AG		1AG		1AG
Volume	Liquid																								
	Solid	250	500																		500		1LT		250
Preservatives		—	—																		—		—		—
ANALYSES REQUESTED		ORGANIC																			INORG				
		VOA	BNA	Pest/PCB	Herb																Metal	CN	TC Pb/Cd		pH

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	PCB																
							VOA	BNA	CPCB																
001	BOWMD 1			S	10-21-99	1012	1	1	✓												1	✓	1	✓	✓
002	2					1017	1	1	✓												1	✓	1	✓	✓
003	3					1047	1	1	✓												1	✓	1	✓	✓
004	4					1102	1	1	✓												1	✓	1	✓	✓
005	5					1118	1	1	✓												1	✓	1	✓	✓
006	6					1130	1	1	✓												1	✓	1	✓	✓
007	7					1140	1	1	✓												1	✓	1	✓	✓
008	8					1150	1	1	✓												1	✓	1	✓	✓

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

Special Instructions:

Saf# B99-078
met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg.

COMPOSITE WASTE

DATE/REVISIONS:

005 1. Samples Rec'd on Original COC They were crossed off. Rec'd COC for
2. ID BOWMD5 for Isotopic
3. uranium but not the sample.
4. Run Matrix QC
5.
10/27/99 6. CN added to COC unit review

RECRA LabNet Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___
Airbill ~~Fed Ex~~ Bulkd
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 31 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 8146 1372 4170

Relinquished by	Received by	Date	Time
FedEx	[illegible]	10-23-99	1000

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.: CKC 99 012 / ERC99023	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA 0 28 10-21-99	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: B20CW1671C	

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									
ok	BOWMD1	Soil	10-21-99	1012		X	X	X	X	X		BOW99	
2k	BOWMD2	Soil	10-21-99	1017		X	X	X	X	X		BOW99	
4k	BOWMD3	Soil	10-21-99	1047		X	X	X	X	X		BOW900	
7k	BOWMD4	Soil	10-21-99	1102		X	X	X	X	X		BOW900	
800	~~BOWMD5~~	Soil	10-21-99	1118	REF	X	X	X	X	X		~~BOW909~~	Ref samples

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	10-21-99/1400
Received By: Ref 3C	Ref 3C	10-21-99/1400
Relinquished By: Ref 3C	Ref 3C	10-22-99 0800
Received By: R Fehlberg	R Fehlberg	10-22-99 0800
Relinquished By: R Fehlberg	R Fehlberg	10-22-99 1330
Received By: Fed Ex	Fed Ex	
Relinquished By: Fed Ex	Fed Ex	10/23/99 1000
Received By: [illegible]	[illegible]	10-23-99 1000

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-145	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 96.025	Field Logbook No. EL-15.1	Method of Shipment FED EX	
Shipped To ~~TMA~~/RECRA B70 10-21-99	Offsite Property No. A00 0005	Bill of Lading/Air Bill No. 42357953 0966	
		COA B20CW1 671C	

008

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
	Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS		Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	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 - WTPrt-D, PCBs - 8082	See item (2) in Special Instructions	See item (3) in Special Instructions

Sample No.	Matrix *	Sample Date	Sample Time										
BOWM D6	Soil	10-21-99	1130					X	X	X	X	X	
BOWM D7	Soil	10-21-99	1170					X	X	X	X	X	
BOWM D8	Soil	10-21-99	1150					X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers	Date/Time 10-21-99/1400	Received By Ref 3C	Date/Time 10-21-99/1400
Relinquished By Ref 3C	Date/Time 10-22-99/0800	Received By R. Thoren/Rikki Thoren	Date/Time 10-22-99/0800
Relinquished By Rikki Thoren R Thoren	Date/Time 10-22-99 1430	Received By FED EX	Date/Time
Relinquished By Fed Ex	Date/Time 10-23-99 1000	Received By [illegible]	Date/Time 10-23-99 1000

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

use BOW 8C1 as TA to ship

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Time	Date/Time
		991CL501	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

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 96-025	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: TMA/RECRA RTB 10-21-99	Offsite Property No.: A000005	Bill of Lading/Air Bill No.: 42357953 0966	
		COA: B20CW1 671C	

003

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			

PM	Sample No.	Matrix *	Sample Date	Sample Time									
0K	BOWMD1	Soil	10-21-99	1012	X						X	BOW9T9	
2K	BOWMD2	Soil	10-21-99	1017	X						X	BOW9WO	T9
4K	BOWMD3	Soil	10-21-99	1047	X						X	BOW9WO	
7K	BOWMD4	Soil	10-21-99	1102	X						X	BOW9WO	
900	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9	

RT 10-22-99

RT 10-22-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C — Date/Time: 10-22-99/0800	Received By: Rikki Thorer — Date/Time: R. Thorer 10-22-99/0800		
Relinquished By: Rikki Thorer — Date/Time: R. Thorer 10-22-99/1430	Received By: FED EX — Date/Time:		
Relinquished By: FED EX — Date/Time: 10-23-99 1000	Received By: [signature] Conty Coc — Date/Time: 10-23-99 1000		

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 # : 9910I 501
SDG/SAF #: H0590 B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 10-23-99

SEMIVOLATILE

Eight (8) soil samples were collected on 10-21-99.

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 11-03,04,05-99.

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 temperatures upon receipt have 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. Sample B0WMD4 required a 5-fold dilution due to high levels of both target and non-target compounds.

