H1291

0055545

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1291 was composed of two water samples designated under SAF No. C01-024 with a Project Designation of: ERDF GW Monitoring, March 2001.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. SDG H1291 (7659) was batched with SDG H1285 (7655).

RECEIVED
OCT 23 2001
EDMC

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

The C-14 MS was batched with SDG H1285 (7655). The MS percent recovery was 102%. 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 Iodine-129 Analyses

The LCS had a percent recovery (112%) slightly above the 3σ limits (89-111%), but within the laboratory protocol limits (80 to 120%). No other problems were encountered during the course of the analyses.

2.5 Radium-226 Analyses

No problems were encountered during the course of the analyses.

2.6 Total Uranium 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

May 3, 2001
Date

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

SAMPLE SUMMARY

SDG 7659
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1291

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B11DF0	Hanford Site	WATER		R103110-01	C01-024	C01-024-7	03/19/01 12:03
B11DF2	Hanford Site	WATER		R103110-02	C01-024	C01-024-7	03/19/01 12:03
Method Blank		WATER		R103095-05	C01-024		
Lab Control Sample		WATER		R103095-04	C01-024		
Duplicate (R103110-01)	Hanford Site	WATER		R103110-03	C01-024		03/19/01 12:03

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

QC SUMMARY

SDG 7659
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1291

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7655		Method Blank	WATER						R103095-05	7655-005
		Lab Control Sample	WATER						R103095-04	7655-004
7659	C01-024-7	B11DF0	WATER				03/20/01	1	R103110-01	7659-001
		B11DF2	WATER				03/20/01	1	R103110-02	7659-002
		Duplicate (R103110-01)	WATER				03/20/01	1	R103110-03	7659-003

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

SDG 7659
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1291

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Beta Counting												
TC	WATER	Technetium 99 in Water	6981-040	10.0	2			1	1	1/1		
Gas Proportional Counting												
82B	WATER	Gross Beta in Water	6981-040	15.0	2			1	1	1/1		
88A	WATER	Gross Alpha in Water	6981-040	20.0	2			1	1	1/1		
Gamma Spectroscopy												
I	WATER	Iodine 129 in Water	6981-040	5.0	2			1	1	1/1		
Kinetic Phosphorimetry												
U_T	WATER	Uranium, Total in Water	6981-040	9.0	2			1	1	1/1		
Liquid Scintillation Counting												
C	WATER	Carbon 14 in Water	6981-040	10.0	2			1	1	1/1		
Radon Counting												
RA	WATER	Radium 226 in Water	6981-040	5.0	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 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

