RECRA ENVIRONMENTAL INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-007
RFW #: 9911L795
SDG/SAF #: H0652/B00-007

W.O. #: 10985-001-001-9999-00
Date Received: 11-20-99

GC/MS VOLATILE

Two (2) water samples were collected on 11-19-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for the client specified Volatile target compounds on 12-01-99.

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

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

RECEIVED
APR 11 2000
EDMC

FEB 2000 RECEIVED Data Log In

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

02-11-00
Date

som\group\data\voa\tnu-hanford-11-795.doc

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

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

GLOSSARY OF VOA DATA

DATA QUALIFIERS

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

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

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

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

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

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

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

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

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

mmz\10-94\gloss.voa

GLOSSARY OF VOA DATA

ABBREVIATIONS

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

mmz\10-94\gloss.voa

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 02/02/00 09:55

RFW Batch Number: **9911L795** Client: **TNU-HANFORD B00-007** Work Order: 10985001001 Page: 1a

	Cust ID:	B0X0D8		B0X0D8		B0X0D8		B0X0D9		VBLKEN		VBLKEN BS	
Sample Information	RFW#:	001		001 MS		001 MSD		002		99LVK722-MB1		99LVK722-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	96	%	95	%	95	%	92	%	97	%	94	%
	Bromofluorobenzene	96	%	92	%	94	%	94	%	95	%	94	%
	1,2-Dichloroethane-d4	94	%	93	%	91	%	98	%	92	%	96	%
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		5	U	5	U	5	U	5	U	2	J	2	JB
Acetone		10	U	10	U	10	U	10	U	1	J	10	U
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	103	%	97	%	5	U	5	U	95	%
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	108	%	102	%	5	U	5	U	101	%
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	104	%	102	%	5	U	5	U	103	%
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	106	%	101	%	5	U	5	U	99	%

*= Outside of EPA CLP QC limits.

02-02-00

RFW Batch Number: **9911L795** Client: **TNU-HANFORD B00-007** Work Order: 10985001001 Page: 1b

Cust ID:	B0X0D8	B0X0D8	B0X0D8	B0X0D9	VBLKEN	VBLKEN BS
RFW#:	001	001 MS	001 MSD	002	99LVK722-MB1	99LVK722-MB1
Chlorobenzene	5 U	107 %	102 %	5 U	5 U	100 %
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 B00-007

DATE RECEIVED: 11/20/99 RFW LOT # :9911L795

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0D8	001	W	99LVK722	11/19/99	N/A	12/01/99
B0X0D8	001 MS	W	99LVK722	11/19/99	N/A	12/01/99
B0X0D8	001 MSD	W	99LVK722	11/19/99	N/A	12/01/99
B0X0D9	002	W	99LVK722	11/19/99	N/A	12/01/99

LAB QC:

VBLKEN	MB1	W	99LVK722	N/A	N/A	12/01/99
VBLKEN	MB1 BS	W	99LVK722	N/A	N/A	12/01/99

RECRA LabNet Use Only

9911L 795

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B00-007

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 11/20/99 Date Due: 12/20/99

Account #:

Refrigerator #		1	3				3				3			1			
#/Type Container	Liquid	3AG	2AG				1PL		1P		1PL	1PL		3PL			
	Solid																
Volume	Liquid	40	950				1L		1LT		500	1LT		500			
	Solid																
Preservatives		HCl	—				—		HNO3		2NaOH NaOH	H2SO4		HNO3			
ANALYSES REQUESTED →		ORGANIC					Item 1		INORG		Sulfide	NO2 NO3 Ammonia		Item 2			
		VOA	BNA	Pest/PCB	Herb				Metal	CN							
RECRA LabNet Use Only		8260	8270	8250			Ang (1)		Met (1)		1SFD	1NO3N2	1NH3N	Met (1)			

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	8260	8270	8250			Ang (1)		Met (1)		1SFD	1NO3N2	1NH3N		Met (1)			
001	Box 008			W	11/19/99	0730	3																
002	1 9			1	1	1005	3	2				1		1		1	1			3			

Special Instructions:

Sub # B00-007

COMPOSITE WASTE

DATE/REVISIONS:

Ang (1) = ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4

2. IPH

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

4. Ni, V, Zn

5.

6. Run matrix QC

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11/20/99	0830

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

RECRA LabNet Use Only

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

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

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

Cooler Temp. 4.3 °C

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

NOTES:

4235795320 86

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-007-01	Page 1 of 1

Collector: Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit -	Sampling Location: 200 West	SAF No.: B00-007	
Ice Chest No.: 6W5124	Field Logbook No.: EL 1435	COA: B20CS1671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA R.F. 11-19-99	Offsite Property No.: A00 0 04 84 11-19-99		Bill of Lading/Air Bill No.: 42357953 20846

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

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

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0D8	Water	11-19-99	0730						X				
B0X0D9	Water	11-19-99	1005	X	X	X	X		X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R Fahlberg / R Fahlberg	11/19/99 1110	R. Nielson / R. Nielson	11/19/99 1110
R. Nielson / R. Nielson	11/19/99 1152	R. Thoren / R. Thoren	11.19.99 1150
R. Thoren / R. Thoren	11.19.99 1430	FED EX	
Fed Ex	11/20/99 0930	[illegible]	11/20/99 0930

SPECIAL INSTRUCTIONS

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

Sample originated in non RAD. Controlled area. <2000 pCi/g NO TA Required

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

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

BHI-EE-011 (10/99)

9911L795

4.3

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-007
RFW #: 9911L795
SDG/SAF #: H0652/B00-007

W.O.#: 10985-001-001-9999-00
Date Received: 11-20-99

SEMIVOLATILE

One (1) water sample was collected on 11-19-99.

The sample and its associated QC samples were extracted on 11-26-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 12-08,09-99.

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. Non-target compounds were detected in the sample.
3. The required holding times for extraction and analysis were met.
4. All surrogate recoveries were within EPA QC limits.
5. All blank spike recoveries were within EPA QC limits.
6. The sample was spectrally searched for Butylated Hydroxytoluene and Tributylphosphate; however, they were not identified in the sample.

