RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

0052624

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9910L555
SDG/SAF #: H0602/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 10-29-99

RECEIVED
FEB 28 2000
EDMC

GC/MS VOLATILE

Four (4) soil samples were collected on 10-27-99.

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 11-08-99.

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

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

2. The required holding time for analysis was met.

3. A non-target compound was detected in sample B0WMH1.

4. All surrogate recoveries were within EPA QC limits.

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

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

7. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL.

JAN 2000
RECEIVED
Data
Log In

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-14-99
Date

som\group\data\voa\tnu10555.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 15 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: 12/10/99 13:42

RFW Batch Number: **9910L555** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1a

	Cust ID:	B0WMH1		B0WMH2		B0WMH3		B0WMH4		B0WMH4		B0WMH4	
Sample Information	RFW#:	001		002		003		004		004 MS		004 MSD	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	0.909		1.04		0.980		0.943		0.980		0.980	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Toluene-d8	99	%	99	%	100	%	98	%	98	%	98	%
	Bromofluorobenzene	99	%	101	%	97	%	99	%	99	%	100	%
	1,2-Dichloroethane-d4	104	%	96	%	99	%	103	%	101	%	101	%
Chloromethane		9	U	11	U	10	U	10	U	10	U	10	U
Bromomethane		9	U	11	U	10	U	10	U	10	U	10	U
Vinyl Chloride		9	U	11	U	10	U	10	U	10	U	10	U
Chloroethane		9	U	11	U	10	U	10	U	10	U	10	U
Methylene Chloride		10	B	12	B	11	B	10	B	10	B	11	B
Acetone		9	JB	11	U	10	B	6	JB	11	B	14	B
Carbon Disulfide		5	U	6	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	6	U	5	U	5	U	120	%	120	%
1,1-Dichloroethane		5	U	6	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	6	U	5	U	5	U	5	U	5	U
Chloroform		5	U	6	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	6	U	5	U	5	U	5	U	5	U
2-Butanone		9	U	11	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	6	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	6	U	5	U	5	U	5	U	5	U
Bromodichloromethane		5	U	6	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	6	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	6	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	6	U	5	U	5	U	98	%	97	%
Dibromochloromethane		5	U	6	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	6	U	5	U	5	U	5	U	5	U
Benzene		5	U	6	U	5	U	5	U	98	%	97	%
Trans-1,3-Dichloropropene		5	U	6	U	5	U	5	U	5	U	5	U
Bromoform		5	U	6	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		9	U	11	U	10	U	10	U	10	U	10	U
2-Hexanone		9	U	11	U	10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	6	U	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	6	U	5	U	5	U	5	U	5	U
Toluene		5	U	6	U	5	U	5	U	99	%	98	%

*= Outside of EPA CLP QC limits.

12-11-99

RFW Batch Number: **9910L555** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1b

Cust ID:	B0WMH1	B0WMH2	B0WMH3	B0WMH4	B0WMH4	B0WMH4
RFW#:	001	002	003	004	004 MS	004 MSD
Chlorobenzene	5 U	6 U	5 U	5 U	96 %	98 %
Ethylbenzene	5 U	6 U	5 U	5 U	5 U	5 U
Styrene	5 U	6 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	6 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WMH1

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-001

Sample wt/vol: 5.50 (g/mL) G Lab File ID: h110809

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: not dec. 3 Date Analyzed: 11/08/99

Column: (pack/cap) CAP Dilution Factor: 0.909

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	26.364	7	J

FORM 1 VOA-TIC 1/87 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WMH2

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-002

Sample wt/vol: 4.80 (g/mL) G Lab File ID: h110810

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: not dec. 3 Date Analyzed: 11/08/99

Column: (pack/cap) CAP Dilution Factor: 1.04

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

FORM 1 VOA-TIC 1/87 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WMH3

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-003

Sample wt/vol: 5.10 (g/mL) G Lab File ID: h110811

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: not dec. 5 Date Analyzed: 11/08/99

Column: (pack/cap) CAP Dilution Factor: 0.980

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

FORM 1 VOA-TIC 1/87 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WMH4

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-004

Sample wt/vol: 5.30 (g/mL) G Lab File ID: h110812

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: not dec. 4 Date Analyzed: 11/08/99

Column: (pack/cap) CAP Dilution Factor: 0.943

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

FORM 1 VOA-TIC 1/87 Rev.

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMH1	001	S	99LVH533	10/27/99	N/A	11/08/99
B0WMH2	002	S	99LVH533	10/27/99	N/A	11/08/99
B0WMH3	003	S	99LVH533	10/27/99	N/A	11/08/99
B0WMH4	004	S	99LVH533	10/27/99	N/A	11/08/99
B0WMH4	004 MS	S	99LVH533	10/27/99	N/A	11/08/99
B0WMH4	004 MSD	S	99LVH533	10/27/99	N/A	11/08/99

LAB QC:

VBLKBD	MB1	S	99LVH533	N/A	N/A	11/08/99
VBLKBD	MB1 BS	S	99LVH533	N/A	N/A	11/08/99

12-1-99

RECRA LabNet Use Only
9910L555

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU HANFORD 899-078

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: 10/29/99 Date Due: 11/28/99

Account #:

Refrigerator #		1	2													
#/Type Container	Liquid															
	Solid	1AG	1AG					1AG	1AG		1AG					
Volume	Liquid															
	Solid	250	500					250	500		1000					
Preservatives		—	—					—	—		—					
ANALYSES REQUESTED	ORGANIC: VOA							PH	INORG: Metal		CN	IC Anions				
	ORGANIC: BNA															
	ORGANIC: Pest/PCB															
	ORGANIC: Herb															
RECRA LabNet Use Only		CG24H	CG25C	CG25H	OPCB			IPH	MetO	CNTO	AngO					

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	CG24H	CG25C	CG25H	OPCB	IPH	MetO	CNTO	AngO
001	BOWMH 1			S	10/27/99	0850	1	1		X	1	1	X	1
002	2					0856	1	1		X	1	1	X	1
003	3					0931	1	1		X	1	1	X	1
004	4					0953	1	1		X	1	1	X	1

Special Instructions:

Saf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

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

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

COC Tape was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 5-4 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/29/99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

NOTES:

4235 7953 1182

44100 557

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.: ERC99-032	Field Logbook No.: EL-1511-1		Method of Shipment: FED EX
Shipped To: ~~DMA~~/RECRA AB 10-27-99	Offsite Property No.: A000014		Bill of Lading/Air Bill No.: AB 10-27-99 4235783182
			COA ~~B20671C~~ B20CW671C

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

	Sample No.	Matrix *	Sample Date	Sample Time										
155	BOWM41	Soil	10-27-99	0850		X	X	X	X	X		BOW801		
156	BOWM42	S	10-27-99	0856		X	X	X	X	X		↓		
157	BOWM43	S	10-27-99	0931		X	X	X	X	X		↓		
158	BOWM44	S	10-27-99	0953		X	X	X	X	X		↓		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 10-27-99/1130	Received By: AOF 3B	Date/Time: 10-27-99/1130
Relinquished By: AOF 3B	Date/Time: 10-28-99/0800	Received By: Rikki Thoren / R. Thoren	Date/Time: 10-28-99/0800
Relinquished By: Rikki Thoren / R. Thoren	Date/Time: 10-28-99/1400	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10/29/99 0945	Received By: [illegible]	Date/Time: 10/29/99 0945

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

Temp 54

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# : 9910L555
SDG/SAF #: H0602/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 10-29-99

SEMIVOLATILE

Four (4) soil samples were collected on 10-27-99.

The samples and their associated QC samples were extracted on 10-27-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Methods 3550B and 8270B for TCL Semivolatile target compounds on 11-12,15-99.

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. All surrogate recoveries were within EPA QC limits.

5. Two (2) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.

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

7. The samples were spectrally searched for Butylated Hydroxytoluene and Tributyl Phosphate; however, they were not identified in the samples.

JAN 2000
RECEIVED
Data
Log In

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-04-00
Date

pef\gorup\data\bna\tnu10555.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 15 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

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BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

mmz\10-94\gloss.bna

Recra LabNet - Lionville Laboratory
Semivolatiles by GC/MS, HSL List

Report Date: 12/24/99 18:39

RFW Batch Number: 9910L555 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1a

	Cust ID:	B0WMH1		B0WMH1		B0WMH1		B0WMH2		B0WMH3		B0WMH4	
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:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Nitrobenzene-d5	88	%	93	%	93	%	86	%	88	%	93	%
	2-Fluorobiphenyl	81	%	85	%	87	%	80	%	82	%	86	%
	Terphenyl-d14	80	%	97	%	86	%	83	%	87	%	97	%
	Phenol-d5	69	%	70	%	73	%	65	%	72	%	74	%
	2-Fluorophenol	65	%	72	%	70	%	65	%	68	%	67	%
	2,4,6-Tribromophenol	81	%	99	%	101	%	83	%	93	%	80	%
Phenol		340	U	66	%	69	%	340	U	350	U	340	U
bis(2-Chloroethyl)ether		340	U	340	U	340	U	340	U	350	U	340	U
2-Chlorophenol		340	U	74	%	73	%	340	U	350	U	340	U
1,3-Dichlorobenzene		340	U	340	U	340	U	340	U	350	U	340	U
1,4-Dichlorobenzene		340	U	79	%	78	%	340	U	350	U	340	U
1,2-Dichlorobenzene		340	U	340	U	340	U	340	U	350	U	340	U
2-Methylphenol		340	U	340	U	340	U	340	U	350	U	340	U
2,2'-oxybis(1-Chloropropane)		340	U	340	U	340	U	340	U	350	U	340	U
4-Methylphenol		340	U	340	U	340	U	340	U	350	U	340	U
N-Nitroso-di-n-propylamine		340	U	97	%	103	%	340	U	350	U	340	U
Hexachloroethane		340	U	340	U	340	U	340	U	350	U	340	U
Nitrobenzene		340	U	340	U	340	U	340	U	350	U	340	U
Isophorone		340	U	340	U	340	U	340	U	350	U	340	U
2-Nitrophenol		340	U	340	U	340	U	340	U	350	U	340	U
2,4-Dimethylphenol		340	U	340	U	340	U	340	U	350	U	340	U
bis(2-Chloroethoxy)methane		340	U	340	U	340	U	340	U	350	U	340	U
2,4-Dichlorophenol		340	U	340	U	340	U	340	U	350	U	340	U
1,2,4-Trichlorobenzene		340	U	86	%	86	%	340	U	350	U	340	U
Naphthalene		340	U	340	U	340	U	340	U	350	U	340	U
4-Chloroaniline		340	U	340	U	340	U	340	U	350	U	340	U
Hexachlorobutadiene		340	U	340	U	340	U	340	U	350	U	340	U
4-Chloro-3-methylphenol		340	U	85	%	86	%	340	U	350	U	340	U
2-Methylnaphthalene		340	U	340	U	340	U	340	U	350	U	340	U
Hexachlorocyclopentadiene		340	U	340	U	340	U	340	U	350	U	340	U
2,4,6-Trichlorophenol		340	U	340	U	340	U	340	U	350	U	340	U
2,4,5-Trichlorophenol		860	U	860	U	860	U	860	U	880	U	860	U

*= Outside of EPA CLP QC limits.

