RECRA LabNet
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Virtual Laboratories Everywhere

0052310

DEC 1999 RECEIVED Data Log In

OCT 1999 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9908L931
SDG# : H0509
SAF# : B99-085

W.O. # : 10985-001-001-9999-00
Date Received: 08-31-99

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. The matrix spike duplicates were within the 20% RPD control limit.

8. The replicate analyses were within the 20% RPD control limit.

Pat Ec

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-29-99
Date

njp\i08-931

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	
✓ Nitrate ___ 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)
MBAS Surfactant	___ 425.1		
✓ Nitrate-Nitrite ___Nitrate ___Nitrite	✓ 353.2		
Nitrogen, Ammonia	✓ 350.3		
Nitrogen, 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.

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INORGANICS DATA SUMMARY REPORT 09/29/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W8W0	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	6.6	PH UNIT	0.01	1.0
		Sulfide	1.0 u	MG/L	1.0	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/29/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC073-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	99LN3046-MB1	Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
BLANK10	99LAMA35-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	99LSDA42-MB1	Sulfide	1.0 u	MG/L	1.0	1.0

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INORGANICS ACCURACY REPORT 09/29/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0W8W0	Chloride by IC	4.8	0.18	5.0	92.4	1.0
		Fluoride by IC	10.5	0.00	10.0	104.7	1.0
		Nitrite by IC	4.8	0.25u	5.0	97.0	1.0
		Nitrate by IC	4.8	0.25u	5.0	95.3	1.0
		Phosphate by IC	4.9	0.25u	5.0	98.2	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.0	1.0
		Nitrate Nitrite	0.52	0.02u	0.50	103.8	1.0
		Nitrate Nitrite MSD	0.52	0.02u	0.50	103.6	1.0
		Ammonia, as N	1.0	0.10u	1.0	104.0	1.0
		Sulfide	9.9	0.00	10.0	99.0	1.0
		Sulfide MSD	9.7	0.00	10.0	97.0	1.0
BLANK10	99LIC073-MB1	Chloride by IC	4.8	0.25u	5.0	95.5	1.0
		Fluoride by IC	10.4	0.50u	10.0	103.6	1.0
		Nitrite by IC	4.8	0.25u	5.0	96.5	1.0
		Nitrate by IC	4.9	0.25u	5.0	97.3	1.0
		Phosphate by IC	4.9	0.25u	5.0	99.0	1.0
		Sulfate by IC	4.8	0.25u	5.0	95.4	1.0
BLANK10	99LN3046-MB1	Nitrate Nitrite	0.51	0.02u	0.50	102.8	1.0
		Nitrate Nitrite MSD	0.51	0.02u	0.50	102.4	1.0
BLANK10	99LAMA35-MB1	Ammonia, as N	1.0	0.10u	1.0	103.0	1.0
		Ammonia, as N MSD	1.0	0.10u	1.0	101.0	1.0
BLANK10	99LSDA42-MB1	Sulfide	10.0	1.0 u	10.0	100	1.0

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INORGANICS DUPLICATE SPIKE REPORT 09/29/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-001	B0W8W0	Nitrate Nitrite	103.8	103.6	0.19
		Sulfide	99.0	97.0	2.0
BLANK10	99LN3046-MB1	Nitrate Nitrite	102.8	102.4	0.39
BLANK10	99LAMA35-MB1	Ammonia, as N	103.0	101.0	2.0

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INORGANICS PRECISION REPORT 09/29/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	B0W8W0	Chloride by IC	0.25u	0.25u	NC	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.25u	0.25u	NC	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.25u	0.25u	NC	1.0
		Nitrate Nitrite	0.02u	0.02u	NC	1.0
		Ammonia, as N	0.10u	0.10u	NC	1.0
		pH	6.6	6.6	0.3	1.0
		Sulfide	1.0 u	1.0 u	NC	1.0

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L931

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W8W0						
CHLORIDE BY IC	001	W	99LIC073	08/27/99	09/01/99	09/01/99
CHLORIDE BY IC	001 REP	W	99LIC073	08/27/99	09/01/99	09/01/99
CHLORIDE BY IC	001 MS	W	99LIC073	08/27/99	09/01/99	09/01/99
FLUORIDE BY IC	001	W	99LIC073	08/27/99	09/01/99	09/01/99
FLUORIDE BY IC	001 REP	W	99LIC073	08/27/99	09/01/99	09/01/99
FLUORIDE BY IC	001 MS	W	99LIC073	08/27/99	09/01/99	09/01/99
NITRITE BY IC	001	W	99LIC073	08/27/99	09/01/99	09/01/99
NITRITE BY IC	001 REP	W	99LIC073	08/27/99	09/01/99	09/01/99
NITRITE BY IC	001 MS	W	99LIC073	08/27/99	09/01/99	09/01/99
NITRATE BY IC	001	W	99LIC073	08/27/99	09/01/99	09/01/99
NITRATE BY IC	001 REP	W	99LIC073	08/27/99	09/01/99	09/01/99
NITRATE BY IC	001 MS	W	99LIC073	08/27/99	09/01/99	09/01/99
PHOSPHATE BY IC	001	W	99LIC073	08/27/99	09/01/99	09/01/99
PHOSPHATE BY IC	001 REP	W	99LIC073	08/27/99	09/01/99	09/01/99
PHOSPHATE BY IC	001 MS	W	99LIC073	08/27/99	09/01/99	09/01/99
SULFATE BY IC	001	W	99LIC073	08/27/99	09/01/99	09/01/99
SULFATE BY IC	001 REP	W	99LIC073	08/27/99	09/01/99	09/01/99
SULFATE BY IC	001 MS	W	99LIC073	08/27/99	09/01/99	09/01/99
NITRATE NITRITE	001	W	99LN3046	08/27/99	09/22/99	09/22/99
NITRATE NITRITE	001 REP	W	99LN3046	08/27/99	09/22/99	09/22/99
NITRATE NITRITE	001 MS	W	99LN3046	08/27/99	09/22/99	09/22/99
NITRATE NITRITE	001 MSD	W	99LN3046	08/27/99	09/22/99	09/22/99
AMMONIA	001	W	99LAMA35	08/27/99	09/15/99	09/15/99
AMMONIA	001 REP	W	99LAMA35	08/27/99	09/15/99	09/15/99
AMMONIA	001 MS	W	99LAMA35	08/27/99	09/15/99	09/15/99
PH	001	W	99LPH093	08/27/99	08/31/99	08/31/99
PH	001 REP	W	99LPH093	08/27/99	08/31/99	08/31/99
SULFIDE	001	W	99LSDA42	08/27/99	09/02/99	09/02/99
SULFIDE	001 REP	W	99LSDA42	08/27/99	09/02/99	09/02/99
SULFIDE	001 MS	W	99LSDA42	08/27/99	09/02/99	09/02/99
SULFIDE	001 MSD	W	99LSDA42	08/27/99	09/02/99	09/02/99
LAB QC:						
CHLORIDE BY IC	MB1	W	99LIC073	N/A	09/01/99	09/01/99

