H0669-TMA/RECRA

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0669 is composed of a single liquid (water) sample designated under SAF No. B99-085 with a Project Designation of: 200 Area Source Characterization – 200-CW-1 OU – QC Sam.

The sample was 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 19, 2000.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analyses

No problems were encountered during the analyses. SDG H0669 was grouped mistakenly with another SDG outside of SAF No. B99-085. Sample B0X487 was reanalyzed due to this error. The sample was not reanalyzed due to analytical problems.

RECEIVED
MAR 20 2000
EDMC

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

SAMPLE SUMMARY

SDG 7310
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0669

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0X487	200 East	WATER		N912059-01	B99-085	B99-085-15	12/02/99 05:25
Method Blank		WATER		N912059-06	B99-085		
Lab Control Sample		WATER		N912059-05	B99-085		
Duplicate (N912059-01)	200 East	WATER		N912059-07	B99-085		12/02/99 05:25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/19/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

QC SUMMARY

SDG 7310
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0669

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
7310	B99-085-15	B0X487	WATER				12/03/99	1	N912059-01	7310-001
		Method Blank	WATER						N912059-06	7310-006
		Lab Control Sample	WATER						N912059-05	7310-005
		Duplicate (N912059-01)	WATER				12/03/99	1	N912059-07	7310-007

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/19/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

SDG 7310
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0669

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
80A	WATER	Gross Alpha in Water	6909-149	20.0	1			1	1	1/1		
80B	WATER	Gross Beta in Water	6909-149	15.0	1			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/19/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

SDG 7310
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0669

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0X487			N912059-01	7310-001	80A/80	A1	01/19/00	01/19/00	MCM	Gross Alpha in Water
200 East		WATER	12/02/99	7310-001	80B/80	A1	01/19/00	01/19/00	MCM	Gross Beta in Water
B99-085-1S	B99-085		12/03/99							
Method Blank			N912059-06	7310-006	80A/80		01/14/00	01/19/00	MCM	Gross Alpha in Water
		WATER		7310-006	80B/80		01/14/00	01/19/00	MCM	Gross Beta in Water
	B99-085									
Lab Control Sample			N912059-05	7310-005	80A/80		01/14/00	01/19/00	MCM	Gross Alpha in Water
		WATER		7310-005	80B/80		01/14/00	01/19/00	MCM	Gross Beta in Water
	B99-085									
Duplicate (N912059-01)			N912059-07	7310-007	80A/80		01/14/00	01/19/00	MCM	Gross Alpha in Water
200 East		WATER	12/02/99	7310-007	80B/80		01/14/00	01/19/00	MCM	Gross Beta in Water
	B99-085		12/03/99							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
80A/80	B99-085	Gross Alpha in Water	EPA900.0	1			1	1	1	4
80B/80	B99-085	Gross Beta in Water	EPA900.0	1			1	1	1	4
TOTALS				2			2	2	2	8

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/19/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0669

N912059-06 Method Blank

METHOD BLANK

SDG	7310	Client/Case no	Hanford SDG H0669
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N912059-06	Client sample id	Method Blank
Dept sample id	7310-006	Material/Matrix	WATER
		SAF No	B99-085

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.126	0.39	0.94	3.0	U	80A
Gross Beta	12587-47-2	0.117	1.2	2.1	4.0	U	80B

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

QC-BLANK 33037

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/19/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

N912059-05 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7310 Client/Case no Hanford SDG H0669

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

Lab sample id N912059-05 Client sample id Lab Control Sample

Dept sample id 7310-005 Material/Matrix WATER

SAF No B99-085

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	62.8	4.6	0.99	3.0		80A	71.7	2.9	88	71-129	80-120
Gross Beta	82.0	3.8	1.9	4.0		80B	82.7	3.3	99	76-124	

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

QC-LCS 33036

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/19/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

N912059-07 B0X487

DUPLICATE

SDG 7310		Client/Case no Hanford	SDG H0669
Contact Melissa C. Mannion		Case no TRB-SBB-207925	
DUPLICATE	ORIGINAL		
Lab sample id N912059-07	Lab sample id N912059-01	Client sample id B0X487	
Dept sample id 7310-007	Dept sample id 7310-001	Location/Matrix 200 East	WATER
	Received 12/03/99	Collected 12/02/99 05:25	
		Custody/SAF No B99-085-15	B99-085

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	-0.014	0.43	0.91	3.0	U	80A	0.088	0.40	0.81	U	-	
Gross Beta	0.035	1.0	1.8	4.0	U	80B	-0.537	1.1	2.0	U	-	

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

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/19/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0669

N912059-01 B0X487

DATA SHEET

SDG	7310	Client/Case no	Hanford	SDG H0669	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N912059-01	Client sample id	B0X487		
Dept sample id	7310-001	Location/Matrix	200 East	WATER	
Received	12/03/99	Collected	12/02/99 05:25		
		Custody/SAF No	B99-085-15	B99-085	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.088	0.40	0.81	3.0	U	80A
Gross Beta	12587-47-2	-0.537	1.1	2.0	4.0	U	80B

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	01/19/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

Test 80A Matrix WATER
SDG 7310
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0669

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 6909-149					
B0X487	N912059-01	80	A1	7310-001	U
BLK (QC ID=33037)	N912059-06	80		7310-006	U
LCS (QC ID=33036)	N912059-05	80		7310-005	ok
Duplicate (N912059-01)	N912059-07	80		7310-007	- U

Nominal values and limits from method RDLs (pCi/L) 3.0
200 Area Source Chara. - 200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-149 2σ prep error 20.0 % Reference Lab Notebook 6909 pg. 149																
B0X487	N912059-01	80	A1	0.81	0.300			0		100			48	01/11/00	01/19	GRB-111
BLK (QC ID=33037)	N912059-06	80		0.94	0.300			20		100				01/11/00	01/14	GRB-114
LCS (QC ID=33036)	N912059-05	80		0.99	0.300			20		100				01/11/00	01/14	GRB-113
Duplicate (N912059-01) (QC ID=33038)	N912059-07	80		0.91	0.300			0		100			43	01/11/00	01/14	GRB-115
Nominal values and limits from method				*3.0*	*0.300*			*5-150*		*100*			*180*			

PROCEDURES REFERENCE EPA900.0
EP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.91 ± 0.15
RESIDUE 10 ± 23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0669

Test 80B Matrix WATER
SDG 7310
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0669

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta	
Preparation batch 6909-149						
B0X487	N912059-01	80	A1	7310-001	U	
BLK (QC ID=33037)	N912059-06	80		7310-006	U	
LCS (QC ID=33036)	N912059-05	80		7310-005	ok	
Duplicate (N912059-01)	N912059-07	80		7310-007	-	U
Nominal values and limits from method				RDLs (pCi/L)	4.0	
200 Area Source Chara. - 200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-149	2σ prep error 15.0 %							Reference Lab Notebook 6909 pg. 149								
B0X487	N912059-01	80	A1	2.0	0.300			0		100			48	01/11/00	01/19	GRB-111
BLK (QC ID=33037)	N912059-06	80		2.1	0.300			20		100				01/11/00	01/14	GRB-114
LCS (QC ID=33036)	N912059-05	80		1.9	0.300			20		100				01/11/00	01/14	GRB-113
Duplicate (N912059-01) (QC ID=33038)	N912059-07	80		1.8	0.300			0		100			43	01/11/00	01/14	GRB-115
Nominal values and limits from method				4.0	0.300			5-150		100			180			

PROCEDURES REFERENCE EPA900.0
EP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2.0 ± 0.26
RESIDUE 10 ± 23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/19/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-15	Page 1 of 1

Collector: Bowers/Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sam	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: SML 264	Field Logbook No.: EL1511-1	COA: B20CW1671C	Method of Shipment: Fed EX
Shipped To: TMA/~~RECRA~~ RF 12.2.99	Offsite Property No.: A000053		Bill of Lading/Air Bill No.: 42357953 2395