Cust ID:	B0WMH1		B0WMH1		B0WMH1		B0WMH2		B0WMH3		B0WMH4	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	340	U	340	U	340	U	340	U	350	U	340	U
2-Nitroaniline	860	U	860	U	860	U	860	U	880	U	860	U
Dimethylphthalate	340	U	340	U	340	U	340	U	350	U	340	U
Acenaphthylene	340	U	340	U	340	U	340	U	350	U	340	U
2,6-Dinitrotoluene	340	U	340	U	340	U	340	U	350	U	340	U
3-Nitroaniline	860	U	860	U	860	U	860	U	880	U	860	U
Acenaphthene	340	U	82	%	79	%	340	U	350	U	340	U
2,4-Dinitrophenol	860	U	860	U	860	U	860	U	880	U	860	U
4-Nitrophenol	860	U	117 *	%	126 *	%	860	U	880	U	860	U
Dibenzofuran	340	U	340	U	340	U	340	U	350	U	340	U
2,4-Dinitrotoluene	340	U	83	%	87	%	340	U	350	U	340	U
Diethylphthalate	340	U	340	U	340	U	340	U	350	U	340	U
4-Chlorophenyl-phenylether	340	U	340	U	340	U	340	U	350	U	340	U
Fluorene	340	U	340	U	340	U	340	U	350	U	340	U
4-Nitroaniline	860	U	860	U	860	U	860	U	880	U	860	U
4,6-Dinitro-2-methylphenol	860	U	860	U	860	U	860	U	880	U	860	U
N-Nitrosodiphenylamine (1)	340	U	340	U	340	U	340	U	350	U	340	U
4-Bromophenyl-phenylether	340	U	340	U	340	U	340	U	350	U	340	U
Hexachlorobenzene	340	U	340	U	340	U	340	U	350	U	340	U
Pentachlorophenol	860	U	88	%	79	%	860	U	880	U	860	U
Phenanthrene	340	U	340	U	340	U	340	U	350	U	340	U
Anthracene	340	U	340	U	340	U	340	U	350	U	340	U
Carbazole	340	U	340	U	340	U	340	U	350	U	340	U
Di-n-butylphthalate	340	U	340	U	340	U	340	U	350	U	340	U
Fluoranthene	340	U	340	U	340	U	340	U	350	U	340	U
Pyrene	340	U	85	%	76	%	340	U	350	U	340	U
Butylbenzylphthalate	340	U	340	U	340	U	340	U	350	U	340	U
3,3'-Dichlorobenzidine	340	U	340	U	340	U	340	U	350	U	340	U
Benzo(a)anthracene	340	U	340	U	340	U	340	U	350	U	340	U
Chrysene	340	U	340	U	340	U	340	U	350	U	340	U
bis(2-Ethylhexyl)phthalate	340	U	340	U	340	U	340	U	350	U	340	U
Di-n-octyl phthalate	340	U	340	U	340	U	340	U	350	U	340	U
Benzo(b)fluoranthene	340	U	340	U	340	U	340	U	350	U	340	U
Benzo(k)fluoranthene	340	U	340	U	340	U	340	U	350	U	340	U
Benzo(a)pyrene	340	U	340	U	340	U	340	U	350	U	340	U
Indeno(1,2,3-cd)pyrene	340	U	340	U	340	U	340	U	350	U	340	U
Dibenz(a,h)anthracene	340	U	340	U	340	U	340	U	350	U	340	U
Benzo(g,h,i)perylene	340	U	340	U	340	U	340	U	350	U	340	U

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WMH1

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A111217

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: 3 decanted: (Y/N) __ Date Extracted: 11/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/12/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WMH2

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A111216

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: 3 decanted: (Y/N) __ Date Extracted: 11/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/12/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WMH3

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A111505

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: 5 decanted: (Y/N) __ Date Extracted: 11/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/15/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

FORM 1 SV-TIC 3/90

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WMH4

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9910L555-004

Sample wt/vol: 30.1 (g/mL) G Lab File ID: A111506

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: 4 decanted: (Y/N) __ Date Extracted: 11/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/15/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	7.99	100	JA
2.	UNKNOWN	13.90	90	J
3.	UNKNOWN	16.24	90	J

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMH1	001	S	99LE1350	10/27/99	11/08/99	11/12/99
B0WMH1	001 MS	S	99LE1350	10/27/99	11/08/99	11/15/99
B0WMH1	001 MSD	S	99LE1350	10/27/99	11/08/99	11/15/99
B0WMH2	002	S	99LE1350	10/27/99	11/08/99	11/12/99
B0WMH3	003	S	99LE1350	10/27/99	11/08/99	11/15/99
B0WMH4	004	S	99LE1350	10/27/99	11/08/99	11/15/99
LAB QC:						
SBLKFW	MB1	S	99LE1350	N/A	11/08/99	11/12/99
SBLKFW	MB1 BS	S	99LE1350	N/A	11/08/99	11/12/99

RECRA LabNet Use Only

99101555

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: ~~B~~ TNX 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: 10/29/99 Date Due: 11/28/99

Account #:

Refrigerator #		1	2												
#/Type Container	Liquid														
	Solid	1AG	1AG					1AG	1AG		1AG				
Volume	Liquid														
	Solid	250	500					250	500		1000				
Preservatives		—	—					—	—		—				

ANALYSES REQUESTED →

ORGANIC							INORG							
VOA	BNA	Pest/PCB	Herb			PH	Metal	CN	IC Anion					
RECRA LabNet Use Only														
8024H 8015C	8025H 8015D	8080				IPH	Mtl O	CN TI	Ang O					

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb			PH	Metal	CN	IC Anion				
001	BOWMH 1			S	10/28/99	0850	1	1	X				1	1	X	1				
002	2					0856	1	1	X				1	1	X	1				
003	3					0931	1	1	X				1	1	X	1				
004	4					0953	1	1	X				1	1	X	1				

Special Instructions:

Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met ① As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se,
3. Ag, V, Zn, Hg
4. Ang ① IN3N2, INH3N, ICCL, ICFL, ICSO4,
5. ICNO2, ICNO3, ICPO4, ICRCr, ISFD
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

COC Tape was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 5.4 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/29/99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

NOTES:

4235 7953 1182

7110L 000

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.: ERC99-032	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: ~~TMA~~/RECRA AB 10-27-99	Offsite Property No.: A000014		Bill of Lading/Air Bill No.: AB 10-27-99 4235783182
			COA ~~B20671C~~ B20W671C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

			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			
				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										
155 BOWM41	Soil	10-27-99	0850		X	X	X	X	X		BOW801		
156 BOWM42	S	10-27-99	0856		X	X	X	X	X				
157 BOWM43	S	10-27-99	0931		X	X	X	X	X				
158 BOWM44	S	10-27-99	0953		X	X	X	X	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	10-27-99/1130	RJE 3B	10-27-99/1130
RJE 3B	10-28-99/0800	Rikki Thorson R. Thorson	10-28-99/0800
Rikki Thorson R. Thorson	10-28-99/1400	FED EX	
FED EX	10/29/99 0945	Vicki Vernon	10/29/99 0945

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

Temp 5.4

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# : 9910L555
SDG/SAF#: H0602/B99-078

W.O #: 10985-001-001-9999-00
Date Received: 10-29-99

DIESEL RANGE ORGANICS

The set of samples consisted of four (4) soil samples collected on 10-27-99.

The sample and its associated QC samples were prepared on 11-11-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-23,24-99. The analysis met the intent of method WTPH-D.

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

2. The sample preparation holding times for extraction was exceeded by one day. A copy of the Sample Discrepancy Report (SDR) has been enclosed in the data package.

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

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

5. All surrogate recoveries were within acceptance criteria.

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

JAN 2000
RECEIVED
Data
Log In

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-6-99
Date

r:\share\ic\gcscan\10-555d.doc

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

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

GLOSSARY OF 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 Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 99CC067

Initiator: C.Schnell
Date: 12/3/99
Client: TNW Hanford

RFW Batch: 9910L555
Samples: 1-4
Method: SW846/MCAWW/CLP/

Parameter: ODRO
Matrix: Soil
Prep Batch: 99CE1362

1. Reason for SDR

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

b. General Discrepancy

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

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

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

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

4. Project Manager Instructions...signature/date: [signature] 12/3/99

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

5. Final Action...signature/date: [signature] 12/3/99 Other Explanation:

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

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

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

L-WI-006/E-03/99

Recra LabNet - Lionville Laboratory

DIESEL RANGE ORGANICS BY GC

Report Date: 11/29/99 17:18

RFW Batch Number: **9910L555** Client: **TNU-HANFORD B99-078** Work Order: **10985-001-001-9999-00** Page: 1

004

	Cust ID:	B0WMH1	B0WMH1	B0WMH1	B0WMH2	B0WMH3	B0WMH4
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
Surrogate:	p-Terphenyl	87 %	92 %	91 %	75 %	77 %	78 %
Diesel Range Organics		4.1 U	106 %	101 %	4.0 U	4.2 U	4.1 U

	Cust ID:	BLK	BLK BS
Sample Information	RFW#:	99LE1362-MB1	99LE1362-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	mg/kg	mg/kg
Surrogate:	p-Terphenyl	82 %	92 %
Diesel Range Organics		4.0 U	84 %

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.

12/3/99

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMH1	001	S	99LE1362	10/27/99	11/11/99	11/23/99
B0WMH1	001 MS	S	99LE1362	10/27/99	11/11/99	11/23/99
B0WMH1	001 MSD	S	99LE1362	10/27/99	11/11/99	11/24/99
B0WMH2	002	S	99LE1362	10/27/99	11/11/99	11/24/99
B0WMH3	003	S	99LE1362	10/27/99	11/11/99	11/24/99
B0WMH4	004	S	99LE1362	10/27/99	11/11/99	11/24/99

LAB QC:

BLK	MB1	S	99LE1362	N/A	11/11/99	11/23/99
BLK	MB1 BS	S	99LE1362	N/A	11/11/99	11/23/99

11/23/99

RECRA LabNet Use Only

9910L555

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: The 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: 10/29/99 Date Due: 11/28/99

Account #:

Refrigerator #		1	2													
#/Type Container	Liquid															
	Solid	1AG	1AG					1AG	1AG		1AG					
Volume	Liquid															
	Solid	250	500					250	500		1000					
Preservatives		—	—					—	—		—					
ANALYSES REQUESTED	ORGANIC: VOA							PH	INORG: Total Metal		IC Anions					
	ORGANIC: BNA															
	ORGANIC: Pest/PCB															
	ORGANIC: Herb															
	INORG: CN															

RECRA LabNet Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H 0625C	0625H 0DRO	0PCB				1PH	Met①	Met②	Ang①
001	BOWMH 1			S	10/27/99	0850	1	1	X				1	1	X	1
002	2					0856	1	1	X				1	1	X	1
003	3					0931	1	1	X				1	1	X	1
004	4					0953	1	1	X				1	1	X	1

Special Instructions:

Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se,
3. Ag, V, Zn, Hg
4. Ang① = IN3N2, INH3N, ICCL, ICFL, ICSO4,
5. ICNO2, ICNO3, ICPO4, ICRCr, ISFD
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

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

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

Cooler Temp. 5-4 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/29/99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

NOTES:

4235 7953 1182

7110L 0JV

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.: ERC99-032	Field Logbook No.: EL-1511-1		Method of Shipment: FED EX
Shipped To: TMA/RECRA AB 10-27-99	Offsite Property No.: A000014		Bill of Lading/Air Bill No.: AB 10-27-99 4235783118
			COA: ~~B2067/C~~ B2CW067/C

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

Sample No.	Matrix *	Sample Date	Sample Time										
1 155 BOWM41	Soil	10-27-99	0850		X	X	X	X	X		BOW801		
2 156 BOWM42	S	10-27-99	0856		X	X	X	X	X				
3 157 BOWM43	S	10-27-99	0931		X	X	X	X	X				
4 158 BOWM44	S	10-27-99	0953		X	X	X	X	X				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 10-27-99/1130	Received By: AB 3B	Date/Time: 10-27-99/1130
Relinquished By: AB 3B	Date/Time: 10-28-99/0800	Received By: Rikki Thorsen R. Thorsen	Date/Time: 10-28-99/0800
Relinquished By: Rikki Thorsen R. Thorsen	Date/Time: 10-28-99/1420	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10/29/99 0945	Received By: [illegible]	Date/Time: 10/29/99 0945

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

Temp 5.4

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 #: 9910L555
SDG/SAF#: H0602/B99-078

W.O. #: #: 10985-001-001-9999-00
Date Received: 10-27-99

GC SCAN

The set of samples consisted of four (4) soil samples collected on 10-27-99.

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%.

JAN 2000
RECEIVED
Data
Log In

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-22-99
Date

r:\share\lc\gcscan\10-555.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 6 pages.