5. All surrogate recoveries were within EPA QC limits.

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

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

8. The sample was spectrally searched for Butylated Hydroxytoluene; however, it was not identified in the samples.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-15-99
Date

som/gorup/data/bna/mu10501.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 21 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.*

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Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 12/15/99 10:37

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1a

	Cust ID:	BOWMD1	BOWMD1	BOWMD1	BOWMD2	BOWMD3	BOWMD4
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	5.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	Nitrobenzene-d5	66 %	65 %	72 %	69 %	70 %	58 %
	2-Fluorobiphenyl	72 %	71 %	81 %	75 %	78 %	67 %
	Terphenyl-d14	75 %	77 %	88 %	79 %	78 %	71 %
	Phenol-d5	55 %	57 %	63 %	57 %	56 %	46 %
	2-Fluorophenol	59 %	60 %	66 %	61 %	62 %	53 %
	2,4,6-Tribromophenol	68 %	72 %	82 %	70 %	66 %	48 %
Phenol		360 U	56 %	61 %	360 U	360 U	1900 U
bis(2-Chloroethyl)ether		360 U	360 U	360 U	360 U	360 U	1900 U
2-Chlorophenol		360 U	64 %	69 %	360 U	360 U	1900 U
1,3-Dichlorobenzene		360 U	360 U	360 U	360 U	360 U	1900 U
1,4-Dichlorobenzene		360 U	63 %	67 %	360 U	360 U	1900 U
1,2-Dichlorobenzene		360 U	360 U	360 U	360 U	360 U	1900 U
2-Methylphenol		360 U	360 U	360 U	360 U	360 U	1900 U
2,2'-oxybis(1-Chloropropane)		360 U	360 U	360 U	360 U	360 U	1900 U
4-Methylphenol		360 U	360 U	360 U	360 U	360 U	1900 U
N-Nitroso-di-n-propylamine		360 U	70 %	74 %	360 U	360 U	1900 U
Hexachloroethane		360 U	360 U	360 U	360 U	360 U	1900 U
Nitrobenzene		360 U	360 U	360 U	360 U	360 U	1900 U
Isophorone		360 U	360 U	360 U	360 U	360 U	1900 U
2-Nitrophenol		360 U	360 U	360 U	360 U	360 U	1900 U
2,4-Dimethylphenol		360 U	360 U	360 U	360 U	360 U	1900 U
bis(2-Chloroethoxy)methane		360 U	360 U	360 U	360 U	360 U	1900 U
2,4-Dichlorophenol		360 U	360 U	360 U	360 U	360 U	1900 U
1,2,4-Trichlorobenzene		360 U	74 %	79 %	360 U	360 U	1900 U
Naphthalene		360 U	360 U	360 U	360 U	360 U	1900 U
4-Chloroaniline		360 U	360 U	360 U	360 U	360 U	1900 U
Hexachlorobutadiene		360 U	360 U	360 U	360 U	360 U	1900 U
4-Chloro-3-methylphenol		360 U	70 %	75 %	360 U	360 U	1900 U
2-Methylnaphthalene		360 U	360 U	360 U	360 U	360 U	1900 U
Hexachlorocyclopentadiene		360 U	360 U	360 U	360 U	360 U	1900 U
2,4,6-Trichlorophenol		360 U	360 U	360 U	360 U	360 U	1900 U
2,4,5-Trichlorophenol		900 U	900 U	900 U	900 U	900 U	4600 U

*= Outside of EPA CLP QC limits.

Cust ID:	BOWMD1		BOWMD1		BOWMD1		BOWMD2		BOWMD3		BOWMD4	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	360	U	360	U	360	U	360	U	360	U	1900	U
2-Nitroaniline	900	U	900	U	900	U	900	U	900	U	4600	U
Dimethylphthalate	360	U	360	U	360	U	360	U	360	U	1900	U
Acenaphthylene	360	U	360	U	360	U	360	U	360	U	1900	U
2,6-Dinitrotoluene	360	U	360	U	360	U	360	U	360	U	1900	U
3-Nitroaniline	900	U	900	U	900	U	900	U	900	U	4600	U
Acenaphthene	360	U	76	%	83	%	360	U	360	U	1900	U
2,4-Dinitrophenol	900	U	900	U	900	U	900	U	900	U	4600	U
4-Nitrophenol	900	U	71	%	77	%	900	U	900	U	4600	U
Dibenzofuran	360	U	360	U	360	U	360	U	360	U	1900	U
2,4-Dinitrotoluene	360	U	71	%	79	%	360	U	360	U	1900	U
Diethylphthalate	360	U	360	U	360	U	360	U	360	U	1900	U
4-Chlorophenyl-phenylether	360	U	360	U	360	U	360	U	360	U	1900	U
Fluorene	360	U	360	U	360	U	360	U	360	U	1900	U
4-Nitroaniline	900	U	900	U	900	U	900	U	900	U	4600	U
4,6-Dinitro-2-methylphenol	900	U	900	U	900	U	900	U	900	U	4600	U
N-Nitrosodiphenylamine (1)	360	U	360	U	360	U	360	U	360	U	1900	U
4-Bromophenyl-phenylether	360	U	360	U	360	U	360	U	360	U	1900	U
Hexachlorobenzene	360	U	360	U	360	U	360	U	360	U	1900	U
Pentachlorophenol	900	U	66	%	76	%	900	U	900	U	4600	U
Phenanthrene	92	J	70	J	88	J	81	J	360	U	1900	U
Anthracene	360	U	360	U	360	U	360	U	360	U	1900	U
Carbazole	360	U	360	U	360	U	360	U	360	U	1900	U
Di-n-butylphthalate	68	J	57	J	56	J	55	J	360	U	1900	U
Fluoranthene	190	J	140	J	170	J	180	J	360	U	1900	U
Pyrene	190	J	80	%	92	%	180	J	360	U	1900	U
Butylbenzylphthalate	360	U	360	U	360	U	360	U	360	U	1900	U
3,3'-Dichlorobenzidine	360	U	360	U	360	U	360	U	360	U	1900	U
Benzo(a)anthracene	64	J	44	J	58	J	63	J	360	U	1900	U
Chrysene	120	J	100	J	110	J	120	J	360	U	1900	U
Bis(2-Ethylhexyl)phthalate	71	J	97	J	130	J	53	J	72	J	2000	
Di-n-octyl phthalate	360	U	360	U	360	U	360	U	360	U	1900	U
Benzo(b)fluoranthene	110	J	92	J	95	J	74	J	360	U	1900	U
Benzo(k)fluoranthene	120	J	82	J	100	J	82	J	360	U	1900	U
Benzo(a)pyrene	91	J	100	J	88	J	80	J	360	U	1900	U
Indeno(1,2,3-cd)pyrene	61	J	69	J	59	J	60	J	360	U	1900	U
Dibenz(a,h)anthracene	22	J	28	J	22	J	360	U	360	U	1900	U
Benzo(g,h,i)perylene	75	J	83	J	64	J	61	J	360	U	1900	U

