1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1198 was composed of four other solid samples designated under SAF No. B99-029 with a Project Designation of: 100-KR-4 Pump & Treat-Resin Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.4 Tritium Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion
Melissa C. Mannion
Program Manager

2/2/01
Date

RECEIVED
APR 0 2 2001
EDMC

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

SAMPLE SUMMARY

SDG 7600
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1198

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B11480	KR-4	SOLID		R012145-01	B99-029	B99-029-65	12/20/00 10:00
B11481	KR-4	SOLID		R012145-02	B99-029	B99-029-65	12/20/00 10:18
B11482	KR-4	SOLID		R012145-03	B99-029	B99-029-65	12/20/00 10:40
B11483	KR-4	SOLID		R012145-04	B99-029	B99-029-65	12/20/00 10:45
Method Blank		SOLID		R012145-06	B99-029		
Lab Control Sample		SOLID		R012145-05	B99-029		
Duplicate (R012145-02)	KR-4	SOLID		R012145-07	B99-029		12/20/00 10:18

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

QC SUMMARY

SDG 7600
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1198

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
7600	B99-029-65	B11480	SOLID	100.0			12/22/00	2	R012145-01	7600-001
		B11481	SOLID	100.0			12/22/00	2	R012145-02	7600-002
		B11482	SOLID	100.0			12/22/00	2	R012145-03	7600-003
		B11483	SOLID	100.0			12/22/00	2	R012145-04	7600-004
		Method Blank	SOLID						R012145-06	7600-006
		Lab Control Sample	SOLID						R012145-05	7600-005
		Duplicate (R012145-02)	SOLID	100.0			12/22/00	2	R012145-07	7600-007

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

PREP BATCH SUMMARY

SDG 7600
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1198

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
U	SOLID	Uranium, Isotopic in Soil	6963-032	5.0	4			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6963-032	10.0	2			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6963-032	10.0	2			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	6963-032	10.0	2			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 02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

WORK SUMMARY

SDG 7600
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1198

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B11480			R012145-01	7600-001	H		01/18/01	02/02/01	MCM	Tritium in Soil
KR-4		SOLID	12/20/00	7600-001	SR		01/11/01	02/02/01	MCM	Total Strontium in Soil
B99-029-65	B99-029		12/22/00	7600-001	TC		01/26/01	02/02/01	MCM	Technetium 99 in Soil
				7600-001	U		01/13/01	02/02/01	MCM	Uranium, Isotopic in Soil
B11481			R012145-02	7600-002	H		01/18/01	02/02/01	MCM	Tritium in Soil
KR-4		SOLID	12/20/00	7600-002	SR		01/11/01	02/02/01	MCM	Total Strontium in Soil
B99-029-65	B99-029		12/22/00	7600-002	TC		01/26/01	02/02/01	MCM	Technetium 99 in Soil
				7600-002	U		01/13/01	02/02/01	MCM	Uranium, Isotopic in Soil
B11482			R012145-03	7600-003	U		01/13/01	02/02/01	MCM	Uranium, Isotopic in Soil
KR-4		SOLID	12/20/00							
B99-029-65	B99-029		12/22/00							
B11483			R012145-04	7600-004	U		01/13/01	02/02/01	MCM	Uranium, Isotopic in Soil
KR-4		SOLID	12/20/00							
B99-029-65	B99-029		12/22/00							
Method Blank			R012145-06	7600-006	H		01/18/01	02/02/01	MCM	Tritium in Soil
		SOLID		7600-006	SR		01/11/01	02/02/01	MCM	Total Strontium in Soil
	B99-029			7600-006	TC		01/27/01	02/02/01	MCM	Technetium 99 in Soil
				7600-006	U		01/13/01	02/02/01	MCM	Uranium, Isotopic in Soil
Lab Control Sample			R012145-05	7600-005	H		01/19/01	02/02/01	MCM	Tritium in Soil
		SOLID		7600-005	SR		01/11/01	02/02/01	MCM	Total Strontium in Soil
	B99-029			7600-005	TC		01/26/01	02/02/01	MCM	Technetium 99 in Soil
				7600-005	U		01/13/01	02/02/01	MCM	Uranium, Isotopic in Soil
Duplicate (R012145-02)			R012145-07	7600-007	H		01/18/01	02/02/01	MCM	Tritium in Soil
KR-4		SOLID	12/20/00	7600-007	SR		01/11/01	02/02/01	MCM	Total Strontium in Soil
	B99-029		12/22/00	7600-007	TC		01/27/01	02/02/01	MCM	Technetium 99 in Soil
				7600-007	U		01/13/01	02/02/01	MCM	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

SDG 7600
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1198

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
H	B99-029	Tritium in Soil	TRITIUM_COX_LSC	2			1	1	1	5
SR	B99-029	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	2			1	1	1	5
TC	B99-029	Technetium 99 in Soil	TC99_TR_SEP_LSC	2			1	1	1	5
U	B99-029	Uranium, Isotopic in Soil	UISO_PLATE_AEA	4			1	1	1	7
TOTALS				10			4	4	4	22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/02/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1198

R012145-06

Method Blank

METHOD BLANK

SDG	7600	Client/Case no	Hanford	SDG_H1198
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925	
Lab sample id	R012145-06	Client sample id	Method Blank	
Dept sample id	7600-006	Material/Matrix		SOLID
		SAF No	B99-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-2.84	3.2	5.7	400	U	H
Total Strontium	SR-RAD	-0.132	0.13	0.32	1.0	U	SR
Technetium 99	14133-76-7	-0.118	0.24	0.73	15	U	TC
Uranium 233	U-233/234	0.025	0.051	0.19	1.0	U	U
Uranium 235	15117-96-1	0	0.061	0.24	1.0	U	U
Uranium 238	U-238	0.025	0.051	0.19	1.0	U	U

100-HR-4 Pump & Treat - Resin Smpl.

QC-BLANK 37179

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

R012145-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7600

Contact Melissa C. Mannion

Client/Case no Hanford SDG H1198

Case no TRC-SBB-207925

Lab sample id R012145-05

Dept sample id 7600-005

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B99-029

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
Tritium	1420	21	5.5	400		H	1480	59	96	84-116	80-120
Total Strontium	24.4	1.0	0.32	1.0		SR	23.1	0.92	106	82-118	80-120
Technetium 99	135	2.7	0.63	15		TC	131	5.2	103	83-117	80-120
Uranium 233	20.9	2.4	1.2	1.0		U	19.3	0.77	108	79-121	80-120
Uranium 235	16.5	2.1	0.32	1.0		U	15.7	0.63	105	78-122	80-120
Uranium 238	21.6	2.5	1.1	1.0		U	21.0	0.84	103	80-120	80-120

100-HR-4 Pump & Treat - Resin Smpl.