WORK SUMMARY

SDG 7659
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1291

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B11DF0			R103110-01	7659-001	82B/82		04/25/01	04/30/01	MCM	Gross Beta in Water
Hanford Site		WATER	03/19/01	7659-001	88A/88		04/16/01	04/30/01	MCM	Gross Alpha in Water
C01-024-7	C01-024		03/20/01	7659-001	C		04/30/01	05/03/01	MCM	Carbon 14 in Water
				7659-001	I		03/28/01	04/30/01	MCM	Iodine 129 in Water
				7659-001	RA		04/23/01	04/30/01	MCM	Radium 226 in Water
				7659-001	TC		04/11/01	04/30/01	MCM	Technetium 99 in Water
				7659-001	U_T		04/18/01	04/30/01	MCM	Uranium, Total in Water
B11DF2			R103110-02	7659-002	82B/82		04/25/01	04/30/01	MCM	Gross Beta in Water
Hanford Site		WATER	03/19/01	7659-002	88A/88		04/25/01	04/30/01	MCM	Gross Alpha in Water
C01-024-7	C01-024		03/20/01	7659-002	C		04/30/01	05/03/01	MCM	Carbon 14 in Water
				7659-002	I		03/29/01	04/30/01	MCM	Iodine 129 in Water
				7659-002	RA		04/24/01	04/30/01	MCM	Radium 226 in Water
				7659-002	TC		04/10/01	04/30/01	MCM	Technetium 99 in Water
				7659-002	U_T		04/18/01	04/30/01	MCM	Uranium, Total in Water
Method Blank			R103095-05	7655-005	82B/82		04/25/01	04/30/01	MCM	Gross Beta in Water
		WATER		7655-005	88A/88		04/16/01	04/30/01	MCM	Gross Alpha in Water
	C01-024			7655-005	C		04/30/01	05/02/01	MCM	Carbon 14 in Water
				7655-005	I		03/28/01	04/30/01	MCM	Iodine 129 in Water
				7655-005	RA		04/24/01	04/30/01	MCM	Radium 226 in Water
				7655-005	TC		04/07/01	04/30/01	MCM	Technetium 99 in Water
				7655-005	U_T		04/18/01	04/30/01	MCM	Uranium, Total in Water
Lab Control Sample			R103095-04	7655-004	82B/82		04/24/01	04/30/01	MCM	Gross Beta in Water
		WATER		7655-004	88A/88		04/16/01	04/30/01	MCM	Gross Alpha in Water
	C01-024			7655-004	C		04/30/01	05/02/01	MCM	Carbon 14 in Water
				7655-004	I		03/28/01	04/30/01	MCM	Iodine 129 in Water
				7655-004	RA		04/23/01	04/30/01	MCM	Radium 226 in Water
				7655-004	TC		04/06/01	04/30/01	MCM	Technetium 99 in Water
				7655-004	U_T		04/18/01	04/30/01	MCM	Uranium, Total in Water
Duplicate (R103110-01)			R103110-03	7659-003	82B/82		04/25/01	04/30/01	MCM	Gross Beta in Water
Hanford Site		WATER	03/19/01	7659-003	88A/88		04/25/01	04/30/01	MCM	Gross Alpha in Water
	C01-024		03/20/01	7659-003	C		04/30/01	05/03/01	MCM	Carbon 14 in Water
				7659-003	I		03/29/01	04/30/01	MCM	Iodine 129 in Water
				7659-003	RA		04/24/01	04/30/01	MCM	Radium 226 in Water
				7659-003	TC		04/06/01	04/30/01	MCM	Technetium 99 in Water
				7659-003	U_T		04/18/01	04/30/01	MCM	Uranium, Total in Water

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

SDG 7659
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1291

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
82B/82	C01-024	Gross Beta in Water	900.0_ALPHABETA_GPC	2			1	1	1	5
88A/88	C01-024	Gross Alpha in Water	900.0_ALPHABETA_GPC	2			1	1	1	5
C	C01-024	Carbon 14 in Water	C14_CHEM_LSC	2			1	1	1	5
I	C01-024	Iodine 129 in Water	I129_SEP_LEPS_GS	2			1	1	1	5
RA	C01-024	Radium 226 in Water	903.1_RA226_LUC	2			1	1	1	5
TC	C01-024	Technetium 99 in Water	TC99_TR_SEP_LSC	2			1	1	1	5
U_T	C01-024	Uranium, Total in Water	UTOT_KPA	2			1	1	1	5
TOTALS				14			7	7	7	35

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 05/03/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1291

R103095-05 Method Blank

METHOD BLANK

SDG	7659	Client/Case no	Hanford	SDG_H1291	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R103095-05	Client sample id	Method Blank		
Dept sample id	7655-005	Material/Matrix		WATER	
		SAF No	C01-024		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.571	0.60	1.4	3.0	U	88A
Gross Beta	12587-47-2	-1.20	1.5	2.6	4.0	U	82B
Carbon 14	14762-75-5	-7.85	27	45	200	U	C
Technetium 99	14133-76-7	2.69	4.0	14	15	U	TC
Radium 226	13982-63-3	-0.073	0.50	0.98	2.0	U	RA
Total Uranium (ug/L)	7440-61-1	0.004	0.032	0.074	0.10	U	U_T
Iodine 129	15046-84-1	-1.03	2.5	5.8	5.0	U	I

ERDF GW Monitoring, March 2001

QC-BLANK 38028

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

R103095-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7659
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1291
Case no No. 630

