H0587-TMA/RECRA

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU HANFORD B99-085
RFW# : 9910L473
SDG# : H0587
SAF# : B99-085

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

RECEIVED
FEB 14 2000
EDMC

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, pH, and Phosphate 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

12-2-99
Date

njp&pef\i10-473

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.

Reeva 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 ✓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 (c)
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 11/15/99

CLIENT: TNU-HANFORD F99-065 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	EOWNW7	Chloride by IC	0.34	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	7.1	PH UNITS	0.01	1.0
		Sulfide	2.0 u	MG/L	2.0	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/15/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC087-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
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LICA87-MB1	Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LN3053-MB1	Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
BLANK10	99LAMA43-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	99LSDA62-MB1	Sulfide	2.0 u	MG/L	2.0	1.0

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INORGANICS ACCURACY REPORT 11/15/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	E0WNW7	Chloride by IC	5.0	0.34	5.0	92.3	1.0
		Fluoride by IC	10.8	0.00	10.0	108.3	1.0
		Nitrite by IC	5.2	0.25u	5.0	103.8	1.0
		Nitrate by IC	5.0	0.25u	5.0	101.0	1.0
		Phosphate by IC	5.0	0.25u	5.0	100.4	1.0
		Sulfate by IC	5.0	0.25u	5.0	100.5	1.0
		Nitrate Nitrite	0.52	0.02u	0.50	103.4	1.0
		Nitrate Nitrite MSD	0.49	0.02u	0.50	98.0	1.0
		Ammonia, as N	0.98	0.10u	1.0	98.3	1.0
		Sulfide	9.8	0.00	10.0	98.0	1.0
BLANK10	99LIC087-MB1	Chloride by IC	4.7	0.25u	5.0	94.5	1.0
		Fluoride by IC	10.5	0.50u	10.0	104.6	1.0
		Nitrite by IC	4.9	0.25u	5.0	98.2	1.0
		Nitrate by IC	4.8	0.25u	5.0	96.5	1.0
		Sulfate by IC	4.8	0.25u	5.0	95.1	1.0
BLANK10	99LICA87-MB1	Phosphate by IC	5.0	0.25u	5.0	99.5	1.0
BLANK10	99LN3053-MB1	Nitrate Nitrite	0.50	0.02u	0.50	99.6	1.0
		Nitrate Nitrite MSD	0.51	0.02u	0.50	101.6	1.0
BLANK10	99LAMA43-MB1	Ammonia, as N	1.0	0.10u	1.0	104.0	1.0
		Ammonia, as N MSD	1.0	0.10u	1.0	103.0	1.0
BLANK10	99LSDA62-MB1	Sulfide	10.0	2.0 u	10.0	100	1.0

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INORGANICS DUPLICATE SPIKE REPORT 11/15/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-002	BOWNW7	Nitrate Nitrite	103.4	98.0	5.4
BLANK10	99LN3053-MB1	Nitrate Nitrite	99.6	101.6	2.0
BLANK10	99LAMA43-MB1	Ammonia, as N	104.0	103.0	0.97

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INORGANICS PRECISION REPORT 11/15/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	E0WNW7	Chloride by IC	0.34	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	7.1	7.1	0.1	1.0
		Sulfide	2.0 u	2.0 u	NC	1.0

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

DATE RECEIVED: 10/22/99 RFW LOT # :9910L473

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNW7						
CHLORIDE BY IC	002	W	99LIC087	10/20/99	10/26/99	10/26/99
CHLORIDE BY IC	002 REP	W	99LIC087	10/20/99	10/26/99	10/26/99
CHLORIDE BY IC	002 MS	W	99LIC087	10/20/99	10/26/99	10/26/99
FLUORIDE BY IC	002	W	99LIC087	10/20/99	10/26/99	10/26/99
FLUORIDE BY IC	002 REP	W	99LIC087	10/20/99	10/26/99	10/26/99
FLUORIDE BY IC	002 MS	W	99LIC087	10/20/99	10/26/99	10/26/99
NITRITE BY IC	002	W	99LIC087	10/20/99	10/26/99	10/26/99
NITRITE BY IC	002 REP	W	99LIC087	10/20/99	10/26/99	10/26/99
NITRITE BY IC	002 MS	W	99LIC087	10/20/99	10/26/99	10/26/99
NITRATE BY IC	002	W	99LIC087	10/20/99	10/26/99	10/26/99
NITRATE BY IC	002 REP	W	99LIC087	10/20/99	10/26/99	10/26/99
NITRATE BY IC	002 MS	W	99LIC087	10/20/99	10/26/99	10/26/99
PHOSPHATE BY IC	002	W	99LICA87	10/20/99	10/26/99	10/26/99
PHOSPHATE BY IC	002 REP	W	99LICA87	10/20/99	10/26/99	10/26/99
PHOSPHATE BY IC	002 MS	W	99LICA87	10/20/99	10/26/99	10/26/99
SULFATE BY IC	002	W	99LIC087	10/20/99	10/26/99	10/26/99
SULFATE BY IC	002 REP	W	99LIC087	10/20/99	10/26/99	10/26/99
SULFATE BY IC	002 MS	W	99LIC087	10/20/99	10/26/99	10/26/99
NITRATE NITRITE	002	W	99LN3053	10/20/99	11/10/99	11/10/99
NITRATE NITRITE	002 REP	W	99LN3053	10/20/99	11/10/99	11/10/99
NITRATE NITRITE	002 MS	W	99LN3053	10/20/99	11/10/99	11/10/99
NITRATE NITRITE	002 MSD	W	99LN3053	10/20/99	11/10/99	11/10/99
AMMONIA	002	W	99LAMA43	10/20/99	11/08/99	11/08/99
AMMONIA	002 REP	W	99LAMA43	10/20/99	11/08/99	11/08/99
AMMONIA	002 MS	W	99LAMA43	10/20/99	11/08/99	11/08/99
PH	002	W	99LPH115	10/20/99	10/24/99	10/24/99
PH	002 REP	W	99LPH115	10/20/99	10/24/99	10/24/99
SULFIDE	002	W	99LSDA62	10/20/99	10/26/99	10/26/99
SULFIDE	002 REP	W	99LSDA62	10/20/99	10/26/99	10/26/99
SULFIDE	002 MS	W	99LSDA62	10/20/99	10/26/99	10/26/99