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	G/P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
B0X487	Water	12.2.99	0525					X					
~~B0X496 Box 3v4~~	Water											Box069	
B 10 12.1.99													

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	R. Fahlberg	12.2.99 0600	Received By	R&F 2.C 12.2.99 0600
Relinquished By	R.L. 2C	12.02.99 0730	Received By R. Thoren	R. Thoren 12.2.99 0730
Relinquished By R. Thoren	R. Thoren	12.2.99 1430	Received By	FED EX 12-2-99
Relinquished By	FedEx	12-3-99 10:00	Received By	TNV M. Goldenberg 12-3-99 10:00
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

See SAF for special instructions.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Copper, Nickel, Vanadium, Zinc}

Matrix *

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

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

BHI-EE-011 (10/99)

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 12-3-99 10:00

CoC No. B 99-085-15

Container I.D. No. SHL264 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1
7. Number of containers per sample: _____ (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. Goldberg Date: 12-3-99 Time: 10:00

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

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

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9912L896
SDG# : H0669
SAF# : B99-085

W.O. # : 10985-001-001-9999-00
Date Received: 12-03-99

INORGANIC CASE NARRATIVE

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

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

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

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.

8. The replicate analyses were within the 20% RPD control limit with the exception of pH; the disparaty between the pH replicate readings may have been manifested due to an apparent weak inonic strength of the sample.

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-24-00
Date

njp\i12-896

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
\cidity	___ 305.1		
__Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
3OD	___ 405.1		___ 5210B (b)
on Chormatography:			
__Bromide ✓Chloride ✓Fluoride	✓ 300.0	___ 9056	
✓Nitrite ✓Nitrate ✓Phosphate	✓ 300.0	___ 9056	
✓Sulfate ___Formate ___Acetate ___Oxalate	✓ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B ___ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
✓Nitrate-Nitrite ___Nitrate ___Nitrite	✓ 353.2		
Ammonia	✓ 350.3		
Total___ Kjeldahl ___ Organic Nitrogen	___ 351.4		
Total___ Organic ___ Inorganic Carbon	___ 415.1	___ 9060	
Oil & Grease	___ 413.1	___ 9070	
✓pH ___ pH; paper	___ 150.1	✓ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 ___ 420.2	___ 9065 ___ 9066	
___Ortho ___Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1 ___ 376.2	✓ 9030B/9034 (acid soluble)	
Reactive ___Cyanide ___Sulfide		___ Section 7.3	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach	___ 1312		
Total ___Dissolved ___Suspended ___Solids	160 ___.1 ___.2 ___.3		
Total Organic Halides	___ 450.1	___ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
__Total __Dissolved __Suspended	___ 160.4		

Other: **Method:**

02

L-WI-034/A-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 12/16/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0X487	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
		Nitrate Nitrite	0.020u	MG/L	0.020	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		pH	7.4	PH UNITS	0.01	1.0
		Sulfide	2.0 u	MG/L	2.0	1.0

04

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/16/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LAC105-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LN3059-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	99LAM046-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	99LSD073-MB1	Sulfide	2.0 u	MG/L	2.0	1.0

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INORGANICS ACCURACY REPORT 12/16/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	BOX487	Chloride by IC	5.0	0.00	5.0	99.7	1.0
		Fluoride by IC	10.7	0.00	10.0	107.3	1.0
		Nitrite by IC	5.0	0.25u	5.0	100.7	1.0
		Nitrate by IC	5.3	0.25u	5.0	105.7	1.0
		Phosphate by IC	4.6	0.25u	5.0	92.7	1.0
		Sulfate by IC	4.9	0.25u	5.0	97.6	1.0
		Nitrate Nitrite	0.50	0.02u	0.50	99.8	1.0
		Ammonia, as N	1.1	0.10u	1.0	109.0	1.0
		Sulfide	10.0	0.00	10.0	100	1.0
BLANK10	99LAC105-MB1	Chloride by IC	4.7	0.25u	5.0	94.5	1.0
		Fluoride by IC	10.6	0.50u	10.0	105.8	1.0
		Nitrite by IC	4.9	0.25u	5.0	97.2	1.0
		Nitrate by IC	5.2	0.25u	5.0	103.2	1.0
		Phosphate by IC	5.3	0.25u	5.0	106.6	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.5	1.0
BLANK10	99LN3059-MB1	Nitrate Nitrite	0.47	0.02u	0.50	94.6	1.0
BLANK10	99LAM046-MB1	Ammonia, as N	1.0	0.10u	1.0	102.0	1.0
		Ammonia, as N MSD	1.0	0.10u	1.0	101.0	1.0
BLANK10	99LSD073-MB1	Sulfide	9.9	2.0 u	10.0	99.0	1.0
		Sulfide MSD	9.8	2.0 u	10.0	98.0	1.0

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INORGANICS DUPLICATE SPIKE REPORT 12/16/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	99LAM046-MB1	Ammonia, as N	102.0	101.0	0.99
BLANK10	99LSD073-MB1	Sulfide	99.0	98.0	1.0

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INORGANICS PRECISION REPORT 12/16/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	BOX487	Chloride by IC	0.25u	0.25u	NC	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.25u	0.25u	NC	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.25u	0.25u	NC	1.0
		Nitrate Nitrite	0.02u	0.02u	NC	1.0
		Ammonia, as N	0.10u	0.10u	NC	1.0
		pH	7.4	5.6	28.2	1.0
		Sulfide	2.0 u	2.0 u	NC	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X487						
CHLORIDE BY IC	001	W	99LAC105	12/02/99	12/03/99	12/03/99
CHLORIDE BY IC	001 REP	W	99LAC105	12/02/99	12/03/99	12/03/99
CHLORIDE BY IC	001 MS	W	99LAC105	12/02/99	12/03/99	12/03/99
FLUORIDE BY IC	001	W	99LAC105	12/02/99	12/03/99	12/03/99
FLUORIDE BY IC	001 REP	W	99LAC105	12/02/99	12/03/99	12/03/99
FLUORIDE BY IC	001 MS	W	99LAC105	12/02/99	12/03/99	12/03/99
NITRITE BY IC	001	W	99LAC105	12/02/99	12/03/99	12/03/99
NITRITE BY IC	001 REP	W	99LAC105	12/02/99	12/03/99	12/03/99
NITRITE BY IC	001 MS	W	99LAC105	12/02/99	12/03/99	12/03/99
NITRATE BY IC	001	W	99LAC105	12/02/99	12/03/99	12/03/99
NITRATE BY IC	001 REP	W	99LAC105	12/02/99	12/03/99	12/03/99
NITRATE BY IC	001 MS	W	99LAC105	12/02/99	12/03/99	12/03/99
PHOSPHATE BY IC	001	W	99LAC105	12/02/99	12/03/99	12/03/99
PHOSPHATE BY IC	001 REP	W	99LAC105	12/02/99	12/03/99	12/03/99
PHOSPHATE BY IC	001 MS	W	99LAC105	12/02/99	12/03/99	12/03/99
SULFATE BY IC	001	W	99LAC105	12/02/99	12/03/99	12/03/99
SULFATE BY IC	001 REP	W	99LAC105	12/02/99	12/03/99	12/03/99
SULFATE BY IC	001 MS	W	99LAC105	12/02/99	12/03/99	12/03/99
NITRATE NITRITE	001	W	99LN3059	12/02/99	12/08/99	12/08/99
NITRATE NITRITE	001 REP	W	99LN3059	12/02/99	12/08/99	12/08/99
NITRATE NITRITE	001 MS	W	99LN3059	12/02/99	12/08/99	12/08/99
AMMONIA	001	W	99LAM046	12/02/99	12/07/99	12/07/99
AMMONIA	001 REP	W	99LAM046	12/02/99	12/07/99	12/07/99
AMMONIA	001 MS	W	99LAM046	12/02/99	12/07/99	12/07/99
PH	001	W	99LPH131	12/02/99	12/07/99	12/07/99
PH	001 REP	W	99LPH131	12/02/99	12/07/99	12/07/99
SULFIDE	001	W	99LSD073	12/02/99	12/05/99	12/05/99
SULFIDE	001 REP	W	99LSD073	12/02/99	12/05/99	12/05/99
SULFIDE	001 MS	W	99LSD073	12/02/99	12/05/99	12/05/99