QC-LCS 37178

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

R012145-07 B11481

DUPLICATE

SDG	7600			Client/Case no	Hanford SDG H1198
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R012145-07	Lab sample id	R012145-02	Client sample id	B11481
Dept sample id	7600-007	Dept sample id	7600-002	Location/Matrix	KR-4 SOLID
		Received	12/22/00	Collected	12/20/00 10:18
% solids	100.0	% solids	100.0	Custody/SAF No	B99-029-65 B99-029

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 PROT TOT LIMIT
Tritium	6.72	3.4	5.3	400	J	H	2.99	3.2	5.3	U	77	146
Total Strontium	0.016	0.14	0.29	1.0	U	SR	-0.054	0.14	0.32	U	-	
Technetium 99	-0.074	0.32	1.0	15	U	TC	0.198	0.34	1.0	U	-	
Uranium 233	0	0.049	0.19	1.0	U	U	0	0.053	0.20	U	-	
Uranium 235	0	0.059	0.23	1.0	U	U	0.032	0.065	0.25	U	-	
Uranium 238	0	0.049	0.19	1.0	U	U	0.080	0.11	0.20	U	-	

100-HR-4 Pump & Treat - Resin Smpl.

QC-DUP#2 37180

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	02/02/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1198

R012145-01

B11480

DATA SHEET

SDG	7600	Client/Case no	Hanford	SDG H1198	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R012145-01	Client sample id	B11480		
Dept sample id	7600-001	Location/Matrix	KR-4	SOLID	
Received	12/22/00	Collected	12/20/00 10:00		
% solids	100.0	Custody/SAF No	B99-029-65	B99-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	2.28	3.4	5.6	400.	U	H
Total Strontium	SR-RAD	-0.044	0.12	0.27	1.0	U	SR
Technetium 99	14133-76-7	0.306	0.35	1.0	15	U	TC
Uranium 233	U-233/234	0.288	0.16	0.20	1.0	J	U
Uranium 235	15117-96-1	0.095	0.13	0.24	1.0	U	U
Uranium 238	U-238	0.262	0.16	0.20	1.0	J	U

100-HR-4 Pump & Treat - Resin Smpl.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1198

R012145-02 **B11481**

DATA SHEET

SDG	7600	Client/Case no	Hanford	SDG H1198	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R012145-02	Client sample id	B11481		
Dept sample id	7600-002	Location/Matrix	KR-4	SOLID	
Received	12/22/00	Collected	12/20/00 10:18		
% solids	100.0	Custody/SAF No	B99-029-65	B99-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	2.99	3.2	5.3	400	U	H
Total Strontium	SR-RAD	-0.054	0.14	0.32	1.0	U	SR
Technetium 99	14133-76-7	0.198	0.34	1.0	15	U	TC
Uranium 233	U-233/234	0	0.053	0.20	1.0	U	U
Uranium 235	15117-96-1	0.032	0.065	0.25	1.0	U	U
Uranium 238	U-238	0.080	0.11	0.20	1.0	U	U

100-HR-4 Pump & Treat - Resin Smpl.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1198

R012145-03 **B11482**

DATA SHEET

SDG	7600	Client/Case no	Hanford	SDG H1198	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R012145-03	Client sample id	B11482		
Dept sample id	7600-003	Location/Matrix	KR-4	SOLID	
Received	12/22/00	Collected	12/20/00 10:40		
% solids	100.0	Custody/SAF No	B99-029-65	B99-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	2.83	0.57	0.19	1.0		U
Uranium 235	15117-96-1	0.118	0.12	0.23	1.0	U	U
Uranium 238	U-238	2.05	0.46	0.19	1.0		U

100-HR-4 Pump & Treat - Resin Smpl.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/01

TMA/RICHMOND
SAMPLE DELIVERY GROUP H1198

R012145-04 B11483

DATA SHEET

SDG	7600	Client/Case no	Hanford	SDG H1198	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R012145-04	Client sample id	B11483		
Dept sample id	7600-004	Location/Matrix	KR-4	SOLID	
Received	12/22/00	Collected	12/20/00 10:45		
% solids	100.0	Custody/SAF No	B99-029-65	B99-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	1.49	0.40	0.19	1.0		U
Uranium 235	15117-96-1	0.118	0.12	0.23	1.0	U	U
Uranium 238	U-238	0.831	0.30	0.19	1.0	J	U

100-HR-4 Pump & Treat - Resin Smpl.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7600
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1198

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 6963-032											
B11480	R012145-01			7600-001	0.288 J	U	0.262 J	110	91	36	54
B11481	R012145-02			7600-002	U	U	U				
B11482	R012145-03			7600-003	2.83	U	2.05	138	42	6	6
B11483	R012145-04			7600-004	1.49	U	0.831 J	179	81	14	15
BLK (QC ID=37179)	R012145-06			7600-006	U	U	U				
LCS (QC ID=37178)	R012145-05			7600-005	ok	ok	ok				
Duplicate (R012145-02)	R012145-07			7600-007	- U	- U	- U				
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
100-HR-4 Pump & Treat - Resin Smpl.							Averages	142		19	

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 6963-032	2σ prep error 5.0 %				Reference Lab Notebook 6963 pg. 032											
B11480	R012145-01			0.24	0.490			80		109			24	01/13/01	01/13	SS-031
B11481	R012145-02			0.25	0.500			78		109			24	01/13/01	01/13	SS-032
B11482	R012145-03			0.23	0.510			85		109			24	01/13/01	01/13	SS-033
B11483	R012145-04			0.23	0.500			85		109			24	01/13/01	01/13	SS-034
BLK (QC ID=37179)	R012145-06			0.24	0.500			90		109				01/13/01	01/13	SS-036
LCS (QC ID=37178)	R012145-05			1.2	0.500			60		109				01/13/01	01/13	SS-035
Duplicate (R012145-02) (QC ID=37180)	R012145-07			0.23	0.500			92		109			24	01/13/01	01/13	SS-038
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.37 ± 0.73
YIELD 81 ± 21

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/01

Test SR Matrix SOLID
SDG 7600
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1198

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6963-032						
B11480	R012145-01			7600-001	U	
B11481	R012145-02			7600-002	U	
BLK (QC ID=37179)	R012145-06			7600-006	U	
LCS (QC ID=37178)	R012145-05			7600-005	ok	
Duplicate (R012145-02)	R012145-07			7600-007	-	U
Nominal values and limits from method			RDLs (pCi/g)		1.0	
100-HR-4 Pump & Treat - Resin Smpl.						

