H0092-TNU

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

0049002

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD
RFW #: 9708L740
SDG #: H0092

W.O. #: 10985-001-011-0099-00
Date Received: 08-06-97

APR 1998 RECEIVED EDMC

SEMIVOLATILE

One (1) solid sample was collected on 07-29-97.

The sample and its associated QC samples were extracted on 08-10-97 and analyzed according to criteria set forth in SW 846 Method 8270 for TCL Semivolatile target compounds on 08-23,24-97.

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. All required holding times for extraction and analysis were met.
3. Non-target compounds were detected in sample BOLC82.
4. All surrogate recoveries were within EPA QC limits.
5. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.
6. Six (6) of twenty-two (22) matrix spike recoveries were outside EPA QC limits. There was an apparent loss of extract prior to the analysis of sample BOLC82 MS; this resulted in low spike recoveries and poor reproducibility with respect to the matrix spike duplicate. The problem was isolated to the matrix spike analysis and did not adversely affect the associated samples.

SEP 1997 RECEIVED Data Log In

J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

Date

mmz\bna\08-740b.cn

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

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

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

RFW Batch Number: **9708L740** Client: **TNU-HANFORD** Work Order: 10985001001 Page: 1a Report Date: 09/01/97 14:21

	Cust ID:	BOLC82		BOLC82		BOLC82		SBLKAI		SBLKAI BS	
Sample Information	RFW#:	001		001 MS		001 MSD		97LE1454-MB1		97LE1454-MB1	
	Matrix:	SOLID		SOLID		SOLID		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Nitrobenzene-d5	63	%	28	%	57	%	57	%	89	%
	2-Fluorobiphenyl	71	%	30	%	63	%	58	%	91	%
	p-Terphenyl-d14	98	%	40	%	80	%	60	%	88	%
	Phenol-d5	86	%	34	%	74	%	62	%	100	%
	2-Fluorophenol	80	%	33	%	70	%	60	%	95	%
	2,4,6-Tribromophenol	80	%	29	%	74	%	54	%	89	%
Phenol		3700	U	34	%	71	%	330	U	92 *	%
bis(2-Chloroethyl)ether		3700	U	3700	U	3700	U	330	U	330	U
2-Chlorophenol		3700	U	32	%	66	%	330	U	86	%
1,3-Dichlorobenzene		3700	U	3700	U	3700	U	330	U	330	U
1,4-Dichlorobenzene		3700	U	19 *	%	37	%	330	U	67	%
Benzyl alcohol		3700	U	1800	J	1000	J	330	U	330	U
1,2-Dichlorobenzene		3700	U	3700	U	3700	U	330	U	330	U
2-Methylphenol		3700	U	3700	U	3700	U	330	U	330	U
bis(2-Chloroisopropyl)ether		3700	U	3700	U	3700	U	330	U	330	U
4-Methylphenol		3700	U	3700	U	3700	U	330	U	330	U
N-Nitroso-Di-n-propylamine		3700	U	28 *	%	59	%	330	U	80	%
Hexachloroethane		3700	U	3700	U	3700	U	330	U	330	U
Nitrobenzene		3700	U	3700	U	3700	U	330	U	330	U
Isophorone		3700	U	3700	U	3700	U	330	U	330	U
2-Nitrophenol		3700	U	3700	U	3700	U	330	U	330	U
2,4-Dimethylphenol		3700	U	3700	U	3700	U	330	U	330	U
Benzoic acid		18000	U	18000	U	18000	U	1700	U	1700	U
bis(2-Chloroethoxy)methane		3700	U	3700	U	3700	U	330	U	330	U
2,4-Dichlorophenol		3700	U	3700	U	3700	U	330	U	330	U
1,2,4-Trichlorobenzene		3700	U	25 *	%	50	%	330	U	76	%
Naphthalene		2300	J	1100	J	1800	J	330	U	330	U
4-Chloroaniline		3700	U	3700	U	3700	U	330	U	330	U
Hexachlorobutadiene		3700	U	3700	U	3700	U	330	U	330	U
4-Chloro-3-methylphenol		3700	U	33	%	75	%	330	U	86	%
2-Methylnaphthalene		380	J	3700	U	420	J	330	U	330	U
Hexachlorocyclopentadiene		3700	U	3700	U	3700	U	330	U	330	U

*= Outside of EPA CLP QC limits.

C04

RFW Batch Number: 9708L740 Client: TNU-HANFORD Work Order: 10985001001 Page: 1b

Cust ID:	BOLC82		BOLC82		BOLC82		SBLKAI		SBLKAI BS	
RFW#:	001		001 MS		001 MSD		97LE1454-MB1		97LE1454-MB1	
2,4,6-Trichlorophenol	3700	U	3700	U	3700	U	330	U	330	U
2,4,5-Trichlorophenol	18000	U	18000	U	18000	U	1700	U	1700	U
2-Chloronaphthalene	3700	U	3700	U	3700	U	330	U	330	U
2-Nitroaniline	18000	U	18000	U	18000	U	1700	U	1700	U
Dimethylphthalate	3700	U	3700	U	3700	U	330	U	330	U
Acenaphthylene	3700	U	3700	U	3700	U	330	U	330	U
2,6-Dinitrotoluene	3700	U	3700	U	3700	U	330	U	330	U
3-Nitroaniline	18000	U	18000	U	18000	U	1700	U	1700	U
Acenaphthene	3700	U	29 *	%	64	%	330	U	83	%
2,4-Dinitrophenol	18000	U	18000	U	18000	U	1700	U	1700	U
4-Nitrophenol	18000	U	12	%	24	%	1700	U	87	%
Dibenzofuran	3700	U	3700	U	3700	U	330	U	330	U
2,4-Dinitrotoluene	3700	U	27 *	%	64	%	330	U	81	%
Diethylphthalate	3700	U	3700	U	3700	U	330	U	330	U
4-Chlorophenyl-phenylether	3700	U	3700	U	3700	U	330	U	330	U
Fluorene	3700	U	3700	U	3700	U	330	U	330	U
4-Nitroaniline	18000	U	18000	U	18000	U	1700	U	1700	U
4,6-Dinitro-2-methylphenol	18000	U	18000	U	18000	U	1700	U	1700	U
N-Nitrosodiphenylamine (1)	3700	U	3700	U	3700	U	330	U	330	U
4-Bromophenyl-phenylether	3700	U	3700	U	3700	U	330	U	330	U
Hexachlorobenzene	3700	U	3700	U	3700	U	330	U	330	U
Pentachlorophenol	18000	U	23	%	61	%	1700	U	90	%
Phenanthrene	3700	U	3700	U	390	J	330	U	330	U
Anthracene	3700	U	3700	U	3700	U	330	U	330	U
Di-n-Butylphthalate	440	J	3700	U	3700	U	330	U	330	U
Fluoranthene	650	J	3700	U	440	J	330	U	330	U
Pyrene	910	J	32 *	%	68	%	330	U	82	%
Butylbenzylphthalate	3700	U	3700	U	3700	U	330	U	330	U
3,3'-Dichlorobenzidine	7300	U	7300	U	7300	U	670	U	670	U
Benzo(a)anthracene	3700	U	3700	U	3700	U	330	U	330	U
Chrysene	3700	U	3700	U	3700	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	34000		21000		24000		330	U	330	U
Di-n-Octyl phthalate	3700	U	3700	U	3700	U	330	U	330	U
Benzo(b)fluoranthene	3700	U	3700	U	3700	U	330	U	330	U
Benzo(k)fluoranthene	3700	U	3700	U	3700	U	330	U	330	U
Benzo(a)pyrene	3700	U	3700	U	3700	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	3700	U	3700	U	3700	U	330	U	330	U
Dibenzo(a,h)anthracene	3700	U	3700	U	3700	U	330	U	330	U
Benzo(g,h,i)perylene	3700	U	3700	U	3700	U	330	U	330	U
Carbazole	3700	U	3700	U	3700	U	330	U	330	U