FEB 2000
RECEIVED
Data
Log In

By J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

02-16-00
Date

som\group\data\bna\tnu11-795.doc

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

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

GLOSSARY OF BNA DATA

DATA QUALIFIERS

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

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

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

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

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

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

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

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

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

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

mmz\10-94\gloss.bna

GLOSSARY OF BNA DATA

ABBREVIATIONS

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

mmz\10-94\gloss.bna

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

RFW Batch Number: **9911L795** Client: **TNU-HANFORD B00-007** Work Order: 10985001001 Report Date: 01/13/00 17:10 Page: 1a

40

	Cust ID:	B0X0D9		SBLKHP		SBLKHP BS	
Sample Information	RFW#:	002		99LE1435-MB1		99LE1435-MB1	
	Matrix:	WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L	
Surrogate Recovery	Nitrobenzene-d5	62	%	82	%	72	%
	2-Fluorobiphenyl	59	%	63	%	68	%
	Terphenyl-d14	78	%	83	%	69	%
	Phenol-d5	59	%	50	%	76	%
	2-Fluorophenol	60	%	86	%	73	%
	2,4,6-Tribromophenol	70	%	67	%	71	%
Phenol		10	U	10	U	81	%
bis(2-Chloroethyl)ether		10	U	10	U	10	U
2-Chlorophenol		10	U	10	U	85	%
1,3-Dichlorobenzene		10	U	10	U	10	U
1,4-Dichlorobenzene		10	U	10	U	64	%
1,2-Dichlorobenzene		10	U	10	U	10	U
2-Methylphenol		10	U	10	U	10	U
2,2'-oxybis(1-Chloropropane)		10	U	10	U	10	U
4-Methylphenol		10	U	10	U	10	U
N-Nitroso-di-n-propylamine		10	U	10	U	72	%
Hexachloroethane		10	U	10	U	10	U
Nitrobenzene		10	U	10	U	10	U
Isophorone		10	U	10	U	10	U
2-Nitrophenol		10	U	10	U	10	U
2,4-Dimethylphenol		10	U	10	U	10	U
bis(2-Chloroethoxy)methane		10	U	10	U	10	U
2,4-Dichlorophenol		10	U	10	U	10	U
1,2,4-Trichlorobenzene		10	U	10	U	68	%
Naphthalene		10	U	10	U	10	U
4-Chloroaniline		10	U	10	U	10	U
Hexachlorobutadiene		10	U	10	U	10	U
4-Chloro-3-methylphenol		10	U	10	U	73	%
2-Methylnaphthalene		10	U	10	U	10	U
Hexachlorocyclopentadiene		10	U	10	U	10	U
2,4,6-Trichlorophenol		10	U	10	U	10	U
2,4,5-Trichlorophenol		26	U	25	U	25	U

*= Outside of EPA CLP QC limits.

Cust ID:	B0X0D9		SBLKHP		SBLKHP BS	
RFW#:	002		99LE1435-MB1		99LE1435-MB1	
2-Chloronaphthalene	10	U	10	U	10	U
2-Nitroaniline	26	U	25	U	25	U
Dimethylphthalate	10	U	10	U	10	U
Acenaphthylene	10	U	10	U	10	U
2,6-Dinitrotoluene	10	U	10	U	10	U
3-Nitroaniline	26	U	25	U	25	U
Acenaphthene	10	U	10	U	71	%
2,4-Dinitrophenol	26	U	25	U	25	U
4-Nitrophenol	26	U	25	U	62	%
Dibenzofuran	10	U	10	U	10	U
2,4-Dinitrotoluene	10	U	10	U	63	%
Diethylphthalate	10	U	10	U	10	U
4-Chlorophenyl-phenylether	10	U	10	U	10	U
Fluorene	10	U	10	U	10	U
4-Nitroaniline	26	U	25	U	25	U
4,6-Dinitro-2-methylphenol	26	U	25	U	25	U
N-Nitrosodiphenylamine (1)	10	U	10	U	10	U
4-Bromophenyl-phenylether	10	U	10	U	10	U
Hexachlorobenzene	10	U	10	U	10	U
Pentachlorophenol	26	U	25	U	64	%
Phenanthrene	10	U	10	U	10	U
Anthracene	10	U	10	U	10	U
Carbazole	10	U	10	U	10	U
Di-n-butylphthalate	1	J	10	U	0.7	J
Fluoranthene	10	U	10	U	10	U
Pyrene	10	U	10	U	72	%
Butylbenzylphthalate	10	U	10	U	10	U
3,3'-Dichlorobenzidine	10	U	10	U	10	U
Benzo(a)anthracene	10	U	10	U	10	U
Chrysene	10	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	10	U	10	U	10	U
Di-n-octyl phthalate	10	U	10	U	10	U
Benzo(b)fluoranthene	10	U	10	U	10	U
Benzo(k)fluoranthene	10	U	10	U	10	U
Benzo(a)pyrene	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U
Dibenz(a,h)anthracene	10	U	10	U	10	U
Benzo(g,h,i)perylene	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.

B0X0D9

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B00-007

Matrix: (soil/water) WATER Lab Sample ID: 9911L795-002

Sample wt/vol: 990 (g/mL) ML Lab File ID: D120904

Level: (low/med) LOW Date Received: 11/20/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 11/26/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 6 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.04	3	J
2.	UNKNOWN	7.74	5	J
3.	UNKNOWN	7.99	6	J
4.	UNKNOWN	8.27	3	J
5.	UNKNOWN	8.36	6	J
6.	UNKNOWN	14.22	2	JB

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKHP

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B00-007

Matrix: (soil/water) WATER Lab Sample ID: 99LE1435-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: D120810

Level: (low/med) LOW Date Received: 11/26/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 11/26/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/08/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	14.22	2	J

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-007

DATE RECEIVED: 11/20/99 RFW LOT # :9911L795

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0D9	002	W	99LE1435	11/19/99	11/26/99	12/09/99

LAB QC:

SBLKHP	MB1	W	99LE1435	N/A	11/26/99	12/08/99
SBLKHP	MB1 BS	W	99LE1435	N/A	11/26/99	12/08/99

RECRA LabNet Use Only
9911L795

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNC Hanford B00-007
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 11/20/99 Date Due: 12/20/99
Account #:

Refrigerator #		1	3				3				3			1		
#/Type Container	Liquid	3AG	2AG				1PL		1P		1PL	1PL		3PL		
	Solid															
Volume	Liquid	40	950				1L		1LT		500	1LT		500		
	Solid															
Preservatives		HCL	—				—		HNO3		2NaOH NaOH	H2SO4 N22 NO3 Amonia		HNO3		
ANALYSES REQUESTED →	ORGANIC: VOA		BNA		Pest/PCB	Herb	Item 1		INORG: Metal		CN			Item 2		

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only: 624SC	624H	625H			Ang ①		Met ①		15FD	1N3N2	1NH3N		Met ①		
	001	Box 008			W	11/19/99	0730	3															
	002	1 9			1	1	1005	3	2				1		1		1	1			3		

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

Special Instructions:

Lab # B00-007

COMPOSITE WASTE

DATE/REVISIONS:

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

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11/20/99	0830

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'd (Y) or N
Cooler Temp. 4.3 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7953 2086

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-007-01	Page 1 of 1

Collector: Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality: [ ]	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit -	Sampling Location: 200 West	SAF No.: B00-007	
Ice Chest No.: 0WS124	Field Logbook No.: EL 1435	COA: B20CS1671C 11.19.99	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA RF 11-19-99	Offsite Property No.: A00 0 04 84		Bill of Lading/Air Bill No.: 42357953 20846

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

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

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0D8	Water	11-19-99	0730						X				
B0X0D9	Water	11-19-99	1005	X	X	X	X		X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R Fahlberg	11/19/99 1110	K Nielsen / R. Nielsen	11/19/99 1110
K Nielsen / R. Nielsen	1152	R. Thoren / R. Thoren	11.19.99/150
R. Thoren / R. Thoren	11.19.99/1430	FED EX	
Fed Ex	11/20/99 0930	[illegible]	11/20/99 0930

SPECIAL INSTRUCTIONS

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

Sample originated in non RAD. Controlled area. <2000 pCi/g ND TA Required

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

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

BHI-EE-011 (10/99)

9911L795

1.3

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD B00-007
RFW #: 9911L795
SDG/SAF#: H0652/B00-007

W.O. #: #: 10985-001-001-9999-00
Date Received: 11-20-99

GC SCAN

The set of samples consisted of two (2) water samples collected on 11-19-99.

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

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

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

2. The required holding time for analysis was met.

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

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

5. Surrogates were not used for this analysis.

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

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-08-99
Date

FEB 2000
RECEIVED
Data
Log In

r:\share\lc\gcscan\11-795.doc

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

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

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

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

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

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

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 12/03/99 11:22

RFW Batch Number: **9911L795** Client: **TNU-HANFORD B00-007** Work Order: **10985-001-001-9999-00** Page: 1

	Cust ID:	B0X0D8	B0X0D8	B0X0D8	B0X0D9	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	99LLC181-MB1	99LLC181-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		fl	fl	fl	fl	fl	fl
n-Propyl Alcohol		5.0 U	95 %	98 %	5.0 U	5.0 U	97 %
Ethanol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

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

Recra LabNet - Lionville Laboratory
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-007

DATE RECEIVED: 11/20/99 RFW LOT # :9911L795

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0D8	001	W	99LLC181	11/19/99	12/02/99	12/02/99
B0X0D8	001 MS	W	99LLC181	11/19/99	12/02/99	12/02/99
B0X0D8	001 MSD	W	99LLC181	11/19/99	12/02/99	12/02/99
B0X0D9	002	W	99LLC181	11/19/99	12/02/99	12/02/99
LAB QC:						
BLK	MB1	W	99LLC181	N/A	12/02/99	12/02/99
BLK	MB1 BS	W	99LLC181	N/A	12/02/99	12/02/99

12/23/99

RECRA LabNet Use Only

9911L 795

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client TNU Hanford B00-007

Est. Final Proj. Sampling Date

Project # 10985-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager OJ

QC Spec Del Std TAT 30 day

Date Rec'd 11/20/99 Date Due 12/20/99

Account #

Refrigerator #		1	3				3				3			1				
#/Type Container	Liquid	3AG	2AG				1PL		1p		1PL	1PL		3PL				
	Solid																	
Volume	Liquid	40	950				1L		1ty		500	1LT		500				
	Solid																	
Preservatives		HCl	—				—		HNO3		2NaOH	H2SO4		HNO3				
ANALYSES REQUESTED →		ORGANIC					Item 1		INORG		NaOH	NH2		Item 2				
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Sulfide	NO3						
											Fe	Ammonia						

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only: OGCL	OW24H	OW25H		Ang	Met		15FD	1N3N2 1NH3N	Met		
001	Box 008			W	11/19/99	0730	3											
002	1 9			1	1	1005	3	2			1			1	1	3		

Special Instructions:

Daf # B00-007

COMPOSITE WASTE

DATE/REVISIONS:

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

RECRA LabNet Use Only

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

COC Tape was: 1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'l (Y) or N
Cooler Temp. 4.3 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 4235795 3 2086

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11/20/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-007-01	Page 1 of 1

Collector: Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit -	Sampling Location: 200 West		SAF No.: B00-007
Ice Chest No.: CW5124	Field Logbook No.: EL 1435	COA: B20CS1671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA RF 11-19-99	Offsite Property No.: A00 04184		Bill of Lading/Air Bill No.: 42357953 20840

Price Code: 7N
Air Quality: ☐
Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	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										
B0X0D8	Water	11-19-99	0730						X				
B0X0D9	Water	11-19-99	1005	X	X	X	X		X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R Fahlberg / R Fahlberg	11/19/99 1110	K Nelson / R. Nelson	11/19/99 1110
R Nelson / R Nelson	11/19/99 1150	R. Thoren	11.19.99/150
R. Thoren	11.19.99/1430	FED EX	
Fed Ex	11/20/99 0930	[illegible]	11/20/99 0930