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L931

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	MB1 BS	W	99LIC073	N/A	09/01/99	09/01/99
FLUORIDE BY IC	MB1	W	99LIC073	N/A	09/01/99	09/01/99
FLUORIDE BY IC	MB1 BS	W	99LIC073	N/A	09/01/99	09/01/99
NITRITE BY IC	MB1	W	99LIC073	N/A	09/01/99	09/01/99
NITRITE BY IC	MB1 BS	W	99LIC073	N/A	09/01/99	09/01/99
NITRATE BY IC	MB1	W	99LIC073	N/A	09/01/99	09/01/99
NITRATE BY IC	MB1 BS	W	99LIC073	N/A	09/01/99	09/01/99
PHOSPHATE BY IC	MB1	W	99LIC073	N/A	09/01/99	09/01/99
PHOSPHATE BY IC	MB1 BS	W	99LIC073	N/A	09/01/99	09/01/99
SULFATE BY IC	MB1	W	99LIC073	N/A	09/01/99	09/01/99
SULFATE BY IC	MB1 BS	W	99LIC073	N/A	09/01/99	09/01/99
NITRATE NITRITE	MB1	W	99LN3046	N/A	09/22/99	09/22/99
NITRATE NITRITE	MB1 BS	W	99LN3046	N/A	09/22/99	09/22/99
NITRATE NITRITE	MB1 BSD	W	99LN3046	N/A	09/22/99	09/22/99
AMMONIA	MB1	W	99LAMA35	N/A	09/15/99	09/15/99
AMMONIA	MB1 BS	W	99LAMA35	N/A	09/15/99	09/15/99
AMMONIA	MB1 BSD	W	99LAMA35	N/A	09/15/99	09/15/99
SULFIDE	MB1	W	99LSDA42	N/A	09/02/99	09/02/99
SULFIDE	MB1 BS	W	99LSDA42	N/A	09/02/99	09/02/99

RECRA LabNet Use Only: 9908L931

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) gcms Corey BNA; voa persons; metals dig. wet lab

011

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: 8/31/99 Date Due: 9/30/99
Account #:

		VOA	BNA	Pest/PCB	Herb			Metal	CN						
Refrigerator #		1	6					6		6	6	6			
#/Type Container	Liquid	3g	2g					1p		1p	1p	1p			
	Solid														
Volume	Liquid	40	Ltr					Ltr		500	Ltr	Ltr			
	Solid							600		ZnAc					
Preservatives		HCl						HNO3		NaOH	-	H2SO4			

ORGANIC / INORG — ANALYSES REQUESTED

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	0024H OGCSC	0025H					Met①		15FD	Ang①	1N3N2 1NH3N			
001	BØW8WØ			W	8/27/99	0640	✓	✓					✓		✓	✓	✓			
002	BØW8W1			W	+	0520	✓													

Run Matrix QC - 9/2/99 SS

Special Instructions:

Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:
1. → pH, ICNO2, ICNO3, ICPO4 rec'd
2. out of hold.
3. OGCSC = 1-propanol, ethanol
4. Met① = As, Ba, Cd, Cr, Cu, Pb, Ni, Se,
5. Ag, V, Zn, Be — 9/2/99 added Be per pm
6. Ang① = IPH, ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
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. 4°C

Relinquished by	Received by	Date	Time
Fed-Ex	D. [signature]	8/31	0930

Relinquished by	Received by	Date	Time
Original Rewritten			

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
*4235795288 30

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-02	Page 1 of 1 012

Collector Doug Bowers/Brent Porter	**Company Contact** Chris 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 200 CW1	**SAF No.** B99-085	
Ice Chest No. ERC 330	**Field Logbook No.** EL-1511	**Method of Shipment** Federal Express	
Shipped To TMA/RECRA 8-27-99	**Offsite Property No.** A99 0234	**Bill of Lading/Air Bill No.** 4235 795 28830	
		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 or H2SO4 to pH <2 Coo	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									
B0W8W0	Water	8-27-99	0640	X	X	X	X		X	X		
B0W8W1	Water	8.27.99	0520						X			

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-27-99/1300	REF 1A	8-27-99/1300
REF 1A	8/30/99 11:00	CFAlico	8/30/99 1100
CFAlico	8/30/99 1400	FEDEX	8/30/99 1400
FEDEX	8/31/99 0930	[illegible]	8/31/99 0930

SPECIAL INSTRUCTIONS

See Chain of Custody comments on SAF for special instructions.

COLLECTOR NOT AVAILABLE TO SIGN COCs.

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

(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, 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 LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9908L931
SDG/SAF# : B99-085/H0509

W.O.# : 10985-001-001-9999-00
Date Received: 08-31-99

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 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-30-99
Date

mld/m08-931

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9908L931

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: ✓3005A __3010A __3015 __3020A __3050A __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:_____

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 09/30/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W8W0	Silver, Total	1.0 u	UG/L	1.0	1.0
		Arsenic, Total	3.3 u	UG/L	3.3	1.0
		Barium, Total	0.65	UG/L	0.30	1.0
		Beryllium, Total	0.13	UG/L	0.10	1.0
		Cadmium, Total	0.30 u	UG/L	0.30	1.0
		Chromium, Total	0.80 u	UG/L	0.80	1.0
		Copper, Total	4.3	UG/L	1.2	1.0
		Nickel, Total	1.2 u	UG/L	1.2	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Antimony, Total	2.5 u	UG/L	2.5	1.0
		Selenium, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	3.7	UG/L	0.80	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/30/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0645-MB1	Silver, Total	1.0 u	UG/L	1.0	1.0
		Arsenic, Total	3.3 u	UG/L	3.3	1.0
		Barium, Total	0.38	UG/L	0.30	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Cadmium, Total	0.30 u	UG/L	0.30	1.0
		Chromium, Total	0.80 u	UG/L	0.80	1.0
		Copper, Total	1.2 u	UG/L	1.2	1.0
		Nickel, Total	1.2 u	UG/L	1.2	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Antimony, Total	2.5 u	UG/L	2.5	1.0
		Selenium, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	0.80 u	UG/L	0.80	1.0