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

GLOSSARY OF 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 17:09

RFW Batch Number: **9910L555** Client: **TNU-HANFORD B99-078** Work Order: **10985-001-001-9999-00** Page: 1

	Cust ID:	B0WMH1	B0WMH1	B0WMH1	B0WMH2	B0WMH3	B0WMH4
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	134 %	130 %	5.0 U	4.8 U	4.8 U
Ethanol		5.0 U	4.8 U	5.0 U	5.0 U	4.8 U	4.8 U

	Cust ID:	BLK	BLK BS
Sample Information	RFW#:	99LLC168-MB1	99LLC168-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	mg/kg	mg/kg
n-Propyl Alcohol		5.0 U	131 %
Ethanol		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: 10/29/99 RFW LOT # :9910L555

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMH1	001	S	99LLC168	10/27/99	11/03/99	11/04/99
B0WMH1	001 MS	S	99LLC168	10/27/99	11/03/99	11/04/99
B0WMH1	001 MSD	S	99LLC168	10/27/99	11/03/99	11/04/99
B0WMH2	002	S	99LLC168	10/27/99	11/03/99	11/04/99
B0WMH3	003	S	99LLC168	10/27/99	11/03/99	11/04/99
B0WMH4	004	S	99LLC168	10/27/99	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

RECRA LabNet Use Only

9910L555

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: B 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 10/29/99 Date Due 11/28/99

Account #

Refrigerator #		1	2								1							
#/Type Container	Liquid																	
	Solid	1AG	1AG	1				1AG	1AG	1	1AG							
Volume	Liquid																	
	Solid	250	500	1				250	500	1	1000							
Preservatives		—	—					—	—		—							
ANALYSES REQUESTED	ORGANIC: VOA							PH	INORG: TOC Metal		CN	IC Anions						
	ORGANIC: BNA																	
	ORGANIC: Pest/PCB																	
	ORGANIC: Herb																	

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8024H CCASC	8025H CDRO	8080 CPOB				IPH	Metals	CN	Anions
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	BOWMH 1			S	10/29/99	0850	1	1	X				1	1	X	1
	002	2					0856	1	1	X				1	1	X	1
	003	3					0931	1	1	X				1	1	X	1
	004	4					0953	1	1	X				1	1	X	1

Special Instructions:

Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se,
3. Ag, V, Zn, Hg
4. Ang ① = IN3N2, INH3N, ICCL, ICFL, ICSO4,
5. ICNO2, ICNO3, ICPO4, ICRC6, ISFD
6.

Relinquished by	Received by	Date	Time
Fed Ex	[illegible]	10/29/99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 4235 7953 1182

RECRA LabNet Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___

Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N

2) Unbroken on Outer Package Y or N

3) Present on Sample Y or N

4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 5.4 °C

9910L 552

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.: ERC99-032	Field Logbook No.: EL-1511-1		Method of Shipment: FED EX
Shipped To: ~~TMA~~/RECRA AB 10-27-99	Offsite Property No.: A000014		Bill of Lading/Air Bill No.: AB 10-27-99 4235783182
			COA ~~B20671C~~ B20CW671C

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

	Sample No.	Matrix *	Sample Date	Sample Time									
155	BOWM41	Soil	10-27-99	0850		X	X	X	X	X		BOW801	
156	BOWM42	S	10-27-99	0856		X	X	X	X	X			
157	BOWM43	S	10-27-99	0931		X	X	X	X	X			
158	BOWM44	S	10-27-99	0953		X	X	X	X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 10-27-99/1130	Received By: Rick 3B	Date/Time: 10-27-99/1130
Relinquished By: Rick 3B	Date/Time: 10-28-99/0800	Received By: Rikki Thorsen R. Thorsen	Date/Time: 10-28-99/0800
Relinquished By: Rikki Thorsen R. Thorsen	Date/Time: 10-28-99/1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10/29/99 0945	Received By: Vicki Nemong	Date/Time: 10/29/99 0945

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

Temp 5.4

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

900

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-078
RFW#: 9910L555
SDG/SAF#: H0602/B99-078

W.O.#: 10985-001-001-9999-00
Date Received: 10-29-99

PCB

The set of samples consisted of four (4) soil samples collected on 10-27-99.

The samples and their associated QC samples were extracted on 11-04-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 11-11-99. 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. All cooler temperatures have 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 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. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-22-99
Date

JAN 2000
RECEIVED
Data
Log In

pef\r:\group\data\pest\10L555.pcb

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

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 GC

Report Date: 11/16/99 16:16

RFW Batch Number: **9910L555** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1

	Cust ID:	B0WMH1		B0WMH1		B0WMH1		B0WMH2		B0WMH3		B0WMH4	
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:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	100	%	95	%	98	%	108	%	102	%	85	%
	Decachlorobiphenyl	92	%	88	%	94	%	101	%	93	%	90	%
Aroclor-1016		34	U	34	U	34	U	34	U	35	U	35	U
Aroclor-1221		68	U	68	U	68	U	68	U	70	U	69	U
Aroclor-1232		34	U	34	U	34	U	34	U	35	U	35	U
Aroclor-1242		34	U	34	U	34	U	34	U	35	U	35	U
Aroclor-1248		34	U	34	U	34	U	34	U	35	U	35	U
Aroclor-1254		34	U	89	%	94	%	34	U	35	U	35	U
Aroclor-1260		34	U	34	U	34	U	34	U	35	U	35	U

	Cust ID:	PBLKYT		PBLKYT BS	
Sample Information	RFW#:	99LE1341-MB1		99LE1341-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	90	%	102	%
	Decachlorobiphenyl	86	%	101	%
Aroclor-1016		33	U	33	U
Aroclor-1221		67	U	67	U
Aroclor-1232		33	U	33	U
Aroclor-1242		33	U	33	U
Aroclor-1248		33	U	33	U
Aroclor-1254		33	U	96	%
Aroclor-1260		33	U	33	U

gw 11-19-99

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

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMH1	001	S	99LE1341	10/27/99	11/04/99	11/11/99
B0WMH1	001 MS	S	99LE1341	10/27/99	11/04/99	11/11/99
B0WMH1	001 MSD	S	99LE1341	10/27/99	11/04/99	11/11/99
B0WMH2	002	S	99LE1341	10/27/99	11/04/99	11/11/99
B0WMH3	003	S	99LE1341	10/27/99	11/04/99	11/11/99
B0WMH4	004	S	99LE1341	10/27/99	11/04/99	11/11/99

LAB QC:

PBLKYT	MB1	S	99LE1341	N/A	11/04/99	11/11/99
PBLKYT	MB1 BS	S	99LE1341	N/A	11/04/99	11/11/99

gw 11-19-99

RECRA LabNet Use Only: 9910L555

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: B 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: 10/29/99 Date Due: 11/28/99

Account #:

Refrigerator #		1	2								1					
#/Type Container	Liquid															
	Solid	1AG	1AG					1AG	1AG		1AG					
Volume	Liquid															
	Solid	250	500					250	500		1000					
Preservatives		—	—					—	—		—					
ANALYSES REQUESTED	ORGANIC: VOA								INORG: Total Metal							
	ORGANIC: BNA															
	ORGANIC: Pest/PCB															
	ORGANIC: Herb															
								PH			IC Anions					

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8024H 8015C	8025H 8DRO	8PCB				1PH	Met ①		Ang ①				
001	BOWMH 1			S	10/27/99	0850	1	1	X				1	1	X	1				
002	2					0856	1	1	X				1	1	X	1				
003	3					0931	1	1	X				1	1	X	1				
004	4					0953	1	1	X				1	1	X	1				

Special Instructions:

Saf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

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

Relinquished by	Received by	Date	Time
Ed Eo	[signature]	10/29/99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

COC Tape was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 5-4 °C

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

NOTES: 4235 7953 1182

44101 557

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.: ERC99-032	Field Logbook No.: EL-1511-1		Method of Shipment: FED EX
Shipped To: TMA/RECRA AB 10-27-99	Offsite Property No.: A000014		Bill of Lading/Air Bill No.: AB 10-27-99 4235783118
			COA ~~B20671C~~ B20CW671C

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

	Sample No.	Matrix *	Sample Date	Sample Time										
155	BOWM41	Soil	10-27-99	0850		X	X	X	X	X		BOW801		
156	BOWM42	S	10-27-99	0856		X	X	X	X	X				
3 157	BOWM43	S	10-27-99	0931		X	X	X	X	X				
4 158	BOWM44	S	10-27-99	0953		X	X	X	X	X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	Doug Bowers	10-27-99/1130	Received By: RCF 3B	10-27-99/1130
Relinquished By	RCF 3B	10-28-99/0800	Received By: Rikki Thoren	10-28-99/0800
Relinquished By: Rikki Thoren	R. Thoren	10-28-99/1400	Received By: FED EX	
Relinquished By: FED EX		10/29/99 0945	Received By: [illegible]	10/29/99 0945

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

Temp 5.4

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

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

JAN 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9910L555
SDG/SAF# : H0602/B99-078

W.O.# : 10985-001-001-9999-00
Date Received: 10-29-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 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 2 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 16 pages.

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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
BOWMH1	Antimony	500	102.8
	Silver	500	101.2

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

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-22-99
Date

mld/m10-555

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9910L555

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 11/22/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0WMH1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.7	MG/KG	0.24	1.0
		Barium, Total	51.5	MG/KG	0.02	1.0
		Beryllium, Total	0.22	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	5.3	MG/KG	0.06	1.0
		Copper, Total	12.8	MG/KG	0.04	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	6.8	MG/KG	0.09	1.0
		Lead, Total	2.5	MG/KG	0.18	1.0
		Antimony, Total	0.18 u	MG/KG	0.18	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Thallium, Total	0.48	MG/KG	0.38	1.0
		Vanadium, Total	53.5	MG/KG	0.05	1.0
		Zinc, Total	36.8	MG/KG	0.04	1.0
-002	B0WMH2	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.9	MG/KG	0.25	1.0
		Barium, Total	47.3	MG/KG	0.02	1.0
		Beryllium, Total	0.23	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	5.9	MG/KG	0.06	1.0
		Copper, Total	13.6	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	6.3	MG/KG	0.09	1.0
		Lead, Total	2.8	MG/KG	0.19	1.0
		Antimony, Total	0.19 u	MG/KG	0.19	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
		Thallium, Total	0.48	MG/KG	0.40	1.0
		Vanadium, Total	56.6	MG/KG	0.06	1.0
		Zinc, Total	38.7	MG/KG	0.05	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B0WMH3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.2	MG/KG	0.25	1.0
		Barium, Total	83.3	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	4.6	MG/KG	0.06	1.0
		Copper, Total	13.9	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	7.0	MG/KG	0.09	1.0
		Lead, Total	3.5	MG/KG	0.19	1.0
		Antimony, Total	0.19 u	MG/KG	0.19	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
		Thallium, Total	0.90	MG/KG	0.40	1.0
		Vanadium, Total	74.3	MG/KG	0.06	1.0
		Zinc, Total	51.8	MG/KG	0.05	1.0
-004	B0WMH4	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Arsenic, Total	2.5	MG/KG	0.21	1.0
		Barium, Total	62.8	MG/KG	0.02	1.0
		Beryllium, Total	0.23	MG/KG	0.02	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	5.3	MG/KG	0.05	1.0
		Copper, Total	12.2	MG/KG	0.04	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Nickel, Total	9.3	MG/KG	0.08	1.0
		Lead, Total	2.5	MG/KG	0.16	1.0
		Antimony, Total	0.16 u	MG/KG	0.16	1.0
		Selenium, Total	0.32 u	MG/KG	0.32	1.0
		Thallium, Total	0.77	MG/KG	0.34	1.0
		Vanadium, Total	48.4	MG/KG	0.05	1.0
		Zinc, Total	35.9	MG/KG	0.04	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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	99C0320-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0WMH1	Silver, Total	7.2	0.07u	4.3	167.4	1.0
		Arsenic, Total	164	3.7	172	92.7	1.0
		Barium, Total	214	51.5	172	94.3	1.0
		Beryllium, Total	3.8	0.22	4.3	83.3	1.0
		Cadmium, Total	3.9	0.04u	4.3	90.7	1.0
		Chromium, Total	20.1	5.3	17.2	86.0	1.0
		Copper, Total	34.5	12.8	21.6	100.5	1.0
		Mercury, Total	0.16	0.02u	0.15	106.0	1.0
		Nickel, Total	45.8	6.8	43.1	90.5	1.0
		Lead, Total	42.6	2.5	43.1	93.0	1.0
		Antimony, Total	22.5	0.18u	43.1	52.2	1.0
		Selenium, Total	156	0.36u	172	90.5	1.0
		Thallium, Total	154	0.48	172	89.2	1.0
		Vanadium, Total	104	53.5	43.1	116.9	1.0
		Zinc, Total	82.8	36.8	43.1	106.7	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0WMH1	Silver, Total	0.07u	0.07u	NC	1.0
		Arsenic, Total	3.7	3.7	0.00	1.0
		Barium, Total	51.5	56.7	9.6	1.0
		Beryllium, Total	0.22	0.24	7.6	1.0
		Cadmium, Total	0.04u	0.03u	NC	1.0
		Chromium, Total	5.3	4.5	16.3	1.0
		Copper, Total	12.8	14.2	10.4	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Nickel, Total	6.8	7.0	2.9	1.0
		Lead, Total	2.5	3.1	21.4	1.0
		Antimony, Total	0.18u	0.18u	NC	1.0
		Selenium, Total	0.36u	0.35u	NC	1.0
		Thallium, Total	0.48	0.58	19.1	1.0
		Vanadium, Total	53.5	64.4	18.5	1.0
		Zinc, Total	36.8	42.6	14.6	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0763-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	99C0320-LC1	Mercury, LCS	1.1	1.0	MG/KG	106.7