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

05

	Cust ID:	BOWMD5		BOWMD6		BOWMD7		BOWMD8		SBLKFK		SBLKFK BS	
Sample Information	RFW#:	005		006		007		008		99LE1313-MB1		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	68	%	72	%	76	%	78	%	71	%	67	%
	2-Fluorobiphenyl	75	%	76	%	80	%	82	%	78	%	74	%
	Terphenyl-d14	75	%	82	%	83	%	86	%	77	%	71	%
	Phenol-d5	59	%	57	%	56	%	61	%	56	%	49	%
	2-Fluorophenol	63	%	60	%	60	%	65	%	59	%	55	%
	2,4,6-Tribromophenol	60	%	51	%	47	%	60	%	62	%	54	%
Phenol		350	U	360	U	350	U	350	U	330	U	49	%
bis(2-Chloroethyl)ether		350	U	360	U	350	U	350	U	330	U	330	U
2-Chlorophenol		350	U	360	U	350	U	350	U	330	U	56	%
1,3-Dichlorobenzene		350	U	360	U	350	U	350	U	330	U	330	U
1,4-Dichlorobenzene		350	U	360	U	350	U	350	U	330	U	68	%
1,2-Dichlorobenzene		350	U	360	U	350	U	350	U	330	U	330	U
2-Methylphenol		350	U	360	U	350	U	350	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		350	U	360	U	350	U	350	U	330	U	330	U
4-Methylphenol		350	U	360	U	350	U	350	U	330	U	330	U
N-Nitroso-di-n-propylamine		350	U	360	U	350	U	350	U	330	U	61	%
Hexachloroethane		350	U	360	U	350	U	350	U	330	U	330	U
Nitrobenzene		350	U	360	U	350	U	350	U	330	U	330	U
Isophorone		350	U	360	U	350	U	350	U	330	U	330	U
2-Nitrophenol		350	U	360	U	350	U	350	U	330	U	330	U
2,4-Dimethylphenol		350	U	360	U	350	U	350	U	330	U	330	U
bis(2-Chloroethoxy)methane		350	U	360	U	350	U	350	U	330	U	330	U
2,4-Dichlorophenol		350	U	360	U	350	U	350	U	330	U	330	U
1,2,4-Trichlorobenzene		350	U	360	U	350	U	350	U	330	U	81	%
Naphthalene		350	U	360	U	350	U	350	U	330	U	330	U
4-Chloroaniline		350	U	360	U	350	U	350	U	330	U	330	U
Hexachlorobutadiene		350	U	360	U	350	U	350	U	330	U	330	U
4-Chloro-3-methylphenol		350	U	360	U	350	U	350	U	330	U	49	%
2-Methylnaphthalene		350	U	360	U	350	U	350	U	330	U	330	U
Hexachlorocyclopentadiene		350	U	360	U	350	U	350	U	330	U	330	U
2,4,6-Trichlorophenol		350	U	360	U	350	U	350	U	330	U	330	U
2,4,5-Trichlorophenol		880	U	900	U	860	U	870	U	840	U	840	U

*= Outside of EPA CLP QC limits.