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INORGANICS ACCURACY REPORT 09/30/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0W8W0	Silver, Total	49.4	1.0 u	50.0	98.8	1.0
		Arsenic, Total	2000	3.3 u	2000	99.9	1.0
		Barium, Total	1920	0.65	2000	95.9	1.0
		Beryllium, Total	49.6	0.13	50.0	98.9	1.0
		Cadmium, Total	49.7	0.30u	50.0	99.4	1.0
		Chromium, Total	196	0.80u	200	98.2	1.0
		Copper, Total	243	4.3	250	95.6	1.0
		Nickel, Total	495	1.2 u	500	99.1	1.0
		Lead, Total	494	2.1 u	500	98.7	1.0
		Antimony, Total	495	2.5 u	500	98.9	1.0
		Selenium, Total	2000	3.7 u	2000	100.1	1.0
		Vanadium, Total	490	0.60u	500	98.0	1.0
		Zinc, Total	485	3.7	500	96.2	1.0

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INORGANICS PRECISION REPORT 09/30/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0W8W0	Silver, Total	1.0 u	1.0 u	NC	1.0
		Arsenic, Total	3.3 u	3.3 u	NC	1.0
		Barium, Total	0.65	12.2	179.8	1.0
		Beryllium, Total	0.13	0.10u	~~NC~~ 200	1.0
		Cadmium, Total	0.30u	0.30u	NC	1.0
		Chromium, Total	0.80u	0.80u	NC	1.0
		Copper, Total	4.3	3.7	15.0	1.0
		Nickel, Total	1.2 u	1.2 u	NC	1.0
		Lead, Total	2.1 u	2.1 u	NC	1.0
		Antimony, Total	2.5 u	2.5 u	NC	1.0
		Selenium, Total	3.7 u	3.7 u	NC	1.0
		Vanadium, Total	0.60u	0.60u	NC	1.0
		Zinc, Total	3.7	3.8	2.7	1.0

Correction MD 9/30/99

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/30/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9908L931

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0645-LC1	Silver, LCS	490	500	UG/L	98.0
		Arsenic, LCS	9940	10000	UG/L	99.4
		Barium, LCS	4880	5000	UG/L	97.6
		Beryllium, LCS	248	250	UG/L	99.4
		Cadmium, LCS	250	250	UG/L	100
		Chromium, LCS	497	500	UG/L	99.4
		Copper, LCS	1210	1250	UG/L	96.4
		Nickel, LCS	2010	2000	UG/L	100.4
		Lead, LCS	2490	2500	UG/L	99.6
		Antimony, LCS	2990	3000	UG/L	99.5
		Selenium, LCS	10000	10000	UG/L	100.2
		Vanadium, LCS	2480	2500	UG/L	99.1
		Zinc, LCS	981	1000	UG/L	98.1

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L931

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W8W0						
SILVER, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
SILVER, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
SILVER, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
ARSENIC, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
ARSENIC, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
ARSENIC, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
BARIUM, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
BARIUM, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
BARIUM, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
BERYLLIUM, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
BERYLLIUM, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
BERYLLIUM, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
CADMIUM, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
CADMIUM, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
CADMIUM, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
CHROMIUM, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
CHROMIUM, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
CHROMIUM, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
COPPER, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
COPPER, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
COPPER, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
NICKEL, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
NICKEL, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
NICKEL, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
LEAD, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
LEAD, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
LEAD, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
ANTIMONY, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
ANTIMONY, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
ANTIMONY, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
SELENIUM, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
SELENIUM, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
SELENIUM, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
VANADIUM, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
VANADIUM, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L931

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99
ZINC, TOTAL	001	W	99L0645	08/27/99	09/22/99	09/23/99
ZINC, TOTAL	001 REP	W	99L0645	08/27/99	09/22/99	09/23/99
ZINC, TOTAL	001 MS	W	99L0645	08/27/99	09/22/99	09/23/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
SILVER, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
ARSENIC LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
ARSENIC, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
BARIUM LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
BARIUM, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
BERYLLIUM LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
BERYLLIUM, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
CADMIUM LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
CADMIUM, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
CHROMIUM LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
CHROMIUM, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
COPPER LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
COPPER, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
NICKEL LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
NICKEL, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
LEAD LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
LEAD, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
ANTIMONY LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
ANTIMONY, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
SELENIUM LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
SELENIUM, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
VANADIUM LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
VANADIUM, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99
ZINC LABORATORY	LC1 BS	W	99L0645	N/A	09/22/99	09/23/99
ZINC, TOTAL	MB1	W	99L0645	N/A	09/22/99	09/23/99

RECRA LabNet Use Only: 9908L931

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8). acms Corey BNA VOA persone metals dig. Wet Lab

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: 8/31/99 Date Due: 9/30/99
Account #:

Refrigerator #	1	6				6		6	6	6	
#/Type Container – Liquid	3g	2g				1p		1p	1p	1p	
#/Type Container – Solid											
Volume – Liquid	40	Ltr				Ltr		500	Ltr	Ltr	
Volume – Solid						500		ZnAC			
Preservatives	HCl					HNO3		NaOH	-	H2SO4	
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb		INORG: Metal	CN				
RECRA LabNet Use Only	0024H OGCSC	0025H				Met①		15FD	Ang①	1N3N2 1NH3N	

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA (0024H OGCSC)	BNA (0025H)	Pest/PCB	Herb	Metal (Met①)	CN	15FD	Ang①	1N3N2 1NH3N
001	BØW8WØ			W	8/27/99	0640	✓	✓			✓		✓	✓	✓
002	BØW8W1			W	↓	0520	✓								

Run Matrix QC - 9/2/99 DS

Special Instructions:

Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:
1. 1pH, 1CN02, 1CN03, 1CP04 rec'd
2. out of hold.
3. OGCSC = 1-propanol, ethanol
4. Met① = As, Ba, Cd, Cr, Cu, Pb, Ni, Se,
5. Ag, V, Zn, Be 9/2/99 added Be per pm
6. Ang① = 1PH, 1CCL, 1CFL, 1CN02, 1CN03, 1CP04, 1CS04

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
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. 4°/7° C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed-Ex	D. [illegible]	8/31	0930		Original Rewritten		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
*423571528830

012

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-02	Page 1 of 1

Collector Doug Bowers/Brent Porter	**Company Contact** Chris 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 200 CW1	**SAF No.** B99-085	
Ice Chest No. ERC 330	**Field Logbook No.** EL-1511	**Method of Shipment** Federal Express	
Shipped To TMA/RECRA B-20 8-27-99	**Offsite Property No.** A99 0234	**Bill of Lading/Air Bill No.** 4235 795 28830	
		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 or H2SO4 to pH <2 Coo	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									
B0W8W0	Water	8-27-99	0640	X	X	X	X		X	X		
B0W8W1	Water	8.27.99	0520						X			

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-27-99/1300	REF 1A	8-27-99/1300
REF 1A	8/30/99 11:00	Fedex	8/30/99 1100
Fedex	8/30/99 1400	FEDEX	8/30/99 1400
Fedex	8/31/99 0930	[illegible]	8/31/99 0930

SPECIAL INSTRUCTIONS

See Chain of Custody comments on SAF for special instructions.

COLLECTOR NOT AVAILABLE TO SIGN COCs.

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

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, 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 B99-078
RFW #: 9908L931
SDG/SAF#: H0509/B99-078

W.O. #: #: 10985-001-001-9999-00
Date Received: 08-31-99

GC SCAN

The set of samples consisted of two (2) water samples collected on 08-27-99.

The samples and their associated QC samples were prepared on 09-02-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and Butanol on 09-02-99.

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 required holding time for analysis was met.

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

4. Continuing calibration criteria (±15%) were exceeded for the continuing calibration verification standard analyzed prior to the sample extracts. Outlying standard(s) generally exhibited increased instrument response. However sample data were not impacted as target analytes were not detected in the associated samples analyzed immediately after such standard(s). A copy of the Sample Discrepancy Report (SDR) has been enclosed in the data package.

5. Surrogates were not used for this analysis.

6. The blank spike recovery was within advisory control limits of 50%-150%.

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-20-99
Date

r:\share\lc\gcscan\08-931.doc

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 #: 1446952

Initiator: C Schnell
Date: 9/16/99
Client: TNU-Hanford

RFW Batch: 9908L821 9908L851 9908L850 9908L931 9908L926 9908L863
Samples: 9909L006
Method: SW846/MCAWW/CLP/

Parameter: OGCSC
Matrix:
Prep Batch: Multiple

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)

CCV response somewhat erratic during sample analysis, most being high. In cases whereby instrument response decreased, the decrease did not exceed -20% Deviation.

2. Known or Probable Causes(s)

- Heavy analysis load combined with aqueous matrix contributes to reduced stability of instrument response compared to solvent type matrices.

3. Discussion and Proposed Action

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

Other Description:

- No positives found in any samples.
- The laboratory limit of ±15% Deviation is derived from common analyses and may not be applicable to extended runs of aqueous samples, where such criteria may not be readily achievable.

4. Project Manager Instructions...signature/date: Michelle G. Johnson 9/16/99

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

5. Final Action...signature/date: _____ 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: LeMin/Taylor
4	X QA (file): Racioppi	__	__ Log-in: Toder
3	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Schnell/Doughty/Kauffman	__	__ Other: _____

L-WI-006/E-03/99

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 09/13/99 15:29

RFW Batch Number: **9908L931** Client: **TNU-HANFORD B99-085** Work Order: **10985-001-001-9999-00** Page: 1

	Cust ID:	B0W8W0	B0W8W0	B0W8W0	B0W8W1	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	99LLC132-MB1	99LLC132-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	100 %	104 %	5.0 U	5.0 U	94 %
Ethanol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

09/16/99

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: 08/31/99 RFW LOT # :9908L931

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W8W0	001	W	99LLC132	08/27/99	09/02/99	09/02/99
B0W8W0	001 MS	W	99LLC132	08/27/99	09/02/99	09/02/99
B0W8W0	001 MSD	W	99LLC132	08/27/99	09/02/99	09/02/99
B0W8W1	002	W	99LLC132	08/27/99	09/02/99	09/02/99
LAB QC:						
BLK	MB1	W	99LLC132	N/A	09/02/99	09/02/99
BLK	MB1 BS	W	99LLC132	N/A	09/02/99	09/02/99

9/13/99

RECRA LabNet Use Only
9908L931

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU-Hanford B99-085
Est. Final Proj. Sampling Date
Project # 10985-001-001-9999-00
Project Contact/Phone #
RECRA Project Manager OJ
QC Apee Del Std TAT 30 day
Date Rec'd 8/31/99 Date Due 9/30/99
Account #

		VOA	BNA	Pest/PCB	Herb				Metal	CN						
Refrigerator #		1	6						6		6	6	6			
#/Type Container	Liquid	3g	2g						1p		1p	1p	1p			
	Solid															
Volume	Liquid	40	Ltr						Ltr		500	Ltr	Ltr			
	Solid								500		2nAC					
Preservatives		HCl							HNO3		NaOH	-	H2SO4			
ANALYSES REQUESTED		ORGANIC							INORG							
RECRA LabNet Use Only		0024H OGCSC	0025H						Met(D)		15FD	Ang(D)	1N3N2 1NH3N			

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb				Metal	CN			
001	BØW8WØ			W	8/27/99	0640	✓	✓						✓		✓	✓	✓
002	BØW8W1			W	+	0520	✓											

Special Instructions:
Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:
1. pH, ICNO2, ICNO3, ICPO4 rec'd
2. out of hold.
OGCSC = 1-propanol, ethanol
Met(D) = As, Ba, Cd, Cr, Cu, Pb, Ni, Se,
5. Ag, V, Zn
Ang(D) = 1PH, ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4

RECRA LabNet Use Only
Samples were: 1) Shipped ✓ or Hand Delivered ___
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. 4 °C

Relinquished by	Received by	Date	Time
Fed-Ex	D. Pahl	8/31	0930

Relinquished by	Received by	Date	Time
	Original Rewritten		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
*423579528830