Lab sample id R103095-04
Dept sample id 7655-004

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No C01-024

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	66.0	4.8	1.3	3.0		88A	71.7	2.9	92	70-130	70-130
Gross Beta	73.6	3.5	2.2	4.0		82B	80.0	3.2	92	77-123	70-130
Carbon 14	19200	200	64	200		C	21300	850	90	85-115	80-120
Technetium 99	2960	84	16	15		TC	2620	100	113	81-119	80-120
Radium 226	321	7.6	1.3	2.0		RA	325	13	99	90-110	80-120
Total Uranium (ug/L)	83.0	9.3	0.74	0.10		U_T	82.5	3.3	101	77-123	80-120
Iodine 129	584	8.1	9.1	5.0		I	524	21	112	89-111	80-120

ERDF GW Monitoring, March 2001

QC-LCS 38027

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

R103110-03

B11DF0

DUPLICATE

SDG 7659
Contact Melissa C. Mannion

DUPLICATE
Lab sample id R103110-03
Dept sample id 7659-003

ORIGINAL
Lab sample id R103110-01
Dept sample id 7659-001
Received 03/20/01

Client/Case no Hanford SDG H1291
Case no No. 630

Client sample id B11DF0
Location/Matrix Hanford Site WATER
Collected 03/19/01 12:03
Custody/SAF No C01-024-7 C01-024

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	2.18	1.6	2.3	3.0	U	88A	1.43	1.3	1.9	U	-		
Gross Beta	31.4	2.6	2.5	4.0		82B	35.5	2.7	2.5		12	36	
Carbon 14	22.2	27	45	200	U	C	57.0	32	51	J	88	160	
Technetium 99	40.3	7.2	15	15		TC	40.2	6.5	13		0	42	
Radium 226	0.376	0.50	0.84	2.0	U	RA	0.033	0.55	1.0	U	-		
Total Uranium (ug/L)	2.82	0.30	0.073	0.10		U_T	2.83	0.30	0.073		0	30	
Iodine 129	3.63	1.3	2.8	5.0	J	I	2.74	2.2	4.9	U	28	121	

ERDF GW Monitoring, March 2001

QC-DUP#1 38025

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 05/03/01

TMA/RICHMOND
SAMPLE DELIVERY GROUP H1291

R103110-01 B11DF0

DATA SHEET

SDG	7659	Client/Case no	Hanford SDG_H1291
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R103110-01	Client sample id	B11DF0
Dept sample id	7659-001	Location/Matrix	Hanford Site WATER
Received	03/20/01	Collected	03/19/01 12:03
		Custody/SAF No	C01-024-7 C01-024

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.43	1.3	1.9	3.0	U	88A
Gross Beta	12587-47-2	35.5	2.7	2.5	4.0		82B
Carbon 14	14762-75-5	57.0	32	51	200	J	C
Technetium 99	14133-76-7	40.2	6.5	13	15		TC
Radium 226	13982-63-3	0.033	0.55	1.0	2.0	U	RA
Total Uranium (ug/L)	7440-61-1	2.83	0.30	0.073	0.10		U_T
Iodine 129	15046-84-1	2.74	2.2	4.9	5.0	U	I

ERDF GW Monitoring, March 2001

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/03/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1291

R103110-02 B11DF2

DATA SHEET

SDG	7659	Client/Case no	Hanford	SDG_H1291
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R103110-02	Client sample id	B11DF2	
Dept sample id	7659-002	Location/Matrix	Hanford Site	WATER
Received	03/20/01	Collected	03/19/01 12:03	
		Custody/SAF No	C01-024-7	C01-024

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.812	1.2	1.7	3.0	U	88A
Gross Beta	12587-47-2	31.9	2.6	2.3	4.0		82B
Carbon 14	14762-75-5	47.2	29	48	200	U	C
Technetium 99	14133-76-7	42.3	6.3	12	15		TC
Radium 226	13982-63-3	0.931	0.72	1.1	2.0	U	RA
Total Uranium (ug/L)	7440-61-1	2.79	0.30	0.073	0.10		U_T
Iodine 129	15046-84-1	6.72	2.7	6.2	5.0		I

ERDF GW Monitoring, March 2001

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/03/01

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@PJL USTATUS DEVICE = ON
@PJL USTATUS TIMED = 0
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