Lab Sample ID:	BOWMD5		BOWMD6		BOWMD7		BOWMD8		SBLKFK		SBLKFK BS	
RFW#:	005		006		007		008		99LE1313-MB1		99LE1313-MB1	
2-Chloronaphthalene	350	U	360	U	350	U	350	U	330	U	330	U
2-Nitroaniline	880	U	900	U	860	U	870	U	840	U	840	U
Dimethylphthalate	350	U	360	U	350	U	350	U	330	U	330	U
Acenaphthylene	350	U	360	U	350	U	350	U	330	U	330	U
2,6-Dinitrotoluene	350	U	360	U	350	U	350	U	330	U	330	U
3-Nitroaniline	880	U	900	U	860	U	870	U	840	U	840	U
Acenaphthene	350	U	360	U	350	U	350	U	330	U	71	%
2,4-Dinitrophenol	880	U	900	U	860	U	870	U	840	U	840	U
4-Nitrophenol	880	U	900	U	860	U	870	U	840	U	50	%
Dibenzofuran	350	U	360	U	350	U	350	U	330	U	330	U
2,4-Dinitrotoluene	350	U	360	U	350	U	350	U	330	U	58	%
Diethylphthalate	350	U	360	U	350	U	350	U	330	U	330	U
4-Chlorophenyl-phenylether	350	U	360	U	350	U	350	U	330	U	330	U
Fluorene	350	U	360	U	350	U	350	U	330	U	330	U
4-Nitroaniline	880	U	900	U	860	U	870	U	840	U	840	U
4,6-Dinitro-2-methylphenol	880	U	900	U	860	U	870	U	840	U	840	U
N-Nitrosodiphenylamine (1)	350	U	360	U	350	U	350	U	330	U	330	U
4-Bromophenyl-phenylether	350	U	360	U	350	U	350	U	330	U	330	U
Hexachlorobenzene	350	U	360	U	350	U	350	U	330	U	330	U
Pentachlorophenol	880	U	900	U	860	U	870	U	840	U	60	%
Phenanthrene	33	J	360	U	350	U	350	U	330	U	330	U
Anthracene	350	U	360	U	350	U	350	U	330	U	330	U
Carbazole	350	U	360	U	350	U	350	U	330	U	330	U
Di-n-butylphthalate	350	U	360	U	350	U	350	U	330	U	330	U
Fluoranthene	89	J	360	U	350	U	350	U	330	U	330	U
Pyrene	92	J	360	U	350	U	350	U	330	U	71	%
Butylbenzylphthalate	350	U	360	U	350	U	350	U	330	U	330	U
3,3'-Dichlorobenzidine	350	U	360	U	350	U	350	U	330	U	330	U
Benzo(a)anthracene	44	J	360	U	350	U	350	U	330	U	330	U
Chrysene	62	J	360	U	350	U	350	U	330	U	330	U
Bis(2-Ethylhexyl)phthalate	110	J	360	U	350	U	350	U	330	U	330	U
Di-n-octyl phthalate	350	U	360	U	350	U	350	U	330	U	330	U
Benzo(b)fluoranthene	37	J	360	U	350	U	350	U	330	U	330	U
Benzo(k)fluoranthene	51	J	360	U	350	U	350	U	330	U	330	U
Benzo(a)pyrene	56	J	360	U	350	U	350	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	34	J	360	U	350	U	350	U	330	U	330	U
Dibenz(a,h)anthracene	350	U	360	U	350	U	350	U	330	U	330	U
Benzo(g,h,i)perylene	38	J	360	U	350	U	350	U	330	U	330	U

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

IF

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BCWMD1

Lab Name: Recra.LabNet Work Order: 10985001001

Client: INU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L501-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110508

Level: (low/med) LOW Date Received: 10/23/99

% Moisture: 8 decanted: (Y/N) Date Extracted: 10/28/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/05/99

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.	HEXACHLOROBIPHENYL	23.48	700	J
2.	HEXACHLOROBIPHENYL	23.79	600	J
3.	HEXACHLOROBIPHENYL	24.28	600	J
4.	HEPTACHLOROBIPHENYL	24.54	600	J
5.	HEPTACHLOROBIPHENYL	25.01	400	J
6.	HEPTACHLOROBIPHENYL	25.51	900	J
7.	OCTACHLOROBIPHENYL	27.88	500	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BCWMD2

Lab Name: Regra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 99101501-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110511

Level: (low/med) LOW Date Received: 10/23/99

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

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/05/99

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.	HEXACHLOROBIPHENYL	23.31	400	J
2.	HEXACHLOROBIPHENYL	23.49	900	J
3.	HEXACHLOROBIPHENYL	23.80	800	J
4.	HEXACHLOROBIPHENYL	24.28	800	J
5.	HEPTACHLOROBIPHENYL	24.55	700	J
6.	HEPTACHLOROBIPHENYL	25.01	400	J
7.	HEPTACHLOROBIPHENYL	25.51	1000	J

TF
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

RCWMD3

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD R99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910I501-003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110312

Level: (low/med) LOW Date Received: 10/23/99

% Moisture: 8 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: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.98	90	JB
2.	ALDOL CONDENSATE	8.53	100	JA
3.	HEPTACHLOROBIPHENYL	24.56	100	J

FORM 1 SV-TIC RFW (v3.3)

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EOWMD4

Lab Name: Beta.LabNet Work Order: 10985001001

Client: TNU-HANFORD 899-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L501-004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110413

Level: (low/med) LOW Date Received: 10/23/99

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

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/05/99

Injection Volume: 2.0(uL) Dilution Factor: 5.00

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.	HEXACHLOROBIPHENYL	23.48	1000	J
2.	HEXACHLOROBIPHENYL	23.79	1000	J
3.	HEXACHLOROBIPHENYL	24.27	1000	J
4.	HEPTACHLOROBIPHENYL	24.54	1000	J
5.	HEPTACHLOROBIPHENYL	25.01	800	J
6.	HEPTACHLOROBIPHENYL	25.50	1000	J
7.	HEPTACHLOROBIPHENYL	26.23	700	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BOWMD5

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 99101501-005

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110313

Level: (low/med) LOW Date Received: 10/23/99

% Moisture: 5 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: 5 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.98	90	JB
2.	ALDOL CONDENSATE	8.53	200	JA
3.	HEXACHLOROBIPHENYL	23.49	100	J
4.	HEXACHLOROBIPHENYL	23.81	90	J
5.	HEPTACHLOROBIPHENYL	24.56	100	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BCWMD6

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L501-006

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110403

Level: (low/med) LOW Date Received: 10/23/99

% Moisture: 8 decanted: (Y/N)__ Date Extracted: 10/28/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/04/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.95	100	JB
2.	ALDOL CONDENSATE	8.51	200	JA

FORM 1 SV-TIC RFW (v3.3)

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BGWMD7

Lab Name: Pecra.LabNet Work Order: 10985001001

Client: TNU-HANFORD F99-078

Matrix: (soil/water) SOIL Lab Sample ID: 99101501-007

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110404

Level: (low/med) LOW Date Received: 10/23/99

% Moisture: 4 decanted: (Y/N) __ Date Extracted: 10/28/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/04/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.96	100	JB
2.	ALDOL CONDENSATE	8.51	200	JA