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-02	Page 1 of 1

Collector Doug Bowers/Brent Porter	**Company Contact** Chris 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 200 CW1	**SAF No.** B99-085	
Ice Chest No. ERC 330	**Field Logbook No.** EL-1511	**Method of Shipment** Federal Express	
Shipped To TMA/RECRA RJB 8-27-99	**Offsite Property No.** A99 0234	**Bill of Lading/Air Bill No.** 4235 795 28830	
		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 or H2SO4 to pH <2 Coo	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									
B0W8W0	Water	8-27-99	0640	X	X	X	X		X	X		
B0W8W1	Water	8-27-99	0520						X			

CHAIN OF POSSESSION

Sign/Print Names	Relinquished By / Date/Time	Received By / Date/Time
	Doug Bowers 8-27-99/1300	REF 1A 8-27-99/1300
	REF 1A 8/30/99 11:00	Office 8/30/99 1100
	Office 8/30/99 1400	FEDEX 8/30/99 1400
	[illegible] 8/31/99 0930	[illegible] 8/31/99 0930 From Non Rad area

SPECIAL INSTRUCTIONS

See Chain of Custody comments on SAF for special instructions.

COLLECTOR NOT AVAILABLE TO SIGN COCs.

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

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

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# : 9908L931
SDG/SAF #: H0509/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 08-31-99

SEMIVOLATILE

One (1) water sample was collected on 08-27-99.

The sample and its associated QC samples were extracted on 09-01-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 09-08-99.

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

5. Six (6) of thirty (30) surrogate recoveries were outside EPA QC limits. EPA CLP surrogate recovery criteria were not met for the method blank 99LE1068-MB1. The sample data was not affected. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

7. Two (2) of eleven (11) blank spike recoveries were outside EPA QC limits.

8. The method blank contained the common laboratory contaminants Bis(2-Ethylhexyl)phthalate and Di-n-Octylphthalate at levels less than the CRQL.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-13-99
Date

som\gorup\data\bna\tnu08931.doc

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.

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.

Recra LabNet Philadelphia Sample Discrepancy Report (SDR) SDR #: 99MS 074

Initiator: S Durke
Date: 9-20-99
Client: TNU Hanford H0509

RFW Batch: 9908L931
Samples: QC
Method: SW846/MCAWW/CLP/

Parameter: BNA
Matrix: Water
Prep Batch: 99LE1068 Cont

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)

5 out of 6 surrogates out / 0% in the Blank
1 surrogate & 2 spikes low in the Blank Spike
Low Recoveries Limited to the Blank + Blank Spike

2. Known or Probable Causes(s) prep

3. Discussion and Proposed Action Other Description: Sample data OK

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

Narrate

4. Project Manager Instructions...signature/date: Arlene Johnson 9/24/99

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
✓ Client Contacted: Date/Person Kevin Johnson 9/27/99
__ Add
__ Cancel

5. Final Action...signature/date: [illegible] 9/30/99 Other Explanation:

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

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

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

L-WI-006/E-03/99

	Cust ID:	B0W8W0	B0W8W0	B0W8W0	SBLKCD	SBLKCD BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LE1068-MB1	99LE1068-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	49 %	63 %	63 %	32 * %	68 %
	2-Fluorobiphenyl	46 %	54 %	51 %	25 * %	39 * %
	Terphenyl-d14	47 %	57 %	62 %	40 %	94 %
	Phenol-d5	48 %	54 %	53 %	2 * %	36 %
	2-Fluorophenol	46 %	53 %	44 %	0 * %	26 %
	2,4,6-Tribromophenol	27 %	44 %	38 %	0 * %	50 %
Phenol		10 U	53 %	52 %	10 U	34 %
bis(2-Chloroethyl)ether		10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	54 %	48 %	10 U	43 %
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	44 %	38 %	10 U	14 * %
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine		10 U	67 %	71 %	10 U	73 %
Hexachloroethane		10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	51 %	41 %	10 U	17 * %
Naphthalene		10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol		10 U	57 %	56 %	10 U	55 %
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		26 U	26 U	26 U	25 U	25 U

*= Outside of EPA CLP QC limits.

	Cust ID:	B0W8W0		B0W8W0		B0W8W0		SBLKCD		SBLKCD BS	
	RFW#:	001		001 MS		001 MSD		99LE1068-MB1		99LE1068-MB1	
2-Chloronaphthalene		10	U	10	U	10	U	10	U	10	U
2-Nitroaniline		26	U	26	U	26	U	25	U	25	U
Dimethylphthalate		10	U	10	U	10	U	10	U	10	U
Acenaphthylene		10	U	10	U	10	U	10	U	10	U
2,6-Dinitrotoluene		10	U	10	U	10	U	10	U	10	U
3-Nitroaniline		26	U	26	U	26	U	25	U	25	U
Acenaphthene		10	U	55	%	51	%	10	U	48	%
2,4-Dinitrophenol		26	U	26	U	26	U	25	U	25	U
4-Nitrophenol		26	U	31	%	24	%	25	U	32	%
Dibenzofuran		10	U	10	U	10	U	10	U	10	U
2,4-Dinitrotoluene		10	U	56	%	61	%	10	U	75	%
Diethylphthalate		10	U	10	U	10	U	10	U	10	U
4-Chlorophenyl-phenylether		10	U	10	U	10	U	10	U	10	U
Fluorene		10	U	10	U	10	U	10	U	10	U
4-Nitroaniline		26	U	26	U	26	U	25	U	25	U
4,6-Dinitro-2-methylphenol		26	U	26	U	26	U	25	U	25	U
N-Nitrosodiphenylamine (1)		10	U	10	U	10	U	10	U	10	U
4-Bromophenyl-phenylether		10	U	10	U	10	U	10	U	10	U
Hexachlorobenzene		10	U	10	U	10	U	10	U	10	U
Pentachlorophenol		26	U	19	%	20	%	25	U	35	%
Phenanthrene		10	U	10	U	10	U	10	U	10	U
Anthracene		10	U	10	U	10	U	10	U	10	U
Carbazole		10	U	10	U	10	U	10	U	10	U
Di-n-butylphthalate		10	U	10	U	10	U	10	U	10	U
Fluoranthene		10	U	10	U	10	U	10	U	10	U
Pyrene		10	U	59	%	63	%	10	U	95	%
Butylbenzylphthalate		10	U	10	U	10	U	10	U	10	U
3,3'-Dichlorobenzidine		10	U	10	U	10	U	10	U	10	U
Benzo(a)anthracene		10	U	10	U	10	U	10	U	10	U
Chrysene		10	U	10	U	10	U	10	U	10	U
bis(2-Ethylhexyl)phthalate		1	JB	2	JB	3	JB	0.9	J	7	JB
Di-n-octyl phthalate		3	JB	3	JB	3	JB	1	J	0.6	JB
Benzo(b)fluoranthene		10	U	10	U	10	U	10	U	10	U
Benzo(k)fluoranthene		10	U	10	U	10	U	10	U	10	U
Benzo(a)pyrene		10	U	10	U	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene		10	U	10	U	10	U	10	U	10	U
Dibenz(a,h)anthracene		10	U	10	U	10	U	10	U	10	U
Benzo(g,h,i)perylene		10	U	10	U	10	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.