LAB QC:

CHLORIDE BY IC	MB1	W	99LIC087	N/A	10/26/99	10/26/99
CHLORIDE BY IC	MB1 BS	W	99LIC087	N/A	10/26/99	10/26/99

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

DATE RECEIVED: 10/22/99 RFW LOT # :9910L473

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
FLUORIDE BY IC	MB1	W	99LIC087	N/A	10/26/99	10/26/99
FLUORIDE BY IC	MB1 BS	W	99LIC087	N/A	10/26/99	10/26/99
NITRITE BY IC	MB1	W	99LIC087	N/A	10/26/99	10/26/99
NITRITE BY IC	MB1 BS	W	99LIC087	N/A	10/26/99	10/26/99
NITRATE BY IC	MB1	W	99LIC087	N/A	10/26/99	10/26/99
NITRATE BY IC	MB1 BS	W	99LIC087	N/A	10/26/99	10/26/99
PHOSPHATE BY IC	MB1	W	99LICA87	N/A	10/26/99	10/26/99
PHOSPHATE BY IC	MB1 BS	W	99LICA87	N/A	10/26/99	10/26/99
SULFATE BY IC	MB1	W	99LIC087	N/A	10/26/99	10/26/99
SULFATE BY IC	MB1 BS	W	99LIC087	N/A	10/26/99	10/26/99
NITRATE NITRITE	MB1	W	99LN3053	N/A	11/10/99	11/10/99
NITRATE NITRITE	MB1 BS	W	99LN3053	N/A	11/10/99	11/10/99
NITRATE NITRITE	MB1 BSD	W	99LN3053	N/A	11/10/99	11/10/99
AMMONIA	MB1	W	99LAMA43	N/A	11/08/99	11/08/99
AMMONIA	MB1 BS	W	99LAMA43	N/A	11/08/99	11/08/99
AMMONIA	MB1 BSD	W	99LAMA43	N/A	11/08/99	11/08/99
SULFIDE	MB1	W	99LSDA62	N/A	10/26/99	10/26/99
SULFIDE	MB1 BS	W	99LSDA62	N/A	10/26/99	10/26/99

RECRA LabNet Use Only

9910L473

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU - Hanford B99-085

Est. Final Proj. Sampling Date:

Project #: 109185-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Appro Del: Std TAT: 30 day

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

Account #:

Refrigerator #		1	2	3		1	
#/Type Container	Liquid	3AG	2AG	1PL	1PL	3PL	1PL
	Solid						
Volume	Liquid	40	1LT	500	1LT	500	1LT
	Solid						
Preservatives		HCL	—	ZnAc NaOH	H2SO4 HNO3 NO3 NO2 SULFIDE AMMONIA	HNO3	—

ANALYSES REQUESTED →

ORGANIC					INORG		
VOA	BNA	Pest/PCB	Herb		Metal	CN	IC anions

RECRA LabNet Use Only

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected										
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								CZ24H	CZ2SH	15FD	NO2 NO3	Metal	Anion				
	001	BOWNW6			W	0455	10/20/99	3									
	002	1 7	X	X	1	1	1	3	2		1	1	3	1			

Special Instructions:

COMPOSITE WASTE

DATE/REVISIONS:

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

2. Ni, V, Zn, Be

Anion ③ = ICCL, ICFL, ICNO2, ICNO3, ICPO4,

4. ICSO4, IPH

5.

6.

RECRA LabNet Use Only

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

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

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

Cooler Temp. 3.6 °C

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

NOTES: 4235 7953 0900 pH out NO2/NO3/PO4 out

Relinquished by	Received by	Date	Time
Jedlicka	Janson	10/22/99	0930
	for UH		

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-12	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.: ER 40	Field Logbook No.: EL1511		Method of Shipment: Fed EX
Shipped To: ~~TMA/RECRA~~ 10/20/99 RECRA	Offsite Property No.: A00003		Bill of Lading/Air Bill No.:
			COA: B20CW1671C

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 Cyanide Special Instructions	SO2 SO3 (-53) Method 14 (-53)	See IC Anions & 7196A (Cr6)	Gross Alpha Gross Beta	IC OA - 8270 A (IC1 IC2 SO3 - NO2 Add On: 2 L Proposal Limited)	See Metals Special Instructions			

Sample No	Matrix *	Sample Date	Sample Time										
~~BOWNX0~~ CT BOWNW6	Water	10/20/99	0455						X				
~~BOWNX1~~ ST BOWNW7	Water	10/20/99	0455	X	X	X	X		X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Charlie Trice	Date/Time: 10/20/99 1230	Received By: Ref 2C	Date/Time: 10/20/99 1230
Relinquished By: Ref 2C	Date/Time: 10.20.99 / 0900	Received By: R. Thoren / Rikki Thoren	Date/Time: 10.21.99 0900
Relinquished By: R. Thoren / Rikki Thoren	Date/Time: 10.21.99 / 1430	Received By: FEDEX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10-22-99 0930	Received By: [illegible]	Date/Time: 10-22-99 0930

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)

NO TA required — from nonrad 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

Temp 3.0

RECRA ENVIRONMENTAL INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9910L473
SDG/SAF# : H0587/B99-085

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

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 analysis for 1 analyte was 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.