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BCWMD8

Lab Name: Revra.LabNet Work Order: 10985001001

Client: TNU HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L501-008

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110405

Level: (low/med) LOW Date Received: 10/23/99

% Moisture: 4 decanted: (Y/N) Date Extracted: 10/28/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/04/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.95	90	JB
2.	ALDOL CONDENSATE	8.51	90	JA

FORM 1 SV-TIC RFW (v3.3)

IF
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKFK

Lab Name: Pegra LabNet Work Order: 10985001001

Client: TNU HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 99LF1313 MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D110303

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: _____ 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: 1

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

AS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.00	80	J

FORM 1 SV-TIC RFW (v3.3)

Beta LabNet - Kirkville Laboratory
ENA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 10/23/99 RFW LOT # 99110101

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PLWMD1	001	S	99LE1313	10/21/99	10/28/99	11/05/99
PLWMD1	001 MS	S	99LE1313	10/21/99	10/28/99	11/05/99
PLWMD1	001 MSD	S	99LE1313	10/21/99	10/28/99	11/05/99
PLWMD2	002	S	99LE1313	10/21/99	10/28/99	11/05/99
PLWMD3	003	S	99LE1313	10/21/99	10/28/99	11/03/99
PLWMD4	004	S	99LE1313	10/21/99	10/28/99	11/05/99
PLWMD5	005	S	99LE1313	10/21/99	10/28/99	11/03/99
PLWMD6	006	S	99LE1313	10/21/99	10/28/99	11/04/99
PLWMD7	007	S	99LE1313	10/21/99	10/28/99	11/04/99
PLWMD8	008	S	99LE1313	10/21/99	10/28/99	11/04/99

LAB QC:

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

RECRA LabNet Use Only

9910L501

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) ~~perrone wet lab~~ 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: 10/23/99 Date Due: 11/22/99

Account #:

Refrigerator #		1	2												
#/Type Container	Liquid														
	Solid	1AG	1AG						1AG		1AG				1AG
Volume	Liquid														
	Solid	250	500						500		1LT				250
Preservatives		—	—						—		—				—

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN, IC Anions, PH

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0024H 0025C	0025H 0DRO	0PCB	Met ①	1CN10	1N3N2 1NH3N	1CCL 1CFL	1CSO4 1CNO2	1CNO3 1CPO4	1CRG 1SFD	1PH
001	BOWMD 1			S	10-21-99	1012	1	1	✓	1	✓	1	✓	✓	✓	✓	1
002	2					1017	1	1	✓	1	✓	1	✓	✓	✓	✓	1
003	3					1047	1	1	✓	1	✓	1	✓	✓	✓	✓	1
004	4					1102	1	1	✓	1	✓	1	✓	✓	✓	✓	1
005	5					1118	1	1	✓	1	✓	1	✓	✓	✓	✓	1
006	6					1130	1	1	✓	1	✓	1	✓	✓	✓	✓	1
007	7					1140	1	1	✓	1	✓	1	✓	✓	✓	✓	1
008	8					1150	1	1	✓	1	✓	1	✓	✓	✓	✓	1

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

Special Instructions:

Saf # B99-078
Met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg.

COMPOSITE WASTE

DATE/REVISIONS:

005 1. Samples Rec'd on Original COC They
2. were crossed off. Rec'd COC for
3. ID BOWMD5 for Isotopic
4. uranium but not the sample.
5. Run Matrix QC
10/27/99 6. CN added to COC unit review

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill Free 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. 31 °C

Relinquished by	Received by	Date	Time
Fed Ex	V. Henry	10-23-99	1000

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 8146 1372 4170

4255795530966

2.9

MPS 8125 9553 5717

3.4

2)

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 99 012 / ERC99023	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA DJB 10-21-99	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: B20CW1671C	

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										
00k	BOWMD1	Soil	10-21-99	1012		X	X	X	X	X		BOW4T9		
82k	BOWMD2	Soil	10-21-99	1017		X	X	X	X	X		BOW4T9		
14h	BOWMD3	Soil	10-21-99	1047		X	X	X	X	X		BOW4WO		
7h	BOWMD4	Soil	10-21-99	1102		X	X	X	X	X		BOW4WO		
1800	~~BOWMD5~~	~~Soil~~	~~10-21-99~~	~~1118~~	RF	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		~~BOWMD9~~	Rec'd samples	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C - 10-22-99 0800	Received By: R Fahlberg — Date/Time: R Fahlberg 10-22-99 0800		
Relinquished By: R Fahlberg — Date/Time: R Fahlberg 10-22-99 1330	Received By: Fed Ex — Date/Time:		
Relinquished By: Fed Ex — Date/Time: 10/23/99 1000	Received By: [signature] — Date/Time: 10-23-99 1000		

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

19

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-145	Page 1 of 1

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078	Data Turnaround: 45 Days
Ice Chest No.: ERC 96.025	Field Logbook No.: EL-15.1		Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA RTD 10-21-99	Offsite Property No.: A00 0005		Bill of Lading/Air Bill No.: 42357953 0966	
			COA: B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage	Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS		Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	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										
Bowm D6	Soil	10-21-99	1130					X	X	X	X	X	
Bowm D7	Soil	10-21-99	1170					X	X	X	X	X	
Bowm D8	Soil	10-21-99	1150					X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C	Date/Time: 10-21-99/1400
Relinquished By: Ref 3C	Date/Time: 10-22-99/0800	Received By: R. Thoren/Rikki Thoren	Date/Time: 10-22-99/0800
Relinquished By: R. Thoren / Rikki Thoren	Date/Time: 10-22-99 1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10-23-99 1000	Received By: [illegible]	Date/Time: 10-23-99 1000

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

use Bow 8C1 as T.A. to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION	Received By	Time	Date/Time
		9910L501	