SPECIAL INSTRUCTIONS

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

Sample originated in non RAD. Controled area. <2000 pCi/g NO TA Required

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

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

BHI-EE-011 (10/99)

9911L795

4.3

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B00-007
RFW# : 9911L795
SDG/SAF# : H0652/B00-007

W.O.# : 10985-001-001-9999-00
Date Received: 11-20-99

METALS CASE NARRATIVE

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

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

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

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

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

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

7. The preparation/method blanks for 2 analytes were outside method criteria. {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

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

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

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

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

11. The duplicate analyses for 5 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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-10-00
Date

mld/m11-795

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9911L795

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

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

Other:_____ Method:_____

L-WI-033/M-11/99

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/30/99

CLIENT: TNU-HANFORD B00-007

RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B0X0D9	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.7 u	UG/L	2.7	1.0
		Barium, Total	1.1	UG/L	0.20	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	0.70 u	UG/L	0.70	1.0
		Copper, Total	0.50 u	UG/L	0.50	1.0
		Nickel, Total	1.0 u	UG/L	1.0	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Selenium, Total	4.1 u	UG/L	4.1	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	1.1	UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/30/99

CLIENT: TNU-HANFORD B00-007

RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0839-MB1	Silver, Total	0.95		UG/L	0.80	1.0
		Arsenic, Total	2.7	u	UG/L	2.7	1.0
		Barium, Total	1.0		UG/L	0.20	1.0
		Beryllium, Total	0.11		UG/L	0.10	1.0
		Cadmium, Total	0.40	u	UG/L	0.40	1.0
		Chromium, Total	0.70	u	UG/L	0.70	1.0
		Copper, Total	2.7		UG/L	0.50	1.0
		Nickel, Total	1.8		UG/L	1.0	1.0
		Lead, Total	2.1	u	UG/L	2.1	1.0
		Selenium, Total	4.1	u	UG/L	4.1	1.0
		Vanadium, Total	1.7		UG/L	0.60	1.0
		Zinc, Total	1.9		UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/30/99

CLIENT: TNU-HANFORD B00-007

RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	B0X0D9	Silver, Total	47.4	0.80u	50.0	94.8	1.0
		Arsenic, Total	2040	2.7 u	2000	101.9	1.0
		Barium, Total	1940	1.1	2000	97.0	1.0
		Beryllium, Total	50.7	0.10u	50.0	101.4	1.0
		Cadmium, Total	50.0	0.40u	50.0	100	1.0
		Chromium, Total	198	0.70u	200	98.8	1.0
		Copper, Total	244	0.50u	250	97.7	1.0
		Nickel, Total	504	1.0 u	500	100.7	1.0
		Lead, Total	503	2.1 u	500	100.7	1.0
		Selenium, Total	2040	4.1 u	2000	101.8	1.0
		Vanadium, Total	496	0.60u	500	99.1	1.0
		Zinc, Total	493	1.1	500	98.4	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/30/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	B0X0D9	Silver, Total	0.80u	0.80	~~NC~~ 200	1.0
		Arsenic, Total	2.7 u	2.7 u	NC	1.0
		Barium, Total	1.1	3.2	97.7	1.0
		Beryllium, Total	0.10u	0.10	~~NC~~ 200	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Chromium, Total	0.70u	1.0	~~NC~~ 200	1.0
		Copper, Total	0.50u	0.50u	NC	1.0
		Nickel, Total	1.0 u	1.0 u	NC	1.0
		Lead, Total	2.1 u	2.1 u	NC	1.0
		Selenium, Total	4.1 u	4.1 u	NC	1.0
		Vanadium, Total	0.60u	0.60u	NC	1.0
		Zinc, Total	1.1	2.4	74.3	1.0

Corrections MD 1/10/00

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/30/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0839-LC1	Silver, LCS	491	500	UG/L	98.1
		Arsenic, LCS	9880	10000	UG/L	98.8
		Barium, LCS	4860	5000	UG/L	97.2
		Beryllium, LCS	248	250	UG/L	99.2
		Cadmium, LCS	244	250	UG/L	97.6
		Chromium, LCS	489	500	UG/L	97.8
		Copper, LCS	1210	1250	UG/L	97.0
		Nickel, LCS	1950	2000	UG/L	97.6
		Lead, LCS	2430	2500	UG/L	97.2
		Selenium, LCS	9880	10000	UG/L	98.8
		Vanadium, LCS	2460	2500	UG/L	98.4
		Zinc, LCS	975	1000	UG/L	97.5

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-007

DATE RECEIVED: 11/20/99 RFW LOT # :9911L795

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0D9						
SILVER, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
SILVER, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
SILVER, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
ARSENIC, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
ARSENIC, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
ARSENIC, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
BARIUM, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
BARIUM, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
BARIUM, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
BERYLLIUM, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
BERYLLIUM, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
BERYLLIUM, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
CADMIUM, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
CADMIUM, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
CADMIUM, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
CHROMIUM, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
CHROMIUM, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
CHROMIUM, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
COPPER, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
COPPER, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
COPPER, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
NICKEL, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
NICKEL, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
NICKEL, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
LEAD, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
LEAD, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
LEAD, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
SELENIUM, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
SELENIUM, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
SELENIUM, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
VANADIUM, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
VANADIUM, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99
VANADIUM, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99
ZINC, TOTAL	002	W	99L0839	11/19/99	12/21/99	12/23/99
ZINC, TOTAL	002 REP	W	99L0839	11/19/99	12/21/99	12/23/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-007