LAB QC:

CHLORIDE BY IC	MB1	W	99LAC105	N/A	12/03/99	12/03/99
CHLORIDE BY IC	MB1 BS	W	99LAC105	N/A	12/03/99	12/03/99
FLUORIDE BY IC	MB1	W	99LAC105	N/A	12/03/99	12/03/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
FLUORIDE BY IC	MB1 BS	W	99LAC105	N/A	12/03/99	12/03/99
NITRITE BY IC	MB1	W	99LAC105	N/A	12/03/99	12/03/99
NITRITE BY IC	MB1 BS	W	99LAC105	N/A	12/03/99	12/03/99
NITRATE BY IC	MB1	W	99LAC105	N/A	12/03/99	12/03/99
NITRATE BY IC	MB1 BS	W	99LAC105	N/A	12/03/99	12/03/99
PHOSPHATE BY IC	MB1	W	99LAC105	N/A	12/03/99	12/03/99
PHOSPHATE BY IC	MB1 BS	W	99LAC105	N/A	12/03/99	12/03/99
SULFATE BY IC	MB1	W	99LAC105	N/A	12/03/99	12/03/99
SULFATE BY IC	MB1 BS	W	99LAC105	N/A	12/03/99	12/03/99
NITRATE NITRITE	MB1	W	99LN3059	N/A	12/08/99	12/08/99
NITRATE NITRITE	MB1 BS	W	99LN3059	N/A	12/08/99	12/08/99
AMMONIA	MB1	W	99LAM046	N/A	12/07/99	12/07/99
AMMONIA	MB1 BS	W	99LAM046	N/A	12/07/99	12/07/99
AMMONIA	MB1 BSD	W	99LAM046	N/A	12/07/99	12/07/99
SULFIDE	MB1	W	99LSD073	N/A	12/05/99	12/05/99
SULFIDE	MB1 BS	W	99LSD073	N/A	12/05/99	12/05/99
SULFIDE	MB1 BSD	W	99LSD073	N/A	12/05/99	12/05/99

RECRA LabNet Use Only

99121896

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TMC Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: Orlette Johnson

QC: Spec Del: Std TAT: 30 days

Date Rec'd: 12-3-99 Date Due: 1/2/00

Account #:

Refrigerator #		1	3						3		3	3	3					
#/Type Container	Liquid	3V	2BG						3P		1P	1P	1P					
	Solid																	
Volume	Liquid	40	1L						500		500	1L	1L					
	Solid																	
Preservatives		HCl	–						HNO3		ZnAc NaOH	–	H2SO4					
ANALYSES REQUESTED →		ORGANIC							INORG									
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Sulfide	IC	NO2 NO3 PO4					
		RECRA LabNet Use Only																
		0624H 0625C	0625H						Met①		ISFD	Anion①	NO3N2 NH3N					

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
001	BOX487	✓	✓	W	12-3-99	0525	✓	✓						✓		✓	✓	✓			

Special Instructions:

ref # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Met① = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, B, Sb, Tl
Anion① = ICCl, ICFl, ICNO2, ICNO3, ICPO4T
4. ICSO4, IPH
5.
6. 12/3/99

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # 4235 7955 2400
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. 5.8 °C

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

NOTES:

Relinquished by	Received by	Date	Time
FedEx	TKoppel	12-3-99	0900

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-15	Page 1 of 1

Collector: Bowers/Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sam	Sampling Location: 200 East		SAF No.: B99-085
Ice Chest No.: SML 430	Field Logbook No.: EL1511-1	COA: B20CW1671C	Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA RF 12-2-99	Offsite Property No.: A000054		Bill of Lading/Air Bill No.: 4235795 3 2400

Price Code: 7N

Air Quality ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	G/P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
B0X487	Water	12.2.99	0525	X	X	X	X		X	X			B0X069
~~B0X490~~ ~~B0X3VG~~	Water		RT 12-08-99										
D28 1MJ-99													

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R. Fahlberg / R. Fahlberg	Date/Time: 0600 12.2.99	Received By: Ref 2.C	Date/Time: 0600 12.2.99
Relinquished By: Ref 2C	Date/Time: 12.2.99/0730	Received By: R. Thoren / R. Thoren	Date/Time: 12.2.99/0730
Relinquished By: R. Thoren / R. Thoren	Date/Time: 12.2.99/1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 12.3.99 0920	Received By: T Koppel	Date/Time: 12.3.99 0920
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

See SAF for special instructions.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Copper, Nickel, Vanadium, Zinc}

Matrix *

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

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

BHI-EE-011 (10/99)

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9912L896
SDG/SAF# : H0669/B99-085

W.O.# : 10985-001-001-9999-00
Date Received: 12-03-99

METALS CASE NARRATIVE

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

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

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

4. The cooler temperature has been recorded on the Chain of Custody.

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

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. The preparation/method blank for 1 analyte was outside 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.

   a.) The MB result for Zinc was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and the sample read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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. All matrix spike (MS) recoveries were within 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 13 pages.

11. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. 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

1-27-00
Date

mld/m12-896

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9912L896

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 01/27/00

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0X487	Silver, Total	0.80	u	UG/L	0.80	1.0
		Arsenic, Total	2.7	u	UG/L	2.7	1.0
		Barium, Total	0.56		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Cadmium, Total	0.40	u	UG/L	0.40	1.0
		Chromium, Total	1.9		UG/L	0.70	1.0
		Copper, Total	1.0		UG/L	0.50	1.0
		Nickel, Total	1.0	u	UG/L	1.0	1.0
		Lead, Total	2.1	u	UG/L	2.1	1.0
		Antimony, Total	2.1	u	UG/L	2.1	1.0
		Selenium, Total	4.1	u	UG/L	4.1	1.0
		Thallium, Total	5.4		UG/L	4.3	1.0
		Vanadium, Total	0.65		UG/L	0.60	1.0
		Zinc, Total	4.5		UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/27/00

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L696

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0929-MB1	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.7 u	UG/L	2.7	1.0
		Barium, Total	0.30	UG/L	0.20	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	0.70 u	UG/L	0.70	1.0
		Copper, Total	0.50 u	UG/L	0.50	1.0
		Nickel, Total	1.0 u	UG/L	1.0	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Antimony, Total	2.1 u	UG/L	2.1	1.0
		Selenium, Total	4.1 u	UG/L	4.1	1.0
		Thallium, Total	4.3 u	UG/L	4.3	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	3.4	UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/27/00

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0X487	Silver, Total	50.6	0.80u	50.0	101.2	1.0
		Arsenic, Total	1950	2.7 u	2000	97.7	1.0
		Barium, Total	1980	0.56	2000	99.0	1.0
		Beryllium, Total	49.5	0.10u	50.0	99.0	1.0
		Cadmium, Total	48.5	0.40u	50.0	97.0	1.0
		Chromium, Total	200	1.9	200	99.2	1.0
		Copper, Total	248	1.0	250	98.9	1.0
		Nickel, Total	485	1.0 u	500	97.0	1.0
		Lead, Total	482	2.1 u	500	96.5	1.0
		Antimony, Total	497	2.1 u	500	99.4	1.0
		Selenium, Total	1950	4.1 u	2000	97.4	1.0
		Thallium, Total	2020	5.4	2000	100.7	1.0
		Vanadium, Total	506	0.65	500	101.1	1.0
		Zinc, Total	492	4.5	500	97.6	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 01/27/00