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

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 96-025	Field Logbook No.: EL-15.1	Method of Shipment: FED EX	
Shipped To: TMA/RECRA 8 TBK 10-21-99	Offsite Property No.: A000005	Bill of Lading/Air Bill No.: 42357953 0966	
		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			

CPM	Sample No.	Matrix *	Sample Date	Sample Time										
50K	BOWMD1	Soil	10-21-99	1012	X						X	BOW4T9		
82K	BOWMD2	Soil	10-21-99	1017	X						X	BOW9WO		
14K	BOWMD3	Soil	10-21-99	1047	X						X	BOW9WO		
7K	BOWMD4	Soil	10-21-99	1102	X						X	BOW9WO		
1800	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9		

RT 10-22-99

RT 10-22-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C — Date/Time: 10-22-99/0800	Received By: Rikki Thorer — Date/Time: 10-22-99/0800		
Relinquished By: Rikki Thorer — Date/Time: 10-22-99/1430	Received By: FED EX — Date/Time:		
Relinquished By: FedEx — Date/Time: 10-23-99 1000	Received By: [signature] Conty Cox — Date/Time: 10-23-99 1000		

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 # : 9910L501
SDG/SAF #: H0590/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 10-23-99

GC/MS VOLATILE

Eight (8) soil samples were collected on 10-21-99.

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 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 temperatures upon receipt have 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. Two (2) of forty-two (42) surrogate recoveries were outside EPA QC limits. The analysis of sample B0WMD4 fulfills the reanalysis requirement for sample B0WMD4 RE.

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 at levels less than the CRQL. The method blank 99LVH505-MB1 also contained the target compound 2-Hexanone at a level less than the CRQL.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-10-99
Date

som/group data/voa/ma10501.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 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: 12/08/99 12:08

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1a

	Cust ID:	BOWMD1		BOWMD1		BOWMD1		BOWMD2		BOWMD3		BOWMD4	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		004	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.06		1.14		0.943		0.909		0.943		1.04	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Toluene-d8	99	%	106	%	103	%	105	%	103	%	112	%
	Bromofluorobenzene	94	%	102	%	100	%	94	%	91	%	78	%
	1,2-Dichloroethane-d4	105	%	112	%	111	%	108	%	112	%	115	%
Chloromethane		12	U	11	U	10	U	10	U	10	U	12	U
Bromomethane		12	U	11	U	10	U	10	U	10	U	12	U
Vinyl Chloride		12	U	11	U	10	U	10	U	10	U	12	U
Chloroethane		12	U	11	U	10	U	10	U	10	U	12	U
Methylene Chloride		9	B	9	B	8	B	7	B	6	B	18	B
Acetone		12	U	11	U	10	U	10	U	10	U	12	U
Carbon Disulfide		6	U	6	U	5	U	5	U	5	U	6	U
1,1-Dichloroethene		6	U	92	%	93	%	5	U	5	U	6	U
1,1-Dichloroethane		6	U	6	U	5	U	5	U	5	U	6	U
1,2-Dichloroethene (total)		6	U	6	U	5	U	5	U	5	U	6	U
Chloroform		6	U	6	U	5	U	5	U	5	U	6	U
1,2-Dichloroethane		6	U	6	U	5	U	5	U	5	U	6	U
2-Butanone		12	U	11	U	10	U	10	U	10	U	12	U
1,1,1-Trichloroethane		6	U	6	U	5	U	5	U	5	U	6	U
Carbon Tetrachloride		6	U	6	U	5	U	5	U	5	U	6	U
Bromodichloromethane		6	U	6	U	5	U	5	U	5	U	6	U
1,2-Dichloropropane		6	U	6	U	5	U	5	U	5	U	6	U
cis-1,3-Dichloropropene		6	U	6	U	5	U	5	U	5	U	6	U
Trichloroethene		6	U	100	%	98	%	5	U	5	U	6	U
Dibromochloromethane		6	U	6	U	5	U	5	U	5	U	6	U
1,1,2-Trichloroethane		6	U	6	U	5	U	5	U	5	U	6	U
Benzene		6	U	107	%	105	%	5	U	5	U	6	U
Trans-1,3-Dichloropropene		6	U	6	U	5	U	5	U	5	U	6	U
Bromoform		6	U	6	U	5	U	5	U	5	U	6	U
4 Methyl-2-pentanone		12	U	11	U	10	U	10	U	10	U	12	U
2-Hexanone		12	U	11	U	10	U	10	U	10	U	12	U
Tetrachloroethene		6	U	6	U	5	U	5	U	5	U	6	U
1,1,2,2-Tetrachloroethane		6	U	6	U	5	U	5	U	5	U	6	U
Toluene		6	U	108	%	106	%	5	U	5	U	6	U

*- outside of EPA CLP QC limits.

[illegible] 9910L5Q1 [illegible] TNU-HANFORD B99-078 [illegible]

[illegible] ID:	BOWMD1	BOWMD1	BOWMD1	BOWMD2	BOWMD3	BOWMD4
RFW#:	001	001 MS	001 MSD	002	003	004
Chlorobenzene	6 U	109 %	106 %	5 U	5 U	6 U
Ethylbenzene	6 U	6 U	5 U	5 U	5 U	6 U
Styrene	6 U	6 U	5 U	5 U	5 U	6 U
Xylene (total)	6 U	6 U	5 U	5 U	5 U	6 U

* = Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 12/08/99 12:08

RESI Batch Number: **9910L501** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 2a