DATE RECEIVED: 11/20/99 RFW LOT # :9911L795

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	002 MS	W	99L0839	11/19/99	12/21/99	12/23/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
SILVER, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
ARSENIC LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
ARSENIC, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
BARIUM LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
BARIUM, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
BERYLLIUM LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
BERYLLIUM, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
CADMIUM LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
CADMIUM, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
CHROMIUM LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
CHROMIUM, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
COPPER LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
COPPER, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
NICKEL LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
NICKEL, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
LEAD LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
LEAD, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
SELENIUM LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
SELENIUM, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
VANADIUM LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
VANADIUM, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99
ZINC LABORATORY	LC1 BS	W	99L0839	N/A	12/21/99	12/23/99
ZINC, TOTAL	MB1	W	99L0839	N/A	12/21/99	12/23/99

RECRA LabNet Use Only

9911L 795

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNC Hanford B00-007

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: SPEC Del: Std TAT: 30 day

Date Rec'd: 11/20/99 Date Due: 12/20/99

Account #:

Refrigerator #		1	3				3				3			1		
#/Type Container	Liquid	3AG	2AG				1PL		1P		1PL	1PL		3PL		
	Solid															
Volume	Liquid	40	950				1L		1Hr		500	1LT		500		
	Solid															
Preservatives		HCL	—				—		HNO3		2NaOH NaOH	H2SO4		HNO3		
ANALYSES REQUESTED	ORGANIC: VOA						Item 1		INORG: Metal		Sulfide Phos	NO2 NO3 Ammonia		Item 2		
	BNA															
	Pest/PCB															
	Herb															

RECRA LabNet Use Only

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OGCSC	0624H	0625H			Ing①		Met①		1SFD	1N3N2	1NH3N	Met①		
S - Soil	001	Box 018			W	11/19/99	0730	3														
SE - Sediment	002	1 9			L	1	1005	3	2				1		1		1	1		3		
SO - Solid																						
SL - Sludge																						
W - Water																						
O - Oil																						
A - Air																						
DS - Drum Solids																						
DL - Drum Liquids																						
L - EP/TCLP Leachate																						
WI - Wipe																						
X - Other																						
F - Fish																						

Special Instructions:

Daf # B00-007

COMPOSITE WASTE

DATE/REVISIONS:

1. Ing① = ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4
2. IPH
3. Met① = As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu,
4. Ni, V, Zn
5.
6. Run matrix QC

RECRA LabNet Use Only

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

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

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

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec'd (Y) or N

Cooler Temp. 4.3 °C

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

NOTES: 4235795 3 2086

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	11/20/99	0730

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-007-01	Page 1 of 1

Collector: Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit -	Sampling Location: 200 West	SAF No.: B00-007	
Ice Chest No.: GDS124	Field Logbook No.: EL 1435	COA: B20CS167IC 11.19.99	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA RF 11-19-99	Offsite Property No.: ADD0D484		Bill of Lading/Air Bill No.: 42357953 2084

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

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

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0D8	Water	11.19.99	0730						X				
B0X0D9	Water	11-19-99	1005	X	X	X	X		X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R Fahlberg	11/19/99 1110	R. Nielson / R. Nielson	11/19/99 1110
R. Nielson / R. Nielson	11/19/99 1152	R. Thoren / R. Thoren	11.19.99/150
R. Thoren / R. Thoren	11.19.99/1430	FED EX	
Fed Ex	11/20/99 0930	[illegible]	11/20/99 093[illegible]

SPECIAL INSTRUCTIONS

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

Sample originated in non RAD. Controlled area. <2000 pCi/g NO TA Required

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

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

BHI-EE-011 (10/99)

9911L795

4.3

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

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B00-007
RFW# : 9911L795
SDG# : H0652
SAF# : B00-007

W.O. # : 10985-001-001-9999-00
Date Received: 11-20-99

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 indicated 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.

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 for Ammonia was within the 20% Relative Percent Difference (RPD).

7. The matrix spike recoveries were within the 75-125% control limits.

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-24-00
Date

njp\i11-795

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

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

Other: **Method:**

02

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/15/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B0X0D9	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
		Nitrate Nitrite	0.020u	MG/L	0.020	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		pH	5.3	PH UNITS	0.01	1.0
		Sulfide	2.0 u	MG/L	2.0	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/15/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LCC101-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LCC102-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LIC101-MB1	Fluoride by IC	0.50 u	MG/L	0.50	1.0
BLANK10	99LIC102-MB1	Fluoride by IC	0.50 u	MG/L	0.50	1.0
BLANK10	99L2C101-MB1	Nitrite by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99L2C102-MB1	Nitrite by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99L3C101-MB1	Nitrate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99L3C102-MB1	Nitrate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LZC101-MB1	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	99LPC102-MB1	Phosphate by IC	0.25 u	MG/L	0.25	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/15/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LSC102-MB1	Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LN3059-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	99LAM046-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	99LSD071-MB1	Sulfide	2.0 u	MG/L	2.0	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/15/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	BCX0D9	Chloride by IC	5.2	0.00	5.0	103.3	1.0
		Fluoride by IC	10.4	0.00	10.0	104.4	1.0
		Nitrite by IC	5.2	0.25u	5.0	104.6	1.0
		Nitrate by IC	4.9	0.25u	5.0	97.4	1.0
		Phosphate by IC	5.0	0.25u	5.0	100	1.0
		Sulfate by IC	5.0	0.25u	5.0	99.5	1.0
		Nitrate Nitrite	0.51	0.02u	0.50	102.8	1.0
		Ammonia, as N	1.0	0.10u	1.0	102.0	1.0
		Sulfide	9.7	0.30	10.0	94.0	1.0
BLANK10	99LCC101-MB1	Chloride by IC	4.7	0.25u	5.0	94.6	1.0
BLANK10	99LCC102-MB1	Chloride by IC	4.8	0.25u	5.0	95.7	1.0
BLANK10	99LIC101-MB1	Fluoride by IC	10.5	0.50u	10.0	104.5	1.0
BLANK10	99LIC102-MB1	Fluoride by IC	10.5	0.50u	10.0	105.4	1.0
BLANK10	99L2C101-MB1	Nitrite by IC	4.8	0.25u	5.0	96.6	1.0
BLANK10	99L2C102-MB1	Nitrite by IC	4.9	0.25u	5.0	97.7	1.0
BLANK10	99L3C101-MB1	Nitrate by IC	4.8	0.25u	5.0	96.6	1.0
BLANK10	99L3C102-MB1	Nitrate by IC	4.7	0.25u	5.0	94.0	1.0
BLANK10	99LZC101-MB1	Phosphate by IC	5.1	0.25u	5.0	101.1	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.0	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/15/99

