RECRA ENVIRONMENTAL INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9911L581
SDG/SAF #: 110605/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 11-02-99

GC/MS VOLATILE

Two (2) water samples were collected on 10-28-99.

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

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. A non-target compound was detected in sample B0WNW9.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.

2000 RECEIVED Data Log In

RECEIVED FEB 28 2000 EDMC

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-14-99
Date

sem/group/data/voa/tnu10581.doc

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

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

GLOSSARY OF VOA DATA

DATA QUALIFIERS

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

mmz\10-94\gloss.voa

GLOSSARY OF VOA DATA

ABBREVIATIONS

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

mmz\10-94\gloss.voa

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 12/10/99 15:44

RFW Batch Number: **9911L581** Client: **TNU-HANFORD B99-085** Work Order: 10985001001 Page: 1a

	Cust ID:	B0WNW8		B0WNW9		B0WNW9		B0WNW9		VBLKCB		VBLKCB BS	
Sample Information	RFW#:	001		002		002 MS		002 MSD		99LVH541-MB1		99LVH541-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate Recovery	Toluene-d8	101	%	98	%	96	%	99	%	99	%	98	%
	Bromofluorobenzene	86	%	95	%	94	%	98	%	95	%	97	%
	1,2-Dichloroethane-d4	91	%	88	%	85	%	89	%	88	%	89	%
			fl		fl		fl		fl		fl		fl
Chloromethane		2	J	3	J	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U	10	U
Methylene Chloride		2	JB	2	JB	2	JB	2	JB	2	J	4	JB
Acetone		10	U	10	U	10	U	10	U	10	U	10	U
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	5	U	92	%	94	%	5	U	94	%
1,1-Dichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	5	U	5	U	5	U
Chloroform		5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U	5	U	5	U	5	U
Bromodichloromethane		5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	5	U	87	%	92	%	5	U	92	%
Dibromochloromethane		5	U	5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
Benzene		5	U	5	U	93	%	95	%	5	U	97	%
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	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	5	U
Toluene		5	U	5	U	93	%	96	%	5	U	97	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9911L581 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1b

Cust ID:	B0WNW8	B0WNW9	B0WNW9	B0WNW9	VBLKCB	VBLKCB BS
RFW#:	001	002	002 MS	002 MSD	99LVH541-MB1	99LVH541-MB1
Chlorobenzene	5 U	5 U	93 %	96 %	5 U	96 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U	5 U

* = Outside of EPA CLP QC limits.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WNW8

Lab Name: Recra.LabNet Contract: 10985001001

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

Matrix: (soil/water) WATER Lab Sample ID: 9911L581-001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: h111034

Level: (low/med) LOW Date Received: 11/02/99

% Moisture: not dec. _____ Date Analyzed: 11/11/99

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

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

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

FORM 1 VOA-TIC 1/87 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WNW9

Lab Name: Recra LabNet Contract: 10985001001

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

Matrix: (soil/water) WATER Lab Sample ID: 99111581-002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: h111035

Level: (low/med) LOW Date Received: 11/02/99

% Moisture: not dec. ____ Date Analyzed: 11/11/99

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	22.050	9	J

FORM 1 VOA-TIC 1/87 Rev.

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

DATE RECEIVED: 11/02/99 RFW LOT # :9911L581

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNW8	001	W	99LVH541	10/28/99	N/A	11/11/99
B0WNW9	002	W	99LVH541	10/28/99	N/A	11/11/99
B0WNW9	002 MS	W	99LVH541	10/28/99	N/A	11/11/99
B0WNW9	002 MSD	W	99LVH541	10/28/99	N/A	11/11/99

LAB QC:

VBLKCB	MB1	W	99LVH541	N/A	N/A	11/10/99
VBLKCB	MB1 BS	W	99LVH541	N/A	N/A	11/10/99

JW 12-11-99

RECRA LabNet Use Only

9911C581

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals

Client: TMU Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 days

Date Rec'd: 11-2-99 Date Due: 12/2/99

Account #:

Refrigerator #		1	2								2		2	2	2			
#/Type Container	Liquid	3v	2P								3 1P 11-10-99		1P	1P	1P			
	Solid																	
Volume	Liquid	40	1L								500		500	1L	1L			
	Solid																	
Preservatives		HCl	—								HNO3		Ice/NaOH	—	HNO3			
ANALYSES REQUESTED		ORGANIC: VCA	BNA	Pest/PCB	Herb						INORG: Metal	CN	Bacteria	TC Chlorid	Cl2 NO2 NO3			

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	CO24H	OGCSC	CO2SH			Metal		ISFD	Cmg	INO2	INH3N		
001	BOWNW8			W	10/28/99	0515	✓												
002	BOWNW9	✓	✓	⊥	⊥	0640	✓	✓				✓		✓	✓	✓			

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

Special Instructions:

Ref # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

1. Cmg = ICCL, ICFL, ICNO2, ICNO3, KPO4,
2. ICSO4, IPH
3. met = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
4. Ni, V, Zn, Be
5. 11/10/99 Sb + Tl added to metals
6. list per pm

Relinquished by	Received by	Date	Time
FedEx	TMurray	11-2-99	0910

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

NOTES:

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4235795312 63
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)
IC out of hold & VH

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. 2.0 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-31	Page 1 of 1

Collector: Bowers/Trice	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 Sa	Sampling Location: 200 East		SAF No.: B99-085
Ice Chest No.: SML 209	Field Logbook No.: EL1511 -1		Method of Shipment: Fed EX
Shipped To: TSDA/RECRA 10-28-99	Offsite Property No.: A000018		Bill of Lading/Air Bill No.: 42357953 R63
			COA: B20CW1 671C

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	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										
B0WNW8	Water	10-28-99	0515						X			CT B0WBC1	
B0WNW9	Water	10-28-99	0640	X	X	X	X		X	X		B0WBC1 10/28/99	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Catherine Trice (Trice)	Date/Time: 10/28/99 1430	Received By: 2A CT 10/28/99 Ref 3B	Date/Time: 10/28/99 1430
Relinquished By: Ref 2A	Date/Time: 11.01.99/0800	Received By: R. Thoren	Date/Time: 11.01.99/0800
Relinquished By: R. Thoren	Date/Time: 11.01.99/1430	Received By: FED EX	Date/Time:
Relinquished By: FedEx	Date/Time: 11-2-99 0910	Received By: T Murray	Date/Time: 11-2-99 0910
LABORATORY SECTION	Received By:	Title:	Date/Time:
FINAL SAMPLE DISPOSITION	Disposal Method:	Disposed By:	Date/Time:

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)

From non rad area

Matrix *

Soil
Water
Vapor
Other Solid
Other Liquid

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

JAN 2000
RECEIVED
Data
Logic

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9911L581
SDG# : H0605
SAF# : B99-085

W.O. # : 10985-001-001-9999-00
Date Received: 11-02-99

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 Nitrate, Nitrite, Phosphate and pH which were received past hold.