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0X487	Silver, Total	0.80u	0.80u	NC	1.0
		Arsenic, Total	2.7 u	2.7 u	NC	1.0
		Barium, Total	0.56	0.58	3.5	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Chromium, Total	1.9	0.94	67.6	1.0
		Copper, Total	1.0	1.1	9.5	1.0
		Nickel, Total	1.0 u	1.0 u	NC	1.0
		Lead, Total	2.1 u	2.1 u	NC	1.0
		Antimony, Total	2.1 u	2.1 u	NC	1.0
		Selenium, Total	4.1 u	4.1 u	NC	1.0
		Thallium, Total	5.4	4.3 u	~~NC~~ 200	1.0
		Vanadium, Total	0.65	0.60u	~~NC~~ 200	1.0
		Zinc, Total	4.5	4.3	4.5	1.0

Corrections
DJ 1/27/00

008

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/27/00

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9912L896

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0929-LC1	Silver, LCS	495	500	UG/L	99.0
		Arsenic, LCS	9760	10000	UG/L	97.6
		Barium, LCS	4890	5000	UG/L	97.7
		Beryllium, LCS	245	250	UG/L	98.0
		Cadmium, LCS	245	250	UG/L	98.1
		Chromium, LCS	494	500	UG/L	98.9
		Copper, LCS	1220	1250	UG/L	97.8
		Nickel, LCS	1920	2000	UG/L	95.9
		Lead, LCS	2440	2500	UG/L	97.4
		Antimony, LCS	2940	3000	UG/L	97.8
		Selenium, LCS	9680	10000	UG/L	96.8
		Thallium, LCS	10100	10000	UG/L	101.4
		Vanadium, LCS	2520	2500	UG/L	100.6
		Zinc, LCS	976	1000	UG/L	97.6

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X487						
SILVER, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
SILVER, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
SILVER, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
ARSENIC, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
ARSENIC, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
ARSENIC, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
BARIUM, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
BARIUM, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
BARIUM, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
BERYLLIUM, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
BERYLLIUM, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
BERYLLIUM, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
CADMIUM, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
CADMIUM, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
CADMIUM, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
CHROMIUM, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
CHROMIUM, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
CHROMIUM, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
COPPER, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
COPPER, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
COPPER, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
NICKEL, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
NICKEL, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
NICKEL, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
LEAD, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
LEAD, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
LEAD, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
ANTIMONY, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
ANTIMONY, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
ANTIMONY, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
SELENIUM, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
SELENIUM, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
SELENIUM, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
THALLIUM, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
THALLIUM, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
THALLIUM, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
VANADIUM, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
VANADIUM, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
VANADIUM, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00
ZINC, TOTAL	001	W	99L0929	12/02/99	01/18/00	01/19/00
ZINC, TOTAL	001 REP	W	99L0929	12/02/99	01/18/00	01/19/00
ZINC, TOTAL	001 MS	W	99L0929	12/02/99	01/18/00	01/19/00

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
SILVER, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
ARSENIC LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
ARSENIC, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
BARIUM LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
BARIUM, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
BERYLLIUM LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
BERYLLIUM, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
CADMIUM LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
CADMIUM, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
CHROMIUM LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
CHROMIUM, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
COPPER LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
COPPER, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
NICKEL LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
NICKEL, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
LEAD LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
LEAD, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
ANTIMONY LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
ANTIMONY, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
SELENIUM LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
SELENIUM, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
THALLIUM LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
THALLIUM, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
VANADIUM LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
VANADIUM, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00
ZINC LABORATORY	LC1 BS	W	99L0929	N/A	01/18/00	01/19/00
ZINC, TOTAL	MB1	W	99L0929	N/A	01/18/00	01/19/00

RECRA LabNet Use Only

9912L896

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNel: COMPLETE ONLY SHADED AREAS (8) metals

RECRA LabNet

Client: TMC Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: Orlette Johnson

QC: spec Del: std TAT: 30 day

Date Rec'd: 12-3-99 Date Due: 1/2/00

Account #:

Refrigerator #		1	3						3		3	3	3			
#/Type Container	Liquid	3V	2BG						3P		1P	1P	1P			
	Solid															
Volume	Liquid	40	1L						500		500	1L	1L			
	Solid															
Preservatives		HCl	—						HNO3		Zn Ac NaOH	—	H2SO4		—	
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/ PCB	Herb				Metal	CN	Sulfide	HC	NO2 NO3 PHS			
RECRA LabNet Use Only		0624H 0625C	0625H						Met①		ISFD	Anq①	NO3N2 NH3N			

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					Met①		ISFD	Anq①	NO3N2 NH3N			
001	BOX487	✓	✓	W	12-2-99	0525	✓	✓					✓		✓	✓	✓			

Special Instructions:

saf# B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Met① = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, ~~Be~~, Sb, Tl, Be
Anq① = ICCL, ICFL, ICNO2, ICNO3, ICPO4T
4. ICSO4, IPH
12/7/99 5. changed Be to Be per pm
6. ~~Pm~~ 12/3/99

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4235 7953 2400
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. 5.8 °C

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

Relinquished by	Received by	Date	Time
[illegible]	TKappel	12-3-99	0820

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-15	Page 1 of 1

Collector: Bowers/Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sam	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: SML 430	Field Logbook No.: EL1511-1	COA: B20CW1671C	Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA REF 12-2-99	Offsite Property No.: A000054		Bill of Lading/Air Bill No.: 4235795 3 2400

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	G/P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
B0X487	Water	12-2-99	0525	X	X	X	X		X	X			B0X069
~~B0X490 Box 3 vg~~	Water		RT 12-2-99										
D20 1Mj-99													

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	12-2-99 0600	REF 2-C	12-2-99 0600
REF 2C	12-2-99/0730	R. Thoren / R. Thoren	12-2-99/0730
R. Thoren / R. Thoren	12-2-99/1430	FED EX	
Fed Ex	12-3-99 0920	T. Koppel	12-3-99 0920

SPECIAL INSTRUCTIONS

See SAF for special instructions.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc)

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

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

BHI-EE-011 (10/99)

013

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

FEB 2000 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD B99-085
RFW #: 9912L896
SDG/SAF#: H0669/B99-085

W.O. #: #: 10985-001-001-9999-00
Date Received: 12-03-99

GC SCAN

One (1) water sample was collected on 12-02-99.

The sample and it's associated QC samples were prepared on 12-15-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 12-16-99.

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 method specified holding time of 7 days was exceeded. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

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

5. Surrogates were not used for this analysis.

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

7. All matrix spike recoveries were within advisory control limits of 50%-150%.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-21-99
Date

r:\share\le\gescan\12-896.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.

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

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

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

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

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 9912070

Initiator: S. Roy | RFW Batch: 9912896, 973 | Parameter: OCLSC
Date: 12/17/99 | Samples: 001, 001 | Matrix: water
Client: TUV | Method: SW846/MCAWW/CLP/ | Prep Batch: 9912C187

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)

Hold time exceeded for water extraction, collected on the 2nd and extracted on the 15th

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] 12/18/99

__ 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] 12-20-99 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
__	X Initiator	__	__ Metals: Doughty
__	X Lab Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Carey/Schrenkel/Johnson	__	__ GC/LC: Schnell
__	X Section Mgr: Wesson/Daniels	__	__ MS: Taylor
__	X QA (file): Racioppi	__	__ Log-in: Janson
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Doughty/Kauffman	__	__ Other: _____

003

L-WI-006/E-03/99

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 12/17/99 10:23

RFW Batch Number: 9912L896 Client: TNU-HANFORD B99-085 Work Order: 10985-001-001-9999-00 Page: 1

	Cust ID:	B0X487	B0X487	B0X487	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LLC187-MB1	99LLC187-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L
n-Propyl Alcohol		5.0 U	95 %	103 %	5.0 U	95 %
Ethanol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

001

LA 12/17/99.