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMH1						
SILVER, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
SILVER, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
SILVER, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
ARSENIC, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
ARSENIC, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
ARSENIC, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
BARIUM, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
BARIUM, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
BARIUM, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
BERYLLIUM, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/09/99
BERYLLIUM, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/09/99
CADMIUM, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
CADMIUM, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
CADMIUM, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
CHROMIUM, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
CHROMIUM, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
CHROMIUM, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
COPPER, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
COPPER, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
COPPER, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
MERCURY, TOTAL	001	S	99C0320	10/27/99	11/01/99	11/03/99
MERCURY, TOTAL	001 REP	S	99C0320	10/27/99	11/01/99	11/03/99
MERCURY, TOTAL	001 MS	S	99C0320	10/27/99	11/01/99	11/03/99
NICKEL, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
NICKEL, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
NICKEL, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
LEAD, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
LEAD, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
LEAD, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
ANTIMONY, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
ANTIMONY, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
ANTIMONY, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
SELENIUM, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
SELENIUM, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
THALLIUM, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
THALLIUM, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
THALLIUM, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
VANADIUM, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
VANADIUM, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
VANADIUM, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
ZINC, TOTAL	001	S	99L0763	10/27/99	11/09/99	11/19/99
ZINC, TOTAL	001 REP	S	99L0763	10/27/99	11/09/99	11/19/99
ZINC, TOTAL	001 MS	S	99L0763	10/27/99	11/09/99	11/19/99
B0WMH2						
SILVER, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
ARSENIC, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
BARIUM, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
BERYLLIUM, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/09/99
CADMIUM, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
CHROMIUM, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
COPPER, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
MERCURY, TOTAL	002	S	99C0320	10/27/99	11/01/99	11/03/99
NICKEL, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
LEAD, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
ANTIMONY, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
SELENIUM, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
THALLIUM, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
VANADIUM, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
ZINC, TOTAL	002	S	99L0763	10/27/99	11/09/99	11/19/99
B0WMH3						
SILVER, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
ARSENIC, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
BARIUM, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
BERYLLIUM, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/09/99
CADMIUM, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
CHROMIUM, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
COPPER, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	003	S	99C0320	10/27/99	11/01/99	11/03/99
NICKEL, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
LEAD, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
ANTIMONY, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
SELENIUM, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
THALLIUM, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
VANADIUM, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
ZINC, TOTAL	003	S	99L0763	10/27/99	11/09/99	11/19/99
B0WMH4						
SILVER, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
ARSENIC, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
BARIUM, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
BERYLLIUM, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/09/99
CADMIUM, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
CHROMIUM, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
COPPER, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
MERCURY, TOTAL	004	S	99C0320	10/27/99	11/01/99	11/03/99
NICKEL, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
LEAD, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
ANTIMONY, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
SELENIUM, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
THALLIUM, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
VANADIUM, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99
ZINC, TOTAL	004	S	99L0763	10/27/99	11/09/99	11/19/99

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

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
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
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

9910L555

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: ~~B~~ 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: 10/29/99 Date Due: 11/28/99

Account #:

Refrigerator #		1	2													
#/Type Container	Liquid															
	Solid	1AG	1AG						1AG	1AG		1AG				
Volume	Liquid															
	Solid	250	500						250	500		1000				
Preservatives		—	—						—	—		—				
ANALYSES REQUESTED	ORGANIC: VOA								PH	INORG: Total Metal		IC 4 Ni ions				
	ORGANIC: BNA															
	ORGANIC: Pest/PCB															
	ORGANIC: Herb															
	INORG: CN															

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	OC 24H CCLSC	OC 25H ODRO	OPCB				IPH	MetO	ICNTN	AngO				
001	BOWMH 1			S	10/27/99	0850	1	1	X				1	1	X	1				
002	2					0856	1	1	X				1	1	X	1				
003	3					0931	1	1	X				1	1	X	1				
004	4					0953	1	1	X				1	1	X	1				

Special Instructions:

Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se,
3. Ag, V, Zn, Hg
4. Ang ① = IN3N2, IN H3N, ICCL, ICFL, ICSO4,
5. ICNO2, ICNO3, ICPO4, ICRCL, ISFD
6. 11/3/99 Sb + Tl added to all metals samples

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

COC Tape was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 5.4 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	10/29/99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

NOTES:

4235 7953 1182

7710L 000

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.: ERC99-032	Field Logbook No.: EL-1511-1		Method of Shipment: FED EX
Shipped To: ~~TMA~~/RECRA AB 10-27-99	Offsite Property No.: A000014		Bill of Lading/Air Bill No.: AB 10-27-99 4235785 3182
			COA ~~B2067/C~~ B2OCW167/C

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									
1155	BOWM41	Soil	10-27-99	0850		X	X	X	X	X		BOW801	
1155	BOWM42	S	10-27-99	0856		X	X	X	X	X		↓	
1171	BOWM43	S	10-27-99	0911		X	X	X	X	X		↓	
1177	BOWM44	S	10-27-99	0953		X	X	X	X	X		↓	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	10-27-99/1130
Received By:	ACF 3B	10-27-99/1130
Relinquished By:	Rick 3B	10-28-99/0800
Received By: Rikki Thorson	R. Thorson	10-28-99/0800
Relinquished By: Rikki Thorson	R. Thorson	10-28-99/1430
Received By:	FED EX	
Relinquished By:	Fed Ex	10/29/99 0945
Received By:	[illegible]	10/29/99 0945

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

Temp 5.4

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

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

JAN 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9910L555
SDG# : H0602
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 10-29-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

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

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

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

5. The method blanks were within method criteria.

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

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

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

12-21-99
Date

njp\i10-555

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 18 pages.

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: Ammonia **Method:** EPA 350.3

Other: Nitrate Nitrite **Method** EPA 353.2

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/20/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0WMH1	% Solids	97.5		%	0.01	1.0
		Chloride by IC	2.7		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	56		MG/KG	2.6	2.0
		Cyanide, Total	0.51	u	MG/KG	0.51	1.0
		Phosphate by IC	1.9		MG/KG	1.3	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Sulfate by IC	73.2		MG/KG	2.6	2.0
		Nitrate Nitrite	13.8		MG/KG	1.0	5.0
		Ammonia, as N	1.2	u	MG/KG	1.2	1.0
		pH	8.4		SOIL PH	0.01	1.0
		Sulfide	2.1	u	MG/KG	2.1	1.0
-002	B0WMH2	% Solids	97.4		%	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	57		MG/KG	2.6	2.0
		Cyanide, Total	0.51	u	MG/KG	0.51	1.0
		Phosphate by IC	1.5		MG/KG	1.3	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Sulfate by IC	21.3		MG/KG	1.3	1.0
		Nitrate Nitrite	12.6		MG/KG	1.0	5.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.8		SOIL PH	0.01	1.0
		Sulfide	3.6		MG/KG	2.1	1.0
-003	B0WMH3	% Solids	94.8		%	0.01	1.0
		Chloride by IC	4.2		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	44		MG/KG	1.3	1.0
		Cyanide, Total	0.53	u	MG/KG	0.53	1.0
		Phosphate by IC	1.4		MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	14.2		MG/KG	1.3	1.0
		Nitrate Nitrite	11.2		MG/KG	1.0	5.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.6		SOIL PH	0.01	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/20/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B0WMH3	Sulfide	7.8		MG/KG	2.1	1.0
-004	B0WMH4	% Solids	96.3		%	0.01	1.0
		Chloride by IC	2.2		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	18		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	7.6		MG/KG	1.3	1.0
		Nitrate Nitrite	3.9		MG/KG	0.19	1.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.7		SOIL PH	0.01	1.0
		Sulfide	3.6		MG/KG	2.1	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/20/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LCS102-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LFS102-MB1	Fluoride by IC	2.5	u	MG/KG	2.5	1.0
BLANK10	99L2S102-MB1	Nitrite by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99L3C103-MB1	Nitrate by IC	1.2	u	MG/KG	1.2	1.0
BLANK1	99LC123-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	99LPS102-MB1	Phosphate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LVI079-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	99LSC103-MB1	Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LN3C56-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	99LAM045-MB1	Ammonia, as N	1.2	u	MG/KG	1.2	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/20/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LSD065-MB1	Sulfide	2.0	u	MG/KG	2.0	1.0
BLANK10	99LZS102-MB1	Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LCC103-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LFC103-MB1	Fluoride by IC	2.5	u	MG/KG	2.5	1.0
BLANK10	99L2C103-MB1	Nitrite by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99L3S102-MB1	Nitrate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LPC103-MB1	Phosphate by IC	1.2	u	MG/KG	1.2	1.0

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INORGANICS ACCURACY REPORT 12/20/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0WMH1	Cyanide, Total	4.9	0.51u	5.1	96.5	1.0
-002	B0WMH2	Ammonia, as N	105	1.3 u	102	103.5	1.0
-003	B0WMH3	Chloride by IC	29.3	4.2	26.4	95.3	1.0
		Fluoride by IC	55.4	0.40	52.7	104.2	1.0
		Nitrite by IC	26	1.3 u	26	99.3	1.0
		Nitrate by IC	100	44	53	107.8	2.0
		Phosphate by IC	27.2	1.4	26.4	97.5	1.0
		Sulfate by IC	41.9	14.2	26.4	105.0	1.0
		Nitrate Nitrite	18.5	11.2	5.2	139.2	5.0
-004	B0WMH4	Soluble Chromium VI	4.3	0.42u	4.2	99.0	1.0
		Insoluble Chromium VI	1150	0.42u	1180	97.5	100
		Sulfide	370	3.6	415	88.2	1.0
BLANK10	99LCS102-MB1	Chloride by IC	23.9	1.2 u	25.0	95.7	1.0
BLANK10	99LFS102-MB1	Fluoride by IC	52.7	2.5 u	50.0	105.4	1.0
BLANK10	99L2S102-MB1	Nitrite by IC	24	1.2 u	25	97.7	1.0
BLANK10	99L3C103-MB1	Nitrate by IC	24	1.2 u	25	97.3	1.0
BLANK10	99LPS102-MB1	Phosphate by IC	24.8	1.2 u	25.0	99.2	1.0
BLANK10	99LVI079-MB1	Soluble Chromium VI	4.2	0.40u	4.0	105.6	1.0
		Insoluble Chromium VI	1120	0.40u	1160	96.2	100

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INORGANICS ACCURACY REPORT 12/20/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
BLANK10	99LSC103-MB1	Sulfate by IC	24.0	1.2 u	25.0	95.9	1.0
BLANK10	99LN3C56-MB1	Nitrate Nitrite	5.0	0.20u	5.0	100.4	1.0
		Nitrate Nitrite MSD	4.9	0.20u	5.0	97.4	1.0
BLANK10	99LAM045-MB1	Ammonia, as N	51.4	1.2 u	50.0	102.8	1.0
		Ammonia, as N MSD	50.6	1.2 u	50.0	101.2	1.0
BLANK10	99LSD065-MB1	Sulfide	9.1	2.0 u	10.0	91.0	1.0
BLANK10	99LZS102-MB1	Sulfate by IC	23.7	1.2 u	25.0	94.8	1.0
BLANK10	99LCC103-MB1	Chloride by IC	23.2	1.2 u	25.0	92.7	1.0
BLANK10	99LFC103-MB1	Fluoride by IC	51.8	2.5 u	50.0	103.5	1.0
BLANK10	99L2C103-MB1	Nitrite by IC	24	1.2 u	25	96.0	1.0
BLANK10	99L3S102-MB1	Nitrate by IC	23	1.2 u	25	94.0	1.0
BLANK10	99LPC103-MB1	Phosphate by IC	24.8	1.2 u	25.0	99.2	1.0