Test TC	Matrix WATER
SDG 7659	
Contact Melissa C. Mannion	

METHOD SUMMARY

TECHNETIUM 99 IN WATER

BETA COUNTING

Client	Hanford
Contract	No. 630
Contract	SDG H1291

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99
Preparation batch 6981-040					
B11DF0	R103110-01			7659-001	40.2
B11DF2	R103110-02			7659-002	42.3
BLK (QC ID=38028)	R103095-05			7655-005	U
LCS (QC ID=38027)	R103095-04			7655-004	ok
Duplicate (R103110-01)	R103110-03			7659-003	ok
Nominal values and limits from method				RDLs (pCi/L)	15
ERDF GW Monitoring, March 2001					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-040	2σ prep error 10.0 %				Reference Lab Notebook 6981 pg. 040											
B11DF0	R103110-01			13	0.0500			80		50			23	04/03/01	04/11	GRB-205
B11DF2	R103110-02			12	0.0500			85		50			22	04/03/01	04/10	GRB-224
BLK (QC ID=38028)	R103095-05			14	0.0500			73		50				04/03/01	04/07	GRB-224
LCS (QC ID=38027)	R103095-04			16	0.0500			62		50				04/03/01	04/06	GRB-205
Duplicate (R103110-01) (QC ID=38025)	R103110-03			15	0.0500			66		50			18	04/03/01	04/06	GRB-222
Nominal values and limits from method				15	0.0500			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-021	Preparation of Tc-99m Tracer, rev 0
	CP-002	Q.C. Preparation, rev 2
	CP-003	Tracing, rev 2
	CP-541	Technetium-99 Purification (Water) by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES				
MDA	14	±	3.2
YIELD	73	±	19

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

Test 82B Matrix WATER
SDG 7659
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1291

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Gross Beta	2: Sum, Beta Emitters	RESULT RATIO (%) 2÷1	2σ
Preparation batch 6981-040								
B11DF0	R103110-01	82		7659-001	35.5			
B11DF2	R103110-02	82		7659-002	31.9			
BLK (QC ID=38028)	R103095-05	82		7655-005	U			
LCS (QC ID=38027)	R103095-04	82		7655-004	ok			
Duplicate (R103110-01)	R103110-03	82		7659-003	ok			
Nominal values and limits from method			RDLs (pCi/L)		4.0			
ERDF GW Monitoring, March 2001						Average		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-040	2σ prep error 15.0 %				Reference Lab Notebook 6981 pg. 040											
B11DF0	R103110-01	82		2.5	0.300			86		100			37	03/29/01	04/25	GRB-115
B11DF2	R103110-02	82		2.3	0.300			85		100			37	03/29/01	04/25	GRB-107
BLK (QC ID=38028)	R103095-05	82		2.6	0.300			21		100				03/29/01	04/25	GRB-105
LCS (QC ID=38027)	R103095-04	82		2.2	0.300			22		100				03/29/01	04/24	GRB-107
Duplicate (R103110-01) (QC ID=38025)	R103110-03	82		2.5	0.300			85		100			37	03/29/01	04/25	GRB-108
Nominal values and limits from method				4.0	0.300			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD MDA 2.4 ± 0.33
FOR 5 SAMPLES RESIDUE 60 ± 70

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

Test 88A	Matrix WATER
SDG 7659	
Contact Melissa C. Mannion	

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Client Hanford	
Contract No. 630	
Contract SDG H1291	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6981-040						
B11DF0	R103110-01	88		7659-001	U	
B11DF2	R103110-02	88		7659-002	U	
BLK (QC ID=38028)	R103095-05	88		7655-005	U	
LCS (QC ID=38027)	R103095-04	88		7655-004	ok	
Duplicate (R103110-01)	R103110-03	88		7659-003	-	U

Nominal values and limits from method RDLs (pCi/L) 3.0

ERDF GW Monitoring, March 2001

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-040	2σ prep error 20.0 %				Reference Lab Notebook 6981 pg. 040											
B11DF0	R103110-01	88		1.9	0.300			90		100			28	03/30/01	04/16	GRB-116
B11DF2	R103110-02	88		1.7	0.300			91		100			37	03/30/01	04/25	GRB-108
BLK (QC ID=38028)	R103095-05	88		1.4	0.300			21		100				03/30/01	04/16	GRB-114
LCS (QC ID=38027)	R103095-04	88		1.3	0.300			23		100				03/30/01	04/16	GRB-113
Duplicate (R103110-01) (QC ID=38025)	R103110-03	88		2.3	0.300			90		100			37	03/30/01	04/25	GRB-113
Nominal values and limits from method				3.0	0.300			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-120	Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD	MDA	1.7	± 0.80
FOR 5 SAMPLES	RESIDUE	63	± 75