12/17/99 JL

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.

Recra LabNet - Lionville Laboratory
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOX487	001	W	99LLC187	12/02/99	12/15/99	12/16/99
BOX487	001 MS	W	99LLC187	12/02/99	12/15/99	12/16/99
BOX487	001 MSD	W	99LLC187	12/02/99	12/15/99	12/16/99
LAB QC:						
BLK	MB1	W	99LLC187	N/A	12/15/99	12/16/99
BLK	MB1 BS	W	99LLC187	N/A	12/15/99	12/16/99

AW 12-20-99

RECRA LabNet Use Only

79121L896

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TMC Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: Orlette Johnson

QC: Spec Del: Std TAT: 30 days

Date Rec'd: 12-3-99 Date Due: 1/2/00

Account #:

Refrigerator #		1	3						3		3	3	3				
#/Type Container	Liquid	3V	2PG						3P		1P	1P	1P				
	Solid																
Volume	Liquid	40	1L						500		500	1L	1L				
	Solid																
Preservatives		HCl	–						HNO_3		ZnAc NaOH	–	H_2SO_4				
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Sulfide	TC	TOC TOX TPH				
		RECRA LabNet Use Only															
		0624H 0625C	0625H						Met(1)		ISFD	Ang(1)	IN3N2 IN H3N				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb				Metal	CN	Sulfide	TC	TOC TOX TPH				
001	BOX487	✓	✓	W	12299	0625	✓	✓						✓		✓	✓	✓				

Special Instructions:

paf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Met(1) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, B, Sb, Tl
Ang(1) = 3. ICCL, ICFL, ICNO2, ICNO3, ICPO4T
4. ICSO4, IPH
5.
6. Rec'd 12/3/99

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4235795324 00
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. 5.8 °C

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

Relinquished by	Received by	Date	Time
FedEx	TKappel	12-3-99	0900

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-15	Page 1 of 1

Collector: Bowers/Fahlberg	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 7N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sam	Sampling Location: 200 East	SAF No.: B99-085	Air Quality ☐
Ice Chest No.: SML 430	Field Logbook No.: EL1511-1 — COA: B20CW1671C	Method of Shipment: Fed EX	
Shipped To: ~~TMA~~/RECRA RF 12-2-99	Offsite Property No.: A000054	Bill of Lading/Air Bill No.: 42357953 2400	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
	Type of Container	P	P	P	aG	G,P	aGs*	P			
	No. of Container(s)	1	1	1	2	2	3	3			
Special Handling and/or Storage	Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS		Sulfides - 9030	See item (1) in Special Instructions	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
B0X487	Water	12-2-99	0525	X	X	X	X		X	X		B0X069	
~~B0X490~~ ~~B0X349~~	Water		RT 12-2-99										
B20 12-1-99													

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	12-2-99 0600	RRF 2-C	12-2-99 0600
R. Fahlberg 2C	12-2-99/0730	R. Thoren	12-2-99/0730
R. Thoren	12-2-99/1430	FED EX	
Fed Ex	12-3-99 0920	T. Poppel	12-3-99 0920

SPECIAL INSTRUCTIONS

See SAF for special instructions.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Copper, Nickel, Vanadium, Zinc}

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

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

BHI-EE-011 (10/99)

RECRA ENVIRONMENTAL INC.

Chemical and Environmental Measurement Information

FEB 2000 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-085
RFW #: 9912L896
SDG/SAF #: H0669/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 12-03-99

GC/MS VOLATILE

One (1) water sample was collected on 12-02-99.

The sample and its associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for the client specified Volatile target compounds on 12-10-99.

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

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

2. The required holding time for analysis was met.

3. Non-target compounds were not detected in the sample.

4. One (1) of fifteen (15) surrogate recoveries was outside EPA QC limits. The surrogate recovery of Bromofluorobenzene was slightly low in 99LVH637-MB1 BS; however, there was no significant impact on the data.

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.

8. The samples were analyzed with a standard, which had expired for the gas compounds; however, upon comparison with a newly prepared standard (prepared on 12-14-99) indicated that the gas recoveries were within criteria; consequently, there were no significant impact on the data. A copy of the Corrective Action Documentation has been enclosed.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-19-00
Date

som\group\data\voa\tnu12896.doc

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

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

GLOSSARY OF VOA DATA

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 Philadelphia

CORRECTIVE ACTION DOCUMENTATION

AUDIT REPORT # AR99-035

INSTRUCTIONS: 1) ORIGINATOR complete PERSON RESPONSIBLE FOR RESPONSE and DESCRIPTION OF PROBLEM blocks.
2) Originator forward form to PERSON RESPONSIBLE FOR RESPONSE.
3) Develop/plan a SEQUENCE OF CORRECTIVE ACTION and obtain INITIAL CA APPROVAL sign-off from supervisor.
4) Forward original form to QA for sign-off and FOLLOW-UP ACTION. This allows all pertinent action to be documented on the original form. On completion of the corrective action, the form is signed off by QA, distributed, and the original archived with the QA records.

DATE/ORIGINATOR MARIE SCHNEIDER 12/14/99

PAGE 1 OF 1

PERSON RESPONSIBLE FOR RESPONSE (corrective action plan and implementation of corrective action plan):

MARIE SCHNEIDER

12/14

DISTRIBUTION:
__ LABORATORY MANAGER
__ INORGANIC MANAGER
__ GC/MS MANAGER
__ GC/EXTR MANAGER
__ QA MANAGER
__ QA REPORT FILE
__
__

DESCRIPTION OF PROBLEM and when identified: Samples analyzed from 12/10 → 12/13/99 ran on calibrations which used an expired std (gases only). The std (8109-006-02) expired on 12/9/99.

CAUSE OF PROBLEM if known or suspected: Replacement std was prepped, but was no good (8109-012-01) (prepped incorrectly)

SEQUENCE OF CORRECTIVE ACTION (CA) planned (signature/date): 12/14/99

The replacement std (8109-012-01) was prepped on 12/9/99; prior to "old" std's expiration. When this std was checked, it did not meet criteria (bad prep). A 2nd replacement std (8109-013-01) was prepped on 12/13/99 - it did meet criteria.

The expired std (gases only) were checked against the "new" std, and met criteria, confirming the validity of the "expired" std.

ATTACHED - Form 7; logbook noting affected batches

INITIAL CA APPROVAL: Supervisor signature/date: D Weston 12-14-99
QA signature/date:

DESCRIPTION OF QA FOLLOW-UP ACTION (include signature/date): 12/28/99

FINAL CA APPROVED (QA signature/date):

RFW 21-21-006/C-05/97

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 01/19/00 12:55

RFW Batch Number: **9912L896** Client: **TNU-HANFORD B99-085** Work Order: 10985001001 Page: 1a

5

	Cust ID:	B0X487		B0X487		B0X487		VBLKGW		VBLKGW BS	
Sample Information	RFW#:	001		001 MS		001 MSD		99LVH637-MB1		99LVH637-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate Recovery	Toluene-d8	100	%	100	%	100	%	101	%	92	%
	Bromofluorobenzene	90	%	90	%	92	%	97	%	83 *	%
	1,2-Dichloroethane-d4	92	%	90	%	93	%	95	%	82	%
Chloromethane		10	U	10	U	2	J	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U
Methylene Chloride		5	BJ	17	B	13	B	10		17	B
Acetone		10	U	3	BJ	10	U	7	J	4	BJ
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	94	%	88	%	5	U	89	%
1,1-Dichloroethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	5	U	5	U
Chloroform		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U	5	U	5	U
Bromodichloromethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	83	%	82	%	5	U	82	%
Dibromochloromethane		5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Benzene		5	U	96	%	95	%	5	U	95	%
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	5	U	5	U
Toluene		5	U	95	%	94	%	5	U	94	%

*= Outside of EPA CLP QC limits.