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

11-17-99
Date

mld/m10-473

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9910L473

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-WT-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 11/17/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	EOWNW7	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.7 u	UG/L	2.7	1.0
		Barium, Total	0.48	UG/L	0.20	1.0
		Beryllium, Total	0.38	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
		Selenium, Total	4.1 u	UG/L	4.1	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	2.4	UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/17/99

CLIENT: TNU-HANFORD E99-085

RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0738-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	0.20 u	UG/L	0.20	1.0
		Beryllium, Total	0.14	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
		Selenium, Total	4.1 u	UG/L	4.1	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	0.50 u	UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/17/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	EOWNW7	Silver, Total	50.1	0.80u	50.0	100.2	1.0
		Arsenic, Total	2060	2.7 u	2000	103.2	1.0
		Barium, Total	2010	0.48	2000	100.6	1.0
		Beryllium, Total	52.7	0.38	50.0	104.6	1.0
		Cadmium, Total	51.1	0.40u	50.0	102.2	1.0
		Chromium, Total	204	0.70u	200	102.0	1.0
		Copper, Total	249	0.50u	250	99.5	1.0
		Nickel, Total	519	1.0 u	500	103.9	1.0
		Lead, Total	517	2.1 u	500	103.4	1.0
		Selenium, Total	2080	4.1 u	2000	104.0	1.0
		Vanadium, Total	506	0.60u	500	101.2	1.0
		Zinc, Total	504	2.4	500	100.4	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/17/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: S910L473

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	EOWNW7	Silver, Total	0.80u	0.80u	NC	1.0
		Arsenic, Total	2.7 u	2.7 u	NC	1.0
		Barium, Total	0.48	0.52	8.0	1.0
		Beryllium, Total	0.38	0.41	7.6	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Chromium, Total	0.70u	0.70u	NC	1.0
		Copper, Total	0.50u	0.50u	NC	1.0
		Nickel, Total	1.0 u	1.0 u	NC	1.0
		Lead, Total	2.1 u	2.1 u	NC	1.0
		Selenium, Total	4.1 u	4.1 u	NC	1.0
		Vanadium, Total	0.60u	0.60u	NC	1.0
		Zinc, Total	2.4	1.9	23.3	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/17/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L473

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0738-LC1	Silver, LCS	501	500	UG/L	100.2
		Arsenic, LCS	10200	10000	UG/L	101.9
		Barium, LCS	5000	5000	UG/L	99.9
		Beryllium, LCS	257	250	UG/L	103.0
		Cadmium, LCS	254	250	UG/L	101.6
		Chromium, LCS	505	500	UG/L	101.0
		Copper, LCS	1240	1250	UG/L	99.5
		Nickel, LCS	2030	2000	UG/L	101.6
		Lead, LCS	2530	2500	UG/L	101.3
		Selenium, LCS	10300	10000	UG/L	102.7
		Vanadium, LCS	2550	2500	UG/L	101.8
		Zinc, LCS	1010	1000	UG/L	100.8

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

DATE RECEIVED: 10/22/99 RFW LOT # :9910L473

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNW7						
SILVER, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
SILVER, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
SILVER, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
ARSENIC, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
ARSENIC, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
ARSENIC, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
BARIUM, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
BARIUM, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
BARIUM, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
BERYLLIUM, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
BERYLLIUM, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
BERYLLIUM, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
CADMIUM, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
CADMIUM, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
CADMIUM, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
CHROMIUM, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
CHROMIUM, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
CHROMIUM, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
COPPER, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
COPPER, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
COPPER, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
NICKEL, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
NICKEL, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
NICKEL, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
LEAD, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
LEAD, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
LEAD, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
SELENIUM, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
SELENIUM, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
SELENIUM, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
VANADIUM, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
VANADIUM, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99
VANADIUM, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99
ZINC, TOTAL	002	W	99L0738	10/20/99	10/29/99	10/29/99
ZINC, TOTAL	002 REP	W	99L0738	10/20/99	10/29/99	10/29/99

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

DATE RECEIVED: 10/22/99 RFW LOT # :9910L473

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	002 MS	W	99L0738	10/20/99	10/29/99	10/29/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
SILVER, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
ARSENIC LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
ARSENIC, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
BARIUM LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
BARIUM, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
BERYLLIUM LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
BERYLLIUM, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
CADMIUM LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
CADMIUM, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
CHROMIUM LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
CHROMIUM, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
COPPER LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
COPPER, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
NICKEL LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
NICKEL, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
LEAD LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
LEAD, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
SELENIUM LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
SELENIUM, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
VANADIUM LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
VANADIUM, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99
ZINC LABORATORY	LC1 BS	W	99L0738	N/A	10/29/99	10/29/99
ZINC, TOTAL	MB1	W	99L0738	N/A	10/29/99	10/29/99

RECRA LabNet Use Only

9910L473

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU - 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: 10/22/99 Date Due: 11/21/99

Account #:

Refrigerator #		1	2							3													
#/Type Container	Liquid	3AG	2AG							1PL	1PL	3PL		1PL									
	Solid																						
Volume	Liquid	40	1LT							500	1LT	500		1LT									
	Solid																						
Preservatives		HCL	—							ZnAc NaOH	H_2SO_4 H_2O_2	HNO3		—									
ANALYSES REQUESTED		ORGANIC								SULFIDE	WI3 NO2 AMMON	INORG		IC Anions									
		VOA	BNA	Pest/PCB	Herb							Metal	CN										
		RECRA LabNet Use Only																					
		8024H 8260C	8270							1SFD	1N3N2 1N4N3	Metal		8260									

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8024H 8260C	8270				1SFD	1N3N2 1N4N3	Metal		8260							
001	BowNW6			W	0455	10/20/99	3																
002	1 7	X	X	1	1	1	3	2				1	1	3		1							

Special Instructions:

COMPOSITE WASTE

DATE/REVISIONS:

Met ① = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, Be
Ang ③ = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
4. ICSO4, IPH
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'd (Y) or N
Cooler Temp. 3.6 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7953 0900 phone out NO2/NO3/PO4 out

Relinquished by	Received by	Date	Time
Jeckey	Janson	10/21/99	0930
	for UH		

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-12	Page 1 of 1

Collector: Bowers/Trice	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SI
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.: ER LD	Field Logbook No.: EL1511		Method of Shipment: Fed EX
Shipped To: ~~TMA/RECRA~~ 10/20/99 RECRA	Offsite Property No.: A00 0003		Bill of Lading/Air Bill No.:
			COA: B20CW167IC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

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			
	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) (Acetone, Propanol, Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time									
~~BOWNX0~~ 10/20/99 BOWNW6	Water	10/20/99	0455						X			
~~BOWNX1~~ 10/20/99 BOWNW7	Water	10/20/99	0455	X	X	X	X		X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible] Trice	10/20/99 1230	Ref 2C	10/20/99 1230
Ref 2C	10.20.99 / 0900	R Thoren / Rikki Thoren	10.21.99 0900
R Thoren / Rikki Thoren	10.21.99 / 1430	FEDEX	
Fed Ex	10.22.99 0930	[illegible]	10.22.99 0930

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)

NO TA Required – from nonrad 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

Temp 3.6

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

DEC 1999

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD B99-078
RFW #: 9910L473
SDG/SAF#: H0587.B99-078

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

GC SCAN

The set of samples consisted of two (2) water samples collected on 10-20-99.