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 6963-032	2σ prep error 10.0 % Reference Lab Notebook 6963 pg. 032															
B11480	R012145-01			0.27	1.00			77		100			22	01/11/01	01/11	GRB-207
B11481	R012145-02			0.32	1.01			85		100			22	01/11/01	01/11	GRB-222
BLK (QC ID=37179)	R012145-06			0.32	1.00			74		100				01/11/01	01/11	GRB-218
LCS (QC ID=37178)	R012145-05			0.32	1.00			75		100				01/11/01	01/11	GRB-217
Duplicate (R012145-02) (QC ID=37180)	R012145-07			0.29	1.01			79		100			22	01/11/01	01/11	GRB-220
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 2
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES				
	MDA	0.30	±	0.046
	YIELD	78	±	9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

Test TC	Matrix SOLID
SDG 7600	
Contact Melissa C. Mannion	

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Client Hanford	
Contract TRC-SBB-207925	
Contract SDG H1198	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6963-032						
B11480	R012145-01			7600-001	U	
B11481	R012145-02			7600-002	U	
BLK (QC ID=37179)	R012145-06			7600-006	U	
LCS (QC ID=37178)	R012145-05			7600-005	ok	
Duplicate (R012145-02)	R012145-07			7600-007	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
100-HR-4 Pump & Treat - Resin Smpl.						

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 6963-032	2σ prep error 10.0 % Reference Lab Notebook 6963 pg. 032															
B11480	R012145-01			1.0	1.02			48		50			37	01/23/01	01/26	GRB-203
B11481	R012145-02			1.0	1.01			53		50			37	01/23/01	01/26	GRB-204
BLK (QC ID=37179)	R012145-06			0.73	1.00			68		56				01/23/01	01/27	GRB-221
LCS (QC ID=37178)	R012145-05			0.63	1.00			84		50				01/23/01	01/26	GRB-202
Duplicate (R012145-02) (QC ID=37180)	R012145-07			1.0	1.01			45		56			38	01/23/01	01/27	GRB-222
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-060	Soil Preparation, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 0
	CP-002	Q.C. Preparation, rev 2
	CP-003	Tracing, rev 2
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD	MDA 0.87 ± 0.36
FOR 5 SAMPLES	YIELD 60 ± 33

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	02/02/01

Test H Matrix SOLID
SDG 7600
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1198

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1198

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6963-032						
B11480	R012145-01			7600-001	U	
B11481	R012145-02			7600-002	U	
BLK (QC ID=37179)	R012145-06			7600-006	U	
LCS (QC ID=37178)	R012145-05			7600-005	ok	
Duplicate (R012145-02)	R012145-07			7600-007	ok	J
Nominal values and limits from method				RDLs (pCi/g)	400	
100-HR-4 Pump & Treat - Resin Smpl.						

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 6963-032	2σ prep error 10.0 %				Reference Lab Notebook 6963 pg. 032											
B11480	R012145-01			5.6	0.203			100		100			29	01/18/01	01/18	LSC-005
B11481	R012145-02			5.3	0.214			100		100			29	01/18/01	01/18	LSC-005
BLK (QC ID=37179)	R012145-06			5.7	0.200			100		100				01/18/01	01/18	LSC-005
LCS (QC ID=37178)	R012145-05			5.5	0.200			100		100				01/18/01	01/19	LSC-005
Duplicate (R012145-02) (QC ID=37180)	R012145-07			5.3	0.210			100		100			29	01/18/01	01/18	LSC-005
Nominal values and limits from method				400	0.200					25			180			

PROCEDURES	REFERENCE	TRITIUM_COX_LSC
	CP-060	Soil Preparation, rev 2
	CP-251	Tritium/Carbon-14 Oxidation, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 5.5 ± 0.36
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-65	Page 1 of 1
Collector: J. Cowgill	Company Contact: T. Pickett; Telephone No.: 373-4630	Project Coordinator: TRENT, SJ	Price Code: 9N; Data Turnaround: 45 Days
Project Designation: 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location: KR-4 H1198 (7600)	SAF No.: B99-029	Air Quality ☐
Ice Chest No.: ERC99.035 (1of1)	Field Logbook No.: EL-1517-1; COA: R10KR4C560	Method of Shipment: Fed Ex	
Shipped To: TMA/~~RECRA~~ JAC 12-20-00	Offsite Property No.: A010716	Bill of Lading/Air Bill No.: 4235 1453 – 1448	

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
SAMPLE ANALYSIS	Isotopic Uranium	Strontium-89,90 -- Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	See item (2) in Special Instructions.	IC Anions - 300.0 (Nitrate)	See item (2) in Special Instructions.		Total#
Sample No. / Matrix * / Sample Date / Sample Time										
B11480 / OTHER SOLID / 12/20/00 / 1000	X	X	X	X						97718
B11481 / OTHER SOLID / 12/20/00 / 1018	X	X	X	X						97723
B11482 / OTHER SOLID / 12/20/00 / 1040	X									97719
B11483 / OTHER SOLID / 12/20/00 / 1045	X									97732

Deleted 12.20.00

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
J. Cowgill	12-20-00 / 1135	R. Thoren	12.20.00 / 1135
R. Thoren	12.20.00 1230	Stored in Ref 2B 3728	12.20.00 / 1230
Removed from Ref 2B 3728	12.21.00 / 0830	R. Thoren	12.21.00 / 0830
R. Thoren	12.21.00 / 0830	FEDEX	12-21-00
Fed Ex	12-22-00 11:30	JRCorso JRCorso	12-22-00 / 11:30

RT 12.20.00

SPECIAL INSTRUCTIONS

** Historical data indicates that samples are less than 2000 pCi/g total activity and therefore do not require a RCF rad screen for off-site shipment.

(1) ~~VOA - 8260A (TCL) {Chloroform, Methylenechloride}; VOA - 8260A (Add-On) {Trichloromonofluoromethane}~~ Deleted
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on 1311/6010 {Antimony, Beryllium, Nickel}

EP 12.20.00

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)

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 12-22-00 11:31

CoC No. B99-029-65, B99-028-61

Container I.D. No. ERL99-035 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: 6
7. Number of containers per sample: _____ (Or see CoC ✓)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [✓] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____
13. Was P.M. notified of any anomalies? Yes [✓] No [ ] Date 12-22-00
14. Received by J R Cuso Date: 12-22-00 Time: 11:30

Customer Sample No.	cpm	mr/hr	Customer Sample No.	Cpm	mr/hr

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1198

DATE RECEIVED: 12/22/00 RFW LOT # :0012L655

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11480						
% SOLIDS	001	SO	00L%S209	12/20/00	12/28/00	12/29/00
% SOLIDS	001 REP	SO	00L%S209	12/20/00	12/28/00	12/29/00
NITRATE BY IC	001	SO	01LIC005	12/20/00	01/23/01	01/23/01
NITRATE BY IC	001 REP	SO	01LIC005	12/20/00	01/23/01	01/23/01
NITRATE BY IC	001 MS	SO	01LIC005	12/20/00	01/23/01	01/23/01
TCLP	001	SO	01LTO001	12/20/00	01/04/01	01/05/01
B11481						
% SOLIDS	002	SO	00L%S209	12/20/00	12/28/00	12/29/00
NITRATE BY IC	002	SO	01LIC005	12/20/00	01/23/01	01/23/01
TCLP	002	SO	01LTO001	12/20/00	01/04/01	01/05/01

LAB QC:

NITRATE BY IC	MB1	S	01LIC005	N/A	01/23/01	01/23/01
NITRATE BY IC	MB1 BS	S	01LIC005	N/A	01/23/01	01/23/01

FEB 2001
RECEIVED

LIONVILLE LABORATORY INC.