01-19-00

RFW Batch Number: 9912L896 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1b

Cust ID:	B0X487	B0X487	B0X487	VBLKGW	VBLKGW BS
RFW#:	001	001 MS	001 MSD	99LVH637-MB1	99LVH637-MB1
Chlorobenzene	5 U	93 %	92 %	5 U	91 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

gwl 01-19-00

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X487	001	W	99LVH637	12/02/99	N/A	12/10/99
B0X487	001 MS	W	99LVH637	12/02/99	N/A	12/10/99
B0X487	001 MSD	W	99LVH637	12/02/99	N/A	12/10/99

LAB QC:

VBLKGW	MB1	W	99LVH637	N/A	N/A	12/10/99
VBLKGW	MB1 BS	W	99LVH637	N/A	N/A	12/10/99

JW 01-19-00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-15	Page 1 of 1

Collector: Bowers/Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sam	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: SML 430	Field Logbook No.: EL1511-1	COA: B20CW1671C	Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA RF 12-2-99	Offsite Property No.: A000054	Bill of Lading/Air Bill No.: 4235795 3 2400	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	G/P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol}	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
B0X487	Water	12.2.99	0525	X	X	X	X		X	X			B0X069
~~B0X490~~ B0X349	Water		RT 12 2 99										
D20 1MJ-99													

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	12.2.99 0600	RRF 2.C	12.2.99 0600
RRF 2C	12.2.99/0730	R. Thoren / R. Thoren	12.2.99/0730
R. Thoren / R. Thoren	12.2.99/1430	FED EX	
FED EX	12.3.99 0920	T. Poppel	12.3.99 0920

SPECIAL INSTRUCTIONS

See SAF for special instructions.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Copper, Nickel, Vanadium, Zinc}

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

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

BHI-EE-011 (10/99)

RECRA LabNet Use Only

9912L896

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TMC Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: Orlette Johnson

QC: Spec Del: Std TAT: 30 days

Date Rec'd: 12-3-99 Date Due: 1/2/00

Account #:

Refrigerator #		1	3							3		3	3	3				
#/Type Container	Liquid	3V	2PG							3P		1P	1P	1P				
	Solid																	
Volume	Liquid	40	1L							500		500	1L	1L				
	Solid																	
Preservatives		HCl	–							HNO3		ZnAc NaOH	–	H2SO4				
ANALYSES REQUESTED →		ORGANIC								INORG								
		VOA	BNA	Pest/PCB	Herb					Metal	CN	Sulfide	TC	Phenol				
		RECRA LabNet Use Only																
		0624H 0625C	0625H							Met(1)		1S5D	Ang(1)	1N3N2 1NH3N				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb					Metal	CN	Sulfide	TC	Phenol				
001	Box 487	✓	✓	W	12-2-99	0525	✓	✓							✓		✓	✓	✓				

Special Instructions:

Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Met(1) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,

2. Ni, V, Zn, B, Sb, Tl

Ang(1) = 3. ICCL, ICFL, ICNO2, ICNO3, ICPO4T

4. ICSO4, IPH

5.

6. ~~Rec~~ 12/3/99

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # 4235795324 00
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. 5.8 °C

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

Relinquished by	Received by	Date	Time
FedEx	TKoppel	12-3-99	0900

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-085
RFW #: 9912L896
SDG/SAF #: H0669/B99-085

W.O.#: 10985-001-001-9999-00
Date Received: 12-03-99

SEMIVOLATILE

One (1) water sample was collected on 12-02-99.

The sample and its associated QC samples were extracted on 12-09-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 12-31-99.

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

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

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

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

4. Three (3) of thirty (30) surrogate recoveries were outside EPA QC limits.

5. Three (3) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.

6. Three (3) of eleven (11) blank spike recoveries were outside EPA QC limits.

7. A spectral search was conducted for the compound Tributylphosphate; this compound was not identified in the sample.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-17-00
Date

som\gorup\data\bna\tnu12896.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

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

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

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

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.bna

GLOSSARY OF BNA DATA

ABBREVIATIONS

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

mmz\10-94\gloss.bna

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 01/18/00 16:31

RFW Batch Number: 9912L896 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1a

	Cust ID:	B0X487	B0X487	B0X487	SBLKIF	SBLKIF BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LE1492-MB1	99LE1492-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate Recovery	Nitrobenzene-d5	63 %	55 %	50 %	48 %	52 %
	2-Fluorobiphenyl	54 %	47 %	40 * %	34 * %	42 * %
	Terphenyl-d14	80 %	66 %	69 %	70 %	60 %
	Phenol-d5	61 %	45 %	55 %	53 %	56 %
	2-Fluorophenol	58 %	55 %	51 %	47 %	51 %
	2,4,6-Tribromophenol	76 %	73 %	74 %	16 %	58 %
Phenol		12 U	56 %	53 %	10 U	55 %
bis(2-Chloroethyl)ether		12 U	24 U	24 U	10 U	10 U
2-Chlorophenol		12 U	54 %	52 %	10 U	55 %
1,3-Dichlorobenzene		12 U	24 U	24 U	10 U	10 U
1,4-Dichlorobenzene		12 U	36 %	33 * %	10 U	33 * %
1,2-Dichlorobenzene		12 U	24 U	24 U	10 U	10 U
2-Methylphenol		12 U	24 U	24 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		12 U	24 U	24 U	10 U	10 U
4-Methylphenol		12 U	24 U	24 U	10 U	10 U
N-Nitroso-di-n-propylamine		12 U	57 %	54 %	10 U	59 %
Hexachloroethane		12 U	24 U	24 U	10 U	10 U
Nitrobenzene		12 U	24 U	24 U	10 U	10 U
Isophorone		12 U	24 U	24 U	10 U	10 U
2-Nitrophenol		12 U	24 U	24 U	10 U	10 U
2,4-Dimethylphenol		12 U	24 U	24 U	10 U	10 U
bis(2-Chloroethoxy)methane		12 U	24 U	24 U	10 U	10 U
2,4-Dichlorophenol		12 U	24 U	24 U	10 U	10 U
1,2,4-Trichlorobenzene		12 U	39 %	34 * %	10 U	34 * %
Naphthalene		12 U	24 U	24 U	10 U	10 U
4-Chloroaniline		12 U	24 U	24 U	10 U	10 U
Hexachlorobutadiene		12 U	24 U	24 U	10 U	10 U
4-Chloro-3-methylphenol		12 U	46 %	47 %	10 U	47 %
2-Methylnaphthalene		12 U	24 U	24 U	10 U	10 U
Hexachlorocyclopentadiene		12 U	24 U	24 U	10 U	10 U
2,4,6-Trichlorophenol		12 U	24 U	24 U	10 U	10 U
2,4,5-Trichlorophenol		31 U	60 U	60 U	25 U	25 U

*= Outside of EPA CLP QC limits.