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INORGANICS DUPLICATE SPIKE REPORT 12/20/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	99LN3C56-MB1	Nitrate Nitrite	100.4	97.4	3.0
BLANK10	99LAM045-MB1	Ammonia, as N	102.8	101.2	1.5

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INORGANICS PRECISION REPORT 12/20/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0WMH1	% Solids	97.5	97.3	0.17	1.0
		Cyanide, Total	0.51u	0.51u	NC	1.0
		pH	8.4	8.4	0.1	1.0
-003REP	B0WMH3	Chloride by IC	4.2	4.4	6.4	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	44	48	10.1	1.0
		Phosphate by IC	1.4	1.3 u	NC	1.0
		Sulfate by IC	14.2	15.4	7.9	1.0
		Nitrate Nitrite	11.2	9.7	14.3	1.0
-004REP	B0WMH4	Sulfide	3.6	3.5	3.1	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/20/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9910L555

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99LC123-LC1	Cyanide, Total LCS	9.1	10	MG/KG	90.6
LCS2	99LC123-LC2	Cyanide, Total LCS	9.1	10	MG/KG	90.6

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WMH1						
% SOLIDS	001	S	99L%S145	10/27/99	11/01/99	11/01/99
% SOLIDS	001 REP	S	99L%S145	10/27/99	11/01/99	11/01/99
CHLORIDE BY IC	001	S	99LCS102	10/27/99	11/23/99	11/23/99
FLUORIDE BY IC	001	S	99LFS102	10/27/99	11/23/99	11/23/99
NITRITE BY IC	001	S	99L2S102	10/27/99	11/23/99	11/23/99
NITRATE BY IC	001	S	99L3C103	10/27/99	11/24/99	11/24/99
TOTAL CYANIDE	001	S	99LC123	10/27/99	11/03/99	11/03/99
TOTAL CYANIDE	001 REP	S	99LC123	10/27/99	11/03/99	11/03/99
TOTAL CYANIDE	001 MS	S	99LC123	10/27/99	11/03/99	11/03/99
PHOSPHATE BY IC	001	S	99LPS102	10/27/99	11/23/99	11/23/99
CHROMIUM VI	001	S	99LVI079	10/27/99	11/02/99	11/02/99
SULFATE BY IC	001	S	99LSC103	10/27/99	11/24/99	11/24/99
NITRATE NITRITE	001	S	99LN3C56	10/27/99	11/23/99	11/24/99
AMMONIA	001	S	99LAM045	10/27/99	11/19/99	11/19/99
PH	001	S	99LPH118	10/27/99	11/01/99	11/01/99
PH	001 REP	S	99LPH118	10/27/99	11/01/99	11/01/99
SULFIDE	001	S	99LSD065	10/27/99	11/02/99	11/02/99
B0WMH2						
% SOLIDS	002	S	99L%S145	10/27/99	11/01/99	11/01/99
CHLORIDE BY IC	002	S	99LCS102	10/27/99	11/23/99	11/23/99
FLUORIDE BY IC	002	S	99LFS102	10/27/99	11/23/99	11/23/99
NITRITE BY IC	002	S	99L2S102	10/27/99	11/23/99	11/23/99
NITRATE BY IC	002	S	99L3C103	10/27/99	11/24/99	11/24/99
TOTAL CYANIDE	002	S	99LC123	10/27/99	11/03/99	11/03/99
PHOSPHATE BY IC	002	S	99LPS102	10/27/99	11/23/99	11/23/99
CHROMIUM VI	002	S	99LVI079	10/27/99	11/02/99	11/02/99
SULFATE BY IC	002	S	99LZS102	10/27/99	11/23/99	11/23/99
NITRATE NITRITE	002	S	99LN3C56	10/27/99	11/23/99	11/24/99
AMMONIA	002	S	99LAM045	10/27/99	11/19/99	11/19/99
AMMONIA	002 MS	S	99LAM045	10/27/99	11/19/99	11/19/99
PH	002	S	99LPH118	10/27/99	11/01/99	11/01/99
SULFIDE	002	S	99LSD065	10/27/99	11/02/99	11/02/99
B0WMH3						
% SOLIDS	003	S	99L%S145	10/27/99	11/01/99	11/01/99

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	003	S	99LCS102	10/27/99	11/23/99	11/23/99
CHLORIDE BY IC	003 REP	S	99LCS102	10/27/99	11/23/99	11/23/99
CHLORIDE BY IC	003 MS	S	99LCC103	10/27/99	11/24/99	11/24/99
FLUORIDE BY IC	003	S	99LFS102	10/27/99	11/23/99	11/23/99
FLUORIDE BY IC	003 REP	S	99LFS102	10/27/99	11/23/99	11/23/99
FLUORIDE BY IC	003 MS	S	99LFC103	10/27/99	11/24/99	11/24/99
NITRITE BY IC	003	S	99L2S102	10/27/99	11/23/99	11/23/99
NITRITE BY IC	003 REP	S	99L2S102	10/27/99	11/23/99	11/23/99
NITRITE BY IC	003 MS	S	99L2C103	10/27/99	11/24/99	11/24/99
NITRATE BY IC	003	S	99L3S102	10/27/99	11/23/99	11/23/99
NITRATE BY IC	003 REP	S	99L3S102	10/27/99	11/23/99	11/23/99
NITRATE BY IC	003 MS	S	99L3C103	10/27/99	11/24/99	11/24/99
TOTAL CYANIDE	003	S	99LC123	10/27/99	11/03/99	11/03/99
PHOSPHATE BY IC	003	S	99LPS102	10/27/99	11/23/99	11/23/99
PHOSPHATE BY IC	003 REP	S	99LPS102	10/27/99	11/23/99	11/23/99
PHOSPHATE BY IC	003 MS	S	99LPC103	10/27/99	11/24/99	11/24/99
CHROMIUM VI	003	S	99LVI079	10/27/99	11/02/99	11/02/99
SULFATE BY IC	003	S	99LZS102	10/27/99	11/23/99	11/23/99
SULFATE BY IC	003 REP	S	99LZS102	10/27/99	11/23/99	11/23/99
SULFATE BY IC	003 MS	S	99LSC103	10/27/99	11/24/99	11/24/99
NITRATE NITRITE	003	S	99LN3C56	10/27/99	11/23/99	11/24/99
NITRATE NITRITE	003 REP	S	99LN3C56	10/27/99	11/23/99	11/24/99
NITRATE NITRITE	003 MS	S	99LN3C56	10/27/99	11/23/99	11/24/99
AMMONIA	003	S	99LAM045	10/27/99	11/19/99	11/19/99
PH	003	S	99LPH118	10/27/99	11/01/99	11/01/99
SULFIDE	003	S	99LSD065	10/27/99	11/02/99	11/02/99
B0WMH4						
% SOLIDS	004	S	99L%S145	10/27/99	11/01/99	11/01/99
CHLORIDE BY IC	004	S	99LCS102	10/27/99	11/23/99	11/23/99
FLUORIDE BY IC	004	S	99LFS102	10/27/99	11/23/99	11/23/99
NITRITE BY IC	004	S	99L2S102	10/27/99	11/23/99	11/23/99
NITRATE BY IC	004	S	99L3S102	10/27/99	11/23/99	11/23/99
TOTAL CYANIDE	004	S	99LC123	10/27/99	11/03/99	11/03/99
PHOSPHATE BY IC	004	S	99LPS102	10/27/99	11/23/99	11/23/99
CHROMIUM VI	004	S	99LVI079	10/27/99	11/02/99	11/02/99
CHROMIUM VI	004 MS	S	99LVI079	10/27/99	11/02/99	11/02/99

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	004 MSD	S	99LVI079	10/27/99	11/02/99	11/02/99
SULFATE BY IC	004	S	99LZS102	10/27/99	11/23/99	11/23/99
NITRATE NITRITE	004	S	99LN3C56	10/27/99	11/23/99	11/24/99
AMMONIA	004	S	99LAM045	10/27/99	11/19/99	11/19/99
PH	004	S	99LPH118	10/27/99	11/01/99	11/01/99
SULFIDE	004	S	99LSD065	10/27/99	11/02/99	11/02/99
SULFIDE	004 REP	S	99LSD065	10/27/99	11/02/99	11/02/99
SULFIDE	004 MS	S	99LSD065	10/27/99	11/02/99	11/02/99

LAB QC:

CHLORIDE BY IC	MB1	S	99LCS102	N/A	11/23/99	11/23/99
CHLORIDE BY IC	MB1 BS	S	99LCS102	N/A	11/23/99	11/23/99
FLUORIDE BY IC	MB1	S	99LFS102	N/A	11/23/99	11/23/99
FLUORIDE BY IC	MB1 BS	S	99LFS102	N/A	11/23/99	11/23/99
NITRITE BY IC	MB1	S	99L2S102	N/A	11/23/99	11/23/99
NITRITE BY IC	MB1 BS	S	99L2S102	N/A	11/23/99	11/23/99
NITRATE BY IC	MB1	S	99L3C103	N/A	11/24/99	11/24/99
NITRATE BY IC	MB1 BS	S	99L3C103	N/A	11/24/99	11/24/99
TOTAL CYANIDE	LC1 L	S	99LC123	N/A	11/03/99	11/03/99
TOTAL CYANIDE	LC2 L	S	99LC123	N/A	11/03/99	11/03/99
TOTAL CYANIDE	MB1	S	99LC123	N/A	11/03/99	11/03/99
PHOSPHATE BY IC	MB1	S	99LPS102	N/A	11/23/99	11/23/99
PHOSPHATE BY IC	MB1 BS	S	99LPS102	N/A	11/23/99	11/23/99
CHROMIUM VI	MB1	S	99LVI079	N/A	11/02/99	11/02/99
CHROMIUM VI	MB1 BS	S	99LVI079	N/A	11/02/99	11/02/99
CHROMIUM VI	MB1 BSD	S	99LVI079	N/A	11/02/99	11/02/99
SULFATE BY IC	MB1	S	99LSC103	N/A	11/24/99	11/24/99
SULFATE BY IC	MB1 BS	S	99LSC103	N/A	11/24/99	11/24/99
NITRATE NITRITE	MB1	S	99LN3C56	N/A	11/23/99	11/24/99
NITRATE NITRITE	MB1 BS	S	99LN3C56	N/A	11/23/99	11/24/99
NITRATE NITRITE	MB1 BSD	S	99LN3C56	N/A	11/23/99	11/24/99
AMMONIA	MB1	S	99LAM045	N/A	11/19/99	11/19/99
AMMONIA	MB1 BS	S	99LAM045	N/A	11/19/99	11/19/99
AMMONIA	MB1 BSD	S	99LAM045	N/A	11/19/99	11/19/99
SULFIDE	MB1	S	99LSD065	N/A	11/02/99	11/02/99
SULFIDE	MB1 BS	S	99LSD065	N/A	11/02/99	11/02/99
SULFATE BY IC	MB1	S	99LZS102	N/A	11/23/99	11/23/99

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

DATE RECEIVED: 10/29/99 RFW LOT # :9910L555

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFATE BY IC	MB1 BS	S	99LZS102	N/A	11/23/99	11/23/99
CHLORIDE BY IC	MB1	S	99LCC103	N/A	11/24/99	11/24/99
CHLORIDE BY IC	MB1 BS	S	99LCC103	N/A	11/24/99	11/24/99
FLUORIDE BY IC	MB1	S	99LFC103	N/A	11/24/99	11/24/99
FLUORIDE BY IC	MB1 BS	S	99LFC103	N/A	11/24/99	11/24/99
NITRITE BY IC	MB1	S	99L2C103	N/A	11/24/99	11/24/99
NITRITE BY IC	MB1 BS	S	99L2C103	N/A	11/24/99	11/24/99
NITRATE BY IC	MB1	S	99L3S102	N/A	11/23/99	11/23/99
NITRATE BY IC	MB1 BS	S	99L3S102	N/A	11/23/99	11/23/99
PHOSPHATE BY IC	MB1	S	99LPC103	N/A	11/24/99	11/24/99
PHOSPHATE BY IC	MB1 BS	S	99LPC103	N/A	11/24/99	11/24/99