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

005

1F

SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BOLC82

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD

Matrix: SOLID Lab Sample ID: 9708L740-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V082312

Level: (low/med) LOW Date Received: 08/06/97

% Moisture: not dec. 91 dec. Date Extracted: 08/10/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/24/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 12

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	BENZYL CHLORIDE	8.95	80000	J
2.	UNKNOWN	18.45	10000	J
3.	UNKNOWN	21.55	100000	J
4.	UNKNOWN	24.18	50000	J
5.	UNKNOWN	27.73	40000	J
6.	UNKNOWN	28.02	80000	J
7.	UNKNOWN	35.18	500000	J
8.	UNKNOWN	35.85	500000	J
9.	UNKNOWN	35.95	90000	J
10.	UNKNOWN	38.53	100000	J
11.	UNKNOWN	38.90	100000	J
12.	UNKNOWN	39.47	100000	J

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

DATE RECEIVED: 08/06/97 RFW LOT # :9708L740

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOLC82	001	SO	97LE1454	07/29/97	08/10/97	08/24/97
BOLC82	001 MS	SO	97LE1454	07/29/97	08/10/97	08/24/97
BOLC82	001 MSD	SO	97LE1454	07/29/97	08/10/97	08/24/97

LAB QC:

SBLKAI	MB1	S	97LE1454	N/A	08/10/97	08/23/97
SBLKAI	MB1 BS	S	97LE1454	N/A	08/10/97	08/24/97

(4) MV

4171415220

RECRA LabNet Use Only: 97081740

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TNU - Hanford.
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: K. B.
QC: STD Del: STD TAT: 15 DAY
Date Rec'd: 8/6/97 Date Due: 8/21/97
Account #: TNUHANFORD

Refrigerator #		1	3				5		5			5				
#/Type Container	Liquid															
	Solid	1GL	1AG				1AG		1AG			LEACHEAD				
Volume	Liquid															
	Solid	125	250				250		250							
Preservatives																
ANALYSES REQUESTED →		ORGANIC: VOA	ORGANIC: BNA	ORGANIC: Pest/PCB	ORGANIC: Herb		TCLP		INORG: Metal	INORG: CN		RECRA Metals				
RECRA LabNet Use Only		06244	06254				ITCLP		MASCLTD			RCRATCLP				

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb		TCLP		Metal	CN		RCRA Metals				
	001	BOLC82			SO	7/29/97	0855	X	X				X		X							
	002	BOLC82 TCLP of 001			#L	*	—											X				

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

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
RSA - Client Info
RMSC - Comp.

SDG #00092

DATE/REVISIONS:
1 VOA by 8260
2 * backdate Date on LABCRON
3 8/11/97 INVENTORY ADDED TO COC
4 per UNIT REVIEW REVISION
5
6

Relinquished by	Received by	Date	Time
Fedex	[illegible]	8/6/97	1230

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES

RECRA LabNet Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # [illegible]
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

740

Thermo NUtech - Richmond

Chain of Custody

CLIENT THERMO NUTECH-RICHMOND

ADDRESS

PROJECT

SAMPLERS SIGNATURE:

DATE 8-5-97 PAGE 1 OF 1

010

SAMPLE NO	DATE	TIME	LOCATION	SEMI-VOA-8270A (TCL)	VOA-8260A (TCL)	(ICP METALS-6010A (TCL), ICP METALS - 6010A (ADD ON) ARSENIC, LEAD	(METALS BY ICP (TCLP) - 1311/6010A, MERCURY (TCLP) - 1311/7470						SAMPLE TYPE OR MATRIX	# CONTAINERS	OBSERVATIONS, COMMENTS, VOLUMES, SPECIAL OR ADDITIONAL TEST
B0LC82	7/31/97	0855	100 AREA 1607-F2	X	X	X	X						SOLID	4	RUSH

1) RELINQUISHED BY / DATE:	2) RECEIVED BY / DATE:	3) RELINQUISHED BY / DATE:	4) RECEIVED BY / DATE:	
8-5-97 1600			8/6/97 1230	TOTAL NO. OF CONTAINERS:
COMPANY: THERMO NUTECH	COMPANY:	COMPANY: Fed-Ex	COMPANY: RECRA	METHOD OF SHIPMENT:
5) RELINQUISHED BY / DATE:	6) RECEIVED BY / DATE:	7) RELINQUISHED BY / DATE:	8) RECEIVED BY / DATE:	SPECIAL SHIPMENT-HANDLING OR STORAGE REQUIREMENTS
8/6/97	8/6/97			
COMPANY:	COMPANY:	COMPANY:	COMPANY:	

2030 Wright Avenue P. O. Box 4040 Richmond, CA 94804-0040 (510) 235-2633 Fax No. (510) 235-0438

Temp - 2.6°C

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

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# : 9708L740
SDG #: H0092

W.O. #: 10985-001-001-9999-00
Date Received: 08-06-97

GC/MS VOLATILE

One (1) solid sample was collected on 07-29-97.

The sample and its associated QC samples were analyzed according to criteria set forth in SW 846 Method 8260 for TCL Volatile target compounds on 08-12-97.

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 detected in sample BOLC82.
4. Sample BOLC82 required a four-fold dilution (nominal) because it contained high levels of both target and non-target compounds.
5. Two (2) of twelve (12) surrogate recoveries were outside EPA QC limits. Sample BOLC82 was reanalyzed on 08-12-97 and reported.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common contaminants Methylene Chloride and Acetone at levels less than 3x the CRQL.