	Cust ID:	BOWMD4	BOWMD5	BOWMD6	BOWMD7	BOWMD8	VBLKAI
Sample Information	RFW#:	004	005	006	007	008	99LVH505-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.02	0.893	0.926	0.862	1.04	1.00
	Units:	UG/KG REPREP	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	Toluene-d8	120 * %	102 %	97 %	98 %	97 %	96 %
	Bromofluorobenzene	106 %	92 %	92 %	92 %	96 %	95 %
	1,2-Dichloroethane-d4	133 * %	102 %	101 %	95 %	105 %	103 %
Chloromethane		11 U	9 U	10 U	9 U	11 U	10 U
Bromomethane		11 U	9 U	10 U	9 U	11 U	10 U
Vinyl Chloride		11 U	9 U	10 U	9 U	11 U	10 U
Chloroethane		11 U	9 U	10 U	9 U	11 U	10 U
Methylene Chloride		10 B	5 B	7 B	5 B	8 B	4 J
Acetone		11 U	9 U	10 U	9 U	11 U	10 U
Carbon Disulfide		6 U	5 U	5 U	4 U	6 U	5 U
1,1-Dichloroethene		6 U	5 U	5 U	4 U	6 U	5 U
1,1-Dichloroethane		6 U	5 U	5 U	4 U	6 U	5 U
1,2-Dichloroethene (total)		6 U	5 U	5 U	4 U	6 U	5 U
Chloroform		6 U	5 U	5 U	4 U	6 U	5 U
1,2-Dichloroethane		6 U	5 U	5 U	4 U	6 U	5 U
2-Butanone		11 U	9 U	10 U	9 U	11 U	10 U
1,1,1-Trichloroethane		6 U	5 U	5 U	4 U	6 U	5 U
Carbon Tetrachloride		6 U	5 U	5 U	4 U	6 U	5 U
Bromodichloromethane		6 U	5 U	5 U	4 U	6 U	5 U
1,2-Dichloropropane		6 U	5 U	5 U	4 U	6 U	5 U
cis-1,3-Dichloropropene		6 U	5 U	5 U	4 U	6 U	5 U
Trichloroethene		6 U	5 U	5 U	4 U	6 U	5 U
Dibromochloromethane		6 U	5 U	5 U	4 U	6 U	5 U
1,1,2-Trichloroethane		6 U	5 U	5 U	4 U	6 U	5 U
Benzene		6 U	5 U	5 U	4 U	6 U	5 U
trans-1,3-Dichloropropene		6 U	5 U	5 U	4 U	6 U	5 U
Bromoform		6 U	5 U	5 U	4 U	6 U	5 U
4-Methyl-2-pentanone		11 U	9 U	10 U	9 U	11 U	10 U
2-Hexanone		6 U	9 U	10 U	9 U	11 U	2 J
Tetrachloroethene		6 U	5 U	2 J	4 U	6 U	5 U
1,1,2,2-Tetrachloroethane		6 U	5 U	5 U	4 U	6 U	5 U
Toluene		6 U	5 U	5 U	4 U	6 U	5 U

* = outside of EPA CLP QC limits.

12-15-99

Cust ID:	BOWMD4	BOWMD5	BOWMD6	BOWMD7	BOWMD8	VBLKAI
RFW#:	004	005	006	007	008	99LVH505-MB1
	REPREP					
Chlorobenzene	[illegible] U	5 U	5 U	4 U	6 U	5 U
Ethylbenzene	6 U	5 U	5 U	4 U	6 U	5 U
Styrene	[illegible] U	5 U	5 U	4 U	6 U	5 U
Xylene (total)	[illegible] U	5 U	5 U	4 U	6 U	5 U

*- Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 12/08/99 12:08

RRW Batch Number: **9910L501** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 3a

	Cust ID:	**VBLKAI BS**	**VBLKWX**
Sample Information	RFW#:	**99LVH505-MB1**	**99LVH507-MB1**
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG

Surrogate Recovery	Toluene-d8	98	%	94	%
	Bromofluorobenzene	96	%	94	%
	1,2-Dichloroethane-d4	99	%	96	%

Chloromethane	10	U	10	U
Bromomethane	10	U	10	U
Vinyl Chloride	10	U	10	U
Chloroethane	10	U	10	U
Methylene Chloride	6	B	4	J
Acetone	10	U	10	U
Carbon Disulfide	5	U	5	U
1,1-Dichloroethene	92	%	5	U
1,1-Dichloroethane	5	U	5	U
1,2-Dichloroethene (total)	5	U	5	U
Chloroform	5	U	5	U
1,2-Dichloroethane	5	U	5	U
2-Butanone	10	U	10	U
1,1,1-Trichloroethane	5	U	5	U
Carbon Tetrachloride	5	U	5	U
Bromodichloromethane	5	U	5	U
1,2-Dichloropropane	5	U	5	U
cis-1,3-Dichloropropene	5	U	5	U
Trichloroethene	94	%	5	U
Dibromochloromethane	5	U	5	U
1,1,2-Trichloroethane	5	U	5	U
Benzene	100	%	5	U
Trans-1,3-Dichloropropene	5	U	5	U
Bromoform	5	U	5	U
4-Methyl-2-pentanone	10	U	10	U
2-Hexanone	10	U	10	U
Tetrachloroethene	5	U	5	U
1,1,2,2-Tetrachloroethane	5	U	5	U
Toluene	99	%	5	U

*= Outside of EPA CLP QC limits.

pw 12-08-99

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: [illegible]

Cust ID: VBLKAI BS VBLKWX

RFW#: 99LVH505-MB1 99LVH507-MB1

Chlorobenzene	99	%	5	U
Ethylbenzene	5	U	5	U
Styrene	5	U	5	U
Xylene (total)	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: 10/23/99 RFW LOT # :9910L501

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWMD1	001	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD1	001 MS	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD1	001 MSD	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD2	002	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD3	003	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD4	004	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD4	004 R1	S	99LVH507	10/21/99	N/A	11/01/99
BOWMD5	005	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD6	006	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD7	007	S	99LVH505	10/21/99	N/A	11/01/99
BOWMD8	008	S	99LVH505	10/21/99	N/A	11/01/99