RECRA LabNet Use Only

9910L555

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: ~~B~~ 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: 10/29/99 Date Due: 11/28/99

Account #:

Refrigerator #		1	2								1					
#/Type Container	Liquid															
	Solid	1AG	1AG	1					1AG	1AG	1	1AG				
Volume	Liquid															
	Solid	250	500	1					250	500	1	1000				
Preservatives		—	—						—	—		—				
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb					PH	INORG: TOC Metal	CN	IC Anions				
RECRA LabNet Use Only	OG24H OG25C	OG25H ODRO	OPCB						IPH	MetO	IcnO	AngO				

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
D - 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	OG24H OG25C	OG25H ODRO	OPCB				IPH	MetO	IcnO	AngO				
001	BOWMH 1			S	10/27/99	0850	1	1	X				1	1	X	1				
002	2					0856	1	1	X				1	1	X	1				
003	3					0931	1	1	X				1	1	X	1				
004	4					0953	1	1	X				1	1	X	1				

Special Instructions:

Daf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met ① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se,
3. Ag, V, Zn, Hg
4. AngO = IN3N2, IN3H3N, ICCL, ICFL, ICSO4,
5. ICNO2, ICNO3, ICPO4, ICRG, ISFD
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

COC Tape was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 5.4 °C

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

NOTES: 4235 7953 1182

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	10/29/99	0745

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.: ERC99-032	Field Logbook No.: EL-1511		Method of Shipment: FED EX
Shipped To: TMA/RECRA AB 10-27-99	Offsite Property No.: A000014		Bill of Lading/Air Bill No.: AB 10-27-99 4235783182
			COA: ~~B2067/C~~ B2067/C

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									
155	BOWM41	Soil	10-27-99	0850		X	X	X	X	X		BOW801	
156	BOWM42	S	10-27-99	0856		X	X	X	X	X			
157	BOWM43	S	10-27-99	0931		X	X	X	X	X			
158	BOWM44	S	10-27-99	0953		X	X	X	X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 10-27-99/1130	Received By: Rick Bo	Date/Time: 10-27-99/1130
Relinquished By: Rick Bo	Date/Time: 10-28-99/0800	Received By: Rikki Thorsen	Date/Time: 10-28-99/0800
Relinquished By: Rikki Thorsen	Date/Time: 10-28-99/1400	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10/29/99 0945	Received By: Vicki Vermong	Date/Time: 10/29/99 0945
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	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

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

Temp 5.4

SDR # B00-044
Revision #: 0
Date Initiated: 01/14/00

SAMPLE DISPOSITION RECORD

SAF: B00-078
OU: 200-CW-1
Project ID: 200-CW-1
Task ID: 1
Sampling Event: 200 Area Source Characterization 200-CW-1 OU

Laboratory: TMA/RECRA

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 21
ID Numbers: see attachment
Matrix: Soil
Collection Date: 09/07/99 – 10/27/99

Issue Background:

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

Type: Addition of Analyses

Description: Addition of Thallium and Antimony Analyses

Disposition:

Description: The 200-CW-1 characterization project requested that thallium and antimony results be reported for the listed samples. ERC Sample Management requested the laboratory to report thallium and antimony results from the existing ICP analyses for the listed samples.

Justification: The project determined that thallium and antimony results were needed to meet the project data quality objectives.

Approval Signatures:

S. J. Trent 1/19/00
Project Coordinator (Print/Sign Name) Date

M. E. Todd
Task Manager (Print/Sign Name) Date

B0W9M2
B0W9M5
B0W9V0
B0W9V1
B0W9V3
B0WBT1
B0WBT3
B0W9M3
B0W9M4
B0W9M0
B0W9V2
B0W9R7
B0WBT2
B0WMF3
B0WMH2
B0WMH3
B0WMF1
B0WMF6
B0WMH1
B0WMH4
B0WMF2

H0602-TMA/KECRA

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0602 was composed of four solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source Characterization – 200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. The results were transmitted to BHI via facsimile on January 20, 2000.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.3 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Uranium Analyses

BHI did not request any of the samples be analyzed for Isotopic Uranium after reporting the Total Uranium results on November 27, 1999 via facsimile.

2.5 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.6 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.7 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

JAN 2000
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

SDG 7266
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0602

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0WMH1	200 B Pond	SOLID		N911006-01	B99-012	B99-078-144	10/27/99 08:50
B0WMH2	200 B Pond	SOLID		N911006-02	B99-012	B99-078-144	10/27/99 08:56
B0WMH3	200 B Pond	SOLID		N911006-03	B99-012	B99-078-144	10/27/99 09:31
B0WMH4	200 B Pond	SOLID		N911006-04	B99-012	B99-078-144	10/27/99 09:53
Method Blank		SOLID		N911006-06	B99-012		
Method Blank		SOLID		N911006-09	B99-012		
Lab Control Sample		SOLID		N911006-05	B99-012		
Lab Control Sample		SOLID		N911006-08	B99-012		
Duplicate (N911006-01)	200 B Pond	SOLID		N911006-07	B99-012		10/27/99 08:50
Duplicate (N911006-01)	200 B Pond	SOLID		N911006-10	B99-012		10/27/99 08:50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

SDG 7266
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0602

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
7266	B99-078-144	B0WMH1	SOLID	97.0			10/29/99	2	N911006-01	7266-001
		B0WMH2	SOLID	96.7			10/29/99	2	N911006-02	7266-002
		B0WMH3	SOLID	95.2			10/29/99	2	N911006-03	7266-003
		B0WMH4	SOLID	96.1			10/29/99	2	N911006-04	7266-004
		Method Blank	SOLID						N911006-06	7266-006
		Method Blank	SOLID						N911006-09	7266-009
		Lab Control Sample	SOLID						N911006-05	7266-005
		Lab Control Sample	SOLID						N911006-08	7266-008
		Duplicate (N911006-01)	SOLID				10/29/99	2	N911006-07	7266-007
		Duplicate (N911006-01)	SOLID				10/29/99	2	N911006-10	7266-010

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

SDG 7266
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0602

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6909-008	5.0	4			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6909-008	5.0	4			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6909-008	5.0	4			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6909-008	10.0	4			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6909-008	15.0	4			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	6909-008	9.0	4			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

WORK SUMMARY

SDG 7266
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0602

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0WMH1			N911006-01	7266-001	AM		01/03/00	01/20/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/27/99	7266-001	GAM		12/13/99	01/20/00	MCM	Gamma Scan
B99-078-144	B99-012		10/29/99	7266-001	PU		01/06/00	01/20/00	MCM	Plutonium, Isotopic in Solids
				7266-001	SR		12/21/99	01/20/00	MCM	Total Strontium in Soil
				7266-001	TH		01/18/00	01/20/00	MCM	Thorium, Isotopic in Soil
				7266-001	U_T		11/18/99	01/20/00	MCM	Uranium, Total in Soil
B0WMH2			N911006-02	7266-002	AM		01/03/00	01/20/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/27/99	7266-002	GAM		12/14/99	01/20/00	MCM	Gamma Scan
B99-078-144	B99-012		10/29/99	7266-002	PU		01/05/00	01/20/00	MCM	Plutonium, Isotopic in Solids
				7266-002	SR		12/21/99	01/20/00	MCM	Total Strontium in Soil
				7266-002	TH		01/18/00	01/20/00	MCM	Thorium, Isotopic in Soil
				7266-002	U_T		11/18/99	01/20/00	MCM	Uranium, Total in Soil
B0WMH3			N911006-03	7266-003	AM		01/05/00	01/20/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/27/99	7266-003	GAM		12/14/99	01/20/00	MCM	Gamma Scan
B99-078-144	B99-012		10/29/99	7266-003	PU		01/05/00	01/20/00	MCM	Plutonium, Isotopic in Solids
				7266-003	SR		12/21/99	01/20/00	MCM	Total Strontium in Soil
				7266-003	TH		01/18/00	01/20/00	MCM	Thorium, Isotopic in Soil
				7266-003	U_T		11/18/99	01/20/00	MCM	Uranium, Total in Soil
B0WMH4			N911006-04	7266-004	AM		01/05/00	01/20/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/27/99	7266-004	GAM		12/14/99	01/20/00	MCM	Gamma Scan
B99-078-144	B99-012		10/29/99	7266-004	PU		01/05/00	01/20/00	MCM	Plutonium, Isotopic in Solids
				7266-004	SR		12/22/99	01/20/00	MCM	Total Strontium in Soil
				7266-004	TH		01/18/00	01/20/00	MCM	Thorium, Isotopic in Soil
				7266-004	U_T		11/18/99	01/20/00	MCM	Uranium, Total in Soil
Method Blank			N911006-06	7266-006	AM		01/03/00	01/20/00	MCM	Americium 241 in Soil
		SOLID		7266-006	GAM		12/14/99	01/20/00	MCM	Gamma Scan
	B99-012			7266-006	PU		01/03/00	01/20/00	MCM	Plutonium, Isotopic in Solids
				7266-006	SR		12/22/99	01/20/00	MCM	Total Strontium in Soil
				7266-006	TH		01/19/00	01/20/00	MCM	Thorium, Isotopic in Soil
Method Blank			N911006-09	7266-009	U_T		01/18/99	01/20/00	MCM	Uranium, Total in Soil
		SOLID								
	B99-012									

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

SDG 7266
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0602

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			N911006-05	7266-005	AM		01/03/00	01/20/00	MCM	Americium 241 in Soil
		SOLID		7266-005	GAM		12/14/99	01/20/00	MCM	Gamma Scan
	B99-012			7266-005	PU		01/05/00	01/20/00	MCM	Plutonium, Isotopic in Solids
				7266-005	SR		12/22/99	01/20/00	MCM	Total Strontium in Soil
				7266-005	TH		01/19/00	01/20/00	MCM	Thorium, Isotopic in Soil
Lab Control Sample			N911006-08	7266-008	U_T		11/18/99	01/20/00	MCM	Uranium, Total in Soil
		SOLID								
	B99-012									
Duplicate (N911006-01)			N911006-07	7266-007	AM		01/05/00	01/20/00	MCM	Americium 241 in Soil
200 B Pond		SOLID	10/27/99	7266-007	GAM		12/14/99	01/20/00	MCM	Gamma Scan
	B99-012		10/29/99	7266-007	PU		01/05/00	01/20/00	MCM	Plutonium, Isotopic in Solids
				7266-007	SR		12/22/99	01/20/00	MCM	Total Strontium in Soil
				7266-007	TH		01/18/00	01/20/00	MCM	Thorium, Isotopic in Soil
Duplicate (N911006-01)			N911006-10	7266-010	U_T		11/18/99	01/20/00	MCM	Uranium, Total in Soil
200 B Pond		SOLID	10/27/99							
	B99-012		10/29/99							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-012	Americium 241 in Soil	AM/CMPLATE	4			1	1	1	7
GAM	B99-012	Gamma Scan	GAMMAHI	4			1	1	1	7
PU	B99-012	Plutonium, Isotopic in Solids	PUPLATE	4			1	1	1	7
SR	B99-012	Total Strontium in Soil	SRTOTAL	4			1	1	1	7
TH	B99-012	Thorium, Isotopic in Soil	THPLATE	4			1	1	1	7
U_T	B99-012	Uranium, Total in Soil	UKPA	4			1	1	1	7
TOTALS				24			6	6	6	42