SEP 1997
RECEIVED
Data
Log In

for

J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

9/2/97
Date

mmz\voa\08-740v.cn

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

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 08/26/97 14:17

RFW Batch Number: **9708L740** Client: **TNU-HANFORD** Work Order: 10985001001 Page: 1a

004

	Cust ID:	BOLC82	BOLC82	VBLKPS	VBLKPS BS
Sample Information	RFW#:	001	001	97LVW176-MB1	97LVW176-MB1
	Matrix:	SOLID	SOLID	SOIL	SOIL
	D.F.:	2.38	3.85	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG
			REPREP		
Surrogate Recovery	Toluene-d8	118 * %	120 * %	100 %	102 %
	Bromofluorobenzene	90 %	97 %	99 %	100 %
	1,2-Dichloroethane-d4	99 %	105 %	100 %	97 %
Chloromethane		260 U	420 U	10 U	10 U
Bromomethane		260 U	420 U	10 U	10 U
Vinyl Chloride		260 U	420 U	10 U	10 U
Chloroethane		260 U	420 U	10 U	10 U
Methylene Chloride		240 B	390 B	11	11 B
Acetone		1800 B	1600 B	9 J	10 B
Carbon Disulfide		51 J	63 J	5 U	5 U
1,1-Dichloroethene		130 U	210 U	5 U	97 %
1,1-Dichloroethane		130 U	210 U	5 U	5 U
1,2-Dichloroethene (total)		720	770	5 U	5 U
Chloroform		130 U	210 U	5 U	5 U
1,2-Dichloroethane		130 U	210 U	5 U	5 U
2-Butanone		600 B	640 B	2 J	10 U
1,1,1-Trichloroethane		130 U	210 U	5 U	5 U
Carbon Tetrachloride		130 U	210 U	5 U	5 U
Bromodichloromethane		130 U	210 U	5 U	5 U
1,2-Dichloropropane		130 U	210 U	5 U	5 U
cis-1,3-Dichloropropene		130 U	210 U	5 U	5 U
Trichloroethene		130 U	210 U	5 U	97 %
Dibromochloromethane		130 U	210 U	5 U	5 U
1,1,2-Trichloroethane		130 U	210 U	5 U	5 U
Benzene		39 J	210 U	5 U	104 %
Trans-1,3-Dichloropropene		130 U	210 U	5 U	5 U
Bromoform		130 U	210 U	5 U	5 U
4-Methyl-2-pentanone		260 U	420 U	10 U	10 U
2-Hexanone		260 U	420 U	10 U	10 U
Tetrachloroethene		130 U	210 U	5 U	5 U
1,1,2,2-Tetrachloroethane		130 U	210 U	5 U	5 U
Toluene		270	250	5 U	105 %

*= Outside of EPA CLP QC limits.

RFW Batch Number: **9708L740** Client: **TNU-HANFORD** Work Order: 10985001001 Page: 1b

Cust ID:	BOLC82		BOLC82		VBLKPS		VBLKPS BS	
RFW#:	001		001 REPREP		97LVW176-MB1		97LVW176-MB1	
Chlorobenzene	130	U	210	U	5	U	102	%
Ethylbenzene	280		270		5	U	5	U
Styrene	130	U	210	U	5	U	5	U
Xylene (total)	2300		2100		5	U	5	U

*= Outside of EPA CLP QC limits.

005

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOLC82

Lab Name: Recra.LabNet Contract: 10985001001

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

Matrix: (soil/water) SOLID Lab Sample ID: 9708L740-001

Sample wt/vol: 2.10 (g/mL) G Lab File ID: W081206

Level: (low/med) LOW Date Received: 08/06/97

% Moisture: not dec. 91 Date Analyzed: 08/12/97

Column: (pack/cap) CAP Dilution Factor: 2.38

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	C4-ALKYLBENZENE	22.100	8000	J
2.	UNKNOWN	22.183	10000	J
3.	C4-ALKYLBENZENE	22.383	5000	J
4.	AROMATIC	22.517	10000	J
5.	UNKNOWN	22.600	10000	J

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

DATE RECEIVED: 08/06/97 RFW LOT # :9708L740

CLIENT ID	RFW #		MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOLC82	001		SO	97LVW176	07/29/97	N/A	08/12/97
BOLC82	001	R1	SO	97LVW176	07/29/97	N/A	08/12/97

LAB QC:

VBLKPS	MB1		S	97LVW176	N/A	N/A	08/12/97
VBLKPS	MB1	BS	S	97LVW176	N/A	N/A	08/12/97

RECRA LabNet Use Only
9708L740

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TNU - Hanford
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: K. B.
QC: STD Del: STD TAT: 15 DAY
Date Rec'd: 8/6/97 Date Due: 8/21/97
Account #: TNUHANFORD

Refrigerator #		1	5				5		5			5					
#/Type Container	Liquid																
	Solid	1GL	1AG				1AG		1AG			1AG					
Volume	Liquid																
	Solid	125	250				250		250			LEACH					
Preservatives																	
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb		TCLP		INORG: Metal	CN		RECRA metals						
RECRA LabNet Use Only		CBX41A	CBZ54				ITCLP		MHSCLD			RCRATCLP					

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected												
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish	001	BOLC82			SO	7/29/97	0855	X	X			X		X		X			
	002	BOLC82 TCLP of 001			L	*	—									X			

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
RSA - Client Info
RMSC - Comp.

SDG #00092

DATE/REVISIONS:
1 VOA by 8260
2 * backdate Date on LABCRON
3 8/11/97 INVENTORY ADDED TO COC
4 per UNIT REVIEW REVISION
5
6

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'd Y or N

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES

Relinquished by	Received by	Date	Time
Fedex	[illegible]	8/6/97	1230

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Page 1 of 1

Thermo NUtech - Richmond

Chain of Custody

CLIENT THERMO NUTECH-RICHMOND

ADDRESS

PROJECT

SAMPLERS SIGNATURE:

DATE 8-5-97 PAGE 1 OF 1

010

SAMPLE NO	DATE	TIME	LOCATION	SEMI-VOA-8270A (TCL)	VOA-8260A (TCL)	ICP METALS-6010A (TAL); ICP METALS-6010A (ADD ON) ARSENIC, LEAD	METALS BY ICP (TCLP)-1311/6010A; MERCURY (TCLP)-1311/7470						SAMPLE TYPE OR MATRIX	# CONTAINERS	OBSERVATIONS, COMMENTS, VOLUMES, SPECIAL OR ADDITIONAL TEST
B0LC82	7/31/97	0855	100 AREA 1607-F2	X	X	X	X						SOLID	4	RUSH

1) RELINQUISHED BY / DATE:	2) RECEIVED BY / DATE:	3) RELINQUISHED BY / DATE:	4) RECEIVED BY / DATE:	TOTAL NO. OF CONTAINERS:
8-5-97 1600			8/6/97 1230	METHOD OF SHIPMENT:
COMPANY: THERMO NUTECH	COMPANY:	COMPANY: Fed Exp	COMPANY: RECRA	SPECIAL SHIPMENT-HANDLING OR STORAGE REQUIREMENTS
5) RELINQUISHED BY / DATE: 8/6/97	6) RECEIVED BY / DATE: 8/6/97	7) RELINQUISHED BY / DATE:	8) RECEIVED BY / DATE:	
COMPANY:	COMPANY:	COMPANY:	COMPANY:	

2030 Wright Avenue P. O. Box 4040 Richmond, CA 94804-0040 (510) 235-2633 Fax No. (510) 235-0438

Temp - 2.6°C

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Virtual Laboratories Everywhere

SEP 1997
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# : 9708L740

W.O.# : 10985-001-001-9999-00
Date Received: 08-06-97

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 solid sample and 1 TCLP leachate sample.