CLIENT: TNU-HANFORD B00-007

RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
BLANK10	99LPC102-MB1	Phosphate by IC	5.0	0.25u	5.0	99.2	1.0
BLANK10	99LSC102-MB1	Sulfate by IC	4.7	0.25u	5.0	94.8	1.0
BLANK10	99LN3059-MB1	Nitrate Nitrite	0.47	0.02u	0.50	94.6	1.0
BLANK10	99LAM046-MB1	Ammonia, as N	1.0	0.10u	1.0	102.0	1.0
		Ammonia, as N MSD	1.0	0.10u	1.0	101.0	1.0
BLANK10	99LSD071-MB1	Sulfide	10.0	2.0 u	10.0	100	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 12/15/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

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

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/15/99

CLIENT: TNU-HANFORD B00-007 RECRA LOT #: 9911L795

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	B0X0D9	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	5.3	5.4	1.1	1.0
		Sulfide	2.0 u	2.0 u	NC	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-007

DATE RECEIVED: 11/20/99 RFW LOT # :9911L795

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0D9						
CHLORIDE BY IC	002	W	99LCC101	11/19/99	11/22/99	11/22/99
CHLORIDE BY IC	002 REP	W	99LCC101	11/19/99	11/22/99	11/22/99
CHLORIDE BY IC	002 MS	W	99LCC102	11/19/99	11/23/99	11/23/99
FLUORIDE BY IC	002	W	99LIC101	11/19/99	11/22/99	11/22/99
FLUORIDE BY IC	002 REP	W	99LIC101	11/19/99	11/22/99	11/22/99
FLUORIDE BY IC	002 MS	W	99LIC102	11/19/99	11/23/99	11/23/99
NITRITE BY IC	002	W	99L2C101	11/19/99	11/22/99	11/22/99
NITRITE BY IC	002 REP	W	99L2C101	11/19/99	11/22/99	11/22/99
NITRITE BY IC	002 MS	W	99L2C102	11/19/99	11/23/99	11/23/99
NITRATE BY IC	002	W	99L3C101	11/19/99	11/22/99	11/22/99
NITRATE BY IC	002 REP	W	99L3C101	11/19/99	11/22/99	11/22/99
NITRATE BY IC	002 MS	W	99L3C102	11/19/99	11/23/99	11/23/99
PHOSPHATE BY IC	002	W	99LZC101	11/19/99	11/22/99	11/22/99
PHOSPHATE BY IC	002 REP	W	99LZC101	11/19/99	11/22/99	11/22/99
PHOSPHATE BY IC	002 MS	W	99LPC102	11/19/99	11/23/99	11/23/99
SULFATE BY IC	002	W	99LZC101	11/19/99	11/22/99	11/22/99
SULFATE BY IC	002 REP	W	99LZC101	11/19/99	11/22/99	11/22/99
SULFATE BY IC	002 MS	W	99LSC102	11/19/99	11/23/99	11/23/99
NITRATE NITRITE	002	W	99LN3059	11/19/99	12/08/99	12/08/99
NITRATE NITRITE	002 REP	W	99LN3059	11/19/99	12/08/99	12/08/99
NITRATE NITRITE	002 MS	W	99LN3059	11/19/99	12/08/99	12/08/99
AMMONIA	002	W	99LAM046	11/19/99	12/07/99	12/07/99
AMMONIA	002 REP	W	99LAM046	11/19/99	12/07/99	12/07/99
AMMONIA	002 MS	W	99LAM046	11/19/99	12/07/99	12/07/99
PH	002	W	99LPH127	11/19/99	11/21/99	11/21/99
PH	002 REP	W	99LPH127	11/19/99	11/21/99	11/21/99
SULFIDE	002	W	99LSD071	11/19/99	11/23/99	11/23/99
SULFIDE	002 REP	W	99LSD071	11/19/99	11/23/99	11/23/99
SULFIDE	002 MS	W	99LSD071	11/19/99	11/23/99	11/23/99

LAB QC:

CHLORIDE BY IC	MB1	W	99LCC101	N/A	11/22/99	11/22/99
CHLORIDE BY IC	MB1 BS	W	99LCC101	N/A	11/22/99	11/22/99
CHLORIDE BY IC	MB1	W	99LCC102	N/A	11/23/99	11/23/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-007

DATE RECEIVED: 11/20/99 RFW LOT # :9911L795

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	MB1 BS	W	99LCC102	N/A	11/23/99	11/23/99
FLUORIDE BY IC	MB1	W	99LIC101	N/A	11/22/99	11/22/99
FLUORIDE BY IC	MB1 BS	W	99LIC101	N/A	11/22/99	11/22/99
FLUORIDE BY IC	MB1	W	99LIC102	N/A	11/23/99	11/23/99
FLUORIDE BY IC	MB1 BS	W	99LIC102	N/A	11/23/99	11/23/99
NITRITE BY IC	MB1	W	99L2C101	N/A	11/22/99	11/22/99
NITRITE BY IC	MB1 BS	W	99L2C101	N/A	11/22/99	11/22/99
NITRITE BY IC	MB1	W	99L2C102	N/A	11/23/99	11/23/99
NITRITE BY IC	MB1 BS	W	99L2C102	N/A	11/23/99	11/23/99
NITRATE BY IC	MB1	W	99L3C101	N/A	11/22/99	11/22/99
NITRATE BY IC	MB1 BS	W	99L3C101	N/A	11/22/99	11/22/99
NITRATE BY IC	MB1	W	99L3C102	N/A	11/23/99	11/23/99
NITRATE BY IC	MB1 BS	W	99L3C102	N/A	11/23/99	11/23/99
PHOSPHATE BY IC	MB1	W	99LZC101	N/A	11/22/99	11/22/99
PHOSPHATE BY IC	MB1 BS	W	99LZC101	N/A	11/22/99	11/22/99
PHOSPHATE BY IC	MB1	W	99LPC102	N/A	11/23/99	11/23/99
PHOSPHATE BY IC	MB1 BS	W	99LPC102	N/A	11/23/99	11/23/99
SULFATE BY IC	MB1	W	99LZC101	N/A	11/22/99	11/22/99
SULFATE BY IC	MB1 BS	W	99LZC101	N/A	11/22/99	11/22/99
SULFATE BY IC	MB1	W	99LSC102	N/A	11/23/99	11/23/99
SULFATE BY IC	MB1 BS	W	99LSC102	N/A	11/23/99	11/23/99
NITRATE NITRITE	MB1	W	99LN3059	N/A	12/08/99	12/08/99
NITRATE NITRITE	MB1 BS	W	99LN3059	N/A	12/08/99	12/08/99
AMMONIA	MB1	W	99LAM046	N/A	12/07/99	12/07/99
AMMONIA	MB1 BS	W	99LAM046	N/A	12/07/99	12/07/99
AMMONIA	MB1 BSD	W	99LAM046	N/A	12/07/99	12/07/99
SULFIDE	MB1	W	99LSD071	N/A	11/23/99	11/23/99
SULFIDE	MB1 BS	W	99LSD071	N/A	11/23/99	11/23/99