The samples and their associated QC samples were prepared on 10-25-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 10-30,31-99.

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

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

2. The required holding time for analysis was met.

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

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

5. Surrogates were not used for this analysis.

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

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-15-99
Date

r:\share le\pscan 10-473.doc

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

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

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP	=	Indicates spiked compound.

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 11/02/99 18:12

RFW Batch Number: 9910L473 Client: TNU-HANFORD B99-085 Work Order: 10985-001-001-9999-00 Page: 1

	Cust ID:	B0WNW6	B0WNW7	B0WNW7	B0WNW7	BLK	BLK BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	99LLC164-MB1	99LLC164-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	102	%	105	%	5.0	U	92	%
Ethanol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U

003

11/3/99

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: 10/22/99 RFW LOT # :9910L473

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BCWNW6	C01	W	99LLC164	10/20/99	10/25/99	10/30/99
BCWNW7	C02	W	99LLC164	10/20/99	10/25/99	10/31/99
BCWNW7	C02 MS	W	99LLC164	10/20/99	10/25/99	10/31/99
BCWNW7	C02 MSD	W	99LLC164	10/20/99	10/25/99	10/31/99

LAB QC:

BLK	MB1	W	99LLC164	N/A	10/25/99	10/30/99
BLK	MB1 BS	W	99LLC164	N/A	10/25/99	10/30/99

11/3/99

RECRA LabNet Use Only

9910L473

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU - Hanford B99-085

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Appr Del: Std TAT: 30 day

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

Account #:

Refrigerator #		1	2				3				1							
#/Type Container	Liquid	3AG	2AG				1PL	1PL	3PL		1PL							
	Solid																	
Volume	Liquid	40	1LT				500	1LT	500		1LT							
	Solid																	
Preservatives		HCL	—				ENRC NaOH	H2SO4 HNO3	HNO3		—							
ANALYSES REQUESTED		ORGANIC							INORG									
		VOA	BNA	Pest/PCB	Herb		SULFIDE	NH3 NO2 AMMONIA	Metal	CN	IC ANIONS							
		RECRA LabNet Use Only																
		CC24H OGCSQ	CC 25H				15FD	1NEN2 1NHSN	MetO		AnigO							

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	IC ANIONS							
001	BowNW6			W	0455	10/20/99	3																	
002	1 7	X	X	1	1	1	3	2					1	1	3		1							

Special Instructions:

COMPOSITE WASTE

DATE/REVISIONS:

Met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, Be
Anig (3) = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
4. ICSO4, IPH
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 3.6 °C

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

NOTES: 4235 7953 0900 ph out NO2/NO3/PO4 out

Relinquished by	Received by	Date	Time
Jeeley	Janson for VH	10/22/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-085-12

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.: ER 40	Field Logbook No.: EL1511		Method of Shipment: Fed EX
Shipped To: ~~TMA/RECRA~~ RECRA 10/20/99	Offsite Property No.: A00 0003		Bill of Lading/Air Bill No.:
			COA: B20CW1671C

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) (2-Propanol Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
~~B0WNX0~~ B0WNW6	Water	10/20/99	0455						X				
~~B0WNX1~~ B0WNW7	Water	10/20/99	0455	X	X	X	X		X	X			

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

Relinquished By	Date/Time	Received By	Date/Time
[illegible] Trice	10/20/99 1230	Ref 2C	10/20/99 1230
Ref 2C	10.20.99 /0900	R. Thoren / Rikki Thoren	10.21.99 0900
R. Thoren / Rikki Thoren	10.21.99/1430	FEDEX	
Fed Ex	10.22.99 0930	[illegible]	10.22.99 0930

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}

NO TA Required — from nonrad 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: _____

Temp 3.6

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

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW # : 9910L473
SDG/SAF #: H0587 B99-085

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

SEMIVOLATILE

One (1) water sample was collected on 10-20-99.

The sample and its associated QC samples were extracted on 10-26-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 11-01-99.

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

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

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

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

4. All surrogate recoveries were within EPA QC limits.

5. One (1) of twenty-two (22) matrix spike recoveries was outside EPA QC limits.

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

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

By J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-23-99
Date

som/group/data/bna/tna10473.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, BSL List

Report Date: 11/20/99 13:46

RFW Batch Number: 9910L473 Client: TNU-HANFORD B99-085 Work Order: 10985001C01 Page: 1a