2. Samples were 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 control limits.

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

7. All preparation/method blanks were within method criteria. 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. The matrix spike (MS) recoveries for 9 analytes and matrix spike duplicate (MSD) recoveries for 7 analytes were outside the 80-120% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 020 pages.

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

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
BOLC82 (solid)	Silver	200	93.8
	Aluminum	20,000	94.0
	Calcium	10,000	98.4
	Copper	200	93.2
	Iron	20,000	98.8
	Manganese	1,000	96.6
	Nickel	200	87.2
	Zinc	200	77.5

12. The MSs and MSDs for 7 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Matrix Spike Duplicate Report.

13. The duplicate analyses for 4 analytes were outside the 20% RPD control limits. Refer to the Inorganics Precision Report.

14. The TCLP extract from sample BOLC82 was selected for the MS for this analytical batch. All MS recoveries were greater than 50% as per method criteria with the exception of Silver. The MS for Silver was below 50% recovery (49.0%). The recovery in the TCLP Leachate was below 80-120% of the action level so standard addition was not required per Federal Register, Vol.57, No.227, Nov. 24, 1992, page 55117.

15. 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.

Bruce C. Schilling unit leader

J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

9399
Date

skl\m08-740

METALS METHODS GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this RFW Lot#: 9708L740

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	✓6010A		__200.7				__99
Antimony	✓6010A	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010A	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010A		__200.7				__99
Beryllium	✓6010A		__200.7				__99
Bismuth	__6010A [1]		__200.7 [1]			__1620	__99
Boron	__6010A [1]		__200.7				__99
Cadmium	✓6010A	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010A		__200.7				__99
Chromium	✓6010A	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010A		__200.7				__99
Copper	✓6010A	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010A		__200.7				__99
Lead	✓6010A	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010A	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010A		__200.7				__99
Manganese	✓6010A		__200.7				__99
Mercury	✓7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010A		__200.7				__99
Nickel	✓6010A		__200.7				__99
Potassium	✓6010A	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010A [1]		__200.7 [1]			__1620	__99
Selenium	✓6010A	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010A [1]		__200.7			__1620	__99
Silica	__6010A [1]		__200.7			__1620	__99
Silver	✓6010A	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010A	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010A		__200.7				__99
Thallium	✓6010A	__7841 [5]	__200.7	__279.2 __200.9			__99
Tin	__6010A [1]		__200.7				__99
Titanium	__6010A [1]		__200.7				__99
Uranium	__6010A [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010A		__200.7				__99
Zinc	✓6010A		__200.7				__99
Zirconium	__6010A [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

RFW 21-21-033/M-01/97

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/29/97

CLIENT: TNU-HANFORD

RECRA LOT #: 9708L740

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOLC82	Silver, Total	94.7		MG/KG	9.6	1.0
		Aluminum, Total	14700		MG/KG	31.7	1.0
		Arsenic, Total	35.2	u	MG/KG	35.2	1.0
		Barium, Total	768		MG/KG	3.1	1.0
		Beryllium, Total	0.75		MG/KG	0.22	1.0
		Calcium, Total	23400		MG/KG	16.9	1.0
		Cadmium, Total	16.8		MG/KG	2.7	1.0
		Cobalt, Total	73.0		MG/KG	5.9	1.0
		Chromium, Total	107		MG/KG	4.6	1.0
		Copper, Total	318		MG/KG	4.6	1.0
		Iron, Total	40000		MG/KG	3.5	1.0
		Mercury, Total	50.8		MG/KG	0.02	5.0
		Potassium, Total	1820		MG/KG	831	1.0
		Magnesium, Total	7700		MG/KG	35.7	1.0
		Manganese, Total	373		MG/KG	0.98	1.0
		Sodium, Total	1470		MG/KG	47.4	1.0
		Nickel, Total	842		MG/KG	9.7	1.0
		Lead, Total	166		MG/KG	36.7	1.0
		Antimony, Total	32.9	u	MG/KG	32.9	1.0
		Selenium, Total	46.2	u	MG/KG	46.2	1.0
		Thallium, Total	39.6		MG/KG	26.8	1.0
		Vanadium, Total	122		MG/KG	3.9	1.0
		Zinc, Total	2900		MG/KG	3.7	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/29/97

CLIENT: TNU-HANFORD

RECRA LOT #: 9708L740

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	BOLC82	Silver, TCLP Leachate	8.8 u	UG/L	8.8	1.0
		Arsenic, TCLP Leachate	40.3	UG/L	32.3	1.0
		Barium, TCLP Leachate	585	UG/L	2.8	1.0
		Cadmium, TCLP Leachate	2.5 u	UG/L	2.5	1.0
		Chromium, TCLP Leachate	5.1	UG/L	3.7	1.0
		Mercury, TCLP Leachate	0.10 u	UG/L	0.10	1.0
		Lead, TCLP Leachate	33.7 u	UG/L	33.7	1.0
		Selenium, TCLP Leachate	52.5	UG/L	42.4	1.0

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

DATE RECEIVED: 08/06/97 RFW LOT # :9708L740

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOLC82						
TCLP	001	SO	97LTO123	07/29/97	08/07/97	08/08/97
SILVER, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
SILVER, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
SILVER, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
SILVER, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
ALUMINUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
ALUMINUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
ALUMINUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
ALUMINUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
ARSENIC, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
ARSENIC, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
ARSENIC, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
ARSENIC, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
BARIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
BARIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
BARIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
BARIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
BERYLLIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
BERYLLIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
BERYLLIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
BERYLLIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
CALCIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
CALCIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
CALCIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
CALCIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
CADMIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
CADMIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
CADMIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
CADMIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
COBALT, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
COBALT, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
COBALT, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
COBALT, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
CHROMIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
CHROMIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97