Analytical Report

Client : TNU-HANFORD B99-029 H1198
RFW# : 0012L655

W.O. # : 10985-001-001-9999-00
Date Received: 12-22-00

INORGANIC CASE NARRATIVE

As of 27 January 2001, Recra LabNet Philadelphia became Lionville Laboratory Inc. Some forms may still reference Recra LabNet Philadelphia.

1. This narrative covers the analyses of 2 solid samples.

2. The samples were 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.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blank for Nitrate was within method criteria.

6. The Laboratory Control Sample (LCS) for Nitrate was within the laboratory control limits.

7. The matrix spike recovery for Nitrate was within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

02-01-01
Date

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

njp\112-655

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 Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		__ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		9095A	

Other: Nitrate **Method:** EPA 300.0 (mod.)

Other: **Method**

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

L-WI-034/D-6/99

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/25/01

CLIENT: TNUHANFORD B99-029 H1198 RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B11480	% Solids	44.0	%	0.01	1.0
		Nitrate by IC	6.0	MG/KG	2.8	1.0
-002	B11481	% Solids	43.9	%	0.01	1.0
		Nitrate by IC	6.0	MG/KG	2.8	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/25/01

CLIENT: TNUHANFORD B99-029 H1198 RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LIC005-MB1	Nitrate by IC	1.2 u	MG/KG	1.2	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/25/01

CLIENT: TNUHANFORD B99-029 H1198 RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B11480	Nitrate by IC	61	6.0	57	97.3	1.0
BLANK10	01LIC005-MB1	Nitrate by IC	24	1.2 u	25	97.5	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 01/25/01

CLIENT: TNUHANFORD B99-029 H1198 RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B11480	% Solids	44.0	44.1	0.11	1.0
		Nitrate by IC	6.0	6.1	0.74	1.0

60

RECRA LabNet Use Only: 00121655

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TRU-Hanford B99-029
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: 12-22-00 Date Due: 1-21-01
Account #:

		A	B					C			D					
Refrigerator #		1	6					6			6					
#/Type Container	Liquid															
	Solid	1AG	1AG					1AG			1AG					
Volume	Liquid															
	Solid	250	250					500			250					
Preservatives		-	-					-	1 drop		-					
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		RECRA LabNet Use Only														
		8240X	8250X					TCLP	Metals		ICP03					

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	8240X	8250X					TCLP	Metals		ICP03					
001	B11480			SO	12-20-00	1000	✓	✓					✓			✓					
002	1			1	1	1018	✓	✓					✓			✓					
003	0 trip of 001			L	*	-								✓							
004	1 1 1 002			1	1	-								✓							

Special Instructions: Saf B99-029

Run Matrix QC

DATE/REVISIONS:
Mt1 ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Br, Ni
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	TBoppel	12-22-00	1040

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 1437

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. 2.0 C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-65	Page 1 of 1

Collector: J. Cowgill	Company Contact: T. Pickett	Telephone No.: 373-4630	Project Coordinator: TRENT. SJ
Price Code: 9N	Data Turnaround: 45 Days	Air Quality: [ ]	
Project Designation: 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location: KR-4	SAF No.: B99-029	
Ice Chest No.: Sml-398 (1of1)	Field Logbook No.: EL-1517-1	COA: R10KR4C560	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA JAC 12-20-00	Offsite Property No.: AØ10186	Bill of Lading/Air Bill No.: 42357953 - 1437	

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

SAMPLE ANALYSIS													
			Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None		
			Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
			No. of Container(s)	1	1	1	1	1	1	1	1		
			Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
				Isotopic Uranium	Strontium-90 -- Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) {Bis(2-ethylhexyl) phthalate}	See item (1) in Special Instructions	IC Anions - 300.0 {Nitrate}	See item (2) in Special Instructions		Tote #
Sample No.	Matrix *	Sample Date	Sample Time										
B11480	OTHER SOLID	12/20/00	1000					X	X	X	X		97718
B11481	OTHER SOLID	12/20/00	1018					X	X	X	X		97723
~~B11482~~	~~OTHER SOLID~~												
~~B11483~~	~~OTHER SOLID~~												

Date 12-20-00

FT 12-20-00

FT 12-20-00

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
J. Cowgill / Cowgill	12/20/00 / 1135	R. Thoren	1135 12.20.00
R. Thoren	12.20.00 1230	Stored in Ref 2B 3728	1230 12.20.00
Removed from Ref 2B 3728 12.20.00	0830	R. Thoren	0830 12.21.00
R. Thoren	0830 12.21.00	FEDEX	
FEDEX	12.22.00 1040	Thoppel	12.22.00 1040

SPECIAL INSTRUCTIONS

** Historical data indicates that samples are less than 2000 pCi/g total activity and therefore do not require a RCF rad screen for off-site shipment.

(1) VOA - 8260A (TCL) {Chloroform, Methylenechloride}; VOA - 8260A (Add-On) {Trichlorofluoromethane}

(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel}

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)

FEB 2001
RECEIVED

Lionville Labs, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1198

DATE RECEIVED: 12/22/00 RFW LOT # :0012L655

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11480						
TCLP	001	SO	01LTO001	12/20/00	01/04/01	01/05/01
B11481						
TCLP	002	SO	01LTO001	12/20/00	01/04/01	01/05/01
B11480						
SILVER, TCLP LEACHAT	003	W	99L1881	01/05/01	01/05/01	01/06/01
SILVER, TCLP LEACHAT	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
SILVER, TCLP LEACHAT	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
ARSENIC, TCLP LEACHA	003	W	99L1881	01/05/01	01/05/01	01/06/01
ARSENIC, TCLP LEACHA	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
ARSENIC, TCLP LEACHA	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
BARIUM, TCLP LEACHAT	003	W	99L1881	01/05/01	01/05/01	01/06/01
BARIUM, TCLP LEACHAT	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
BARIUM, TCLP LEACHAT	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
BERYLLIUM, TCLP LEAC	003	W	99L1881	01/05/01	01/05/01	01/06/01
BERYLLIUM, TCLP LEAC	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
BERYLLIUM, TCLP LEAC	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
CADMIUM, TCLP LEACHA	003	W	99L1881	01/05/01	01/05/01	01/06/01
CADMIUM, TCLP LEACHA	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
CADMIUM, TCLP LEACHA	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
CHROMIUM, TCLP LEACH	003	W	99L1881	01/05/01	01/05/01	01/06/01
CHROMIUM, TCLP LEACH	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
CHROMIUM, TCLP LEACH	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
NICKEL, TCLP LEACHAT	003	W	99L1881	01/05/01	01/05/01	01/06/01
NICKEL, TCLP LEACHAT	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
NICKEL, TCLP LEACHAT	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
LEAD, TCLP LEACHATE	003	W	99L1881	01/05/01	01/05/01	01/06/01
LEAD, TCLP LEACHATE	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
LEAD, TCLP LEACHATE	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
ANTIMONY, TCLP LEACH	003	W	99L1881	01/05/01	01/05/01	01/06/01
ANTIMONY, TCLP LEACH	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
ANTIMONY, TCLP LEACH	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01