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

Test I	Matrix WATER
SDG 7659	
Contact Melissa C. Mannion	

METHOD SUMMARY

IODINE 129 IN WATER

GAMMA SPECTROSCOPY

Client Hanford	
Contract No. 630	
Contract SDG H1291	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Iodine 129	
Preparation batch 6981-040						
B11DF0	R103110-01			7659-001	U	
B11DF2	R103110-02			7659-002	6.72	
BLK (QC ID=38028)	R103095-05			7655-005	U	
LCS (QC ID=38027)	R103095-04			7655-004	HIGH	
Duplicate (R103110-01)	R103110-03			7659-003	ok	J

Nominal values and limits from method RDLs (pCi/L) 5.0

ERDF GW Monitoring, March 2001

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-040	2σ prep error 5.0 %				Reference Lab Notebook 6981 pg. 040											
B11DF0	R103110-01			4.9	0.250			92		533			9	03/27/01	03/28	XSPEC-014
B11DF2	R103110-02			6.2	0.250			92		1600			10	03/27/01	03/29	XSPEC-002
BLK (QC ID=38028)	R103095-05			5.8	0.250			94		364				03/27/01	03/28	XSPEC-014
LCS (QC ID=38027)	R103095-04			9.1	0.250			95		374				03/27/01	03/28	XSPEC-002
Duplicate (R103110-01) (QC ID=38025)	R103110-03			2.8	0.250			92		1600			10	03/27/01	03/29	XSPEC-014
Nominal values and limits from method				5.0	0.250			20-105		300	100		180			

PROCEDURES	REFERENCE	I129_SEP_LEPS_GS
	CP-024	Iodine-129, Sample Dissolution, rev 1
	CP-560	Iodine-129 Purification, rev 2

AVERAGES ± 2 SD	MDA	5.8	± 4.6
FOR 5 SAMPLES	YIELD	93	± 3

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

Test U T Matrix WATER
SDG 7659
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN WATER
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H1291

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium (ug/L)
Preparation batch 6981-040					
B11DF0	R103110-01			7659-001	2.83
B11DF2	R103110-02			7659-002	2.79
BLK (QC ID=38028)	R103095-05			7655-005	U
LCS (QC ID=38027)	R103095-04			7655-004	ok
Duplicate (R103110-01)	R103110-03			7659-003	ok
Nominal values and limits from method ERDF GW Monitoring, March 2001				RDLs (ug/L)	0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-040	2σ prep error 9.0 %				Reference Lab Notebook 6981 pg. 040											
B11DF0	R103110-01			0.073	0.0200								30	04/18/01	04/18	KPA-001
B11DF2	R103110-02			0.073	0.0200								30	04/18/01	04/18	KPA-001
BLK (QC ID=38028)	R103095-05			0.074	0.0200									04/18/01	04/18	KPA-001
LCS (QC ID=38027)	R103095-04			0.74	0.0200									04/18/01	04/18	KPA-001
Duplicate (R103110-01) (QC ID=38025)	R103110-03			0.073	0.0200								30	04/18/01	04/18	KPA-001
Nominal values and limits from method				0.10	0.0200								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-040	Environmental Water Dissolution, rev 3
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 2
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.21 ± 0.60
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

Test C Matrix WATER
SDG 7659
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1291

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6981-040						
B11DF0	R103110-01			7659-001	57.0	J
B11DF2	R103110-02			7659-002	U	
BLK (QC ID=38028)	R103095-05			7655-005	U	
LCS (QC ID=38027)	R103095-04			7655-004	ok	
Duplicate (R103110-01)	R103110-03			7659-003	ok	U

Nominal values and limits from method RDLs (pCi/L) 200
ERDF GW Monitoring, March 2001