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

DATE RECEIVED: 08/06/97 RFW LOT # :9708L740

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
CHROMIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
COPPER, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
COPPER, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
COPPER, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
COPPER, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
IRON, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
IRON, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
IRON, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
IRON, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
MERCURY, TOTAL	001	SO	97C0615	07/29/97	08/12/97	08/13/97
MERCURY, TOTAL	001 REP	SO	97C0615	07/29/97	08/12/97	08/13/97
MERCURY, TOTAL	001 MS	SO	97C0615	07/29/97	08/12/97	08/13/97
MERCURY, TOTAL	001 MSD	SO	97C0615	07/29/97	08/12/97	08/13/97
POTASSIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
POTASSIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
POTASSIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
POTASSIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
MAGNESIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
MAGNESIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
MAGNESIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
MAGNESIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
MANGANESE, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
MANGANESE, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
MANGANESE, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
MANGANESE, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
SODIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
SODIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
SODIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
SODIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
NICKEL, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
NICKEL, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
NICKEL, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
NICKEL, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
LEAD, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
LEAD, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
LEAD, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
LEAD, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97

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

DATE RECEIVED: 08/06/97 RFW LOT # :9708L740

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ANTIMONY, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
ANTIMONY, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
ANTIMONY, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
ANTIMONY, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
SELENIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
SELENIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
SELENIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
SELENIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
THALLIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
THALLIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
THALLIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
THALLIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
VANADIUM, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
VANADIUM, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
VANADIUM, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
VANADIUM, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
ZINC, TOTAL	001	SO	97L1646	07/29/97	08/21/97	08/22/97
ZINC, TOTAL	001 REP	SO	97L1646	07/29/97	08/21/97	08/22/97
ZINC, TOTAL	001 MS	SO	97L1646	07/29/97	08/21/97	08/22/97
ZINC, TOTAL	001 MSD	SO	97L1646	07/29/97	08/21/97	08/22/97
SILVER, TCLP LEACHAT	002	W	97L1603	08/08/97	08/18/97	08/20/97
SILVER, TCLP LEACHAT	002 MS	W	97L1603	08/08/97	08/18/97	08/20/97
ARSENIC, TCLP LEACHA	002	W	97L1603	08/08/97	08/18/97	08/20/97
ARSENIC, TCLP LEACHA	002 MS	W	97L1603	08/08/97	08/18/97	08/20/97
BARIUM, TCLP LEACHAT	002	W	97L1603	08/08/97	08/18/97	08/20/97
BARIUM, TCLP LEACHAT	002 MS	W	97L1603	08/08/97	08/18/97	08/20/97
CADMIUM, TCLP LEACHA	002	W	97L1603	08/08/97	08/18/97	08/20/97
CADMIUM, TCLP LEACHA	002 MS	W	97L1603	08/08/97	08/18/97	08/20/97
CHROMIUM, TCLP LEACH	002	W	97L1603	08/08/97	08/18/97	08/20/97
CHROMIUM, TCLP LEACH	002 MS	W	97L1603	08/08/97	08/18/97	08/20/97
MERCURY, TCLP LEACHA	002	W	97C0628	08/08/97	08/15/97	08/18/97
MERCURY, TCLP LEACHA	002 MS	W	97C0628	08/08/97	08/15/97	08/18/97
LEAD, TCLP LEACHATE	002	W	97L1603	08/08/97	08/18/97	08/20/97
LEAD, TCLP LEACHATE	002 MS	W	97L1603	08/08/97	08/18/97	08/20/97
SELENIUM, TCLP LEACH	002	W	97L1603	08/08/97	08/18/97	08/20/97
SELENIUM, TCLP LEACH	002 MS	W	97L1603	08/08/97	08/18/97	08/20/97

LAB QC:

SILVER LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97

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

DATE RECEIVED: 08/06/97 RFW LOT # :9708L740

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
ALUMINUM LABORTORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
ALUMINUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
ARSENIC LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
ARSENIC, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
BARIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
BARIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
BERYLLIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
BERYLLIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
CALCIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
CALCIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
CADMIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
CADMIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
COBALT LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
COBALT, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
CHROMIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
CHROMIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
COPPER LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
COPPER, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
IRON LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
IRON, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
MERCURY LABORATORY	LC1 BS	S	97C0615	N/A	08/12/97	08/13/97
MERCURY, TOTAL	MB1	S	97C0615	N/A	08/12/97	08/13/97
POTASSIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
POTASSIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
MAGNESIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
MAGNESIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
MANGANESE LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
MANGANESE, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
SODIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
SODIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
NICKEL LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
NICKEL, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
LEAD LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
LEAD, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
ANTIMONY LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
ANTIMONY, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
SELENIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97

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

DATE RECEIVED: 08/06/97 RFW LOT # :9708L740

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
THALLIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
THALLIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
VANADIUM LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
VANADIUM, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
ZINC LABORATORY	LC1 BS	S	97L1646	N/A	08/21/97	08/22/97
ZINC, TOTAL	MB1	S	97L1646	N/A	08/21/97	08/22/97
SILVER LABORATORY	LC1 BS	W	97L1603	N/A	08/18/97	08/20/97
SILVER, TCLP LEACHAT	MB1	W	97L1603	N/A	08/18/97	08/20/97
SILVER, TCLP LEACHAT	MB2	W	97L1603	N/A	08/18/97	08/20/97
ARSENIC LABORATORY	LC1 BS	W	97L1603	N/A	08/18/97	08/20/97
ARSENIC, TCLP LEACHA	MB1	W	97L1603	N/A	08/18/97	08/20/97
ARSENIC, TCLP LEACHA	MB2	W	97L1603	N/A	08/18/97	08/20/97
BARIUM LABORATORY	LC1 BS	W	97L1603	N/A	08/18/97	08/20/97
BARIUM, TCLP LEACHAT	MB1	W	97L1603	N/A	08/18/97	08/20/97
BARIUM, TCLP LEACHAT	MB2	W	97L1603	N/A	08/18/97	08/20/97
CADMIUM LABORATORY	LC1 BS	W	97L1603	N/A	08/18/97	08/20/97
CADMIUM, TCLP LEACHA	MB1	W	97L1603	N/A	08/18/97	08/20/97
CADMIUM, TCLP LEACHA	MB2	W	97L1603	N/A	08/18/97	08/20/97
CHROMIUM LABORATORY	LC1 BS	W	97L1603	N/A	08/18/97	08/20/97
CHROMIUM, TCLP LEACH	MB1	W	97L1603	N/A	08/18/97	08/20/97
CHROMIUM, TCLP LEACH	MB2	W	97L1603	N/A	08/18/97	08/20/97
MERCURY LABORATORY	LC1 BS	W	97C0628	N/A	08/15/97	08/18/97
MERCURY, TOTAL	MB1	W	97C0628	N/A	08/15/97	08/18/97
LEAD LABORATORY	LC1 BS	W	97L1603	N/A	08/18/97	08/20/97
LEAD, TCLP LEACHATE	MB1	W	97L1603	N/A	08/18/97	08/20/97
LEAD, TCLP LEACHATE	MB2	W	97L1603	N/A	08/18/97	08/20/97
SELENIUM LABORATORY	LC1 BS	W	97L1603	N/A	08/18/97	08/20/97
SELENIUM, TCLP LEACH	MB1	W	97L1603	N/A	08/18/97	08/20/97
SELENIUM, TCLP LEACH	MB2	W	97L1603	N/A	08/18/97	08/20/97