B0W8W0

Lab
Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 9908L931-001

Sample wt/vol: 960 (g/mL) ML Lab File ID: A090817

Level: (low/med) LOW Date Received: 08/31/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 09/01/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/08/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		PHTHALATE	25.33	10	J
2.		PHTHALATE	27.36	2	J

1F

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SBLKCD

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 99LE1068-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: D090803

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 09/01/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/08/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	23.91	6	J
2.		PHTHALATE	25.00	3	J

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L931

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W8W0	001	W	99LE1068	08/27/99	09/01/99	09/08/99
B0W8W0	001 MS	W	99LE1068	08/27/99	09/01/99	09/08/99
B0W8W0	001 MSD	W	99LE1068	08/27/99	09/01/99	09/08/99
LAB QC:						
SBLKCD	MB1	W	99LE1068	N/A	09/01/99	09/08/99
SBLKCD	MB1 BS	W	99LE1068	N/A	09/01/99	09/08/99

RECRA LabNet Use Only
99082931

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: OT
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8/31/99 Date Due: 9/30/99
Account #:

		ORGANIC				INORG				
ANALYSES REQUESTED		VOA	BNA	Pest/PCB	Herb	Metal	CN			
Refrigerator #		1	6			6		6	6	6
#/Type Container	Liquid	3g	2g			1P		1P	1P	1P
	Solid									
Volume	Liquid	40	Ltr			Ltr		500	Ltr	Ltr
	Solid					500		2nAC		
Preservatives		HCl				HNO3		NaOH	-	H2SO4
RECRA LabNet Use Only		0024H OGCSC	0025H			Met(1)		ISFD	Ang(1)	IN3N2 INH3N

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			
001	BØW8WØ			W	8/27/99	0640	✓	✓			✓		✓	✓	✓
002	BØW8W1			W	"	0520	✓								

Special Instructions:

Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:
1. → 1pH, ICNO2, ICNO3, ICPO4 rec'd
2. out of hold.
3. OGCSC = 1-propanol, ethanol
4. Met(1) = As, Ba, Cd, Cr, Cu, Pb, Ni, Se,
5. Ag, V, Zn
6. Ang(1) = 1PH, ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4

Relinquished by	Received by	Date	Time
Fed-Ex	D. [illegible]	8/31	0930

Relinquished by	Received by	Date	Time
	Original Rewritten		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
*423571528830

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___
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. 4° °C

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-02	Page 1 of 1

Collector Doug Bowers/Brent Porter	**Company Contact** Chris 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 200 CW1	**SAF No.** B99-085	
Ice Chest No. ERC 930	**Field Logbook No.** EL-1511	**Method of Shipment** Federal Express	
Shipped To TMA/RECRA RCB 8-27-99	**Offsite Property No.** A99 0234	**Bill of Lading/Air Bill No.** 4235 795 28830	
		COA B20CW1 671E	

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 or H2SO4 to pH <2 Coo	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										
B0W8W0	Water	8-27-99	0640	X	X	X	X		X	X			
B0W8W1	Water	8.27.99	0520						X				

CHAIN OF POSSESSION

	Sign/Print Names	Date/Time
Relinquished By	Doug Bowers	8-27-99/1300
Received By	Ref 1A	8-27-99/1300
Relinquished By	Ref 1A	8/30/99 11:00
Received By	[illegible]	8/30/99 1100
Relinquished By	[illegible]	8/30/99 1400
Received By	FEDEX	8/30/99 1400
Relinquished By	[illegible]	8/31/99 0930
Received By	[illegible]	8/31/99 0930

SPECIAL INSTRUCTIONS

See Chain of Custody comments on SAF for special instructions.

COLLECTOR NOT AVAILABLE TO SIGN COCs.

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

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

From Non Red 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# : 9908L931
SDG/SAF #: H0509/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 08-31-99

GC/MS VOLATILE

Two (2) water samples were collected on 08-27-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 09-09,10-99.

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

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

2. The required holding time for analysis was met.

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

4. All surrogate recoveries were outside 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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-13-99
Date

som\group\data\ voa\tnu08931.doc

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.

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.

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 10/04/99 04:19

RFW Batch Number: 9908L931 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1a

	Cust ID:	B0W8W0	B0W8W1	B0W8W1	B0W8W1	VBLKOY	VBLKOY BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	99LVN269-MB1	99LVN269-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	105 %	109 %	107 %	103 %	106 %	106 %
	Bromofluorobenzene	95 %	97 %	95 %	97 %	97 %	97 %
	1,2-Dichloroethane-d4	110 %	112 %	111 %	112 %	104 %	107 %
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		3 JB	3 JB	3 JB	3 JB	7	7 B
Acetone		2 JB	10 U	10 U	1 JB	1 J	1 BJ
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	5 U	98 %	98 %	5 U	100 %
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	106 %	107 %	5 U	107 %
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	112 %	113 %	5 U	112 %
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	116 %	116 %	5 U	116 %

*= Outside of EPA CLP QC limits.