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-040	2σ prep error 10.0 %				Reference Lab Notebook 6981 pg. 040											
B11DF0	R103110-01			51	0.0300			100		100			42	04/27/01	04/30	LSC-004
B11DF2	R103110-02			48	0.0300			100		100			42	04/27/01	04/30	LSC-004
BLK (QC ID=38028)	R103095-05			45	0.0300			100		100				04/27/01	04/30	LSC-004
LCS (QC ID=38027)	R103095-04			64	0.0300			100		44				04/27/01	04/30	LSC-004
Duplicate (R103110-01) (QC ID=38025)	R103110-03			45	0.0300			100		100			42	04/27/01	04/30	LSC-004
Nominal values and limits from method				200	0.0300					50			180			

PROCEDURES REFERENCE C14_CHEM_LSC
CP-241 Carbon-14 in Aqueous Samples, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 51 ± 16
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1291

Test RA	Matrix WATER
SDG 7659	
Contact Melissa C. Mannion	

METHOD SUMMARY

RADIUM 226 IN WATER

RADON COUNTING

Client Hanford	
Contract No. 630	
Contract SDG H1291	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Radium 226	
Preparation batch 6981-040						
B11DF0	R103110-01			7659-001	U	
B11DF2	R103110-02			7659-002	U	
BLK (QC ID=38028)	R103095-05			7655-005	U	
LCS (QC ID=38027)	R103095-04			7655-004	ok	
Duplicate (R103110-01)	R103110-03			7659-003	-	U
Nominal values and limits from method				RDLs (pCi/L)	2.0	
ERDF GW Monitoring, March 2001						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-040	2σ prep error 5.0 %				Reference Lab Notebook 6981 pg. 040											
B11DF0	R103110-01			1.0	0.0400			100		112			35	04/23/01	04/23	RN-009
B11DF2	R103110-02			1.1	0.0400			100		109			36	04/23/01	04/24	RN-012
BLK (QC ID=38028)	R103095-05			0.98	0.0400			100		109				04/23/01	04/24	RN-009
LCS (QC ID=38027)	R103095-04			1.3	0.0400			100		112				04/23/01	04/23	RN-010
Duplicate (R103110-01) (QC ID=38025)	R103110-03			0.84	0.0400			100		109			36	04/23/01	04/24	RN-013
Nominal values and limits from method				2.0	0.0400			20-105		100			180			

PROCEDURES	REFERENCE	903.1_RA226_LUC
	CP-701	Radium-226 in Water and Dissolved Samples, rev 2

AVERAGES ± 2 SD	MDA	1.0	± 0.34
FOR 5 SAMPLES	YIELD	100	± 0

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	05/03/01

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-024-7

Collector K.J. YOUNG	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-024	Sampling Origin HANFORD SITE H1291 (7659)	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFSNW-SMWS-H43	Ice Chest No. SMI188 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235-7954-3094
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DD9 (F)		W	3-19-01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF0		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF0		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF0		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF0		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF0		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF0		W			1x20-mL P	Activity Scan	None
B11DF0		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF0		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF0		W			1x1000-mL G/P	Carbon-14	None
B11DF0		W			4x1000-mL G/P	Iodine-129	None
B11DF0		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG [signature]	3-19-01/1315	Fed Ex	3-19-01
FED EXPRESS	3-20-01 10 AM	E. SEGURO & [signature]	3-20-01 10 AM

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H1291 (7659)

C.O.C. # C01-024-7

SAF No. C01-024

Contact/Requestor JH KESSNER

Telephone No. (509) 375-4688

MSIN

FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF0		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF0		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF0		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF0		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	K.J. YOUNG		3-19-01 1315		FED EX		3-19-01
Relinquished By			Date/Time	Received By			Date/Time
FED EXPRESS			3-20-01 10 AM	E. SEGURO			
Relinquished By			Date/Time	Received By			Date/Time
							3-20-01 10 AM
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-024-8