Lionville Labs, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1198

DATE RECEIVED: 12/22/00 RFW LOT # :0012L655

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TCLP LEACH	003	W	99L1881	01/05/01	01/05/01	01/06/01
SELENIUM, TCLP LEACH	003 REP	W	99L1881	01/05/01	01/05/01	01/06/01
SELENIUM, TCLP LEACH	003 MS	W	99L1881	01/05/01	01/05/01	01/06/01
B11481						
SILVER, TCLP LEACHAT	004	W	99L1881	01/05/01	01/05/01	01/06/01
ARSENIC, TCLP LEACHA	004	W	99L1881	01/05/01	01/05/01	01/06/01
BARIUM, TCLP LEACHAT	004	W	99L1881	01/05/01	01/05/01	01/06/01
BERYLLIUM, TCLP LEAC	004	W	99L1881	01/05/01	01/05/01	01/06/01
CADMIUM, TCLP LEACHA	004	W	99L1881	01/05/01	01/05/01	01/06/01
CHROMIUM, TCLP LEACH	004	W	99L1881	01/05/01	01/05/01	01/06/01
NICKEL, TCLP LEACHAT	004	W	99L1881	01/05/01	01/05/01	01/06/01
LEAD, TCLP LEACHATE	004	W	99L1881	01/05/01	01/05/01	01/06/01
ANTIMONY, TCLP LEACH	004	W	99L1881	01/05/01	01/05/01	01/06/01
SELENIUM, TCLP LEACH	004	W	99L1881	01/05/01	01/05/01	01/06/01

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
SILVER, TCLP LEACHAT	MB1	W	99L1881	N/A	01/05/01	01/06/01
SILVER, TCLP LEACHAT	MB2	W	99L1881	N/A	01/05/01	01/06/01
ARSENIC LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
ARSENIC, TCLP LEACHA	MB1	W	99L1881	N/A	01/05/01	01/06/01
ARSENIC, TCLP LEACHA	MB2	W	99L1881	N/A	01/05/01	01/06/01
BARIUM LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
BARIUM, TCLP LEACHAT	MB1	W	99L1881	N/A	01/05/01	01/06/01
BARIUM, TCLP LEACHAT	MB2	W	99L1881	N/A	01/05/01	01/06/01
BERYLLIUM LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
BERYLLIUM, TCLP LEAC	MB1	W	99L1881	N/A	01/05/01	01/06/01
BERYLLIUM, TCLP LEAC	MB2	W	99L1881	N/A	01/05/01	01/06/01
CADMIUM LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
CADMIUM, TCLP LEACHA	MB1	W	99L1881	N/A	01/05/01	01/06/01
CADMIUM, TCLP LEACHA	MB2	W	99L1881	N/A	01/05/01	01/06/01
CHROMIUM LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
CHROMIUM, TCLP LEACH	MB1	W	99L1881	N/A	01/05/01	01/06/01
CHROMIUM, TCLP LEACH	MB2	W	99L1881	N/A	01/05/01	01/06/01
NICKEL LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01

Lionville Labs, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1198

DATE RECEIVED: 12/22/00 RFW LOT # :0012L655

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NICKEL, TCLP LEACHAT	MB1	W	99L1881	N/A	01/05/01	01/06/01
NICKEL, TCLP LEACHAT	MB2	W	99L1881	N/A	01/05/01	01/06/01
LEAD LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
LEAD, TCLP LEACHATE	MB1	W	99L1881	N/A	01/05/01	01/06/01
LEAD, TCLP LEACHATE	MB2	W	99L1881	N/A	01/05/01	01/06/01
ANTIMONY LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
ANTIMONY, TCLP LEACH	MB1	W	99L1881	N/A	01/05/01	01/06/01
ANTIMONY, TCLP LEACH	MB2	W	99L1881	N/A	01/05/01	01/06/01
SELENIUM LABORATORY	LC1 BS	W	99L1881	N/A	01/05/01	01/06/01
SELENIUM, TCLP LEACH	MB1	W	99L1881	N/A	01/05/01	01/06/01
SELENIUM, TCLP LEACH	MB2	W	99L1881	N/A	01/05/01	01/06/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B99-029
RFW#: 0012L655
SDG/SAF#: H1198/B99-029

W.O.#: 10985-001-001-9999-00
Date Received: 12-22-00

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 TCLP leachates.

2. The 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 the 90-110% control limits (80-120% for Mercury).

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

11. The TCLP extract from sample B11480 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

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.

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.

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13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

14. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Inc. Some forms may still reference Recra LabNet Philadelphia.

J. Michael Taylor
President
Lionville Laboratory, Inc.

jjw/m12-655

02-05-01
Date

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0012L655

Leaching Procedure: __1310 X1311 __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	X 6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	X 6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	X 6010B		__200.7				__99
Beryllium	X 6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	X 6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	X 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	X 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	X 6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	X 6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	X 6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-11/99

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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

Lionville Labs, I

INORGANICS DATA SUMMARY REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1198 RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B11480	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	37.1		UG/L	33.9	1.0
		Barium, TCLP Leachate	3.8		UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	2390		UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0
-004	B11481	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	43.3		UG/L	33.9	1.0
		Barium, TCLP Leachate	6.9		UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	1860		UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0

Lionville Labs, I

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/30/01

CLIENT: TNUHANFORD B99-029 H1198 RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1881-MB1	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	3.0	u	UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	4.9	u	UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0
BLANK2	99L1881-MB2	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	3.0	u	UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	4.9	u	UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.7		UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0

Lionville Labs, I

INORGANICS ACCURACY REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1198

RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	B11480	Silver, TCLP Leachate	4350	2.5 u	5000	87.0	1.0
		Arsenic, TCLP Leachate	5120	37.1	5000	101.7	1.0
		Barium, TCLP Leachate	77100	3.8	100000	77.1	1.0
		Beryllium, TCLP Leacha	913	0.60u	1000	91.3	1.0
		Cadmium, TCLP Leachate	971	3.4 u	1000	97.1	1.0
		Chromium, TCLP Leachat	7280	2390	5000	97.7	1.0
		Nickel, TCLP Leachate	958	12.5 u	1000	95.8	1.0
		Lead, TCLP Leachate	4990	25.0 u	5000	99.7	1.0
		Antimony, TCLP Leachat	662	17.0 u	1000	66.2	1.0
		Selenium, TCLP Leachat	1090	62.3 u	1000	109.1	1.0