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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-15-99
Date

njp\i11-581

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
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chormatography:			
___Bromide ✓Chloride ✓Fluoride	✓ 300.0	___ 9056	
✓Nitrite ___Nitrite ✓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:**

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 11/30/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	ECWNW9	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	0.02 u	MG-N/L	0.02	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		pH	6.7	PH UNITS	0.01	1.0
		Sulfide	2.0 u	MG/L	2.0	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/30/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC091-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	99LN3C56-MB1	Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
BLANK10	99LAMA45-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	99LSDC06-MB1	Sulfide	2.0 u	MG/L	2.0	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/30/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 99111581

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	BCWNW9	Chloride by IC	5.0	0.00	5.0	99.3	1.0
		Fluoride by IC	10.7	0.00	10.0	107.0	1.0
		Nitrite by IC	5.0	0.25u	5.0	100.4	1.0
		Nitrate by IC	4.9	0.25u	5.0	97.7	1.0
		Phosphate by IC	4.9	0.25u	5.0	97.8	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.5	1.0
		Ammonia, as N	1.1	0.10u	1.0	106.0	1.0
		Sulfide	9.7	0.00	10.0	97.0	1.0
BLANK10	991ICC91-MB1	Chloride by IC	4.7	0.25u	5.0	94.1	1.0
		Fluoride by IC	10.7	0.50u	10.0	106.7	1.0
		Nitrite by IC	4.8	0.25u	5.0	96.0	1.0
		Nitrate by IC	4.8	0.25u	5.0	96.0	1.0
		Phosphate by IC	5.0	0.25u	5.0	100.2	1.0
		Sulfate by IC	4.7	0.25u	5.0	93.3	1.0
BLANK10	991N2CEC-MB1	Nitrate Nitrite	0.50	0.02u	0.50	100.4	1.0
		Nitrate Nitrite MSD	0.49	0.02u	0.50	97.4	1.0
BLANK10	99LAMA45-MB1	Ammonia, as N	1.0	0.10u	1.0	104.0	1.0
		Ammonia, as N MSD	1.0	0.10u	1.0	100	1.0
BLANK10	99LSLC66-MB1	Sulfide	9.9	2.0 u	10.0	99.0	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 11/30/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 99111581

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	99LN3010-MB1	Nitrate Nitrite	100.4	97.4	3.0
BLANK10	99LAMA45-MB1	Ammonia, as N	104.0	100	3.9

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/30/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	E0WNW9	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
		Ammonia, as N	0.10u	0.10u	NC	1.0
		pH	6.7	6.6	0.3	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: 11/02/99 RFW LOT # :99111581

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNW9						
CHLORIDE BY IC	002	W	99LIC091	10/28/99	11/03/99	11/03/99
CHLORIDE BY IC	002 REP	W	99LIC091	10/28/99	11/03/99	11/03/99
CHLORIDE BY IC	002 MS	W	99LIC091	10/28/99	11/03/99	11/03/99
FLUORIDE BY IC	002	W	99LIC091	10/28/99	11/03/99	11/03/99
FLUORIDE BY IC	002 REP	W	99LIC091	10/28/99	11/03/99	11/03/99
FLUORIDE BY IC	002 MS	W	99LIC091	10/28/99	11/03/99	11/03/99
NITRITE BY IC	002	W	99LIC091	10/28/99	11/03/99	11/03/99
NITRITE BY IC	002 REP	W	99LIC091	10/28/99	11/03/99	11/03/99
NITRITE BY IC	002 MS	W	99LIC091	10/28/99	11/03/99	11/03/99
NITRATE BY IC	002	W	99LIC091	10/28/99	11/03/99	11/03/99
NITRATE BY IC	002 REP	W	99LIC091	10/28/99	11/03/99	11/03/99
NITRATE BY IC	002 MS	W	99LIC091	10/28/99	11/03/99	11/03/99
PHOSPHATE BY IC	002	W	99LIC091	10/28/99	11/03/99	11/03/99
PHOSPHATE BY IC	002 REP	W	99LIC091	10/28/99	11/03/99	11/03/99
PHOSPHATE BY IC	002 MS	W	99LIC091	10/28/99	11/03/99	11/03/99
SULFATE BY IC	002	W	99LIC091	10/28/99	11/03/99	11/03/99
SULFATE BY IC	002 REP	W	99LIC091	10/28/99	11/03/99	11/03/99
SULFATE BY IC	002 MS	W	99LIC091	10/28/99	11/03/99	11/03/99
NITRATE NITRITE	002	W	99LN3056	10/28/99	11/24/99	11/24/99
AMMONIA	002	W	99LAMA45	10/28/99	11/19/99	11/19/99
AMMONIA	002 REP	W	99LAMA45	10/28/99	11/19/99	11/19/99
AMMONIA	002 MS	W	99LAMA45	10/28/99	11/19/99	11/19/99
PH	002	W	99LPH121	10/28/99	11/05/99	11/05/99
PH	002 REP	W	99LPH121	10/28/99	11/05/99	11/05/99
SULFIDE	002	W	99LSD066	10/28/99	11/04/99	11/04/99
SULFIDE	002 REP	W	99LSD066	10/28/99	11/04/99	11/04/99
SULFIDE	002 MS	W	99LSD066	10/28/99	11/04/99	11/04/99

LAB QC:

CHLORIDE BY IC	MB1	W	99LIC091	N/A	11/03/99	11/03/99
CHLORIDE BY IC	MB1 BS	W	99LIC091	N/A	11/03/99	11/03/99
FLUORIDE BY IC	MB1	W	99LIC091	N/A	11/03/99	11/03/99
FLUORIDE BY IC	MB1 BS	W	99LIC091	N/A	11/03/99	11/03/99
NITRITE BY IC	MB1	W	99LIC091	N/A	11/03/99	11/03/99

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

DATE RECEIVED: 11/02/99 RFW LOT # :99111581

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRITE BY IC	MB1 BS	W	99LIC091	N/A	11/03/99	11/03/99
NITRATE BY IC	MB1	W	99LIC091	N/A	11/03/99	11/03/99
NITRATE BY IC	MB1 BS	W	99LIC091	N/A	11/03/99	11/03/99
PHOSPHATE BY IC	MB1	W	99LIC091	N/A	11/03/99	11/03/99
PHOSPHATE BY IC	MB1 BS	W	99LIC091	N/A	11/03/99	11/03/99
SULFATE BY IC	MB1	W	99LIC091	N/A	11/03/99	11/03/99
SULFATE BY IC	MB1 BS	W	99LIC091	N/A	11/03/99	11/03/99
NITRATE NITRITE	MB1	W	99LN3056	N/A	11/24/99	11/24/99
NITRATE NITRITE	MB1 BS	W	99LN3056	N/A	11/24/99	11/24/99
NITRATE NITRITE	MB1 BSD	W	99LN3056	N/A	11/24/99	11/24/99
AMMONIA	MB1	W	99LAMA45	N/A	11/19/99	11/19/99
AMMONIA	MB1 BS	W	99LAMA45	N/A	11/19/99	11/19/99
AMMONIA	MB1 BSD	W	99LAMA45	N/A	11/19/99	11/19/99
SULFIDE	MB1	W	99LSD066	N/A	11/04/99	11/04/99
SULFIDE	MB1 BS	W	99LSD066	N/A	11/04/99	11/04/99

RECRA LabNet Use Only

9911L581

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

011

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: The Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 11-2-99 Date Due: 12/2/99

Account #:

Refrigerator #		1 2	2 2 2 2
#/Type Container	Liquid	3x 2P	3x 2P 1P 1P 1P
	Solid		TM 11-2-99
Volume	Liquid	40 1L	500 500 1L 1L
	Solid		
Preservatives		HCl —	HNO3 ZnAc NaOH — HgSO4
ANALYSES REQUESTED	ORGANIC: VOA, BNA, Pest/PCB, Herb		INORG: Metal, CN, Total Solids, Cl, F, SO4, PO4

RECRA LabNet Use Only

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA (CL2 4H, CL2 SC, 02 2SH)	BNA	Pest/PCB	Herb	Metal	CN	Total Solids	Cl, F, SO4, PO4	NO2, NO3, NH3-N
	001	Bow Nw8			W	10/28/99	0515	✓								
	002	Bow Nw9	✓	✓	↓	↓	0440	✓	✓			✓		✓	✓	✓

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

Special instructions:

ref # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

1. Cmg (1) = ICCL, ICFL, ICNO2, ICNO3, KPO4,
2. ICSO4, LPH
3. Met (2) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
4. Ni, V, Zn, Be
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # 423579531263
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. 2.6 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: NO3/NO2 Pg out of hold on pH

Relinquished by	Received by	Date	Time
FedEx	T Murray	11-2-99	0910

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-11	Page 1 of 1

Collector: Bowers/Trice	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 Sa	Sampling Location: 200 East		SAF No.: B99-085
Ice Chest No.: SML 209	Field Logbook No.: EL1511 -1		Method of Shipment: Fed EX
Shipped To: TSDA/RECRA	Offsite Property No.: A000018		Bill of Lading/Air Bill No.: 42357953 R63
			COA: B20CW1 671C

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	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 - 350.1	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										
B0WNW8	Water	10-28-99	0715						X			CT B0W8C1	
B0WNW9	Water	10-28-99	0640	X	X	X	X		X	X		B0W8C1 10/28/99	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Catherine Trice (TRICE)	Date/Time: 10/28/99 1430	Received By: 2A CT 10/28/99 Ref 3B	Date/Time: 10/28/99 1430
Relinquished By: Ref 2A	Date/Time: 11.01.99/0800	Received By: R. Thoren	Date/Time: 11.01.99/0800
Relinquished By: R. Thoren	Date/Time: 11.01.99/1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 11-2-99 0910	Received By: T Murray	Date/Time: 11-2-99 0910

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}

From Bay rad area

Temp 2.6

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

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

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

JUN 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9911L581
SDG/SAF# : H0605/B99-085

W.O.# : 10985-001-001-9999-00
Date Received: 11-02-99

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. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

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

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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-16-99
Date

mld/m

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9911L581

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: ✓3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	✓6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	✓6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-11/99

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/16/99

CLIENT: TNU-HANFORD E59-085 RECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	EGWNW9	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.7 u	UG/L	2.7	1.0
		Barium, Total	0.37	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	1.0	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	1.3	UG/L	0.50	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/99

CLIENT: TNU-HANFORD F99-085 RECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0770-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	0.51	UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/16/99

CLIENT: TNU-HANFORD PS9-085 RECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	PCWNW9	Silver, Total	49.6	0.80u	50.0	99.2	1.0
		Arsenic, Total	1980	2.7 u	2000	99.0	1.0
		Barium, Total	1900	0.37	2000	95.2	1.0
		Beryllium, Total	49.6	0.10u	50.0	99.2	1.0
		Cadmium, Total	49.6	0.40u	50.0	99.2	1.0
		Chromium, Total	197	1.0	200	98.2	1.0
		Copper, Total	240	0.50u	250	96.0	1.0
		Nickel, Total	479	1.0 u	500	95.8	1.0
		Lead, Total	491	2.1 u	500	98.2	1.0
		Antimony, Total	488	2.1 u	500	97.6	1.0
		Selenium, Total	1970	4.1 u	2000	98.6	1.0
		Thallium, Total	2020	4.3 u	2000	101.0	1.0
		Vanadium, Total	505	0.60u	500	101.0	1.0
		Zinc, Total	479	1.3	500	95.5	1.0