	Cust ID:	B0WNW7		B0WNW7		B0WNW7		SBLKFG		SBLKFG BS	
Sample Information	RFW#:	002		002 MS		002 MSD		99LE1299-MB1		99LE1299-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	81	%	76	%	82	%	79	%	79	%
	2-Fluorobiphenyl	78	%	78	%	81	%	79	%	76	%
	Terphenyl-d14	82	%	80	%	84	%	84	%	79	%
	Phenol-d5	67	%	48	%	76	%	62	%	66	%
	2-Fluorophenol	79	%	73	%	79	%	79	%	79	%
	2,4,6-Tribromophenol	82	%	76	%	84	%	84	%	83	%
Phenol		11	U	54	%	74	%	10	U	67	%
bis(2-Chloroethyl)ether		11	U	22	U	22	U	10	U	10	U
2-Chlorophenol		11	U	67	%	82	%	10	U	76	%
1,3-Dichlorobenzene		11	U	22	U	22	U	10	U	10	U
1,4-Dichlorobenzene		11	U	49	%	62	%	10	U	46	%
1,2-Dichlorobenzene		11	U	22	U	22	U	10	U	10	U
2-Methylphenol		11	U	22	U	22	U	10	U	10	U
2,2'-oxybis(1-Chloropropane)		11	U	22	U	22	U	10	U	10	U
4-Methylphenol		11	U	22	U	22	U	10	U	10	U
N-Nitroso-di-n-propylamine		11	U	42	%	79	%	10	U	62	%
Hexachloroethane		11	U	22	U	22	U	10	U	10	U
Nitrobenzene		11	U	22	U	22	U	10	U	10	U
Isophorone		11	U	22	U	22	U	10	U	10	U
2-Nitrophenol		11	U	22	U	22	U	10	U	10	U
2,4-Dimethylphenol		11	U	22	U	22	U	10	U	10	U
bis(2-Chloroethoxy)methane		11	U	22	U	22	U	10	U	10	U
2,4-Dichlorophenol		11	U	22	U	22	U	10	U	10	U
1,2,4-Trichlorobenzene		11	U	64	%	71	%	10	U	59	%
Naphthalene		11	U	22	U	22	U	10	U	10	U
4-Chloroaniline		11	U	22	U	22	U	10	U	10	U
Hexachlorobutadiene		11	U	22	U	22	U	10	U	10	U
4-Chloro-3-methylphenol		11	U	62	%	69	%	10	U	66	%
2-Methylnaphthalene		11	U	22	U	22	U	10	U	10	U
Hexachlorocyclopentadiene		11	U	22	U	22	U	10	U	10	U
2,4,6-Trichlorophenol		11	U	22	U	22	U	10	U	10	U
2,4,5-Trichlorophenol		28	U	55	U	55	U	25	U	25	U

*= Outside of EPA CLP QC limits.

Cust ID:	B0WNW7		B0WNW7		B0WNW7		SBLKFG		SBLKFG BS	
RFW#:	002		002 MS		002 MSD		99LE1299-MB1		99LE1299-MB1	
2-Chloronaphthalene	11	U	22	U	22	U	10	U	10	U
2-Nitroaniline	28	U	55	U	55	U	25	U	25	U
Dimethylphthalate	11	U	22	U	22	U	10	U	10	U
Acenaphthylene	11	U	22	U	22	U	10	U	10	U
2,6-Dinitrotoluene	11	U	22	U	22	U	10	U	10	U
3-Nitroaniline	28	U	55	U	55	U	25	U	25	U
Acenaphthene	11	U	72	%	80	%	10	U	74	%
2,4-Dinitrophenol	28	U	55	U	55	U	25	U	25	U
4-Nitrophenol	28	U	68	%	86 *	%	25	U	74	%
Dibenzofuran	11	U	22	U	22	U	10	U	10	U
2,4-Dinitrotoluene	11	U	72	%	81	%	10	U	77	%
Diethylphthalate	11	U	22	U	22	U	10	U	10	U
4-Chlorophenyl-phenylether	11	U	22	U	22	U	10	U	10	U
Fluorene	11	U	22	U	22	U	10	U	10	U
4-Nitroaniline	28	U	55	U	55	U	25	U	25	U
4,6-Dinitro-2-methylphenol	28	U	55	U	55	U	25	U	25	U
N-Nitrosodiphenylamine (1)	11	U	22	U	22	U	10	U	10	U
4-Bromophenyl-phenylether	11	U	22	U	22	U	10	U	10	U
Hexachlorobenzene	11	U	22	U	22	U	10	U	10	U
Pentachlorophenol	28	U	75	%	75	%	25	U	89	%
Phenanthrene	11	U	22	U	22	U	10	U	10	U
Anthracene	11	U	22	U	22	U	10	U	10	U
Carbazole	11	U	22	U	22	U	10	U	10	U
Di-n-butylphthalate	11	U	22	U	22	U	10	U	10	U
Fluoranthene	11	U	22	U	22	U	10	U	10	U
Pyrene	11	U	77	%	83	%	10	U	80	%
Butylbenzylphthalate	11	U	22	U	22	U	10	U	10	U
3,3'-Dichlorobenzidine	11	U	22	U	22	U	10	U	10	U
Benzo(a)anthracene	11	U	22	U	22	U	10	U	10	U
Chrysene	11	U	22	U	22	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	11	U	22	U	22	U	10	U	10	U
Di-n-octyl phthalate	11	U	22	U	22	U	10	U	10	U
Benzo(b)fluoranthene	11	U	22	U	22	U	10	U	10	U
Benzo(k)fluoranthene	11	U	22	U	22	U	10	U	10	U
Benzo(a)pyrene	11	U	22	U	22	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	11	U	22	U	22	U	10	U	10	U
Dibenz(a,h)anthracene	11	U	22	U	22	U	10	U	10	U
Benzo(g,h,i)perylene	11	U	22	U	22	U	10	U	10	U

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

1F

SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

F0WNW7

Lab Name: Battelle/Kat Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 99101473-002

Sample wt/vol: 900 (g/mL) ML Lab File ID: D110109

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

% Moisture: _____ decanted: (Y/N) __ Date Extracted: 10/26/99

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

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 9 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.23	7	JB
2.	UNKNOWN	7.30	5	JB
3.	UNKNOWN	7.33	4	J
4.	UNKNOWN	8.03	7	JB
5.	UNKNOWN	8.09	4	JB
6.	UNKNOWN	8.29	3	JB
7.	UNKNOWN	8.55	7	J
8.	UNKNOWN	8.66	9	JB
9.	C3-ALKYLBENZENE	9.57	3	J

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKPG

Lab Name: Paragon Lab Inc. Work Order: 10995001001

Client: DOE-HANFORD F99-085

Matrix: (soil/water) WATER Lab Sample ID: 99LB1299 MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: D110103

Level: (low/med) LOW Date Received: 10/26/99

% Moisture: ____ decanted: (Y/N) __ Date Extracted: 10/26/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/01/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.22	4	J
2.	UNKNOWN	7.29	3	J
3.	UNKNOWN	8.01	6	J
4.	UNKNOWN	8.07	2	J
5.	UNKNOWN	8.18	1	J
6.	UNKNOWN	8.12	1	J
7.	UNKNOWN	8.55	3	J
8.	UNKNOWN	8.64	9	J
9.	UNKNOWN	14.45	4	J
10.	UNKNOWN	27.44	2	J