	Cust ID:	B0W8W0	B0W8W1	B0W8W1	B0W8W1	VBLKOY	VBLKOY BS
	RFW#:	001	002	002 MS	002 MSD	99LVN269-MB1	99LVN269-MB1
Chlorobenzene		5 U	5 U	107 %	109 %	5 U	110 %
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: 08/31/99 RFW LOT # :9908L931

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W8W0	001	W	99LVN269	08/27/99	N/A	09/10/99
B0W8W1	002	W	99LVN269	08/27/99	N/A	09/10/99
B0W8W1	002 MS	W	99LVN269	08/27/99	N/A	09/10/99
B0W8W1	002 MSD	W	99LVN269	08/27/99	N/A	09/10/99
LAB QC:						
VBLKOY	MB1	W	99LVN269	N/A	N/A	09/09/99
VBLKOY	MB1 BS	W	99LVN269	N/A	N/A	09/09/99

RECRA LabNet Use Only
99082 931

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

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 8/31/99 Date Due 9/30/99
Account #

	VOA	BNA	Pest/PCB	Herb				Metal	CN			
Refrigerator #	1	6						6		6	6	6
#/Type Container Liquid	3g	2ag						1p		1p	1p	1p
#/Type Container Solid												
Volume Liquid	40	Ltr						Ltr		500	Ltr	Ltr
Volume Solid								600		2nAC		
Preservatives	HCl							HNO3		NaOH	-	H2SO4
RECRA LabNet Use Only	0024H OGCSC	0025H						MetD		1SFD	Ang1	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	MS	MSD	Matrix	Date Collected	Time Collected	VOA (0024H OGCSC)	BNA (0025H)	Metal (MetD)	1SFD	Ang1	1N3N2 1NH3N
001	BØW8WØ			W	8/27/99	0640	✓	✓	✓	✓	✓	✓
002	BØW8W1			W	↓	0520	✓					

Special Instructions:
Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:
→ 1. 1pH, 1CN02, 1CN03, 1CP04 rec'd
2. out of hold.
3. OGCSC = 1-propanol, ethanol
4. MetD = as, Ba, Cd, Cr, Cu, Pb, Ni, Se,
5. Ag, V, Zn
6. Ang1 = 1PH, 1CCL, 1CFL, 1CN02, 1CN03, 1CP04, 1CS04

Relinquished by	Received by	Date	Time
Fed-Ex	D. [illegible]	8/31	0930

Relinquished by	Received by	Date	Time
Original Rewritten			

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
*423571528830

RECRA LabNet Use Only
Samples were:
1) Shipped ✓ or Hand Delivered
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. 4 °C

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-02	Page 1 of 1

Collector Doug Bowers/Brent Porter	**Company Contact** Chris 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 200 CW1	**SAF No.** B99-085	
Ice Chest No. ERC 330	**Field Logbook No.** EL-1511	**Method of Shipment** Federal Express	
Shipped To TMA/RECRA	**Offsite Property No.** A99 0234	**Bill of Lading/Air Bill No.** 4235 795 28830	
		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 or H2SO4 to pH <2 Coo	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										
B0W8W0	Water	8-27-99	0640	X	X	X	X		X	X			
B0W8W1	Water	8.27.99	0520						X				

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-27-99/1300	REF LA	8-27-99/1300
REF LA	8/30/99 11:00	Chico	8/30/99 1100
Chico	8/30/99 1400	FEDEX	8/30/99 1400
FEDEX	8/31/99 0920		8/31/99 0920

SPECIAL INSTRUCTIONS

See Chain of Custody comments on SAF for special instructions.

COLLECTOR NOT AVAILABLE TO SIGN COCs.

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

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

From Non Red 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

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0509 is composed of one liquid (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 document. Any discrepancies are noted on the TNU Sample Receipt Checklist. The results were transmitted to BHI via facsimile on October 1, 1999.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

SAMPLE SUMMARY

SDG 7190
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0W8W0	200 East 200 CWI	WATER		N908174-01	B99-085	B99-085-02	08/27/99 06:40
Method Blank		WATER		N908174-03	B99-085		
Lab Control Sample		WATER		N908174-02	B99-085		
Duplicate (N908174-01)	200 East 200 CWI	WATER		N908174-04	B99-085		08/27/99 06:40

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 10/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

QC SUMMARY

SDG 7190
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

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
7190	B99-085-02	B0W8W0	WATER				08/31/99	4	N908174-01	7190-001
		Method Blank	WATER						N908174-03	7190-003
		Lab Control Sample	WATER						N908174-02	7190-002
		Duplicate (N908174-01)	WATER				08/31/99	4	N908174-04	7190-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 10/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

PREP BATCH SUMMARY

SDG 7190
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
80A	WATER	Gross Alpha in Water	6893-135	20.0	1			1	1	1/1		
80B	WATER	Gross Beta in Water	6893-135	15.0	1			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 10/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

WORK SUMMARY

SDG 7190
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0W8W0			N908174-01	7190-001	80A/80		09/27/99	10/01/99	NJV	Gross Alpha in Water
200 East 200 CWI		WATER	08/27/99	7190-001	80B/80		09/27/99	10/01/99	NJV	Gross Beta in Water
B99-085-02.	B99-085		08/31/99							
Method Blank			N908174-03	7190-003	80A/80		09/27/99	10/01/99	NJV	Gross Alpha in Water
		WATER		7190-003	80B/80		09/27/99	10/01/99	NJV	Gross Beta in Water
	B99-085									
Lab Control Sample			N908174-02	7190-002	80A/80		09/27/99	10/01/99	NJV	Gross Alpha in Water
		WATER		7190-002	80B/80		09/27/99	10/01/99	NJV	Gross Beta in Water
	B99-085									
Duplicate (N908174-01)			N908174-04	7190-004	80A/80		09/27/99	10/01/99	NJV	Gross Alpha in Water
200 East 200 CWI		WATER	08/27/99	7190-004	80B/80		09/27/99	10/01/99	NJV	Gross Beta in Water
	B99-085		08/31/99							

COUNTS OF TESTS BY SAMPLE TYPE

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 10/02/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0509

N908174-03 Method Blank

METHOD BLANK

SDG	7190	Client/Case no	Hanford SDG-H0509
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N908174-03	Client sample id	Method Blank
Dept sample id	7190-003	Material/Matrix	WATER
		SAF No	B99-085

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.172	0.37	1.0	3.0	U	80A
Gross Beta	12587-47-2	0.124	1.4	2.4	4.0	U	80B

200 Area Src chr 200-CW-1 OU-QC Sa

QC-BLANK 31861

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

N908174-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7190
Contact Kevin C. Johnson