RECRA LabNet Use Only

9911L 795

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU HANFORD BOU-007

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: SPEC Del: Std TAT: 30 day

Date Rec'd: 11/20/99 Date Due: 12/20/99

Account #:

Refrigerator #		1	3				3			3		1
#/Type Container	Liquid	3AG	2AG				1PL	1P		1PL	1PL	3PL
	Solid											
Volume	Liquid	40	950				1L	1L		500	1LT	500
	Solid											
Preservatives		HCL	—				—	HNO3		2NaOH NaOH	H2SO4	HNO3
ANALYSES REQUESTED →		ORGANIC VOA	BNA	Pest/PCB	Herb		Item 1	INORG Metal	CN	Sulfide, Nitrate, Nitrite, Ammonia		Item 2

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	CLCSD 624H	625H		Mng O	Met O		15FD	1N3N2	1NH3N	Met O
001	Box 008			W	11/19/99	0730	3									
002	1 9			1	1	1005	3	2		1	1		1	1		3

Special Instructions:

Daf # BOU-007

COMPOSITE WASTE

DATE/REVISIONS:

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

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.3 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235795 3 2086

Relinquished by	Received by	Date	Time
[signature]	[signature]	11/20/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-007-01	Page 1 of 1

Collector: Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality: [ ]	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit -	Sampling Location: 200 West		SAF No.: B00-007
Ice Chest No.: 6W5124	Field Logbook No.: EL 1435	COA: B20CS1671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA R.F. 11-19-99	Offsite Property No.: A00 0484	11.19.99	Bill of Lading/Air Bill No.: 42357953 2084

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

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

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0D8	Water	11.19.99	0730						X				
B0X0D9	Water	11-19-99	1005	X	X	X	X		X	X			

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

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R Fahlberg	11/19/99 1110	R. Nelson / R. Nelson	11/19/99 1110
R. Nelson / R Nelson	11/19/99 1152	R. Thoren	11.19.99/150
R. Thoren	11.19.99/1430	FED EX	
Fed Ex	11/20/99 0930	[illegible]	11/20/99 0930

SPECIAL INSTRUCTIONS

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

Sample originated in non RAD. Controlled area. <2000 pCi/g NO TA Required

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

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

BHI-EE-011 (10/99)

9911L795

4.3

H0652- TMA / RECRA

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0652 was composed of one liquid (water) sample designated under SAF No. B00-007 with a Project Designation of: 200 Area Source Characterization 200-CS-1 Operable Unit.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

FEB 2

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

SAMPLE SUMMARY

SDG 7298
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0652

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0X0D9	200 West	WATER		N911215-01	B00-007	B00-007-01	11/19/99 10:05
Method Blank		WATER		N911215-03	B00-007		
Lab Control Sample		WATER		N911215-02	B00-007		
Duplicate (N911215-01)	200 West	WATER		N911215-04	B00-007		11/19/99 10:05

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

SDG 7298
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TRB-SPB-207925
Case no SDG H0652

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
7298	B00-007-01	B0X0D9	WATER				11/20/99	1	N911215-01	7298-001
		Method Blank	WATER						N911215-03	7298-003
		Lab Control Sample	WATER						N911215-02	7298-002
		Duplicate (N911215-01)	WATER				11/20/99	1	N911215-04	7298-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

SDG 7298
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0652

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
80A	WATER	Gross Alpha in Water	6909-111	20.0	1			1	1	1/1		
80B	WATER	Gross Beta in Water	6909-111	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 02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

WORK SUMMARY

SDG 7298
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0652

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0X0D9			N911215-01	7298-001	80A/80		12/30/99	02/02/00	MCM	Gross Alpha in Water
200 West		WATER	11/19/99	7298-001	80B/80		12/30/99	02/01/00	MCM	Gross Beta in Water
B00-007-01	B00-007		11/20/99							
Method Blank			N911215-03	7298-003	80A/80		12/30/99	02/02/00	MCM	Gross Alpha in Water
		WATER		7298-003	80B/80		12/30/99	02/01/00	MCM	Gross Beta in Water
	B00-007									
Lab Control Sample			N911215-02	7298-002	80A/80		12/30/99	02/02/00	MCM	Gross Alpha in Water
		WATER		7298-002	80B/80		12/30/99	02/01/00	MCM	Gross Beta in Water
	B00-007									
Duplicate (N911215-01)			N911215-04	7298-004	80A/80		12/30/99	02/02/00	MCM	Gross Alpha in Water
200 West		WATER	11/19/99	7298-004	80B/80		12/30/99	02/01/00	MCM	Gross Beta in Water
	B00-007		11/20/99							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
80A/80	B00-007	Gross Alpha in Water	EPA900.0	1			1	1	1	4
80B/80	B00-007	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 02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