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-06 Method Blank

METHOD BLANK

SDG	7266	Client/Case no	Hanford	SDG H0602	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N911006-06	Client sample id	Method Blank		
Dept sample id	7266-006	Material/Matrix		SOLID	
		SAF No	B99-012		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.020	0.033	0.063	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.003	0.026	0.051	1.0	U	PU
Americium 241	14596-10-2	0.028	0.030	0.046	1.0	U	AM
Total Strontium	SR-RAD	-0.043	0.076	0.14	1.0	U	SR
Thorium 228	14274-82-9	0.009	0.072	0.15	1.0	U	TH
Thorium 230	14269-63-7	0.108	0.11	0.16	1.0	U	TH
Thorium 232	TH-232	0.009	0.018	0.069	1.0	U	TH
Potassium 40	13966-00-2	U		1.5		U	GAM
Cobalt 60	10198-40-0	U		0.055	0.050	U	GAM
Cesium 137	10045-97-3	U		0.054	0.10	U	GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	U		0.10	0.10	U	GAM
Radium 228	15262-20-1	U		0.24	0.20	U	GAM
Thorium 228	14274-82-9	U		0.072		U	GAM
Thorium 232	TH-232	U		0.24		U	GAM
Americium 241	14596-10-2	U		0.054		U	GAM
Uranium 238	U-238	U		5.2		U	GAM
Uranium 235	15117-96-1	U		0.19		U	GAM

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

QC-BLANK 32748

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-09 Method Blank

METHOD BLANK

SDG	7266	Client/Case no	Hanford	SDG	H0602
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N911006-09	Client sample id	Method Blank		
Dept sample id	7266-009	Material/Matrix		SOLID	
		SAF No	B99-012		

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	-0.005	0.002	0.004	1.0	U	U_T

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

QC-BLANK 32390

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-05 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7266 Client/Case no Hanford SDG H0602

Contact Melissa C. Mannion Case no TRB-SBB-207925

Lab sample id N911006-05 Client sample id Lab Control Sample

Dept sample id 7266-005 Material/Matrix SOLID

SAF No B99-012

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
Plutonium 238	9.84	0.79	0.033	1.0		PU	10.0	0.40	98	85-115	80-120
Plutonium 239/240	10.1	0.80	0.033	1.0		PU	10.6	0.42	95	85-115	80-120
Americium 241	9.48	0.57	0.041	1.0		AM	9.58	0.38	99	87-113	80-120
Total Strontium	11.7	0.71	0.47	1.0		SR	11.3	0.45	104	81-119	
Thorium 228	0.203	0.15	0.25	1.0	U	TH					
Thorium 230	21.4	1.5	0.17	1.0		TH	20.4	0.82	105	85-115	
Thorium 232	0.013	0.051	0.12	1.0	U	TH					
Cobalt 60	1.57	0.078	0.048	0.050		GAM	1.43	0.057	110	73-127	80-120
Cesium 137	1.62	0.074	0.059	0.10		GAM	1.50	0.060	108	74-126	80-120

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

QC-LCS 32747

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-08 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7266 Client/Case no Hanford SDG H0602

Contact Melissa C. Mannion Case no TRB-SBB-207925

Lab sample id N911006-08 Client sample id Lab Control Sample

Dept sample id 7266-008 Material/Matrix SOLID

SAF No B99-012

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium (ug/g)	28.4	3.7	0.039	1.0		U_T	33.0	1.3	86	79-121	80-120

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

QC-LCS 32389

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-07

B0WMH1

DUPLICATE

SDG	7266			Client/Case no	Hanford SDG H0602
Contact	Melissa C. Mannion			Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL			
Lab sample id	N911006-07	Lab sample id	N911006-01	Client sample id	B0WMH1
Dept sample id	7266-007	Dept sample id	7266-001	Location/Matrix	200 B Pond SOLID
		Received	10/29/99	Collected	10/27/99 08:50
		% solids	97.0	Custody/SAF No	B99-078-144 B99-012

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
Plutonium 238	0	0.010	0.036	1.0	U	PU	0.064	0.047	0.045	J	200	226	
Plutonium 239/240	-0.005	0.019	0.045	1.0	U	PU	0.035	0.035	0.044	U	-		
Americium 241	0.012	0.016	0.031	1.0	U	AM	-0.015	0.015	0.040	U	-		
Total Strontium	2.00	0.31	0.26	1.0		SR	2.33	0.18	0.13		15	33	
Thorium 228	0.414	0.17	0.22	1.0	J	TH	0.363	0.14	0.15	J	13	86	
Thorium 230	0.814	0.25	0.22	1.0	J	TH	0.830	0.19	0.15	J	2	58	
Thorium 232	0.365	0.15	0.13	1.0	J	TH	0.476	0.12	0.066	J	26	69	
Potassium 40	10.6	0.44	0.21			GAM	10.9	0.37	0.14		3	33	
Cobalt 60	U		0.023	0.050	U	GAM	U		0.016	U	-		
Cesium 137	U		0.019	0.10	U	GAM	U		0.014	U	-		
Europium 152	U		0.046	0.10	U	GAM	U		0.040	U	-		
Europium 154	U		0.079	0.10	U	GAM	U		0.059	U	-		
Europium 155	U		0.041	0.10	U	GAM	U		0.042	U	-		
Radium 226	0.413	0.040	0.040	0.10		GAM	0.403	0.030	0.028		2	37	
Radium 228	0.558	0.087	0.087	0.20		GAM	0.621	0.071	0.067		11	43	
Thorium 228	0.556	0.025	0.024			GAM	0.556	0.023	0.020		0	33	
Thorium 232	0.558	0.087	0.087			GAM	0.621	0.071	0.067		11	43	
Americium 241	U		0.032		U	GAM	U		0.051	U	-		
Uranium 238	U		2.8		U	GAM	U		1.9	U	-		
Uranium 235	U		0.068		U	GAM	U		0.13	U	-		

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

QC-DUP#1 32749

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-10 B0WMH1

DUPLICATE

SDG	7266			Client/Case no	Hanford SDG H0602
Contact	Melissa C. Mannion			Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL			
Lab sample id	N911006-10	Lab sample id	N911006-01	Client sample id	B0WMH1
Dept sample id	7266-010	Dept sample id	7266-001	Location/Matrix	200 B Pond SOLID
		Received	10/29/99	Collected	10/27/99 08:50
		% solids	97.0	Custody/SAF No	B99-078-144 B99-012

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Total Uranium (ug/g)	0.587	0.075	0.004	1.0	J	U_T	0.619	0.080	0.004	J	5	33	

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

QC-DUP#1 32391

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-01 B0WMH1

DATA SHEET

SDG	7266	Client/Case no	Hanford SDG H0602
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N911006-01	Client sample id	B0WMH1
Dept sample id	7266-001	Location/Matrix	200 B Pond SOLID
Received	10/29/99	Collected	10/27/99 08:50
% solids	97.0	Custody/SAF No	B99-078-144 B99-012

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	0.619	0.080	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	0.064	0.047	0.045	1.0	J	PU
Plutonium 239/240	PU-239/240	0.035	0.035	0.044	1.0	U	PU
Americium 241	14596-10-2	-0.015	0.015	0.040	1.0	U	AM
Total Strontium	SR-RAD	2.33	0.18	0.13	1.0		SR
Thorium 228	14274-82-9	0.363	0.14	0.15	1.0	J	TH
Thorium 230	14269-63-7	0.830	0.19	0.15	1.0	J	TH
Thorium 232	TH-232	0.476	0.12	0.066	1.0	J	TH
Potassium 40	13966-00-2	10.9	0.37	0.14			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	U		0.014	0.10	U	GAM
Europium 152	14683-23-9	U		0.040	0.10	U	GAM
Europium 154	15585-10-1	U		0.059	0.10	U	GAM
Europium 155	14391-16-3	U		0.042	0.10	U	GAM
Radium 226	13982-63-3	0.403	0.030	0.028	0.10		GAM
Radium 228	15262-20-1	0.621	0.071	0.067	0.20		GAM
Thorium 228	14274-82-9	0.556	0.023	0.020			GAM
Thorium 232	TH-232	0.621	0.071	0.067			GAM
Americium 241	14596-10-2	U		0.051		U	GAM
Uranium 238	U-238	U		1.9		U	GAM
Uranium 235	15117-96-1	U		0.13		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-02 B0WMH2

DATA SHEET

SDG	7266	Client/Case no	Hanford	SDG H0602	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N911006-02	Client sample id	B0WMH2		
Dept sample id	7266-002	Location/Matrix	200 B Pond	SOLID	
Received	10/29/99	Collected	10/27/99 08:56		
% solids	96.7	Custody/SAF No	B99-078-144	B99-012	

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	0.511	0.065	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	-0.005	0.021	0.051	1.0	U	PU
Plutonium 239/240	PU-239/240	0.016	0.032	0.051	1.0	U	PU
Americium 241	14596-10-2	0.008	0.023	0.047	1.0	U	AM
Total Strontium	SR-RAD	-0.043	0.11	0.15	1.0	U	SR
Thorium 228	14274-82-9	0.450	0.16	0.18	1.0	J	TH
Thorium 230	14269-63-7	0.441	0.16	0.17	1.0	J	TH
Thorium 232	TH-232	0.441	0.12	0.066	1.0	J	TH
Potassium 40	13966-00-2	10.5	0.42	0.19			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.10	U	GAM
Europium 152	14683-23-9	U		0.049	0.10	U	GAM
Europium 154	15585-10-1	U		0.065	0.10	U	GAM
Europium 155	14391-16-3	U		0.050	0.10	U	GAM
Radium 226	13982-63-3	0.378	0.034	0.035	0.10		GAM
Radium 228	15262-20-1	0.565	0.080	0.084	0.20		GAM
Thorium 228	14274-82-9	0.527	0.024	0.024			GAM
Thorium 232	TH-232	0.565	0.080	0.084			GAM
Americium 241	14596-10-2	U		0.073		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Uranium 235	15117-96-1	U		0.079		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-03

B0WMH3

DATA SHEET

SDG	7266	Client/Case no	Hanford SDG H0602
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N911006-03	Client sample id	B0WMH3
Dept sample id	7266-003	Location/Matrix	200 B Pond SOLID
Received	10/29/99	Collected	10/27/99 09:31
% solids	95.2	Custody/SAF No	B99-078-144 B99-012

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	0.464	0.059	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	0.005	0.019	0.036	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.019	0.045	1.0	U	PU
Americium 241	14596-10-2	0.023	0.023	0.029	1.0	U	AM
Total Strontium	SR-RAD	-0.015	0.086	0.14	1.0	U	SR
Thorium 228	14274-82-9	0.343	0.13	0.15	1.0	J	TH
Thorium 230	14269-63-7	0.596	0.17	0.16	1.0	J	TH
Thorium 232	TH-232	0.335	0.099	0.062	1.0	J	TH
Potassium 40	13966-00-2	12.0	0.29	0.12			GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Europium 152	14683-23-9	U		0.030	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		0.046	0.10	U	GAM
Radium 226	13982-63-3	0.436	0.024	0.021	0.10		GAM
Radium 228	15262-20-1	0.635	0.056	0.053	0.20		GAM
Thorium 228	14274-82-9	0.612	0.018	0.015			GAM
Thorium 232	TH-232	0.635	0.056	0.053			GAM
Americium 241	14596-10-2	U		0.038		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Uranium 235	15117-96-1	U		0.045		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

N911006-04 B0WMH4

DATA SHEET

SDG	7266	Client/Case no	Hanford SDG H0602
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N911006-04	Client sample id	B0WMH4
Dept sample id	7266-004	Location/Matrix	200 B Pond SOLID
Received	10/29/99	Collected	10/27/99 09:53
% solids	96.1	Custody/SAF No	B99-078-144 B99-012

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	0.386	0.049	0.004	1.0	J	U_T
Plutonium 238	13981-16-3	0.012	0.025	0.039	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.016	0.039	1.0	U	PU
Americium 241	14596-10-2	-0.004	0.022	0.040	1.0	U	AM
Total Strontium	SR-RAD	0.361	0.10	0.13	1.0	J	SR
Thorium 228	14274-82-9	0.528	0.17	0.18	1.0	J	TH
Thorium 230	14269-63-7	0.489	0.17	0.18	1.0	J	TH
Thorium 232	TH-232	0.479	0.14	0.073	1.0	J	TH
Potassium 40	13966-00-2	10.2	0.32	0.14			GAM
Cobalt 60	10198-40-0	U		0.014	0.050	U	GAM
Cesium 137	10045-97-3	0.046	0.016	0.017	0.10	J	GAM
Europium 152	14683-23-9	U		0.036	0.10	U	GAM
Europium 154	15585-10-1	U		0.049	0.10	U	GAM
Europium 155	14391-16-3	U		0.053	0.10	U	GAM
Radium 226	13982-63-3	0.432	0.033	0.030	0.10		GAM
Radium 228	15262-20-1	0.614	0.068	0.064	0.20		GAM
Thorium 228	14274-82-9	0.533	0.021	0.021			GAM
Thorium 232	TH-232	0.614	0.068	0.064			GAM
Americium 241	14596-10-2	U		0.13		U	GAM
Uranium 238	U-238	U		1.8		U	GAM
Uranium 235	15117-96-1	U		0.066		U	GAM