15

Cust ID:	B0X487		B0X487		B0X487		SBLKIF		SBLKIF BS	
RFW#:	001		001 MS		001 MSD		99LE1492-MB1		99LE1492-MB1	
2-Chloronaphthalene	12	U	24	U	24	U	10	U	10	U
2-Nitroaniline	31	U	60	U	60	U	25	U	25	U
Dimethylphthalate	12	U	24	U	24	U	10	U	10	U
Acenaphthylene	12	U	24	U	24	U	10	U	10	U
2,6-Dinitrotoluene	12	U	24	U	24	U	10	U	10	U
3-Nitroaniline	31	U	60	U	60	U	25	U	25	U
Acenaphthene	12	U	47	%	44 *	%	10	U	44 *	%
2,4-Dinitrophenol	31	U	60	U	60	U	25	U	25	U
4-Nitrophenol	31	U	49	%	53	%	25	U	37	%
Dibenzofuran	12	U	24	U	24	U	10	U	10	U
2,4-Dinitrotoluene	12	U	46	%	47	%	10	U	45	%
Diethylphthalate	12	U	24	U	24	U	10	U	10	U
4-Chlorophenyl-phenylether	12	U	24	U	24	U	10	U	10	U
Fluorene	12	U	24	U	24	U	10	U	10	U
4-Nitroaniline	31	U	60	U	60	U	25	U	25	U
4,6-Dinitro-2-methylphenol	31	U	60	U	60	U	25	U	25	U
N-Nitrosodiphenylamine (1)	12	U	24	U	24	U	10	U	10	U
4-Bromophenyl-phenylether	12	U	24	U	24	U	10	U	10	U
Hexachlorobenzene	12	U	24	U	24	U	10	U	10	U
Pentachlorophenol	31	U	25	%	39	%	25	U	22	%
Phenanthrene	12	U	24	U	24	U	10	U	10	U
Anthracene	12	U	24	U	24	U	10	U	10	U
Carbazole	12	U	24	U	24	U	10	U	10	U
Di-n-butylphthalate	0.9	J	24	U	24	U	10	U	10	U
Fluoranthene	12	U	24	U	24	U	10	U	10	U
Pyrene	12	U	58	%	70	%	10	U	58	%
Butylbenzylphthalate	12	U	24	U	24	U	10	U	10	U
3,3'-Dichlorobenzidine	12	U	24	U	24	U	10	U	10	U
Benzo(a)anthracene	12	U	24	U	24	U	10	U	10	U
Chrysene	12	U	24	U	24	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	12	U	24	U	24	U	10	U	10	U
Di-n-octyl phthalate	12	U	24	U	24	U	10	U	10	U
Benzo(b)fluoranthene	12	U	24	U	24	U	10	U	10	U
Benzo(k)fluoranthene	12	U	24	U	24	U	10	U	10	U
Benzo(a)pyrene	12	U	24	U	24	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	12	U	24	U	24	U	10	U	10	U
Dibenz(a,h)anthracene	12	U	24	U	24	U	10	U	10	U
Benzo(g,h,i)perylene	12	U	24	U	24	U	10	U	10	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.

B0X487

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 9912L896-001

Sample wt/vol: 800 (g/mL) ML Lab File ID: A123111

Level: (low/med) LOW Date Received: 12/03/99

% Moisture: ____ decanted: (Y/N)__ Date Extracted: 12/09/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/31/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	23.61	4	J

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X487	001	W	99LE1492	12/02/99	12/09/99	12/31/99
B0X487	001 MS	W	99LE1492	12/02/99	12/09/99	12/31/99
B0X487	001 MSD	W	99LE1492	12/02/99	12/09/99	12/31/99

LAB QC:

SBLKIF	MB1	W	99LE1492	N/A	12/09/99	12/31/99
SBLKIF	MB1 BS	W	99LE1492	N/A	12/09/99	12/31/99

RECRA LabNet Use Only

79121896

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TPA Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: Cristie Johnson

QC: spec Del: std TAT: 30 days

Date Rec'd: 12-3-99 Date Due: 1/2/00

Account #:

Refrigerator #		1	3						3		3	3	3			
#/Type Container	Liquid	3V	2BG						3P		1P	1P	1P			
	Solid															
Volume	Liquid	40	1L						500		500	1L	1L			
	Solid															
Preservatives		HCl	—						HNO3		ZnAc NaOH	—	H2SO4			
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Sulfide	HC	NO2 NO3 PHS			
		RECRA LabNet Use Only														
		0624H 0625C	0625H						Met①		1SFD	Anq①	1N3A02 1NH3A1			

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					Met①		1SFD	Anq①	1N3A02 1NH3A1			
001	BOX487	✓	✓	W	12-3-99	0625	✓	✓					✓		✓	✓	✓			

Special Instructions:

Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Met① = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, B, Sb, Tl
Anq① = ICCL, ICFL, ICNO2, ICNO3, ICPO4T
4. ICSO4, IPH
5.
6. ~~Rec~~ 12/3/99

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4235 1953 2400
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. 5.8 °C

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

Relinquished by	Received by	Date	Time
FedEx	TKoppel	12-3-99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-15	Page 1 of 1

Collector: Bowers/Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sam	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: SML 430	Field Logbook No.: EL1511-1	COA: B20CW1671C	Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA RCF 12-2-99	Offsite Property No.: A000054		Bill of Lading/Air Bill No.: 7235795 3 2400

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	GP	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol}	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time									
B0X487	Water	12.2.99	0525	X	X	X	X		X	X		B0X069
~~B0X490~~ B0X3YG	Water		RT 12-2-99									
D20 1MJ-99												

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time 0600	Received By	Date/Time 0600
R. Fahlberg / R. Fahlberg	12.2.99	RCF 2.C	12.2.99
Relinquished By	Date/Time	Received By	Date/Time
RCF 2C	12.2.99/0730	R. Thoren	12.2.99/0730
Relinquished By	Date/Time	Received By	Date/Time
R. Thoren	12.2.99/1430	FED EX	
Relinquished By	Date/Time	Received By	Date/Time
Fed Ex	12.3.99 0920	Thoren	12.3.99 0920
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

See SAF for special instructions.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Copper, Nickel, Vanadium, Zinc}

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

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

BHI-EE-011 (10/99)

H0669-TMA / RECRA

RECRA ENVIRONMENTAL INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report
REVISION

Client: TNU-HANFORD B99-085
RFW #: 9912L896
SDG/SAF #: H0669/B99-085

W.O.#: 10985-001-001-9999-00
Date Received: 12-03-99

SEMIVOLATILE - This narrative was revised to add the TIC search for Butylated Hydroxytoluene.

One (1) water sample was collected on 12-02-99.

The sample and its associated QC samples were extracted on 12-09-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 12-31-99.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding times for extraction and analysis were met.
3. A non-target compound was detected in the sample.
4. Three (3) of thirty (30) surrogate recoveries were outside EPA QC limits.
5. Three (3) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
6. Three (3) of eleven (11) blank spike recoveries were outside EPA QC limits.
7. These samples were spectrally searched for Butylated Hydroxytoluene and Tributylphosphate; however, they were not identified in the samples.

By J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

02-01-00
Date

pefigorupidata\bna-tnu1289b.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages

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

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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.
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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

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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: 01/18/00 16:31

RFW Batch Number: **9912L896** Client: **TNU-HANFORD B99-085** Work Order: 10985001001 Page: 1a