Pecra LabNet - Lionville

INORGANICS PRECISION REPORT 11/16/99

CLIENT: TNU-HANFORD F99-085 PECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	E0WNW9	Silver, Total	0.80u	0.80u	NC	1.0
		Arsenic, Total	2.7 u	2.7 u	NC	1.0
		Barium, Total	0.37	0.34	8.5	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Chromium, Total	1.0	1.3	26.1	1.0
		Copper, Total	0.50u	1.0	~~NC~~ 200	1.0
		Nickel, Total	1.0 u	1.0 u	NC	1.0
		Lead, Total	2.1 u	2.3	~~NC~~ 200	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	4.3 u	4.3 u	NC	1.0
		Vanadium, Total	0.60u	0.60u	NC	1.0
		Zinc, Total	1.3	1.2	8.0	1.0

Correction
AG 11/16/99

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/16/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9911L581

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0770-LC1	Silver, LCS	491	500	UG/L	98.2
		Arsenic, LCS	9740	10000	UG/L	97.4
		Barium, LCS	4820	5000	UG/L	96.3
		Beryllium, LCS	245	250	UG/L	97.9
		Cadmium, LCS	242	250	UG/L	97.0
		Chromium, LCS	486	500	UG/L	97.3
		Copper, LCS	1210	1250	UG/L	96.5
		Nickel, LCS	1910	2000	UG/L	95.5
		Lead, LCS	2400	2500	UG/L	96.0
		Antimony, LCS	2890	3000	UG/L	96.3
		Selenium, LCS	9710	10000	UG/L	97.1
		Thallium, LCS	9850	10000	UG/L	98.5
		Vanadium, LCS	2510	2500	UG/L	100.4
		Zinc, LCS	967	1000	UG/L	96.7

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD E99-085

DATE RECEIVED: 11/02/99 RFW LOT # :9911L581

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNW9						
SILVER, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
SILVER, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
SILVER, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
ARSENIC, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
ARSENIC, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
ARSENIC, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
BARIUM, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
BARIUM, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
BARIUM, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
BERYLLIUM, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
BERYLLIUM, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
BERYLLIUM, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
CADMIUM, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
CADMIUM, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
CADMIUM, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
CHROMIUM, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
CHROMIUM, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
CHROMIUM, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
COPPER, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
COPPER, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
COPPER, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
NICKEL, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
NICKEL, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
NICKEL, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
LEAD, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
LEAD, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
LEAD, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
ANTIMONY, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
ANTIMONY, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
ANTIMONY, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
SELENIUM, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
SELENIUM, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
SELENIUM, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
THALLIUM, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
THALLIUM, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD E99-085

DATE RECEIVED: 11/02/99 RFW LOT # :9911L581

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
THALLIUM, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
VANADIUM, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
VANADIUM, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
VANADIUM, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99
ZINC, TOTAL	002	W	99L0770	10/28/99	11/11/99	11/11/99
ZINC, TOTAL	002 REP	W	99L0770	10/28/99	11/11/99	11/11/99
ZINC, TOTAL	002 MS	W	99L0770	10/28/99	11/11/99	11/11/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
SILVER, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
ARSENIC LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
ARSENIC, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
BARIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
BARIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
BERYLLIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
BERYLLIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
CADMIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
CADMIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
CHROMIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
CHROMIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
COPPER LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
COPPER, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
NICKEL LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
NICKEL, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
LEAD LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
LEAD, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
ANTIMONY LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
ANTIMONY, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
SELENIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
SELENIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
THALLIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
THALLIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
VANADIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
VANADIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
ZINC LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
ZINC, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99

RECRA LabNet Use Only

9911L581

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals

Client: TRU Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 11-2-99 Date Due: 12/2/99

Account #:

Refrigerator #		1	2					2		2	2	2
#/Type Container	Liquid	3v	2P					3 1P		1P	1P	1P
	Solid											
Volume	Liquid	40	1L					500		500	1L	1L
	Solid											
Preservatives		HCl	—					HNO3		ZnAc NaOH	—	HNO3
ANALYSES REQUESTED		ORGANIC						INORG				
		VOA	BNA	Pest/PCB	Herb			Metal	CN	Fluoride	Cl, NO3, SO4	PH

RECRA LabNet Use Only

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	624H CGCSC	8260SH					Met(1)		1SFD	Ang(1)	1N3U2 1NH3N
S - Soil	001	BOWNW8			W	10/28/99	0515	✓										
SE - Sediment	002	BOWNW9	✓	✓	⊥	⊥	0640	✓	✓					✓		✓	✓	✓
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																		

Special Instructions:

saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Ang (1) = ICCL, ICFL, ICNO2, ICNO3, KPO4,

2. ICSO4, IPH

met (8) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,

4. Ni, V, Zn, Be

11/10/99 5. Sb + Tl added to metals

6. list pg 2 of 2

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered

Airbill # 423579531263

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)

IC out of hold

PH

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. 2.6 °C

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

NOTES:

Relinquished by	Received by	Date	Time
FedEx	JMurray	11-2-99	0910

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-11	Page 1 of 1

Collector: Bowers/Trice	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 Sa	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: SML 209	Field Logbook No.: EL1511 -7	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA	Offsite Property No.: A000018	Bill of Lading/Air Bill No.: 42357953 R263	
		COA: B20CW1 671C	

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	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										
B0WNW8	Water	10-28-99	CT15						X			~~BOWBCI~~ CT	
B0WNW9	Water	10-28-99	CG40	X	X	X	X		X	X		~~BOWBCI~~ BOWBCI 10/28/99	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Catherine Trice (Trice)	Date/Time: 10/28/99 1430	Received By: 2A CT 10/28/99 Ref 3B	Date/Time: 10/28/99 1430
Relinquished By: Ref 2A	Date/Time: 11.01.99/0800	Received By: R. Thoren	Date/Time: 11.01.99/0800
Relinquished By: R. Thoren	Date/Time: 11.01.99/1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 11-2-99 0910	Received By: T Murray	Date/Time: 11-2-99 0910

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)

From hay road area

temp 216

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

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

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

JAN 2000 RECEIVED Log In

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

Client: TNU HANFORD B99-085
RFW #: 9911L581
SDG/SAF#: H0605.B99-085

W.O. #: #: 10985-001-001-9999-00
Date Received: 11-02-99

GC SCAN

This package was revised to add Sample Discrepancy Report.