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

DATE RECEIVED: 10/22/99 RPW LOT # :9910L473

CLIENT ID	RPW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNW7	CC2	W	99LE1299	10/20/99	10/26/99	11/01/99
B0WNW7	CC2 MS	W	99LE1299	10/20/99	10/26/99	11/01/99
B0WNW7	CC2 MSD	W	99LE1299	10/20/99	10/26/99	11/01/99

LAB QC:

SBLKFG	MB1	W	99LE1299	N/A	10/26/99	11/01/99
SBLKFG	MB1 BS	W	99LE1299	N/A	10/26/99	11/01/99

RECRA LabNet Use Only: 9910L473

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU - 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: 10/22/99 Date Due: 11/21/99
Account #:

Refrigerator #		1	2				2				1					
#/Type Container	Liquid	3AG	2AG				1PL	1PL	3PL		1PL					
	Solid															
Volume	Liquid	40	1LT				500	1LT	500		1LT					
	Solid															
Preservatives		HCL	—				ZNAC NaOH	H2SO4 HNO3	HNO3		—					
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb		SULFIDE AMMONIA	NH3 NO2	Metal	CN	IC ANIONS					

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only: 02 24H 02 25C	02 25H			15FD	1NEW 1NEW	1METO		1ANIO				
001	BOWNW6			W	0455	10/21/99	3												
002	1 7	X	X	1	1	1	3	2			1	1	3		1				

Special Instructions:

COMPOSITE WASTE

DATE/REVISIONS:
1. Met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, Be
3. Ang (1) = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
4. ICSO4, IPH
5.
6.

RECRA LabNet Use Only

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

COC Tape was: 1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Records Present Upon Sample Rec't (Y) or N
Cooler Temp 3.6 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 4235 7953 0900 pH out NO2/NO3/PO4 out

Relinquished by	Received by	Date	Time
Jedey	Janson for UH	10/22/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-12	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.: ER LD	Field Logbook No.: EL1511		Method of Shipment: Fed EX
Shipped To: ~~TMA/RECRA~~ 10/22/99 RECRA	Offsite Property No.: A00 0003		Bill of Lading/Air Bill No.:
			COA: B20CW167IC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

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			
	Sulfides - 9034	See Special Instructions	NO2/NO3 - 353.1 Ammonia - 350.1	See SAOA - 8270A (TCL)	Gross Alpha Gross Beta	SAOA - 8260A (TCL), SAOA - 8260A Add-On [2-Propanol Ethanol]	See Special Instructions			

Sample No	Matrix *	Sample Date	Sample Time										
~~B0WN00~~ B0WNW6	Water	10/20/99	0455						X				
~~B0WN01~~ B0WNW7	Water	10/20/99	0455	X	X	X	X		X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
Clarence Trice	10/20/99 1230	Ref 2C	10/20/99 1230
Ref 2C	10.2.99 /0900	R. Thoren / Rick Thoren	10.2.99 0900
R. Thoren / R.K. Thoren	10.21.99/1430	FEDEX	
Fed Ex	10.22.99 0930	[illegible]	10.22.99 0930

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)

no TA required — from nonrad 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 LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW # : 9910L473
SDG/SAF #: H0587/B99-085

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

GC/MS VOLATILE

Two (2) water samples were collected on 10-20-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 10-30,31-99.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL.

DEC 1999
RECEIVED
Data
Log In

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-30-99
Date

sem\group\data\voa\tnu10473.doc

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

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.

mm2\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: 11/27/99 15:17

RFW Batch Number: 9910L473 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1a

	Cust ID:	B0WNW6		B0WNW7		B0WNW7		B0WNW7		VBLKXJ		VBLKXJ BS	
Sample Information	RFW#:	001		002		002 MS		002 MSD		99LVH462-MB1		99LVH462-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	94	%	97	%	96	%	99	%	90	%	95	%
	Bromofluorobenzene	92	%	98	%	97	%	97	%	90	%	96	%
	1,2-Dichloroethane-d4	97	%	100	%	102	%	97	%	86	%	100	%
Chloromethane		10	U	10	U	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		4	JB	4	JB	5	B	6	B	8		6	B
Acetone		10	U	10	U	10	U	10	U	7	J	6	JB
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	5	U	83	%	94	%	5	U	78	%
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	94	%	94	%	5	U	89	%
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	99	%	99	%	5	U	95	%
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	2	J	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	98	%	101	%	5	U	94	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9910L473 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1b

Cust ID:	B0WNW6	B0WNW7	B0WNW7	B0WNW7	VBLKXJ	VBLKXJ BS
RFW#:	001	002	002 MS	002 MSD	99LVH462-MB1	99LVH462-MB1
Chlorobenzene	5 U	5 U	99 %	101 %	5 U	95 %
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.

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

DATE RECEIVED: 10/22/99 RFW LOT # :9910L473

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
E0WNW6	001	W	99LVH462	10/20/99	N/A	10/31/99
E0WNW7	002	W	99LVH462	10/20/99	N/A	10/31/99
E0WNW7	002 MS	W	99LVH462	10/20/99	N/A	10/31/99
E0WNW7	002 MSD	W	99LVH462	10/20/99	N/A	10/31/99
LAB QC:						
VELKXJ	MB1	W	99LVH462	N/A	N/A	10/30/99
VELKXJ	MB1 BS	W	99LVH462	N/A	N/A	10/31/99

gw 11-22-99

RECRA LabNet Use Only

9910L473

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU - Hanford B99-085
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Appr Del: Std TAT: 30 day
Date Rec'd: 10/22/99 Date Due: 11/21/99
Account #:

Refrigerator #		1	2				2				1						
#/Type Container	Liquid	3AG	2AG				1PL	1PL	3PL		1PL						
	Solid																
Volume	Liquid	40	1LT				500	1LT	500		1LT						
	Solid																
Preservatives		HCL	—				ENHC NaOH	H2SO4 HNO3	HNO3		—						
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb		Sulfide	NH3 NO2 Anions	Metal	CN	IC Anions						
		RECRA LabNet Use Only															
		CLP HCSC	OC 25H				15FD	INORG INHEN	Metal		Ang						