(4) MC

4171415220

RECRA LabNet Use Only
9708L740

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TNU - Hanford.
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: K. B.
QC: STD Del: STD TAT: 15 DAY
Date Rec'd: 8/6/97 Date Due: 8/21/97
Account #: TNUHANFORD

Refrigerator #		1	5				5		5			5				
#/Type Container	Liquid															
	Solid	1GL	1AG				1AG		1AG			1AG				
Volume	Liquid															
	Solid	125	250				250		250			250				
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb		TCLP		Metal	CN		RCRA metals				
RECRA LabNet Use Only		0624/A	0625/A				TCLP		MHSLPD			RCRATCLP				

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		TCLP		Metal	CN		RCRA metals				
001	BOLC82			SO	7/29/97	0855	X	X				X		X							
002	BOLC82 TCLP of 001			L	*	—											X				

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
RSA - Client Info
RMSC - Comp.

SDG #00092

DATE/REVISIONS:
1 VOA by 8260
2 * backdate Date on LABCRON
3 8/11/97 INVENTORY ADDED TO COC
4 per UNIT REVIEW REVISION
5
6

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

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

Relinquished by	Received by	Date	Time
Fedex	[illegible]	8/6/97	1230

Relin	Date	Time

ORIGINAL REWRITTEN

Page 1 of 1

020

Case Narrative

1.0 GENERAL

Thermo NUtech Sample Delivery Group H0092 is comprised of the single sludge sample designated as SAF B97-150 delivered under Project Designation Group 4 Waste Sites - Septic Systems Sludge.

The sample was received as stated on the Chain-of-Custody document.

2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analysis
No problems were encountered during the analysis.

2.2 Isotopic Plutonium Analysis
No problems were encountered during the analysis.

2.3 Total Strontium Analysis
No problems were encountered during the analysis.

2.4 Gamma Scan
There was insufficient sample received to perform a duplicate analysis. No other problems were encountered during the analysis.

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

SAMPLE SUMMARY

SDG 7445
Contact N. Joseph Verville

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0LC82		SOLID		N708013-01	B97-150	B97-150,EL-1309	07/29/97 08:55
Method Blank		SOLID		N708013-03	B97-150		
Lab Control Sample		SOLID		N708013-02	B97-150		
Duplicate (N708013-01)		SOLID		N708013-04	B97-150		07/29/97 08:55

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 08/19/97

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

QC SUMMARY

SDG 7445
Contact N. Joseph Verville

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% MOIST	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7445	B97-150,EL-1309	B0LC82	SOLID				08/05/97	7	N708013-01	7445-001
		Method Blank	SOLID						N708013-03	7445-003
		Lab Control Sample	SOLID						N708013-02	7445-002
		Duplicate (N708013-01)	SOLID				08/05/97	7	N708013-04	7445-004

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/19/97

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

SDG 7445
Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
PU	SOLID	Plutonium, Isotopic in Soil	2785-043	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	2785-043	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Strontium, Total in Soil	2785-043	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	2785-043	15.0	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 WHC-HASM-1
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 08/19/97

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

WORK SUMMARY

SDG 7445
Contact N. Joseph Verville

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0LC82			N708013-01	7445-001	GAM		08/07/97	08/18/97	NJV	Gamma Scan
		SOLID	07/29/97	7445-001	PU		08/16/97	08/19/97	NJV	Plutonium, Isotopic in Soil
B97-150,EL-1309	B97-150		08/05/97	7445-001	SR		08/15/97	08/19/97	NJV	Strontium, Total in Soil
				7445-001	U		08/14/97	08/19/97	NJV	Uranium, Isotopic in Soil
Method Blank			N708013-03	7445-003	GAM		08/07/97	08/18/97	NJV	Gamma Scan
		SOLID		7445-003	PU		08/16/97	08/19/97	NJV	Plutonium, Isotopic in Soil
	B97-150			7445-003	SR		08/15/97	08/19/97	NJV	Strontium, Total in Soil
				7445-003	U		08/14/97	08/19/97	NJV	Uranium, Isotopic in Soil
Lab Control Sample			N708013-02	7445-002	GAM		08/07/97	08/18/97	NJV	Gamma Scan
		SOLID		7445-002	PU		08/16/97	08/19/97	NJV	Plutonium, Isotopic in Soil
	B97-150			7445-002	SR		08/15/97	08/19/97	NJV	Strontium, Total in Soil
				7445-002	U		08/14/97	08/19/97	NJV	Uranium, Isotopic in Soil
Duplicate (N708013-01)			N708013-04	7445-004	PU		08/16/97	08/19/97	NJV	Plutonium, Isotopic in Soil
		SOLID	07/29/97	7445-004	SR		08/15/97	08/19/97	NJV	Strontium, Total in Soil
	B97-150		08/05/97	7445-004	U		08/14/97	08/19/97	NJV	Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RB	BLANK	LCS	DUP	SPIKE	TOTAL
GAM	B97-150	Gamma Scan	GAMMAHI	1			1	1			3
PU	B97-150	Plutonium, Isotopic in Soil	PUPLATE	1			1	1	1		4
SR	B97-150	Strontium, Total in Soil	SR8990	1			1	1	1		4
U	B97-150	Uranium, Isotopic in Soil	UPLATE	1			1	1	1		4
TOTALS				4			4	4	3		15

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/19/97

N708013-03

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

METHOD BLANK

Method Blank

SDG 7445
Contact N. Joseph Verville
Client/Case no Westinghouse Hanford SDG H0092
Case no TSH-SBV-207925

Lab sample id N708013-03
Dept sample id 7445-003
Client sample id Method Blank
Material/Matrix SOLID
SAF No B97-150

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.005	0.010	0.017	0.30	U	U
Uranium 235	15117-96-1	0.002	0.007	0.011	0.30	U	U
Uranium 238	U-238	0.001	0.004	0.008	0.30	U	U
Plutonium 238	13981-16-3	0.012	0.018	0.028	0.050	U	PU
Plutonium 239/240	15117-48-3	0.013	0.012	0.014	0.050	U	PU
Strontium-90	10098-97-2	0.009	0.13	0.19		U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		0.042		U	GAM
Cobalt 60	10198-40-0	U		0.003	0.050	U	GAM
Cesium 137	10045-97-3	U		0.003	0.050	U	GAM
Europium 152	14683-23-9	U		0.006	0.10	U	GAM
Europium 154	15585-10-1	U		0.004	0.10	U	GAM
Europium 155	14391-16-3	U		0.008	0.10	U	GAM
Americium 241	14596-10-2	U		0.007		U	GAM
Uranium 238	U-238	U		0.38		U	GAM