The set of samples consisted of two (2) water samples collected on 10-28-99.

The samples and their associated QC samples were prepared on 11-04-99 and 12-02-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 11-05-99 and 12-02-99.

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

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

2. The analysis hold time criteria were exceeded for sample B0WNW8. A copy of the Sample Discrepancy Report (SDR) has been enclosed in the data package.

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

4. All 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%.

for Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-3-99
Date

r:\share\le\gescan\11-581.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 (includes 002A).

X01

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 #: 99LC063

99LC528-001

Initiator: C. Schnell RFW Batch: 99111581 Parameter: 06CSC
Date: 11/26/99 Samples: 001 Matrix: Water
Client: TNU Water Method: SW846 MCAWW/CLP/ Prep Batch: _____
H0605, B99-085

1. Reason for SDR

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

b. General Discrepancy

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

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

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

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

4. Project Manager Instructions...signature/date: Brenda L. Johnson

__ 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: 12/3/99 Other Explanation:

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

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

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

L-WI-006/E-03/99

002A

Recra LabNet - Lionville Laboratory

GC STAN

Report Date: 12/03/99 11:21

RFW Batch Number: 9911L581 Client: TNU-HANFORD B99-085 Work Order: 10985-001-001-9999-00 Page: 1

003

	Cust ID:	B0WNW8	B0WNW9	B0WNW9	B0WNW9	BLK	BLK BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	99LLC181-MB1	99LLC181-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
n-Propyl Alcohol		5.0 U	5.0 U	103 %	100 %	5.0 U	97 %
Ethanol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

	Cust ID:	BLK	BLK BS
Sample Information	RFW#:	99LLC170-MB1	99LLC170-MB1
	Matrix:	WATER	WATER
	D.F.:	1.00	1.00
	Units:	mg/L	mg/L
n-Propyl Alcohol		5.0 U	99 %
Ethanol		5.0 U	5.0 U

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

12/3/99

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

DATE RECEIVED: 11/02/99 RFW LOT # :99111081

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BCWNW8	001	W	99LLC181	10/28/99	12/02/99	12/02/99
BCWNW9	002	W	99LLC170	10/28/99	11/04/99	11/05/99
BCWNW9	002 MS	W	99LLC170	10/28/99	11/04/99	11/05/99
BCWNW9	002 MSD	W	99LLC170	10/28/99	11/04/99	11/05/99

LAB QC:

BLK	MB1	W	99LLC181	N/A	12/02/99	12/02/99
BLK	MB1 BS	W	99LLC181	N/A	12/02/99	12/02/99
BLK	MB1	W	99LLC170	N/A	11/04/99	11/05/99
BLK	MB1 BS	W	99LLC170	N/A	11/04/99	11/05/99

12/3/99

RECRA LabNet Use Only

9911C581

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals

RECRA LabNet

Client TMU Hanford B99-085

Est. Final Proj. Sampling Date

Project # 10985-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager OJ

QC spec Del std TAT 30 days

Date Rec'd 11-2-99 Date Due 12/2/99

Account #

Refrigerator #		1	2						2		2	2	2				
#/Type Container	Liquid	3x	2P					3	1P		1P	1P	1P				
	Solid																
Volume	Liquid	40	1L						500		500	1L	1L				
	Solid																
Preservatives		HCl	—						HNO3		Ent. Cool	—	Hold				
ANALYSES REQUESTED		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Burial	IC anions	CC cations				
		RECRA LabNet Use Only															
		0624H	0625C	8082SH					metC		ISFD	Ang	INH3N2				

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	8082SH	metC	ISFD	Ang	INH3N2
001	BOWNW8			W	10/28/99	0515	✓						
002	BOWNW9	✓	✓	⊥	⊥	0640	✓	✓		✓	✓	✓	✓

Special Instructions:

ref # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Ang (1) = ICCL, ICFL, ICNO2, ICNO3, RPO4,
2. ICSO4, IPH
met (6) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
4. Ni, V, Zn, Be
11/10/99 5. Sb + Tl added to metals
6. list ppm

RECRA LabNet Use Only

Samples were:
1) Snipped ✓ or
Hand Delivered
AirBill # 423579531263
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)
IC out of hold
pH

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. 2.6 °C

Relinquished by	Received by	Date	Time
FedEx	TMurray	11-2-99	0910

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

NOTES:

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-31	Page 1 of 1

Collector: Bowers/Trice	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 Sa	Sampling Location: 200 East		SAF No.: B99-085
Ice Chest No.: SML 209	Field Logbook No.: EL1511-1		Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A000018		Bill of Lading/Air Bill No.: 42357953 R463
			COA: B20CW1 671C

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	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										
B0WNW8	Water	10-28-99	0715						X			~~B0W8C1~~	
B0WNW9	Water	10-28-99	0640	X	X	X	X		X	X		~~B0W8C1~~ 10/28/99	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Catherine Trice	Date/Time: 10/28/99 1430	Received By: 2A 10/28/99 Ref 3B	Date/Time: 10/28/99 1430
Relinquished By: Ref 2A	Date/Time: 11.01.99/0800	Received By: R. Thoren	Date/Time: 11.01.99/0800
Relinquished By: R. Thoren	Date/Time: 11.01.99/1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 11-2-99 0910	Received By: T Murray	Date/Time: 11-2-99 0910

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)

From non rad area

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9911L581
SDG/SAF #: H0605/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 11-02-99

SEMIVOLATILE

One (1) water sample was collected on 10-28-99.

The sample and it's associated QC samples were extracted on 11-03-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Methods 3550B and 8270B for TCL Semivolatile target compounds on 11-15-99.

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

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.