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test AM Matrix SOLID
SDG 7266
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SRB-207925
Case no SDG H0602

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6909-008					
B0WMH1	N911006-01			7266-001	U
B0WMH2	N911006-02			7266-002	U
B0WMH3	N911006-03			7266-003	U
B0WMH4	N911006-04			7266-004	U
BLK (QC ID=32748)	N911006-06			7266-006	U
LCS (QC ID=32747)	N911006-05			7266-005	ok
Duplicate (N911006-01)	N911006-07			7266-007	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara. - 200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-008	2σ prep error 5.0 %									Reference Lab Notebook 6909 pg. 8						
B0WMH1	N911006-01			0.040	0.500			62		1098			68	12/30/99	01/03	SS-016
B0WMH2	N911006-02			0.047	0.500			56		1065			68	12/30/99	01/03	SS-060
B0WMH3	N911006-03			0.029	0.500			75		848			70	12/30/99	01/05	SS-009
B0WMH4	N911006-04			0.040	0.500			74		848			70	12/30/99	01/05	SS-010
BLK (QC ID=32748)	N911006-06			0.046	0.500			89		1055				12/20/99	01/03	SS-047
LCS (QC ID=32747)	N911006-05			0.041	0.500			81		1067				12/30/99	01/03	SS-058
Duplicate (N911006-01) (QC ID=32749)	N911006-07			0.031	0.500			74		848			70	12/30/99	01/05	SS-011
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test	AM
Matrix	SOLID
SDG	7266
Contact	Melissa C. Mannion

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0602

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

AVERAGES ± 2 SD	MDA	0.039	±	0.014
FOR 7 SAMPLES	YIELD	73	±	22

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test PU Matrix SOLID
SDG 7266
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0602

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6909-008								
B0WMH1	N911006-01			7266-001	0.064 J		U	
B0WMH2	N911006-02			7266-002	U		U	
B0WMH3	N911006-03			7266-003	U		U	
B0WMH4	N911006-04			7266-004	U		U	
BLK (QC ID=32748)	N911006-06			7266-006	U		U	
LCS (QC ID=32747)	N911006-05			7266-005	ok		ok	
Duplicate (N911006-01)	N911006-07			7266-007	ok	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200 Area Source Chara. - 200-CW-1 OU								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-008	2σ prep error 5.0 %			Reference Lab Notebook 6909 pg. 8												
B0WMH1	N911006-01			0.045	0.500			50		808			71	12/29/99	01/06	SS-006
B0WMH2	N911006-02			0.051	0.500			53		852			70	12/29/99	01/05	SS-002
B0WMH3	N911006-03			0.045	0.500			59		852			70	12/29/99	01/05	SS-003
B0WMH4	N911006-04			0.039	0.500			68		853			70	12/29/99	01/05	SS-005
BLK (QC ID=32748)	N911006-06			0.063	0.500			65		1081				12/29/99	01/03	SS-044
LCS (QC ID=32747)	N911006-05			0.033	0.500			64		853				12/29/99	01/05	SS-006
Duplicate (N911006-01) (QC ID=32749)	N911006-07			0.045	0.500			60		853			70	12/29/99	01/05	SS-008
Nominal values and limits from method				1.0	0.500			20-105		10	100		180			

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

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.046 ± 0.019
YIELD 60 ± 13

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/00

Test TH Matrix SOLID
SDG 7266
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SPB-207925
Case no SDG H0602

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6909-008							
B0WMH1	N911006-01			7266-001	0.363 J	0.830 J	0.476 J
B0WMH2	N911006-02			7266-002	0.450 J	0.441 J	0.441 J
B0WMH3	N911006-03			7266-003	0.343 J	0.596 J	0.335 J
B0WMH4	N911006-04			7266-004	0.528 J	0.489 J	0.479 J
BLK (QC ID=32748)	N911006-06			7266-006	U	U	U
LCS (QC ID=32747)	N911006-05			7266-005	No data U	ok	No data U
Duplicate (N911006-01)	N911006-07			7266-007	ok J	ok J	ok J
Nominal values and limits from method			RDLs (pCi/g)		1.0	1.0	1.0
200 Area Source Chara. - 200-CW-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-008	2σ prep error 5.0 %				Reference Lab Notebook 6909 pg. 8											
B0WMH1	N911006-01			0.15	0.250			89		629			83	01/11/00	01/18	SS-027
B0WMH2	N911006-02			0.18	0.250			84		629			83	01/11/00	01/18	SS-029
B0WMH3	N911006-03			0.16	0.250			89		629			83	01/11/00	01/18	SS-031
B0WMH4	N911006-04			0.18	0.250			76		629			83	01/11/00	01/18	SS-032
BLK (QC ID=32748)	N911006-06			0.16	0.250			82		629				01/19/00	01/19	SS-034
LCS (QC ID=32747)	N911006-05			0.25	0.250			59		629				01/19/00	01/19	SS-033
Duplicate (N911006-01) (QC ID=32749)	N911006-07			0.22	0.250			62		629			83	01/11/00	01/18	SS-035
Nominal values and limits from method				1.0	0.250			20-105		200			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test TH	Matrix SOLID
SDG 7266	
Contact Melissa C. Mannion	

METHOD SUMMARY, cont.

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SPB-207925	
Case no SDG H0602	

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

AVERAGES ± 2 SD	MDA	0.19	±	0.073
FOR 7 SAMPLES	YIELD	77	±	25

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test SR	Matrix SOLID
SDG 7266	
Contact Melissa C. Mannion	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0602	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6909-008					
B0WMH1	N911006-01			7266-001	2.33
B0WMH2	N911006-02			7266-002	U
B0WMH3	N911006-03			7266-003	U
B0WMH4	N911006-04			7266-004	0.361 J
BLK (QC ID=32748)	N911006-06			7266-006	U
LCS (QC ID=32747)	N911006-05			7266-005	ok
Duplicate (N911006-01)	N911006-07			7266-007	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara. - 200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-008	2σ prep error 10.0 % Reference Lab Notebook 6909 pg. 8															
B0WMH1	N911006-01			0.13	1.00			88		200			55	12/06/99	12/21	GRB-202
B0WMH2	N911006-02			0.15	1.00			94		400			55	12/06/99	12/21	GRB-203
B0WMH3	N911006-03			0.14	1.00			92		200			55	12/06/99	12/21	GRB-231
B0WMH4	N911006-04			0.13	1.00			91		200			56	12/22/99	12/22	GRB-204
BLK (QC ID=32748)	N911006-06			0.14	1.00			83		200				12/22/99	12/22	GRB-202
LCS (QC ID=32747)	N911006-05			0.47	1.00			76		400				12/22/99	12/22	GRB-220
Duplicate (N911006-01) (QC ID=32749)	N911006-07			0.26	1.00			91		200			56	12/22/99	12/22	GRB-230
Nominal values and limits from method				1.0	1.00					100			180			

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

AVERAGES ± 2 SD	MDA	0.20	±	0.25
FOR 7 SAMPLES	YIELD	88	±	13

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test GAM Matrix SOLID
SDG 7266
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0602

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6909-008						
B0WMH1	N911006-01			7266-001	U	U
B0WMH2	N911006-02			7266-002	U	U
B0WMH3	N911006-03			7266-003	U	U
B0WMH4	N911006-04			7266-004	U	0.046 J
BLK (QC ID=32748)	N911006-06			7266-006	U	U
LCS (QC ID=32747)	N911006-05			7266-005	ok	ok
Duplicate (N911006-01)	N911006-07			7266-007	- U	- U
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.10
200 Area Source Chara. - 200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-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 6909-008	2σ prep error 15.0 % Reference Lab Notebook 6909 pg. 8															
B0WMH1	N911006-01			0.050	807					234			47	12/03/99	12/13	02,04,00
B0WMH2	N911006-02			0.055	818					472			48	12/03/99	12/14	02,03,00
B0WMH3	N911006-03			0.038	732					472			48	12/03/99	12/14	02,04,00
B0WMH4	N911006-04			0.040	858					471			48	12/03/99	12/14	MB,05,00
BLK (QC ID=32748)	N911006-06			0.11	171					220				12/03/99	12/14	MB,07,00
LCS (QC ID=32747)	N911006-05			0.048	171					471				12/03/99	12/14	MB,07,00
Duplicate (N911006-01) (QC ID=32749)	N911006-07			0.068	807					470			48	12/03/99	12/14	02,01,00
Nominal values and limits from method				0.050	171					100			180			

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

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.058 ± 0.050
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test U T Matrix SOLID
SDG 7266
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract TRB-SPB-207925
Case no SDG H0602

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 6909-008					
B0WMH1	N911006-01			7266-001	0.619 J
B0WMH2	N911006-02			7266-002	0.511 J
B0WMH3	N911006-03			7266-003	0.464 J
B0WMH4	N911006-04			7266-004	0.386 J
BLK (QC ID=32390)	N911006-09			7266-009	U
LCS (QC ID=32389)	N911006-08			7266-008	ok
Duplicate (N911006-01)	N911006-10			7266-010	ok J
Nominal values and limits from method				RDLs (ug/g)	1.0
200 Area Source Chara. - 200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-008 2σ prep error 9.0 % Reference Lab Notebook 6909 pg. 8																
B0WMH1	N911006-01			0.004	0.0500								22	11/16/99	11/18	KPA-001
B0WMH2	N911006-02			0.004	0.0500								22	11/16/99	11/18	KPA-001
B0WMH3	N911006-03			0.004	0.0500								22	11/16/99	11/18	KPA-001
B0WMH4	N911006-04			0.004	0.0500								22	11/16/99	11/18	KPA-001
BLK (QC ID=32390)	N911006-09			0.004	0.0500									01/16/99	01/18	KPA-001
LCS (QC ID=32389)	N911006-08			0.039	0.0500									11/16/99	11/18	KPA-001
Duplicate (N911006-01) (QC ID=32391)	N911006-10			0.004	0.0500								22	11/16/99	11/18	KPA-001
Nominal values and limits from method				1.0	0.0500								180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0602

Test	U T
Matrix	SOLID
SDG	7266
Contact	Melissa C. Mannion

METHOD SUMMARY, cont.

URANIUM, TOTAL IN SOIL

KINETIC PHOSPHORIMETRY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0602

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

AVERAGES ± 2 SD	MDA	0.009	±	0.026
FOR 7 SAMPLES	YIELD		±	

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/20/00

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 96054	Field Logbook No.: EL-1511-1	Method of Shipment: FED EX	
Shipped To: TMA/RECRA RB 10-27-99	Offsite Property No.: 99 ~~A00 0~~ - A00 0015	Bill of Lading/Air Bill No.: 42357953 1150	
		COA: B20CW1 67/C	

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

cpm	Sample No.	Matrix *	Sample Date	Sample Time									
155	BOWM#1	Soil	10-27-99	0850	X						X		Dow 8C)
155	BOWM#2	Soil	10-27-99	0856	X						X		
175	BOWM#3	Soil	10-27-99	0931	X						X		
177	BOWM#4	Soil	10-27-99	0953	X						X		

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	Doug Bowers	10-27-99/1130
Received By	Ref 3B	10-27-99/1130
Relinquished By	Ref 3B	10.28.99/0800
Received By	RKKithong R.Thoren	10.28.99/0800
Relinquished By	RKKithong R.Thoren	10.28.99/1430
Received By	FED EX	10/28/99
Relinquished By	FedEx	10/29/99 10:00
Received By	TNU M.Goldenberg	10/29-99 10:00

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 10-29-99 10:00

CoC No. B99-078-144

Container I.D. No. ERC96654 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 M. Goldenberg Date: 10-29-99 Time: 10:00

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____