Lionville Labs, I

INORGANICS PRECISION REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1198 RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-003REP	B11480	Silver, TCLP Leachate	2.5 u	2.5 u	NC	1.0
		Arsenic, TCLP Leachate	37.1	41.1	10.2	1.0
		Barium, TCLP Leachate	3.8	4.0	5.1	1.0
		Beryllium TCLP Leachate	0.60u	0.60u	NC	1.0
		Cadmium, TCLP Leachate	3.4 u	3.4 u	NC	1.0
		Chromium, TCLP Leachate	2390	2420	1.3	1.0
		Nickel, Leachate	12.5 u	12.5 u	NC	1.0
		Lead, TCLP Leachate	25.0 u	25.0 u	NC	1.0
		Antimony, Leachate	17.0 u	17.0 u	NC	1.0
		Selenium, TCLP Leachate	62.3 u	62.3 u	NC	1.0

Lionville Labs, I

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1198

RECRA LOT #: 0012L655

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1881-LC1	Silver, LCS	465	500	UG/L	93.0
		Arsenic, LCS	9510	10000	UG/L	95.1
		Barium, LCS	4590	5000	UG/L	91.8
		Beryllium, LCS	233	250	UG/L	93.4
		Cadmium, LCS	238	250	UG/L	95.0
		Chromium, LCS	481	500	UG/L	96.2
		Nickel, LCS	1950	2000	UG/L	97.3
		Lead, LCS	2420	2500	UG/L	97.0
		Antimony, LCS	2860	3000	UG/L	95.2
		Selenium, LCS	9420	10000	UG/L	94.2

13

RECRA LabNet Use Only: 00121655

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TRU-Hanford B99-029

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: 12-22-00 Date Due: 1-21-01

Account #:

		A	B					C			D					
Refrigerator #		1	6					6	8		6					
#/Type Container	Liquid								1 pt Chemicals							
	Solid	1AG	1AG					1AG			1AG					
Volume	Liquid															
	Solid	250	250					500			250					
Preservatives		-	-					-			-					
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		RECRA LabNet Use Only														
		0C24X	0C25X					ITCLP	Mt(1)		ICP03					

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	0C24X	0C25X					ITCLP	Mt(1)		ICP03					
001	B11480			SO	12/20/00	1000	✓	✓					✓			✓					
002	" "			"	"	1018	✓	✓					✓			✓					
003	" " o tclp of 001			L	*	-								✓							
004	" " " " 002			"	"	-								✓							

Special Instructions: Saf B99-029

Run Matrix QC

DATE/REVISIONS:

Mt(1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Br, Ni

2.

3.

4.

5.

6.

Relinquished by	Received by	Date	Time
Fed Ex	J Boppel	12/20/00	1040

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 1437

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. 2.0 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-65	Page 1 of 1

Collector: J. Cowgill	Company Contact: T. Pickett	Telephone No.: 373-4630	Project Coordinator: TRENT, SJ
Project Designation: 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location: KR-4		SAF No.: B99-029
Ice Chest No.: Sml-398 (1of1)	Field Logbook No.: EL-1517-1	COA: R10KR4C560	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA JAC 12-20-00	Offsite Property No.: A0 10186		Bill of Lading/Air Bill No.: 42357953 - 1437

Price Code: 9N

Air Quality: ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL			
SAMPLE ANALYSIS	Isotopic Uranium	Strontium-90 - Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	See item (1) in Special Instructions	IC Anions - 300.0 (Nitrate)	See item (2) in Special Instructions			Tdc #
Sample No.	Matrix *	Sample Date	Sample Time								
B11480	OTHER SOLID	12/20/00	1000					X	X	X	X		97718
B11481	OTHER SOLID	12/20/00	1018					X	X	X	X		97723
~~B11482~~	~~OTHER SOLID~~												
~~B11483~~	~~OTHER SOLID~~												

ET 12-20-00

ET 12-20-00

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
J. Cowgill / J. Cowgill	12/20/00 1135	R. Thoren	1135 12.20.00
R. Thoren	12.28.00 1230	Stored in Ref 2B 3728	1230 12.20.00
Removed from Ref 2B 3728 ET 12.20.00	12.21.00 0830	R. Thoren	0830 12.21.00
R. Thoren	12.21.00 0830	FEDEX	
FEDEX	12.22.00 1046	Thappal	12.22.00 1010

SPECIAL INSTRUCTIONS

** Historical data indicates that samples are less than 2000 pCi/g total activity and therefore do not require a RCF rad screen for off-site shipment.

(1) VOA - 8260A (TCL) (Chloroform, Methylenechloride); VOA - 8260A (Add-On) (Trichloromonofluoromethane)
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (TCLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)

Matrix *

S=Soil
SE=Sediment
SD=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)

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1198

DATE RECEIVED: 12/22/00 RFW LOT # :0012L655

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11480	001	SO	00LE1701	12/20/00	12/28/00	01/18/01
B11480	001 MS	SO	00LE1701	12/20/00	12/28/00	01/24/01
B11480	001 MSD	SO	00LE1701	12/20/00	12/28/00	01/24/01
B11481	002	SO	00LE1701	12/20/00	12/28/00	01/24/01

LAB QC:

SBLKLK	MB1	S	00LE1701	N/A	12/28/00	01/03/01
SBLKLK	MB1 BS	S	00LE1701	N/A	12/28/00	01/03/01

FEB 2001
RECEIVED

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B99-029
RFW #: 0012L655
SDG/SAF #: H1198/B99-029

W.O. #: 10985-001-001-9999-00
Date Received: 12-22-2000

SEMIVOLATILE

Two (2) solid samples were collected on 12-20-2000.

The samples and their associated QC samples were extracted on 12-28-2000 and analyzed according to criteria set forth in Lionville laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compound Bis(2-Ethylhexyl)phthalate on 01-03,18,24-2001.

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

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

2. The samples were extracted and analyzed within required holding times.

3. All surrogate recoveries were within EPA QC limits.

4. One (1) of six (6) blank spike recoveries was outside EPA QC limits.

   One (1) of twelve (12) matrix spike recoveries was outside EPA QC limits.

   The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

5. Internal standard area criteria were not met for samples. The GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly and all surrogate recoveries were within QC limits; consequently, samples were not reanalyzed.

6. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

7. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Inc. Some Forms may still reference Recra LabNet Philadelphia.

J. Michael Taylor
President
Lionville Laboratory Inc.

02-08-01
Date

som\group\data\bna\tnu-hanford-12-655.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 1 0 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, Special List

RFW Batch Number: **0012L655** Client: **TNUHANFORD B99-029 H1198** Work Order: 10985001001 Report Date: 01/25/01 16:40 Page: 1a

	Cust ID:	B11480		B11480		B11480		B11481		SBLKLK		SBLKLK BS	
Sample Information	RFW#:	001		001 MS		001 MSD		002		00LE1701-MB1		00LE1701-MB1	
	Matrix:	SOLID		SOLID		SOLID		SOLID		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	95	%	94	%	72	%	94	%	88	%	68	%
	2-Fluorobiphenyl	93	%	96	%	68	%	92	%	84	%	75	%
	p-Terphenyl-d14	111	%	104	%	61	%	84	%	92	%	88	%
bis(2-Ethylhexyl)phthalate		150	J	NS		NS		86	J	330	U	NS	

*= Outside of EPA CLP QC limits.