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

3. Non-target compounds were detected in the samples.

4. One (1) of thirty (30) surrogate recoveries was outside the USEPA QC limits.

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

6. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-4-00
Date

pef/pouip data bua tm10581 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

RFW Batch Number: 9911L581 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Report Date: 12/28/99 18:32 Page: 1a

	Cust ID:	B0WNW9		B0WNW9		B0WNW9		SBLKFR		SBLKFR BS	
Sample Information	RFW#:	002		002 MS		002 MSD		99LE1336-MB1		99LE1336-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	95	%	92	%	83	%	89	%	85	%
	2-Fluorobiphenyl	84	%	82	%	75	%	75	%	78	%
	Terphenyl-d14	99	%	95	%	78	%	94	%	99	%
	Phenol-d5	77	%	74	%	74	%	76	%	75	%
	2-Fluorophenol	72	%	71	%	68	%	73	%	74	%
	2,4,6-Tribromophenol	96	%	127 *	%	93	%	81	%	112	%
Phenol		12	U	74	%	68	%	10	U	69	%
bis(2-Chloroethyl)ether		12	U	24	U	24	U	10	U	10	U
2-Chlorophenol		12	U	76	%	72	%	10	U	69	%
1,3-Dichlorobenzene		12	U	24	U	24	U	10	U	10	U
1,4-Dichlorobenzene		12	U	63	%	64	%	10	U	56	%
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	107	%	85	%	10	U	77	%
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	73	%	69	%	10	U	61	%
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	93	%	73	%	10	U	83	%
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		30	U	60	U	60	U	25	U	25	U

*= Outside of EPA CLP QC limits.

Cust ID:	B0WNW9		B0WNW9		B0WNW9		SBLKFR		SBLKFR BS	
RFW#:	002		002 MS		002 MSD		99LE1336-MB1		99LE1336-MB1	
2-Chloronaphthalene	12	U	24	U	24	U	10	U	10	U
2-Nitroaniline	30	U	[illegible]	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	30	U	60	U	60	U	25	U	25	U
Acenaphthene	12	U	81	%	72	%	10	U	72	%
2,4-Dinitrophenol	30	U	60	U	60	U	25	U	25	U
4-Nitrophenol	30	U	147 *	%	104 *	%	25	U	117 *	%
Dibenzofuran	12	U	24	U	24	U	10	U	10	U
2,4-Dinitrotoluene	12	U	92	%	78	%	10	U	80	%
Diethylphthalate	1	J	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	30	U	60	U	60	U	25	U	25	U
4,6-Dinitro-2-methylphenol	30	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	30	U	110 *	%	76	%	25	U	66	%
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	12	U	24	U	24	U	10	U	10	U
Fluoranthene	12	U	24	U	24	U	10	U	10	U
Pyrene	12	U	84	%	71	%	10	U	83	%
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	18	J	24	U	10	U	3	J
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.

BCWNW9

Lab Name: Paragon Lab Net Work Order: 1099F001001

Client: TNCL-MANFORD 099-165

Matrix: (soil/water) WATER Lab Sample ID: 99111181-002

Sample wt/vol: 850 (g/mL) ML Lab File ID: A111809

Level: (low/med) LOW Date Received: 11/02/99

% Moisture: ____ Decanted: (Y/N) __ Date Extracted: 11/03/99

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

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 7 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	6.83	6	J
2.	UNKNOWN	7.52	10	JB
3.	UNKNOWN	7.58	4	J
4.	UNKNOWN	7.78	8	JB
5.	UNKNOWN	8.06	6	J
6.	UNKNOWN	8.14	10	JB
7.	UNKNOWN	23.33	3	J

1F

SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SPIKER

Lab Name: Brunswick Nat Work Order: 1099500001

Client: TNX-HANFORD PROJECT

Matrix: (soil/water) WATER Lab Sample ID: 9911F186-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A111507

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N) __ Date Extracted: 11/03/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/18/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.52	2	J
2.	UNKNOWN	7.78	4	J
3.	UNKNOWN	8.15	4	J

Sierra Nevada - Nicholville Laboratory
PNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD F99-065

DATE RECEIVED: 11/02/99 RFW LOT # :99111181

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BCWNW9	002	W	99LE1336	10/28/99	11/03/99	11/15/99
BCWNW9	002 MS	W	99LE1336	10/28/99	11/03/99	11/15/99
BCWNW9	002 MSD	W	99LE1336	10/28/99	11/03/99	11/15/99

LAB QC:

SPLKFR	MB1	W	99LF1336	N/A	11/03/99	11/15/99
SPLKFR	MB1 BS	W	99LE1336	N/A	11/03/99	11/15/99

RECRA LabNet Use Only

9911L581

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals

RECRA LabNet

Client: TTU Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 11-2-99 Date Due: 12/2/99

Account #:

Refrigerator #		1	2							2		2	2	2				
#/Type Container	Liquid	3v	2P							3 1P 11-10-99		1P	1P	1P				
	Solid																	
Volume	Liquid	40	1L							500		500	1L	1L				
	Solid																	
Preservatives		HCl	—							HNO3		EnCore Doom	—	H2SO4				
ANALYSES REQUESTED →		ORGANIC								INORG								
		VOA	BNA	Pest/PCB	Herb					Metal	CN	Fluoride	CL SO4 NO3 NO2	PO4				
		RECRA LabNet Use Only																
		624H 624SC	625C	625H						Met (8)		15FD	Chng (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	624H 624SC	625C	625H					Met (8)		15FD	Chng (1)	1N3N2 1NH3N				
001	BOWNW8			W	10/28/99	0515	✓															
002	BOWNW9	✓	✓	⊥	⊥	0640	✓	✓						✓		✓	✓	✓				

Special Instructions:

Ref # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

Chng (1) = ICCL, ICFL, ICNO2, ICNO3, KPO4,

2. ICSO4, IPH

met (8) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,

4. Ni, V, Zn, Be

11/10/99 5. Sb + Tl added to metals

6. list per pm

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___
Airbill # 423579531263
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