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	CLP HCSC	OC 25H				15FD	INORG INHEN	Metal		Ang						
001	BOWNW6			W	0455	10/20/99	3															
002	1 7	X	X	1	1	1	3	2				1	1	3		1						

Special Instructions:

COMPOSITE WASTE

DATE/REVISIONS:
Met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
2. Ni, V, Zn, Be
Ang (3) = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
4. ICSO4, IPH
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 3.6 °C

Relinquished by	Received by	Date	Time
Deeley	Janson	10/22/99	0930
	for UH		

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7953 0900 ph out NO2/NO3/PO4

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-12	Page 1 of 1

Collector Bowers/Trice	Company Contact C Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location 200 East		SAF No. B99-085
Ice Chest No. ER LD	Field Logbook No. EL1511		Method of Shipment Fed EX
Shipped To ~~TMA/RECRA~~ 10/20/99 RECRA	Offsite Property No. A00 0003		Bill of Lading/Air Bill No.
			COA B20CW167IC

Price Code 7N

Data Turnaround 45 Days

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	aG*	P			
Special Handling and/or Storage	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 (Acetone, Propanol, Ethanol)	See Item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
~~B0WNX0~~ B0WNW6	Water	10/20/99	0455						X				
~~B0VNX1~~ B0WNW7	Water	10/20/99	0455	X	X	X	X		X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
[illegible]	10/20/99 1230	Rec 2C	10/20/99 1230
Rec 2C	10.2.99 /0900	R.Thoren/Rick Thoren	10.2.99 0900
R.Thoren/R.K.Thoren	10.21.99/1430	FEDEX	
Fed Ex	10.22.99 0930	[illegible]	10.22.99 0930

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)

no TA required – from nonrad 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

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0587 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 H0587

SAMPLE SUMMARY

SDG 3154
Contract Melissa C. Marchan

Client Hanford
Contract DE-AC-[illegible]
Case no SDG H0587

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
P:WNW7	Hanford Site	WATER		N910178-01	B99-085	B99-085-12	10/20/99 04:55
Method Blank		WATER		N910178-03	B99-085		
Lab Control Sample		WATER		N910178-02	B99-085		
Duplicate (N910178-01)	Hanford Site	WATER		N910178-04	B99-085		10/20/99 04:55

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 H0187

QC SUMMARY

SDG 7254
Contact Robert C. Marston

Client Hanford
Contract DE-AC06-97RL13725
Case No. SDG H0187

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
7254	H99-185-12	H1WNW7	WATER				10/22/99	2	N910178-01	7254-001
		Method Blank	WATER						N910178-03	7254-003
		Lab Control Sample	WATER						N910178-02	7254-002
		Duplicate (N910178-01)	WATER				10/22/99	2	N910178-04	7254-004

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

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

PREP BATCH SUMMARY

TCS [illegible]	
Contact William C. Marston	

Client Fluor	
Contract [illegible]	
Case no [illegible]	

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
83A	WATER	Gross Alpha in Water	6904-164	20.0	1			1	1	1/1		
83B	WATER	Gross Beta in Water	6904-164	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	PVD-PBS
Version	3.06
Report date	01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0587

WORK SUMMARY

SDG 7154
Contact Melissa C. Manson

Client Hanford
Contract TKP-SBP 207915
Case no SDG H0587

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
P9WNW7			N910178-01	7154-001	80A/80		12/13/99	12/30/99	NJV	Gross Alpha in Water
Hanford Site		WATER	10/20/99	7154-001	80B/80		12/13/99	12/30/99	NJV	Gross Beta in Water
B99-085-12	B99-085		10/22/99							
Method Blank			N910178-03	7154-003	80A/80		12/13/99	12/30/99	NJV	Gross Alpha in Water
		WATER		7154-003	80B/80		12/13/99	12/30/99	NJV	Gross Beta in Water
	B99-085									
Lab Control Sample			N910178-02	7154-002	80A/80		12/13/99	12/30/99	NJV	Gross Alpha in Water
		WATER		7154-002	80B/80		12/13/99	12/30/99	NJV	Gross Beta in Water
	B99-085									
Replicate (N910178-01)			N910178-04	7154-004	80A/80		12/13/99	12/30/99	NJV	Gross Alpha in Water
Hanford Site		WATER	10/20/99	7154-004	80B/80		12/13/99	12/30/99	NJV	Gross Beta in Water
	B99-085		10/22/99							

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 DVT CWS
Version 3.06
Report date 02/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0587

N910178 03

Method Blank

METHOD BLANK

SLG 7254	Client/Case no Hanford	SDG H0587	
Contact Melissa C. Mannion	Contract TEP-SPB-207925		
Lab sample id N910178-03	Client sample id Method Blank		
Dept sample id 7254-003	Material/Matrix	WATER	
	SAF No F99-085		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.064	0.59	1.2	3.0	U	8CA
Gross Beta	12587-47-2	-0.709	1.0	1.9	4.0	U	8CB

200 East, 200 Area Source Chara.

QC-BLANK 32601

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 HG187

N910178-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG	HG4	Client/Case no	Hanford HG187
Contact	Melissa C. Manion	Case no	TLP-PDP-203925
Lab sample id	N910178-02	Client sample id	Lab Control Sample
Dept sample id	HG4-002	Material/Matrix	WATER
		SAF No	PSS-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	65.5	4.7	0.96	3.0		RIA	71.7	2.9	91	71-130	80-120
Gross Beta	85.5	3.9	2.1	4.0		RIA	82.7	3.3	103	71-125	

100 Test, 100 Area Source Chara.

LCS-LCS 57100

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 8

Lab id	TMANC
Protocol	Hanford
Version	Ver 2.0
Form	DVD-LCS
Version	3.06
Report date	01/22/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0587