Collector: K.J. YOUNG	Contact/Requester: JH KESSNER H1291 (7659)	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-024	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ERDF GW MONITORING, MARCH 2001	Logbook No.: DESNW-5AWS-H43	Ice Chest No.: SML533 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235-7954-3109
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF1 (F)		W	3/20/01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF2		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF2		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF2		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF2		W			1x20-mL P	Activity Scan	None
B11DF2		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF2		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF2		W			1x1000-mL G/P	Carbon-14	None
B11DF2		W			4x1000-mL G/P	Iodine-129	None
B11DF2		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG [signature]	3-19-01 1315	Fed Ex	3-19-01
FED. EXPRESS	3-20-01 10AM	E. SEGURO [signature]	3-20-01 10AM

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H1291 (7659)

C.O.C. # C01-024-8

SAF No. C01-024

Contact/Requestor JH KESSNER

Telephone No. (509) 375-4688

MSIN

FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF2		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF2		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF2		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF2		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	K.J. YOUNG	Jan Young	3-19-01/1315		Fed Ex		3-19-01
Relinquished By			Date/Time	Received By			Date/Time
FED EXPRESS			3-20-01 10AM		E. SEGURO	E. Seguro	3-20-01 10AM
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

ThermoRetec
Richmond Laboratory

Analytical Services

ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: (WMGT) BECHTEL HANFORD (PNNL) Date: 3-20-01 10:AM

Ice chest # or description	SML-533					
Thermometer: time in	10:AM					
Thermometer: time out	11:00					
Thermometer reading	4°C					
Thermometer number	6536					
Correction factor	NONE					
Actual temperature*	—					
Custody seals on ice chest intact?	Yes					
Custody seals dated ?	Yes					
Custody seals signed?	Yes					
Custody seals on samples?	Yes					
Ice chest scanned for activity?	Yes					

* Temperature is in degrees centigrade.

Technician: E. Segura

Comments:

ThermoRetec
Richmond Laboratory

Analytical Services

ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: (WGMT) BECHTEL HANFORD (PNNL) Date: 3-20-01 10:00am

Ice chest # or description	SML-188					
Thermometer: time in	10:45					
Thermometer: time out	11:30					
Thermometer reading	4°C					
Thermometer number	2132					
Correction factor	NONE					
Actual temperature*	—					
Custody seals on ice chest intact?	Yes					
Custody seals dated ?	Yes					
Custody seals signed?	Yes					
Custody seals on samples?	Yes					
Ice chest scanned for activity?	Yes					

* Temperature is in degrees centigrade.

Technician: E. Segura

Comments:

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: (WMGMTS) BECHTEL HANFORD (PNNL) Date/Time received 3-20-01 10:AM

CoC No. C01-024-7, 8, 13, AND 14.

Container I.D. No. SML-188, SML-533, 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: CHECK (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 _____
14. Received by E. Seguro Date: 3-20-01 Time: 10:AM

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

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

MAY 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-024 H1291

DATE RECEIVED: 03/22/01 LVL LOT # :0103L345

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11DF2						
ALKALINITY	003	W	01LAKA20	03/19/01	03/28/01	03/28/01
ALKALINITY	003 REP	W	01LAKA20	03/19/01	03/28/01	03/28/01
BROMIDE BY IC	003	W	01LIC026	03/19/01	04/17/01	04/17/01
BROMIDE BY IC	003 REP	W	01LIC026	03/19/01	04/17/01	04/17/01
BROMIDE BY IC	003 MS	W	01LIC026	03/19/01	04/17/01	04/17/01
CHLORIDE BY IC	003	W	01LIC026	03/19/01	04/17/01	04/17/01
CHLORIDE BY IC	003 REP	W	01LIC026	03/19/01	04/17/01	04/17/01
CHLORIDE BY IC	003 MS	W	01LIC026	03/19/01	04/17/01	04/17/01
FLUORIDE BY IC	003	W	01LIC026	03/19/01	04/17/01	04/17/01
FLUORIDE BY IC	003 REP	W	01LIC026	03/19/01	04/17/01	04/17/01
FLUORIDE BY IC	003 MS	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRITE BY IC	003	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRITE BY IC	003 REP	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRITE BY IC	003 MS	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRATE BY IC	003	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRATE BY IC	003 REP	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRATE BY IC	003 MS	W	01LIC026	03/19/01	04/17/01	04/17/01
PHOSPHATE BY IC	003	W	01LIC026	03/19/01	04/17/01	04/17/01
PHOSPHATE BY IC	003 REP	W	01LIC026	03/19/01	04/17/01	04/17/01
PHOSPHATE BY IC	003 MS	W	01LIC026	03/19/01	04/17/01	04/17/01
SULFATE BY IC	003	W	01LIC026	03/19/01	04/17/01	04/17/01
SULFATE BY IC	003 REP	W	01LIC026	03/19/01	04/17/01	04/17/01
SULFATE BY IC	003 MS	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRATE NITRITE	003	W	01LN3B20	03/19/01	04/06/01	04/06/01
NITRATE NITRITE	003 REP	W	01LN3B20	03/19/01	04/06/01	04/06/01
NITRATE NITRITE	003 MS	W	01LN3B20	03/19/01	04/06/01	04/06/01
TOTAL DISSOLVED SOLI	003	W	01LSS049	03/19/01	03/23/01	03/26/01
TOTAL DISSOLVED SOLI	003 REP	W	01LSS049	03/19/01	03/23/01	03/26/01
TOTAL ORGANIC HALIDE	003	W	01LX010	03/19/01	03/26/01	03/29/01
B11DF0						
ALKALINITY	005	W	01LAKA20	03/19/01	03/28/01	03/28/01
BROMIDE BY IC	005	W	01LIC026	03/19/01	04/17/01	04/17/01
CHLORIDE BY IC	005	W	01LIC026	03/19/01	04/17/01	04/17/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-024 H1291