IC out of hold at PH

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

COC Record Present Upon Sample Rec'd Y or N

Cooler Temp. 2.6 °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES

Relinquished by	Received by	Date	Time
FedEx	TMurray	11-2-99	0910

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-11	Page 1 of 1

Collector: Bowers/Trice	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 Sa	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: SML 209	Field Logbook No.: EL1511 -1	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA	Offsite Property No.: A000018	Bill of Lading/Air Bill No.: 42357953 R263	
		COA: B20CW1 671C	

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	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 (1CL)	Gross Alpha, Gross Beta	VOA - 8260A (1CL), VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
B0WNW8	Water	10-28-99	0715						X			CT B0WBC1	
B0WNW9	Water	10-28-99	0640	X	X	X	X		X	X		B0WBC1 10/28/99	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
Catherine Bowers/Trice	10/28/99 1430	2A CT 10/28/99 Ref 3B	10/28/99 1430
Ref 2A	11.01.99/0800	R. Thoren	11.01.99/0800
R. Thoren	11.01.99/1430	FED EX	
Fed Ex	11-2-99 0910	T Murray	11-2-99 0910

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)

From non rad area

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

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

H0605-TMM/RECRA

Thermo Retec
W.O. No. N9-11-029-7268

Bechtel Hanford Inc.
SDG H0605

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0605 is composed of one water sample designated under SAF No. B99-085 with a Project Designation of: 200 Area Source Characterization – 200-CW-1 OU – QC Sa.

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 3, 2000.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

JAN 2000
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0605

SAMPLE SUMMARY

SDG 2268
Contact Melissa C. Marion

Client Hanford
Contract TRB SDB-207925
Case no SDG H0605

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
1(WNW9	Hanford Site	WATER		N911029-01	B99-085	B99-085-11	10/28/99 06:40
Method Blank		WATER		N911029-03	B99-085		
Lab Control Sample		WATER		N911029-02	B99-085		
Duplicate (N911029-01)	Hanford Site	WATER		N911029-04	B99-085		10/28/99 06:40

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0605

QC SUMMARY

SDG 7268
Contract Melissa C. Maslin

Client Hanford
Contract DE-AC06-96RL13925
Case no SDG H0605

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DATE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7268	F99 085-11	F0W3W9	WATER				11/02/99	5	N911029-01	7268-001
		Method Blank	WATER						N911029-03	7268-003
		Lab Control Sample	WATER						N911029-02	7268-002
		Duplicate (N911029-01)	WATER				11/02/99	5	N911029-04	7268-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0C05

PREP BATCH SUMMARY

SDG H0C8
Contact Melissa C. Marsden

Client Hanford
Contract TEP-CSP-207925
Case no SDG H0C05

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	CLIENT	MORE	BLANKETS ANALYZED RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
6PA	WATER	Gross Alpha in Water	6909-018	20.0	1			1	1	1/1		
6PB	WATER	Gross Beta in Water	6909-018	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 blankets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVT-PBS
Version 3.06
Report date 01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0005

WORK SUMMARY

SDG 1198
Contact Melissa C. Martin

Client Hanford
Contract [illegible]
Case no H0005

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	FLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
[illegible]			N911129-01	9768-001	89A/80		12/17/99	12/30/99	NJV	Gross Alpha in Water
Hanford Site		WATER	10/11/99	9768-001	89B/80		12/17/99	12/30/99	NJV	Gross Beta in Water
H99-085-11	H99-085		11/12/99							
Method Blank			N911129-03	9768-003	89A/80		12/10/99	12/30/99	NJV	Gross Alpha in Water
		WATER		9768-003	89B/80		12/10/99	12/30/99	NJV	Gross Beta in Water
	H99-085									
Lab Control Sample			N911129-02	9768-002	89A/80		11/30/99	12/30/99	NJV	Gross Alpha in Water
		WATER		9768-002	89B/80		11/30/99	12/30/99	NJV	Gross Beta in Water
	H99-085									
Duplicate (N911129-01)			N911129-04	9768-004	89A/80		12/17/99	12/30/99	NJV	Gross Alpha in Water
Hanford Site		WATER	10/18/99	9768-004	89B/80		12/17/99	12/30/99	NJV	Gross Beta in Water
	H99-085		11/12/99							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MS/MD	RE	BLANK	LCS	DUP SPIKE	TOTAL
89A/80	H99-085	Gross Alpha in Water	EPA900.0	1			1	1	1	4
89B/80	H99-085	Gross Beta in Water	EPA900.0	1			1	1	1	4
TOTALS				2			2	2	2	8

Lab id TMLNC
Protocol Hanford
Version Ver 1.0
Form DVE CWS
Version 2.06
Report date 01/03/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0605

N911029 03 Method Blank

METHOD BLANK

SDG	2168	Client/Case no	Hanford SDG H0605
Contact	Melissa C. Mannion	Contract	TBP-SBR 20/525
Lab sample id	N911029-03	Client sample id	Method Blank
Dept sample id	2268-003	Material/Matrix	WATER
		SAF No	P99-085

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.155	0.41	1.0	3.0	U	8CA
Gross Beta	12587-47-2	-0.423	1.2	2.1	4.0	U	8CB

200 East, 200 Area Source Chara.

QC-BLANK 37634

METHOD BLANKS
Page 1
SUMMARY DATA SECTION
Page 7

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0605

N911029 02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 1178

Client Melissa C. Marchan

Client/Project Federal SDG NO. 5

Case no 98E-1186/1875

Lab sample id N911029-02

Client sample id Lab Control Sample

Dept sample id 1178.002

Material/Matrix WATER

LAF No. 1066155

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	72.5	5.0	1.2	3.0		RA	71.7	2.9	101	67-123	60-130
Gross Beta	96.3	3.8	1.9	4.0		RB	92.7	3.3	104	75-125	

2σ Part, 1AB Area Prorce Chara.