Client/Case no Hanford SDG-H0509
Case no TRB-SBB-207925

Lab sample id N908174-02
Dept sample id 7190-002

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No B99-085

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	66.4	5.1	1.2	3.0		80A	67.0	2.7	99	68-132	80-120
Gross Beta	77.8	3.7	2.1	4.0		80B	75.7	3.0	103	75-125	

200 Area Src chr 200-CW-1 OU-QC Sa

QC-LCS 31860

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

N908174-04 B0W8W0

DUPLICATE

SDG 7190 Client/Case no Hanford SDG-H0509

Contact Kevin C. Johnson Case no TRB-SBB-207925

DUPLICATE		ORIGINAL		
Lab sample id N908174-04	Lab sample id N908174-01	Client sample id B0W8W0		
Dept sample id 7190-004	Dept sample id 7190-001	Location/Matrix 200 East 200 CWI	WATER	
	Received 08/31/99	Collected 08/27/99 06:40		
		Custody/SAF No B99-085-02	B99-085	

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	0.018	0.43	0.88	3.0	U	80A	-0.068	0.37	0.85	U	-	
Gross Beta	0.197	1.1	1.8	4.0	U	80B	-0.656	1.4	2.5	U	-	

200 Area Src chr 200-CW-1 OU-QC Sa

QC-DUP#1 31862

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 10/02/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0509

N908174-01 B0W8W0

DATA SHEET

SDG	7190	Client/Case no	Hanford SDG-H0509
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N908174-01	Client sample id	B0W8W0
Dept sample id	7190-001	Location/Matrix	200 East 200 CWI WATER
Received	08/31/99	Collected	08/27/99 06:40
		Custody/SAF No	B99-085-02 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	-0.068	0.37	0.85	3.0	U	80A
Gross Beta	12587-47-2	-0.656	1.4	2.5	4.0	U	80B

200 Area Src chr 200-CW-1 OU-QC Sa

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test 80A Matrix WATER
SDG 7190
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6893-135						
B0W8W0	N908174-01	80		7190-001	U	
BLK (QC ID=31861)	N908174-03	80		7190-003	U	
LCS (QC ID=31860)	N908174-02	80		7190-002	ok	
Duplicate (N908174-01)	N908174-04	80		7190-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	3.0	
200 Area Src chr 200-CW-1 OU-QC Sa						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6893-135	2σ prep error 20.0 %			Reference Lab Notebook 6893 pg.135												
B0W8W0	N908174-01	80		0.85	0.300			3	100				31	09/23/99	09/27	GRB-110
BLK (QC ID=31861)	N908174-03	80		1.0	0.300			38	100					09/23/99	09/27	GRB-112
LCS (QC ID=31860)	N908174-02	80		1.2	0.300			38	100					09/23/99	09/27	GRB-111
Duplicate (N908174-01) (QC ID=31862)	N908174-04	80		0.88	0.300			1	100				31	09/23/99	09/27	GRB-113
Nominal values and limits from method				3.0	0.300			5-150	100				180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.98 ± 0.32
RESIDUE 20 ± 42

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0509

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test 80B Matrix WATER
SDG 7190
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta	
Preparation batch 6893-135						
B0W8W0	N908174-01	80		7190-001	U	
BLK (QC ID=31861)	N908174-03	80		7190-003	U	
LCS (QC ID=31860)	N908174-02	80		7190-002	ok	
Duplicate (N908174-01)	N908174-04	80		7190-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	4.0	
200 Area Src chr 200-CW-1 OU-QC Sa						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6893-135 2σ prep error 15.0 % Reference Lab Notebook 6893 pg.135																
B0W8W0	N908174-01	80		2.5	0.300			3		100			31	09/23/99	09/27	GRB-110
BLK (QC ID=31861)	N908174-03	80		2.4	0.300			38		100				09/23/99	09/27	GRB-112
LCS (QC ID=31860)	N908174-02	80		2.1	0.300			38		100				09/23/99	09/27	GRB-111
Duplicate (N908174-01) (QC ID=31862)	N908174-04	80		1.8	0.300			1		100			31	09/23/99	09/27	GRB-113
Nominal values and limits from method				4.0	0.300			5-150		100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2.2 ± 0.63
RESIDUE 20 ± 42

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/02/99

SDG 7190
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/02/99

SDG 7190
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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Form DVD-RG
Version 3.06
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Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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GUIDE, cont.

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

Client Hanford
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Case no SDG-H0509

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
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REPORT GUIDE

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Contract TRB-SBB-207925
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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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GUIDE, cont.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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Version Ver 1.0
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Version 3.06
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GUIDE, cont.

Client Hanford
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Case no SDG-H0509

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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Protocol Hanford
Version Ver 1.0
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Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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GUIDE, cont.

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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/02/99

SDG 7190
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0509

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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Case no SDG-H0509

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Protocol Hanford
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Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-02	Page 1 of 1

Collector Doug Bowers/Brent Porter	**Company Contact** Chris 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 200 CW1	**SAF No.** B99-085	
Ice Chest No. ERC 96-068	**Field Logbook No.** EL-1511	**Method of Shipment** Federal Express	
Shipped To TMA/RECRA 8.27.99	**Offsite Property No.** A99 0232	**Bill of Lading/Air Bill No.** 423579528793	
		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 or H2SO4 to pH <2 Coo	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) {I-Propanol, Ethanol}	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time									
B0W8W0	Water	8-27-99	0640					X				
B0W8W1	Water	8-27-99	0520					X	X	8-27-99		

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

	Relinquished By	Date/Time	Received By	Date/Time
1	Brent Porter	8/27/99 1300	Refer IA	8/27/99 1200
2	REFER IA	8/30/99 1100	CHRIS KAIser	8/30/99 1100
3	CKaiser	8-30-99 1400	REFER	8/30/99 1400
4	FedEx	8-31-99 9:30	TNV M. Goldenberg	8-31-99 9:30

SPECIAL INSTRUCTIONS

See Chain of Custody comments on SAF for special instructions.

COLLECTOR NOT AVAILABLE TO SIGN COCs.

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

(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, 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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 8-31-99 9:30

CoC No. B99-085-02

Container I.D. No. ERC96-068 Requested TAT (Days) 45 P.O. Received Yes [ ] No [V]

INSPECTION

1. Custody seals on shipping container intact? Yes [V] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [V] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [V] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [V] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [V]
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 [ ] Rad labels [ ] Appropriate sample labels [V]
10. Samples are: In good condition [V] 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: 8-31-99 Time: 9:30

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____