N916178 04 BGWNW7

DUPLICATE

SDG 3154

Contact Melissa C. Maillon

Client/Case no Hanford SDG H0587

Case no TMR-CHP-107915

DUPLICATE	ORIGINAL	
Lab sample id N916178-04	Lab sample id N916178-01	Client sample id BGWNW7
Dept sample id 3154-004	Dept sample id 3154-001	Location/Matrix Hanford Site WATER
	Received 10/22/99	Collected 10/20/99 04:05
		Custody/COC No H99-185-12 H99-185

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 TOT LIMIT
Gross Alpha	0.192	0.34	0.91	3.0	U	900A	0.162	0.39	0.91	U	-	
Gross Beta	0.954	1.1	1.8	4.0	U	900B	0.929	1.1	1.8	U	-	

100 Fact, 100 Area Source Check.

QC-179#1 -2602

DUPLICATES

Page 1

SUMMARY DATA SECTION

Page 9

Lab id TMANC

Protocol Hanford

Version Ver 3.0

Form DVD-SMP

Version 3.06

Report Date 01/03/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0587

N910178-01 B0WNW7

DATA SHEET

SDG 7154 Client/Case no Hanford SDG H0587

Contact Melissa C. Morgan Contract DOE DE-AC07-99

Lab sample id N910178-01 Client sample id B0WNW7

Dept sample id 7154-001 Location/Matrix Hanford Site WATER

Received 10/22/99 Collected 10/20/99 04:55

Custody/COC No B99-085-12 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	-0.162	0.39	0.91	3.0	U	80A
Gross Beta	12587-47-2	0.929	1.1	1.8	4.0	U	80B

100 Fast, 200 Area Source Chara.

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 [illegible]

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

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

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

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 6904 164					
[illegible]	N910178-01	80		[illegible]-001	U
[illegible]	N910178-03	80		[illegible]-003	U
[illegible]	N910178-02	80		[illegible]-002	ok
[illegible]	N910178-04	80		[illegible]-004	- U

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

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	SHIFT keV	DAYS HELD	DATE ANALYZED	ANAL-YZED	DETECTOR
Preparation batch 6904 164 20 prep error 20.0 % Reference Lab Notebook 6904 pg. 164																
[illegible]	N910178-01	80		0.91	0.300			0		100			14	11/07/99	12/13	GRP-113
[illegible]	N910178-03	80		1.2	0.300			1		100				11/07/99	12/13	GRP-115
[illegible]	N910178-02	80		0.96	0.300			1		100				11/07/99	12/13	GRP-114
[illegible] (2)	N910178-04	80		0.81	0.300			0		100			14	11/07/99	12/13	GRP-113
Nominal values and limits from method				3.0	0.300			5.150		100			180			

PROCEDURES REFERENCE EPA900.0
EP-220 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD MDA 1.0 ± 0.18
FOR 4 SAMPLES RESIDUE 10 ± 24

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

TMA/RICHMOND

SAMPLE DELIVERY GROUP [illegible]

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test [illegible] Matrix WATER
[illegible]
[illegible] Mallinckrodt [illegible]

Client Hanford
Contract [illegible]
Work SDG [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta	
Preparation batch 6904 164						
[illegible] WNW7	N9[illegible]178-01	80		9154-001	U	
[illegible] (QC [illegible]-[illegible]01)	N9[illegible]178-03	80		9154-003	U	
[illegible] (QC [illegible]-[illegible]00)	N9[illegible]178-02	80		9154-002	ok	
Duplicate (N9[illegible]178-01)	N9[illegible]178-04	80		9154-004	-	U

Nominal values and limits from method RELs (pCi/L) 4.0
200 Fast, 200 Area Source Chara.

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	SHIFT keV	DAYS HELD	DAYS PREPARED	DAYS ANAL-YZED	DETECTOR
Preparation batch 6904 164	Se prep error 25.0 %				Reference Lab Notebook 6904 pg. 164											
[illegible] WNW7	N9[illegible]178-01	80		1.8	0.300			0		100			54	[illegible]	[illegible]	[illegible] 113
[illegible] (QC [illegible]-[illegible]01)	N9[illegible]178-03	80		1.9	0.300			21		100				[illegible]	[illegible]	[illegible]115
[illegible] (QC [illegible]-[illegible]00)	N9[illegible]178-02	80		2.1	0.300			11		[illegible]				[illegible]	[illegible]	[illegible] 114
Duplicate (N9[illegible]178-01) (QC [illegible]-[illegible]02)	N9[illegible]178-04	80		1.8	0.300			0		100			54	[illegible]	[illegible]	[illegible] 113
Nominal values and limits from method				4.0	0.300			5 150		100			180			

PROCEDURES REFERENCE HA900.0
LP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES + 2 SD FOR 4 SAMPLES
MDA 1.9 ± 0.28
RESIDUE 10 ± 24

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-12	Page 1 of 1

Collector: Bowers/Trice	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnarnound: 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 551	Field Logbook No.: EL1511	Method of Shipment: Fed EX	
Shipped To: ~~TMA/RECRA~~ TMA 10/20/99	Offsite Property No.: A000001	Bill of Lading/Air Bill No.: 42357953 0922	
		COA: B20CW1671C	

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			
Special Handling and/or Storage	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										
~~BOWNX0~~ 10/20/99 BOWNW6	~~Water~~ RT 10-21-99	10/20/99	0455										
~~BOWNX1~~ 10/20/99 BOWNW7	Water	10/20/99	0455					X*					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Catherine Orin	Date/Time: 10/20/99 1230	Received By: Ref 2C	Date/Time: 10/20/99 1230
Relinquished By: REF 2C	Date/Time: 10-21-99/0900	Received By: Rikki Thoren / RIKKI Thoren	Date/Time: 10-21-99/0900
Relinquished By: R Thoren / Rikki Thoren	Date/Time: 10/21/99 0930	Received By: FEDEX	Date/Time:
Relinquished By:	Date/Time:	Received 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)

no TA required - from nonrad area

sampler not available for Reposition

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

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

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

CoC No. B99-085-12

Container I.D. No. SM2 557 Requested TAT (Days) 95 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: 2 (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Red labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by M. Goldenberg Date: 10-22-99 Time: 10:00

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____