SD-1178 01-33

Lab Id 2MANC

Protocol Hanford

Version Ver 1.0

Form LVD-LCS

Version 3.06

Report date 01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP B0C05

N911029 04

P0WNW9

DUPLICATE

SDG ID 0168

Client Melissa C. Marlin

Client/Project Id Hanford HMC B0C05

Case Id SDF 1BF-100915

DUPLICATE

Lab sample Id N911029-04

Dept sample Id 0195 004

ORIGINAL

Lab sample Id 2911029-01

Dept sample Id 0195 001

Received 11/01/99

Client sample Id P0WNW9

Location/Matrix Hanford Site WATER

Collected 10/18/99 00:40

Data by/TAP No P99-187-11 100-195

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALIFIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	-0.002	0.45	1.06	3.0	U	EPA	0.003	0.34	0.75	U	-		
Gross Beta	0.022	1.2	2.0	4.0	U	EPA	-0.006	1.2	2.1	U	-		

100 East, 100 Area Source Chara.

QC LCS#1 91125

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-DUP

Version 3.06

Report date 01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0605

N911029-01 B0WNW9

DATA SHEET

SDG 7768		Client/Case no Hanford	SDG H0605
Contact Melissa C. Manion		Contract TMB-SPF-782915	
Lab sample id N911029-01		Client sample id B0WNW9	
Dept sample id 7768-001		Location/Matrix Hanford Site	WATER
Received 11/02/99		Collected 10/28/99 06:40	
		Custody/FAF No L99-085-11	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	0.003	0.34	0.75	3.0	U	80A
Gross Beta	11787-47-2	-0.796	1.2	2.1	4.0	U	80B

700 Part, 100 Area Source Chala.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0005

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test [illegible] Matrix WATER
SDG [illegible]
Contact [illegible]

Client Hanford
Contract [illegible]
Case no [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 0909 018						
[illegible]W9	N[illegible] 01	80		[illegible]-001	U	
[illegible] (LCS [illegible])	N[illegible] 03	80		[illegible]-003	U	
[illegible] (LCS [illegible])	N[illegible] 02	80		[illegible]-002	ok	
Duplicate (N[illegible] 01)	N[illegible] 04	80		[illegible]-004	-	U

Nominal values and limits from method MDLs (pCi/L) 3.0
200 East, 200 Area Source Class.

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	FINAL VOLUME mg	RESID %	DEF COUNT min	FWHM keV	DRIFT keV	DAYS HELD	PREPARED	ANALYZED	DETECTOR
Preparation batch 0909 018 2σ prep error 20.0 % Reference Lab Notebook 0909 pg. 18															
[illegible]W9	N[illegible] 01	80		0.75	0.300		1		300			50	12/10/99	11/17	GBP-1.4
[illegible] (LCS [illegible])	N[illegible] 03	80		1.0	0.300		13		100				11/19/99	11/20	GBP-1.4
[illegible] (LCS [illegible])	N[illegible] 02	80		1.2	0.300		12		100				11/19/99	11/17	GBP-1.1
Duplicate (N[illegible] 01) LCS [illegible]	N[illegible] 04	80		0.86	0.300		1		100			50	12/10/99	11/17	GBP-1.1
Nominal values and limits from method				3.0	0.300		5-150		100			180			

PROCEDURES REFERENCE EPA-900.0
EI-100 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES + 2 SD MDA 0.98 ± 0.17
FOR 4 SAMPLES RESIDUE 12 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD SMS
Version 3.06
Report date 01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP R6C05

Test [illegible]	WATER
[illegible]	
Project [illegible]	

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Client	Hanford
Contract	[illegible]
Case no	[illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	PLANCHET	Gross Beta	
Preparation Batch 0909 018						
[illegible]	[illegible]-01	80		[illegible]-001	U	
[illegible] (LC [illegible])	[illegible]-03	80		[illegible]-003	U	
LCS (LC [illegible])	[illegible]-02	80		[illegible]-002	ok	
Duplicate ([illegible])	[illegible]-04	80		[illegible]-004	-	U

Nominal values and limits from method MDLs (pCi/L) 4.0

200 Part, 200 Area Source Chara.

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	MDA pCi/L	ALIQ L	DILU-FAC	DILU-TION	RETD mg	EFF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation Batch 0909 018 2σ prep error 15.0 % Reference Lab Notebook 0909 pg. 18																
[illegible]	[illegible]-01	80		2.1	0.300			1		100			50	[illegible]	[illegible]	BP-114
[illegible] (LC [illegible])	[illegible]-03	80		2.1	0.300			3		100				[illegible]	[illegible]	BP-114
LCS (LC [illegible])	[illegible]-02	80		1.9	0.300			2		100				[illegible]	[illegible]	BP-115
Duplicate ([illegible] (LC [illegible])	[illegible]-04	80		1.0	0.300			1		100			50	[illegible]	[illegible]	BP-111
Nominal values and limits from method				4.0	0.300			5-150		100			180			

PROCEDURES REFERENCE	EPA900.0	
11 120	Gross Alpha and Gross Beta in Drinking Water, rev 2	

AVERAGES ± 2 SD	MDA	2.0	± 0.39
FOR 4 SAMPLES	BEHIGHE	12	± 15

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	PVF-GMS
Version	3.06
Report date	01/03/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-11	Page 1 of 1

Collector: Bowers/Trice	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 Sa	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: ERC 96.059	Field Logbook No.: EL1511 ~)	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA 10-28-99	Offsite Property No.: A000017	Bill of Lading/Air Bill No.: 4235795 3 1219	
		COA: B20CW1671C	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	ZnAc+NaOH to pH>9 Cool	Cool 4C	HNO3 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	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 - 353.2, 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								
? B0WNW8	Water	10-28-99	0910								~~BOWTC~~ 10/28/99
✓ B0WNW9	Water	10-28-99	0640				X *				~~BOWTC~~ 10/28/99

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: Bowers/Trice CTrice 10/28/99 1430	Received By: CT 2A Ref 3B 10/28/99	Date/Time: 1430
Relinquished By: Ref 2A 11.01.99	Received By: 10/28/99 R Thorsen 11.01.99	Date/Time: 0800
Relinquished By: Rikki Thorsen 11.01.99	Received By: FED EX	Date/Time: 11/1/99
Relinquished By: FedEx 11/2/99 10:00	Received By: TNW H. Goldenberg	Date/Time: 11/2/99

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)

From non rad area. < 2000 pCi/gr
NO TA NEEDED

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

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 11-2-99 10:00

CoC No. B99-085-11

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

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 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. Goldenberg Date: 11-2-99 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 _____