	Cust ID:	B0X487		B0X487		B0X487		SBLKIF		SBLKIF BS	
Sample Information	RFW#:	001		001 MS		001 MSD		99LE1492-MB1		99LE1492-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate Recovery	Nitrobenzene-d5	63	%	55	%	50	%	48	%	52	%
	2-Fluorobiphenyl	54	%	47	%	40 *	%	34 *	%	42 *	%
	Terphenyl-d14	80	%	66	%	69	%	70	%	60	%
	Phenol-d5	61	%	45	%	55	%	53	%	56	%
	2-Fluorophenol	58	%	55	%	51	%	47	%	51	%
	2,4,6-Tribromophenol	76	%	73	%	74	%	16	%	58	%
Phenol		12	U	56	%	53	%	10	U	55	%
bis(2-Chloroethyl)ether		12	U	24	U	24	U	10	U	10	U
2-Chlorophenol		12	U	54	%	52	%	10	U	55	%
1,3-Dichlorobenzene		12	U	24	U	24	U	10	U	10	U
1,4-Dichlorobenzene		12	U	36	%	33 *	%	10	U	33 *	%
1,2-Dichlorobenzene		12	U	24	U	24	U	10	U	10	U
2-Methylphenol		12	U	24	U	24	U	10	U	10	U
2,2'-oxybis(1-Chloropropane)		12	U	24	U	24	U	10	U	10	U
4-Methylphenol		12	U	24	U	24	U	10	U	10	U
N-Nitroso-di-n-propylamine		12	U	57	%	54	%	10	U	59	%
Hexachloroethane		12	U	24	U	24	U	10	U	10	U
Nitrobenzene		12	U	24	U	24	U	10	U	10	U
Isophorone		12	U	24	U	24	U	10	U	10	U
2-Nitrophenol		12	U	24	U	24	U	10	U	10	U
2,4-Dimethylphenol		12	U	24	U	24	U	10	U	10	U
bis(2-Chloroethoxy)methane		12	U	24	U	24	U	10	U	10	U
2,4-Dichlorophenol		12	U	24	U	24	U	10	U	10	U
1,2,4-Trichlorobenzene		12	U	39	%	34 *	%	10	U	34 *	%
Naphthalene		12	U	24	U	24	U	10	U	10	U
4-Chloroaniline		12	U	24	U	24	U	10	U	10	U
Hexachlorobutadiene		12	U	24	U	24	U	10	U	10	U
4-Chloro-3-methylphenol		12	U	46	%	47	%	10	U	47	%
2-Methylnaphthalene		12	U	24	U	24	U	10	U	10	U
Hexachlorocyclopentadiene		12	U	24	U	24	U	10	U	10	U
2,4,6-Trichlorophenol		12	U	24	U	24	U	10	U	10	U
2,4,5-Trichlorophenol		31	U	60	U	60	U	25	U	25	U

*= Outside of EPA CLP QC limits.

Cust ID:	B0X487		B0X487		B0X487		SBLKIF		SBLKIF BS	
RFW#:	001		001 MS		001 MSD		99LE1492-MB1		99LE1492-MB1	
2-Chloronaphthalene	12	U	24	U	24	U	10	U	10	U
2-Nitroaniline	31	U	60	U	60	U	25	U	25	U
Dimethylphthalate	12	U	24	U	24	U	10	U	10	U
Acenaphthylene	12	U	24	U	24	U	10	U	10	U
2,6-Dinitrotoluene	12	U	24	U	24	U	10	U	10	U
3-Nitroaniline	31	U	60	U	60	U	25	U	25	U
Acenaphthene	12	U	47	%	44 *	%	10	U	44 *	%
2,4 Dinitrophenol	31	U	60	U	60	U	25	U	25	U
4-Nitrophenol	31	U	49	%	53	%	25	U	37	%
Dibenzofuran	12	U	24	U	24	U	10	U	10	U
2,4-Dinitrotoluene	12	U	46	%	47	%	10	U	45	%
Diethylphthalate	12	U	24	U	24	U	10	U	10	U
4-Chlorophenyl-phenylether	12	U	24	U	24	U	10	U	10	U
Fluorene	12	U	24	U	24	U	10	U	10	U
4-Nitroaniline	31	U	60	U	60	U	25	U	25	U
4,6-Dinitro-2-methylphenol	31	U	60	U	60	U	25	U	25	U
N-Nitrosodiphenylamine (1)	12	U	24	U	24	U	10	U	10	U
4-Bromophenyl-phenylether	12	U	24	U	24	U	10	U	10	U
Hexachlorobenzene	12	U	24	U	24	U	10	U	10	U
Pentachlorophenol	31	U	25	%	39	%	25	U	22	%
Phenanthrene	12	U	24	U	24	U	10	U	10	U
Anthracene	12	U	24	U	24	U	10	U	10	U
Carbazole	12	U	24	U	24	U	10	U	10	U
Di-n-butylphthalate	0.9	J	24	U	24	U	10	U	10	U
Fluoranthene	12	U	24	U	24	U	10	U	10	U
Pyrene	12	U	58	%	70	%	10	U	58	%
Butylbenzylphthalate	12	U	24	U	24	U	10	U	10	U
3,3'-Dichlorobenzidine	12	U	24	U	24	U	10	U	10	U
Benzo(a)anthracene	12	U	24	U	24	U	10	U	10	U
Chrysene	12	U	24	U	24	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	12	U	24	U	24	U	10	U	10	U
Di-n-octyl phthalate	12	U	24	U	24	U	10	U	10	U
Benzo(b)fluoranthene	12	U	24	U	24	U	10	U	10	U
Benzo(k)fluoranthene	12	U	24	U	24	U	10	U	10	U
Benzo(a)pyrene	12	U	24	U	24	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	12	U	24	U	24	U	10	U	10	U
Dibenz(a,h)anthracene	12	U	24	U	24	U	10	U	10	U
Benzo(g,h,i)perylene	12	U	24	U	24	U	10	U	10	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.

B0X487

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 9912L896-001

Sample wt/vol: 800 (g/mL) ML Lab File ID: A123111

Level: (low/med) LOW Date Received: 12/03/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 12/09/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/31/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	23.61	4	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKIF

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 99LE1492-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A123109

Level: (low/med) LOW Date Received: 12/09/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 12/09/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/31/99

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/L

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

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 12/03/99 RFW LOT # :9912L896

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X487	001	W	99LE1492	12/02/99	12/09/99	12/31/99
B0X487	001 MS	W	99LE1492	12/02/99	12/09/99	12/31/99
B0X487	001 MSD	W	99LE1492	12/02/99	12/09/99	12/31/99
LAB QC:						
SBLKIF	MB1	W	99LE1492	N/A	12/09/99	12/31/99
SBLKIF	MB1 BS	W	99LE1492	N/A	12/09/99	12/31/99

RECRA LabNet Use Only

9912L896

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TTU Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: Orlette Johnson

QC: Spec Del: Std TAT: 30 days

Date Rec'd: 12-3-99 Date Due: 1/2/00

Account #:

Refrigerator #		1	3						3		3	3	3				
#/Type Container	Liquid	3V	2PG						3P		1P	1P	1P				
	Solid																
Volume	Liquid	40	1L						500		500	1L	1L				
	Solid																
Preservatives		HCl	–						HNO3		ZnAc NaOH	–	H2SO4				
ANALYSES REQUESTED		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Sulfide	IC	Total Sol Solids				
RECRA LabNet Use Only		0624H 0625C	0625H						Met①		1SFD	Ang①	NH3N2 NH3N				

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					Met①		1SFD	Ang①	NH3N2 NH3N				
001	BOX487	✓	✓	W	12299	0625	✓	✓					✓		✓	✓	✓				

Special Instructions:

saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Met① = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, B, Sb, Tl
Ang① = 3. ICCL, ICFL, ICNO2, ICNO3, ICPO4T
4. ICSO4, IPH
5.
6. 12/13/99

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # 4235 7953 2400
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. 5.8 °C

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

Relinquished by	Received by	Date	Time
FedEx	TKappel	12-3-99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-15	Page 1 of 1

Collector: Bowers/Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sam	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: SML 430	Field Logbook No.: EL1511-1	COA: B20CW1671C	Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA RF 12-2-99	Offsite Property No.: A000054		Bill of Lading/Air Bill No.: 42357953 2400

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	G/P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time									
B0X487	Water	12.2.99	0525	X	X	X	X		X	X		B0X069
~~B0X490~~ B0X369	Water		RT 12-2-99									
B2B 12/1-99												

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R. Fahlberg	Date/Time: 12.2.99 0600	Received By: Ref 2.C	Date/Time: 12.2.99 0600
Relinquished By: Ref 2C	Date/Time: 12.2.99/0730	Received By: R. Thoren	Date/Time: 12.2.99/0730
Relinquished By: R. Thoren	Date/Time: 12.2.99/1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 12.3.99 0920	Received By: TKappel	Date/Time: 12.3.99 0920
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

See SAF for special instructions.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Copper, Nickel, Vanadium, Zinc}

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

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

BHI-EE-011 (10/99)