LAB QC:

VBLKAI	MB1	S	99LVH505	N/A	N/A	11/01/99
VBLKAI	MB1 BS	S	99LVH505	N/A	N/A	11/01/99
VBLKWX	MB1	S	99LVH507	N/A	N/A	11/01/99

12-03-99

RECRA LabNet Use Only

9910L501

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) ~~percent wet lab~~ metals

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: 10/23/99 Date Due: 11/22/99

Account #:

Refrigerator #		1	2																
#/Type Container	Liquid																		
	Solid	1AG	1AG									1AG		1AG					1AG
Volume	Liquid																		
	Solid	250	500									500		1LT					250
Preservatives		—	—									—		—					—
ANALYSES REQUESTED	ORGANIC	VOA	BNA	Pest/PCB	Herb						INORG	Total Metal	CN	TC Pu 1104					pH

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	CL 2AH	OGCSC	C625H	CDRO	CPCB	MCD	ICNTD	IN2N2	INH3N	ICCL	ICFL	ICSO4	ICNO2	ICNO3	ICPO4	ICPG	ISFD	IPH
001	BOWMD 1			S	10-21-99	1012	1	1	✓			1	✓	1	✓	✓	✓	✓	1					
002	2					1017	1	1	✓			1	✓	1	✓	✓	✓	✓	1					
003	3					1047	1	1	✓			1	✓	1	✓	✓	✓	✓	1					
004	4					1102	1	1	✓			1	✓	1	✓	✓	✓	✓	1					
005	5					1118	1	1	✓			1	✓	1	✓	✓	✓	✓	1					
006	6					1130	1	1	✓			1	✓	1	✓	✓	✓	✓	1					
007	7					1140	1	1	✓			1	✓	1	✓	✓	✓	✓	1					
008	8					1150	1	1	✓			1	✓	1	✓	✓	✓	✓	1					

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

Special Instructions:

Sap # B99-078
Met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg.

COMPOSITE WASTE

DATE/REVISIONS:

005 1. Samples Rec'd on Original COC They were crossed off. Rec'd COC for ID BOWMD5 for isotopic uranium but not the sample.
2.
3.
4.
5. Run Matrix QC
10/27/99 6. CN added to COC unit review

RECRA LabNet Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___
Airbill ~~Fed Ex~~
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 31 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 8146 1372 4170

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10-23-99	1000

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

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 99 012 / ERC99 023	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: TMA/RECRA DB 10-21-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B20CW167 1C

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									
10h	BOWMD1	Soil	10-21-99	1012		X	X	X	X	X		BOW9T9	
82h	BOWMD2	Soil	10-21-99	1017		X	X	X	X	X		BOW9T9	
14h	BOWMD3	Soil	10-21-99	1047		X	X	X	X	X		BOW9W0	
7h	BOWMD4	Soil	10-21-99	1102		X	X	X	X	X		BOW9W0	
1800	BOWMD5	Soil	10-21-99	1118	RF	X	X	X	X	X		BOW9T9	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	10-21-99/1400	Ref 3C	10-21-99/1400
Ref 3C	10-22-99 0800	[signature]	10-22-99 0800
[signature]	10-22-99 1330	Fed Ex	
Fed Ex	10/23/99 1000	[signature]	10-23-99 1000

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: _____

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE REPORT

Collector: Bowers/Trice	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 B pond		SAF No.: B99-078
Ice Chest No.: ERC 96-025	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: TMA/RECRA 10-21-99	Offsite Property No.: A00 0005		Bill of Lading/Air Bill No.: 42357953 0966
			COA: B20CW1 671C

Price Code: 8N

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS	Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	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										
BOWMD6	Soil	10-21-99	1130					X	X	X	X	X	
BOWMD7	Soil	10-21-99	1140					X	X	X	X	X	
BOWMD8	Soil	10-21-99	1150					X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	10-21-99/1400
Received By: Ref 3C	Ref 3C	10-21-99/1400
Relinquished By: Ref 3C	Ref 3C	10-22-99/0800
Received By: R Thoren/Rikki Thoren	R Thoren/Rikki Thoren	10-22-99/0800
Relinquished By: Rikki Thoren	R Thoren	10-22-99/1430
Received By: FED EX	FED EX	
Relinquished By: Fed Ex	Fed Ex	10-23-99 1000
Received By: Vicki Hennig	Vicki Hennig	10-23-99 1000

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

use BOW8C1 as TA to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

99IC501

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 96-025	Field Logbook No.: EL-1511	Method of Shipment: FED EX	
Shipped To: TMA/RECRA BTB 10-21-99	Offsite Property No.: A000005	Bill of Lading/Air Bill No.: 42357953 0966	
		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									
0	BOWMD1	Soil	10-21-99	1012	X						X	BOW9T9	
8	BOWMD2	Soil	10-21-99	1017	X						X	BOW9WO	T9
14	BOWMD3	Soil	10-21-99	1047	X						X	BOW9WO	
7	BOWMD4	Soil	10-21-99	1102	X						X	BOW9WO	
1800	BOWMD5	Soil	10-21-99	1118	X						X	BOWMD9	

RT 10-22-99

RT 10-22-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 10-21-99/1400	Received By: Ref 3C — Date/Time: 10-21-99/1400		
Relinquished By: Ref 3C — Date/Time: 10.22.99/0800	Received By: RIKKI Thoren — Date/Time: R. Thoren 10.22.99/0800		
Relinquished By: RIKKI Thoren — Date/Time: R. Thoren 10.22.99/1430	Received By: FED EX — Date/Time:		
Relinquished By: FedEx — Date/Time: 10.23.99 1000	Received By: [signature] Conly Cox — Date/Time: 10.23.99 1000		

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