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-029 H1198 RFW Lot No.: 0012L655-001

MATRIX Spike - Sample No.: B11480 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	3790	0	2630	69	28 -104
N-Nitroso-Di-n-propylamine	3790	0	3670	97	41 -126
1,2,4-Trichlorobenzene	3790	0	2840	75	38 -107
Acenaphthene	3790	0	3160	83	31 -137
2,4-Dinitrotoluene	3790	0	3400	90 *	28 -89
Pyrene	3790	0	3710	98	35 -142

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
1,4-Dichlorobenzene	3790	2110	56	20	27	28 -104
N-Nitroso-Di-n-propylamine	3790	3020	80	19	38	41 -126
1,2,4-Trichlorobenzene	3790	2190	58	25 *	23	38 -107
Acenaphthene	3790	2250	60	32 *	19	31 -137
2,4-Dinitrotoluene	3790	2470	65	32	47	28 -89
Pyrene	3790	2240	59	50 *	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 3 out of 6 outside limits
Spike Recovery: 1 out of 12 outside limits

COMMENTS:

3D

SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-029 H1198 RFW Lot No.: 0012L655

BLANK Spike - Sample No.: SBLKLKLE1701-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	BS CONCENTRATION UG/KG	BS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	1670	0	1090	65	28 -104
N-Nitroso-Di-n-propylamine	1670	0	995	60	41 -126
1,2,4-Trichlorobenzene	1670	0	903	54	38 -107
Acenaphthene	1670	0	1380	83	31 -137
2,4-Dinitrotoluene	1670	0	1500	90 *	28 -89
Pyrene	1670	0	1240	75	35 -142

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 1 out of 6 outside limits

COMMENTS:

RECRA LabNet Use Only
00121655

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TRU-Hanford B99-029
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: 12-22-00 Date Due: 1-21-01
Account #:

		A	B					C			D					
Refrigerator #		1	6					6			6					
#/Type Container	Liquid															
	Solid	1AG	1AG					1AG			1AG					
Volume	Liquid															
	Solid	250	250					500			250					
Preservatives		-	-					-			-					
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
RECRA LabNet Use Only		0024X	0025X					ITCLP	Mtl(1)		ICP03					

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0024X	0025X					ITCLP	Mtl(1)		ICP03					
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	B11480			So	12-20-00	1000	✓	✓					✓			✓					
	002	"			"	"	1018	✓	✓					✓			✓					
	003	" tclp of 001			L	*	-								✓							
	004	" " " 002			"	"	-								✓							

Special Instructions: Saf B99-029

Run Matrix QC

DATE/REVISIONS:
Mtl(1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Br, Ni
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	Thappel	12-22-00	1040

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 1437

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 2.0 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-65	Page 1 of 1

Collector: J. Cowgill	Company Contact: T. Pickett	Telephone No.: 373-4630	Project Coordinator: TRENT, SJ
Price Code: 9N	Data Turnaround: 45 Days	Air Quality:	
Project Designation: 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location: KR-4	SAF No.: B99-029	
Ice Chest No.: Sml-398 (1of1)	Field Logbook No.: EL-1517-1	COA: R10KR4C560	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA JAC 12-20-00	Offsite Property No.: AQ0186	Bill of Lading/Air Bill No.: 42357953 - 1437	

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

SAMPLE ANALYSIS													
Preservation				None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container				aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
				Isotopic Uranium	Strontium-90 - Total Sr	Technetium-99	Tritium - HT	Semi-VOA - 8270A (TCL) {Bis(2-ethylhexyl) phthalate}	See item (1) in Special Instructions	IC Anions - 300.0 {Nitrate}	See item (2) in Special Instructions		TOC #
Sample No.	Matrix *	Sample Date	Sample Time										
B11480	OTHER SOLID	12/20/00	1000					X	X	X	X		97718
B11481	OTHER SOLID	12/20/00	1018					X	X	X	X		97723
~~B11482~~	~~OTHER SOLID~~												
~~B11483~~	~~OTHER SOLID~~												

KT 12-20-00

KT 12-20-00

Delete KT 12-20-00

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: J. Cowgill / Date/Time: 12/20/00 1135	Received By: R. Thoren / Date/Time: 1135 12-20-00	
Relinquished By: R. Thoren / Date/Time: 12-20-00 1230	Stored in Ref 2B 3728 / Date/Time: 1230 12-20-00	
Relinquished By: Removed from Ref 2B 3728 / Date/Time: 0830 12-21-00	Received By: R. Thoren / Date/Time: 0830 12-21-00	
Relinquished By: R. Thoren / Date/Time: 0830 12-21-00	Received By: FEDEX / Date/Time:	
Relinquished By: Fed Ex / Date/Time: 12-22-00 1046	Received By: [illegible] / Date/Time: 12-22-00 1046	
Relinquished By: / Date/Time:	Received By: / Date/Time:	

SPECIAL INSTRUCTIONS

** Historical data indicates that samples are less than 2000 pCi/g total activity and therefore do not require a RCT rad screen for off-site shipment.

(1) VOA - 8260A (TCL) {Chloroform, Methylenechloride}; VOA - 8260A (Add-On) {Trichlorotrifluoroethane}

(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel}

Matrix *

S=Soil
SE=Sediment
SD=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)

Figure 1. Sample Check-in List

Date/Time Received: 12-22-00 / 1040

SDG#: 00121655

Work Order Number: — SAF# B99-029

Shipping Container ID: SML398 Chain of Custody # B99-029-C5

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 2°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 8
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/Laboratory: Theppel / Becca Date: 12-22-00

Telephoned to: _____ On _____ By _____

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU HANFORD B99-029 H1198

RFW LOT # :0012L655

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B11480	001	SO	00LVH566	12/20/00	12/22/00	N/A	12/29/00
B11481	002	SO	00LVH566	12/20/00	12/22/00	N/A	12/29/00
B11481	002 MS	SO	00LVH566	12/20/00	12/22/00	N/A	12/29/00
B11481	002 MSD	SO	00LVH566	12/20/00	12/22/00	N/A	12/29/00
LAB QC:							
VBLKGJ	MB1	S	00LVH566	N/A	N/A	N/A	12/29/00
VBLKGJ	MB1 BS	S	00LVH566	N/A	N/A	N/A	12/29/00

FEB 2001
RECEIVED

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B99-029
RFW #: 0012L655
SDG/SAF #: H1198/B99-029

W.O. #: 10985-001-001-9999-00
Date Received: 12-22-2000

GC/MS VOLATILE

Two (2) solid samples were collected on 12-20-2000.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville laboratory OPs based on SW 846 Method 8260A for client specified Volatile target compounds on 12-29-2000.

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. All samples were analyzed within required holding time.