QC-BLANK 27251

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/19/97

N708013-02

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

LAB CONTROL SAMPLE

Lab Control Sample

SDG 7445
Contact N. Joseph Verville

Client/Case no Westinghouse Hanford SDG H0092
Case no TSH-SBV-207925

Lab sample id N708013-02
Dept sample id 7445-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B97-150

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	4.6	0.19	0.083	0.30		U	4.86	0.19	95	89-111	80-120
Uranium 235	3.7	0.16	0.008	0.30		U	3.72	0.15	99	88-112	80-120
Uranium 238	4.9	0.19	0.078	0.30		U	4.83	0.19	101	89-111	80-120
Plutonium 238	4.8	0.29	0.019	0.050		PU	5.10	0.20	94	87-113	80-120
Plutonium 239/240	4.3	0.27	0.009	0.050		PU	4.63	0.19	93	87-113	80-120
Strontium-90	20	0.51	0.18			SR	18.4	0.74	109	82-118	
GAMMA SCAN ANALYTES	U										
Potassium 40	U		0.15		U	GAM					
Cobalt 60	0.33	0.021		0.050		GAM	0.317	0.013	104	74-126	80-120
Cesium 137	0.38	0.017		0.050		GAM	0.361	0.014	105	75-125	80-120
Europium 152	U		0.017	0.10	U	GAM					
Europium 154	U		0.011	0.10	U	GAM					
Europium 155	U		0.022	0.10	U	GAM					
Americium 241	U		0.027		U	GAM					
Uranium 238	U		1.6		U	GAM					

QC-LCS 27250

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/19/97

N708013-04

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

DUPLICATE

B0LC82

SDG 7445
Contact N. Joseph Verville

DUPLICATE
Lab sample id N708013-04
Dept sample id 7445-004

ORIGINAL
Lab sample id N708013-01
Dept sample id 7445-001
Received 08/05/97

Client/Case no Westinghouse Hanford SDG H0092
Case no TSH-SBV-207925
Client sample id B0LC82
Location/Matrix SOLID
Collected 07/29/97 08:55
Custody/SAF No B97-150,EL-1309 B97-150

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Uranium 233/234	5.6	0.21	0.024	0.30		U	5.7	0.22	0.033		2	13	
Uranium 235	0.23	0.032	0.008	0.30	J	U	0.35	0.043	0.009		41	30	
Uranium 238	4.9	0.19	0.022	0.30		U	5.0	0.20	0.028		2	14	
Plutonium 238	0.063	0.023	0.027	0.050		PU	0.065	0.021	0.016		3	74	
Plutonium 239/240	0.23	0.037	0.012	0.050		PU	0.21	0.035	0.014		9	37	
Strontium-90	0.28	0.13	16000		U	SR	0.27	0.088	0.11		4	88	

QC-DUP#1 27252

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 08/19/97

N708013-01

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

DATA SHEET

B0LC82

SDG 7445
Contact N. Joseph Verville
Client/Case no Westinghouse Hanford SDG H0092
Case no TSH-SBV-207925

Lab sample id N708013-01
Dept sample id 7445-001
Received 08/05/97
Client sample id B0LC82
Location/Matrix SOLID
Collected 07/29/97 08:55
Custody/SAF No B97-150,EL-1309 B97-150

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	5.7	0.22	0.033	0.30		U
Uranium 235	15117-96-1	0.35	0.043	0.009	0.30		U
Uranium 238	U-238	5.0	0.20	0.028	0.30		U
Plutonium 238	13981-16-3	0.065	0.021	0.016	0.050		PU
Plutonium 239/240	15117-48-3	0.21	0.035	0.014	0.050		PU
Strontium-90	10098-97-2	0.27	0.088	0.11			SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	11	3.1				GAM
Cobalt 60	10198-40-0	U		0.28	0.050	U	GAM
Cesium 137	10045-97-3	1.7	0.34		0.050		GAM
Europium 152	14683-23-9	U		0.76	0.10	U	GAM
Europium 154	15585-10-1	U		0.75	0.10	U	GAM
Europium 155	14391-16-3	U		0.53	0.10	U	GAM
Radium 226	13982-63-3	17	0.70		0.10		GAM
Americium 241	14596-10-2	U		0.38		U	GAM
Uranium 238	U-238	U		31		U	GAM

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/19/97

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

Test PU Matrix SOLID
SDG 7445
Contact N. Joseph Verville

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 2785-043						
B0LC82	N708013-01			7445-001	0.065	0.21
BLK (QC ID=27251)	N708013-03			7445-003	U	U
LCS (QC ID=27250)	N708013-02			7445-002	ok	ok
Duplicate (N708013-01)	N708013-04			7445-004	ok	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-043	2σ prep error 5.0 %				Reference Lab			Notebook #2785 pg. 043								
B0LC82	N708013-01			0.016	1.00			80		1112			18	08/16/97	08/16	SS-043
BLK (QC ID=27251)	N708013-03			0.028	1.00			69		1112				08/16/97	08/16	SS-048
LCS (QC ID=27250)	N708013-02			0.019	1.00			86		1112				08/16/97	08/16	SS-044
Duplicate (N708013-01) (QC ID=27252)	N708013-04			0.027	1.00			81		1112			18	08/16/97	08/16	SS-049
Nominal values and limits from method				0.050	1.00			20-105		700	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.022 ± 0.012
YIELD 79 ± 14

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/19/97

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7445
Contact N. Joseph Verville

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 2785-043											
B0LC82	N708013-01			7445-001	5.7	0.35	5.0	114	6	7	1
BLK (QC ID=27251)	N708013-03			7445-003	U	U	U				
LCS (QC ID=27250)	N708013-02			7445-002	ok	ok	ok				
Duplicate (N708013-01)	N708013-04			7445-004	ok	OUT J	ok	114	6	5	1
Nominal values and limits from method				RDLs (pCi/g)	0.30	0.30	0.30	100		4	
							Averages	114		6	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-043	2σ prep error 5.0 %				Reference Lab		Notebook #2785 pg. 043									
B0LC82	N708013-01			0.033	1.00			88		1386			16	08/14/97	08/14	SS-035
BLK (QC ID=27251)	N708013-03			0.017	1.00			86		1386				08/14/97	08/14	SS-037
LCS (QC ID=27250)	N708013-02			0.083	1.00			97		1386				08/14/97	08/14	SS-036
Duplicate (N708013-01) (QC ID=27252)	N708013-04			0.024	1.00			98		1386			16	08/14/97	08/14	SS-038
Nominal values and limits from method				0.30	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Uranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.039 ± 0.060
YIELD 92 ± 12