N911215-03 Method Blank

METHOD BLANK

SDG	7298	Client/Case no	Hanford	SDG H0652	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	N911215-03	Client sample id	Method Blank		
Dept sample id	7298-003	Material/Matrix		WATER	
		SAF No	B00-007		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.157	0.46	1.1	3.0	U	80A
Gross Beta	12587-47-2	0.543	1.4	2.3	4.0	U	80B

200 Area Source Chara. 200-CS-1 OU

QC-BLANK #32854

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

N911215-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7298

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0652

Case no TRB-SPB-207925

Lab sample id N911215-02

Dept sample id 7298-002

Client sample id Lab Control Sample

Material/Matrix WATER

SAF No B00-007

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	64.6	4.7	0.70	3.0		80A	67.0	2.7	96	69-131	70-130
Gross Beta	75.0	3.6	2.0	4.0		80B	75.0	3.0	100	76-124	70-130

200 Area Source Chara. 200-CS-1 OU

QC-LCS #32853

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

N911215-04

B0X0D9

DUPLICATE

SDG	7298			Client/Case no	Hanford SDG H0652
Contact	Melissa C. Mannion			Case no	TRB-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	N911215-04	Lab sample id	N911215-01	Client sample id	B0X0D9
Dept sample id	7298-004	Dept sample id	7298-001	Location/Matrix	200 West WATER
		Received	11/20/99	Collected	11/19/99 10:05
				Custody/SAF No	B00-007-01 B00-007

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	-0.144	0.48	1.0	3.0	U	80A	-0.034	0.44	0.94	U	-	
Gross Beta	0.486	1.1	1.9	4.0	U	80B	-0.002	1.4	2.5	U	-	

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 32855

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

N911215-01 B0X0D9

DATA SHEET

SDG	7298	Client/Case no	Hanford SDG H0652
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	N911215-01	Client sample id	B0X0D9
Dept sample id	7298-001	Location/Matrix	200 West WATER
Received	11/20/99	Collected	11/19/99 10:05
		Custody/SAF No	B00-007-01 B00-007

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.034	0.44	0.94	3.0	U	80A
Gross Beta	12587-47-2	-0.002	1.4	2.5	4.0	U	80B

200 Area Source Chara. 200-CS-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

Test 80A Matrix WATER
SDG 7298
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0652

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6909-111						
B0X0D9	N911215-01	80		7298-001	U	
BLK (QC ID=32854)	N911215-03	80		7298-003	U	
LCS (QC ID=32853)	N911215-02	80		7298-002	ok	
Duplicate (N911215-01)	N911215-04	80		7298-004	-	U

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

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-111 2σ prep error 20.0 % Reference Lab Notebook 6909 pg. 111																
B0X0D9	N911215-01	80		0.94	0.300			1		100			41	12/30/99	12/30	GRB-110
BLK (QC ID=32854)	N911215-03	80		1.1	0.300			23		100				12/30/99	12/30	GRB-112
LCS (QC ID=32853)	N911215-02	80		0.70	0.300			23		100				12/30/99	12/30	GRB-111
Duplicate (N911215-01) (QC ID=32855)	N911215-04	80		1.0	0.300			1		100			41	12/30/99	12/30	GRB-113
Nominal values and limits from method				3.0	0.300			5-250		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 0.94 ± 0.34
RESIDUE 12 ± 25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0652

Test 80B Matrix WATER
SDG 7298
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0652

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta	
Preparation batch 6909-111						
B0X0D9	N911215-01	80		7298-001	U	
BLK (QC ID=32854)	N911215-03	80		7298-003	U	
LCS (QC ID=32853)	N911215-02	80		7298-002	ok	
Duplicate (N911215-01)	N911215-04	80		7298-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	4.0	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-111 2σ prep error 15.0 % Reference Lab Notebook 6909 pg. 111																
B0X0D9	N911215-01	80		2.5	0.300			1		100			41	12/30/99	12/30	GRB-110
BLK (QC ID=32854)	N911215-03	80		2.3	0.300			23		100				12/30/99	12/30	GRB-112
LCS (QC ID=32853)	N911215-02	80		2.0	0.300			23		100				12/30/99	12/30	GRB-111
Duplicate (N911215-01) (QC ID=32855)	N911215-04	80		1.9	0.300			1		100			41	12/30/99	12/30	GRB-113
Nominal values and limits from method				4.0	0.300			5-250		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 ± 0.55
RESIDUE 12 ± 25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-007-01	Page 1 of 1

Collector: Fahlberg	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit -	Sampling Location: 200 West	SAF No.: B00-007	
Ice Chest No.: SML 264	Field Logbook No.: EL 1435	COA: B20CS1671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA R.F. 11.19.99	Offsite Property No.: AØØ0045		Bill of Lading/Air Bill No.: 42357953 2101

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

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

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0D8	Water	11-19-99	0770										
B0X0D9	Water	11-19-99	1005					X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R.Fahlberg / R.Fahlberg	1110 11-19-99	R.Nelson / R.Nelson	1110 11/19/99
R.Nelson / R.Nelson	1150 11/19/99	R. Thoren	11.19.99/1150
R. Thoren	11.19.99/1430	FED EX	11-19-99
Fed Ex	11-20-99 10:30	J.R.Cooper / J.R.Cooper	10:30 11-20-99

SPECIAL INSTRUCTIONS

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

Sample originated from non Radiologically Controlled Area <2000 pCi/g no TA Required

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

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

BHI-EE-011 (10/99)

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 11-20-99 10:30

CoC No. B00-007-01

Container I.D. No. SML-264 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [ ] No [ ] N/A [✓]
2. Custody seals on shipping container dated & signed? Yes [ ] No [ ] N/A [✓]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1
7. Number of containers per sample: 2 (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [✓] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [ ]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: No custody seal on ice chest

13. Was P.M. notified of any anomalies? Yes [✓] No [ ] Date 11-22-99
14. Received by [signature] Date: 11-20-99 Time: 10:30

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____