3. Two (2) of eighteen (18) surrogate recoveries were outside EPA QC limits. The surrogate recovery criteria were not met for samples B11480, B11281 MS and B11281 MSD. The analysis of unspiked sample fulfills the reanalysis requirement of B11281 MS and B11281 MSD. Sample B11480 was not reanalyzed due to historical evidence of matrix effect. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

4. Four (4) of ten (10) matrix spike recoveries were outside EPA QC limits.

   All blank spike recoveries were within EPA QC limits.

   The target compounds are not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

5. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.

6. Internal standard area criteria were not met for the samples. The analysis of associated matrix spike samples fulfills the reanalysis requirement of sample B11281. Sample B11480 was not reanalyzed due to historical evidence of matrix effect.

7. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

8. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Inc. Some Forms may still reference Recra LabNet Philadelphia.

by J. Michael Taylor
President
Lionville laboratory Inc.

02-08-01
Date

som\group\data\voa\tnu-hanford-12-655.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 1 0 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, Special List

Report Date: 01/26/01 09:44

RFW Batch Number: **0012L655** Client: **TNUHANFORD B99-029 H1198** Work Order: 10985001001 Page: 1a

	Cust ID:	B11480	B11481	B11481	B11481	VBLKGJ	VBLKGJ BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	00LVH566-MB1	00LVH566-MB1
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOIL	SOIL
	D.F.:	1.04	0.980	1.04	1.09	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	1,2-Dichloroethane-d4	87 %	89 %	96 %	91 %	84 %	88 %
	Toluene-d8	142 * %	136 %	141 * %	135 %	98 %	96 %
	Bromofluorobenzene	68 %	66 %	68 %	64 * %	87 %	86 %
Trichlorofluoromethane		12 U	11 U	12 U	12 U	5 U	5 U
Methylene Chloride		61 B	88 B	83 B	82 B	3 J	3 BJ
Chloroform		3 J	2 J	2 J	12 U	5 U	5 U

*= Outside of EPA CLP QC limits.

3B

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 12L655

Matrix Spike - EPA Sample No.: B11481 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	118.75	0.0000	52.906	44*	59-172
Trichloroethene	118.75	0.0000	108.86	92	62-137
Benzene	118.75	0.0000	122.07	103	66-142
Toluene	118.75	9.064	184.20	147*	59-139
Chlorobenzene	118.75	0.0000	114.67	96	60-133

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	123.91	60.982	49*	11	22	59-172
Trichloroethene	123.91	109.88	89	3	24	62-137
Benzene	123.91	124.21	100	3	21	66-142
Toluene	123.91	189.58	146*	1	21	59-139
Chlorobenzene	123.91	117.62	95	1	21	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 4 out of 10 outside limits

COMMENTS: _____

3B
SOIL VOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 12L655

Matrix Spike - EPA Sample No.: VBLKGJ Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	BLANK CONCENTRATION (ug/Kg)	BS CONCENTRATION (ug/Kg)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.000	0.0000	38.543	77	59-172
Trichloroethene	50.000	0.0000	47.502	95	62-137
Benzene	50.000	0.0000	50.070	100	66-142
Toluene	50.000	0.0000	53.079	106	59-139
Chlorobenzene	50.000	0.0000	51.573	103	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS:

RECRA LabNet Use Only
00126655

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TRU-Hanford B99-029
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: 12-22-00 Date Due: 1-21-01
Account #:

		A	B					C			D					
Refrigerator #		1	6					6			6					
#/Type Container	Liquid															
	Solid	1AG	1AG					1AG			1AG					
Volume	Liquid															
	Solid	250	250					500			250					
Preservatives		-	-					-	1+ 6 drops		-					
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
RECRA LabNet Use Only		0824X	0825X					ITCLP	Metl (1)		ICP03					

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	0824X	0825X				ITCLP	Metl (1)		ICP03					
001	B11480			SO	12-20-00	1000	✓	✓				✓			✓					
002	1			1	1	1018	✓	✓				✓			✓					
003	0 trip of 001			L	*	-							✓							
004	1 1 1 002			1	1	-							✓							

Special Instructions: Saf B99-029

Run Matrix QC

DATE/REVISIONS:
Metl (1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Br, Ni
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	TRoppel	12-22-00	1040

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 1437

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 2.0 C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-65	Page 1 of 1

Collector: J. Cowgill	Company Contact: T. Pickett	Telephone No.: 373-4630	Project Coordinator: TRENT, SJ
Price Code: 9N	Data Turnaround: 45 Days	Air Quality:	
Project Designation: 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location: KR-4	SAF No.: B99-029	
Ice Chest No.: Sml-398 (1of1)	Field Logbook No.: EL-1517-1	COA: R10KR4C560	Method of Shipment: Fed Ex
Shipped To: ~~TMA~~/RECRA JAC 12-20-00	Offsite Property No.: A0 10186		Bill of Lading/Air Bill No.: 42357953 - 1437

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

SAMPLE ANALYSIS													
Preservation				None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container				aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
				Isotopic Uranium	Strontium-90 - Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) {Bis(2-ethylhexyl) phthalate}	See item (1) in Special Instructions	IC Anions - 300.0 {Nitrate}	See item (2) in Special Instructions		Tote #
Sample No.	Matrix *	Sample Date	Sample Time										
B11480	OTHER SOLID	12/20/00	1000					X	X	X	X		97718
B11481	OTHER SOLID	12/20/00	1018					X	X	X	X		97723
~~B11482~~	~~OTHER SOLID~~												
~~B11483~~	~~OTHER SOLID~~												

RT 12-20-00 RT 12-20-00

Delete RT 12-20-00

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: J. Cowgill	Date/Time: 12/20/00 1135	Received By: R. Thoren	Date/Time: 1135 12-20-00
Relinquished By: R. Thoren	Date/Time: 1230 12-20-00	Received By: Stored in Ref 2B 3728	Date/Time: 1230 12-20-00
Relinquished By: Removed from Ref 2B 3728 12-20-00	Date/Time: 0830	Received By: R. Thoren	Date/Time: 0830 12-21-00
Relinquished By: R. Thoren	Date/Time: 0830 12-21-00	Received By: FEDEX	Date/Time:
Relinquished By: FEDEX	Date/Time: 12-22-00 1040	Received By:	Date/Time: 12-22-00 1040
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

** Historical data indicates that samples are less than 2000 pCi/g total activity and therefore do not require a RCT rad screen for off-site shipment.

(1) VOA - 8260A (TCL) {Chloroform, Methylenechloride}; VOA - 8260A (Add-On) {Trichlorotrifluoromethane}
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel}

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)

Figure 1. Sample Check-in List

Date/Time Received: 12.22.00 /1040

SDG#: 00121655

Work Order Number: — SAF# B99-029

Shipping Container ID: SML398 Chain of Custody # B99-029-65

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 2°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 8
7. Sample holding times exceeded? Yes [ ] No [✓]

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

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

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: Thappel Berra Date: 12.22.00

Telephoned to: _____ On _____ By _____

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