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/19/97

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

Test SR Matrix SOLID
SDG 7445
Contact N. Joseph Verville

METHOD SUMMARY

STRONTIUM, TOTAL IN SOIL
BETA COUNTING

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Strontium-90	
Preparation batch 2785-043						
B0LC82	N708013-01			7445-001	0.27	
BLK (QC ID=27251)	N708013-03			7445-003	U	
LCS (QC ID=27250)	N708013-02			7445-002	ok	
Duplicate (N708013-01)	N708013-04			7445-004	ok	U
Nominal values and limits from method				RDLs (pCi/g)		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-043	2σ prep error 10.0 %				Reference Lab		Notebook #2785 pg. 043									
B0LC82	N708013-01				1.00			90		400			17	08/15/97	08/15	GRB-218
BLK (QC ID=27251)	N708013-03				1.00			83		400				08/15/97	08/15	GRB-219
LCS (QC ID=27250)	N708013-02				1.00			85		400				08/15/97	08/15	GRB-217
Duplicate (N708013-01) (QC ID=27252)	N708013-04				1.00			93		400			17	08/15/97	08/15	GRB-219
Nominal values and limits from method				1.0	1.00			20-105		100			180			

PROCEDURES	REFERENCE	SR8990
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-500	Strontium-89,90 - Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA _____ ± _____
YIELD 88 ± 9

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/19/97

THERMO NUTECH

SAMPLE DELIVERY GROUP H0092

Test GAM Matrix SOLID
SDG 7445
Contact N. Joseph Verville

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Westinghouse Hanford
Contract TSH-SBV-207925
Case no SDG H0092

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2785-043						
B0LC82	N708013-01			7445-001	U	1.7
BLK (QC ID=27251)	N708013-03			7445-003	U	U
LCS (QC ID=27250)	N708013-02			7445-002	ok	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-043	2σ prep error 15.0 % Reference Lab Notebook #2785 pg. 043															
B0LC82	N708013-01			0.28	42.6					693			9	08/07/97	08/07	01,01,00
BLK (QC ID=27251)	N708013-03			0.003	750					694				08/07/97	08/07	01,04,00
LCS (QC ID=27250)	N708013-02				750					694				08/07/97	08/07	01,03,00
Nominal values and limits from method				0.050	750					100			180			

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD FOR 2 SAMPLES
MDA 0.14 ± 0.39
YIELD ____ ± ____

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/19/97

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B97-150-05	Page 1 of 1

Collector Robert Fahlberg / Doug Bowers	**Company Contact** Dave Blumenkranz	**Telephone No.** 372-9658	**Project Coordinator** Koerner, CC	**Data Turnaround** 15 Days
Project Designation Group 4 Waste Sites - Septic Systems Sludge	**Sampling Location** 100 Area 1607-F2		**SAF No.** B97-150	
Ice Chest No.	**Field Logbook No.** EL-1309-1		**Method of Shipment** Hand deliver	
Shipped To TMA NORCAL	**Offsite Property No.**		**Bill of Lading/Air Bill No.**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60ml	60ml	60ml	250ml	250ml	250ml	500ml	1000ml		
SAMPLE ANALYSIS SDG# H0092	Activity Scan	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 – Total Sr	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Arsenic, Lead)	Metals by ICP (TCLP) - 1311/6010A; Mercury (TCLP) - 1311/7470	Gamma Spectroscopy; Gamma Spec - Add-on (Uranium-238)		
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**								
B0LC82	Other Solid	7/29/97	0855	X	X	X	X	X	X	X	X
30											

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-4-97/1010	[illegible]	8-5-97/11:40

SPECIAL INSTRUCTIONS

** The TCLP analysis is to be performed only upon direction from Sample Management.

All samples < 1k γ.B < 20 γ

Matrix *

S	= Soil
SE	= Sediment
SO	= Solid
SL	= 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

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W97-2221-19

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER ENG. Support	Field Analytical Support	Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☒ Prepaid ☐ Collect

Shipped to: Company: TMA NORCAL Address: 2030 Wright Ave City: Richmond, State: CA, Zip Code: 94804-9949 Country: USA	Off-site Custodian: On-site Custodian: Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
~~1-53.5 lbs~~ 97C 8497 1-54 lbs		Sample # BOLC82 cooler ID ERC96-008 with solid (+ free liquid water) packed in wet ice, surrounded by vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. Group by Waste Sites (1607-F2)

☐ Business Trip

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. _____ Bill of Lading # 423579502370

☐ Other (Please specify) _____

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
N/A Doug Bowers		8-4-97 ~~7-14-97~~ NDB 8-4-97

Location of and Contact for Property (Name/Phone No./Bldg./Area)

Doug Bowers (509) 372-8498 / 4706 Bld / 400 Area

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
8-4-97	CHE 9353 CIIFX5600C	

Originated By	Date	Authorized By	Date
Doug Bowers	8-4-97	Doug Bowers	8-4-97
Property Representative Signature	**Date**	**Property Management Approval**	**Date**

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
C. R. Kelsey	8-11-97

31

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

54-3000-479 (01/94)

US DOE %
FLUOR DANIEL HANFORD CO. INC.
2355 STEVENS DRIVE/1163 BLDG.
RICHLAND WA 99352
(509)376-5098

SHIP DATE: 04AUG97
ACC# 188288189

ACTUAL WGT: 54 LBS MAN-WT

TO: THA NORCAL/SAMPLE RECEIVING
THA NORCAL
2030 WRIGHT AVE.

RICHMOND CA 94804-9949

BILL THIRD PARTY

4235 7950 2370

FedEx.

Form 0201

PART # 147923 FORMAT # 077 RIT 03/96

REF: [illegible]

PRIORITY OVERNIGHT TUE

CAD# 0053292 04AUG97

TRK# 4235 7950 2370 Form 0201 Deliver by: 05AUG97

OAK

94804-CA-US WA JEM

WHC/BHI SAMPLE CHECK-IN LIST

Date/Time Received: 8-5-97/11:40 SDG #: H0092

Work Order Number: N7-08-013-7445 SAF#: B97-150

Shipping Container ID: ERG 96-008 Chain-of-Custody #: 1607-F2

1. Custody Seals on shipping container intact? Yes [✓] No [ ]

2. Custody Seals dated and signed? Yes [✓] No [ ]

3. Chain-of-Custody record present? Yes [✓] No [ ]

4. Cooler Temperature 1°C

5. Vermiculite/packing maaterials is Wet [ ] Dry [✓]

6. Number of samples in shipping container: 8 BOTS.

7. Sample holding times exceeded? Yes [ ] No [ ]

8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels

9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [ ]

11. Description of anomalies (include sample numbers): _____

Sample Custodian [signature] on 8-5-97/11:40

Telephoned To: _____ on _____ By _____

4/5/95 Revised