DATE RECEIVED: 03/22/01 LVL LOT # :0103L345

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
FLUORIDE BY IC	005	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRITE BY IC	005	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRATE BY IC	005	W	01LIC026	03/19/01	04/17/01	04/17/01
PHOSPHATE BY IC	005	W	01LIC026	03/19/01	04/17/01	04/17/01
SULFATE BY IC	005	W	01LIC026	03/19/01	04/17/01	04/17/01
NITRATE NITRITE	005	W	01LN3B20	03/19/01	04/06/01	04/06/01
TOTAL DISSOLVED SOLI	005	W	01LSS049	03/19/01	03/23/01	03/26/01
TOTAL ORGANIC HALIDE	005	W	01LX010	03/19/01	03/26/01	03/29/01
TOTAL ORGANIC HALIDE	005 REP	W	01LX010	03/19/01	03/26/01	03/29/01
TOTAL ORGANIC HALIDE	005 MS	W	01LX010	03/19/01	03/26/01	03/29/01

LAB QC:

ALKALINITY	MB1	W	01LAKA20	N/A	03/28/01	03/28/01
ALKALINITY	MB1 BS	W	01LAKA20	N/A	03/28/01	03/28/01
ALKALINITY	MB1 BSD	W	01LAKA20	N/A	03/28/01	03/28/01
BROMIDE BY IC	MB1	W	01LIC026	N/A	04/17/01	04/17/01
BROMIDE BY IC	MB1 BS	W	01LIC026	N/A	04/17/01	04/17/01
CHLORIDE BY IC	MB1	W	01LIC026	N/A	04/17/01	04/17/01
CHLORIDE BY IC	MB1 BS	W	01LIC026	N/A	04/17/01	04/17/01
FLUORIDE BY IC	MB1	W	01LIC026	N/A	04/17/01	04/17/01
FLUORIDE BY IC	MB1 BS	W	01LIC026	N/A	04/17/01	04/17/01
NITRITE BY IC	MB1	W	01LIC026	N/A	04/17/01	04/17/01
NITRITE BY IC	MB1 BS	W	01LIC026	N/A	04/17/01	04/17/01
NITRATE BY IC	MB1	W	01LIC026	N/A	04/17/01	04/17/01
NITRATE BY IC	MB1 BS	W	01LIC026	N/A	04/17/01	04/17/01
PHOSPHATE BY IC	MB1	W	01LIC026	N/A	04/17/01	04/17/01
PHOSPHATE BY IC	MB1 BS	W	01LIC026	N/A	04/17/01	04/17/01
SULFATE BY IC	MB1	W	01LIC026	N/A	04/17/01	04/17/01
SULFATE BY IC	MB1 BS	W	01LIC026	N/A	04/17/01	04/17/01
NITRATE NITRITE	MB1	W	01LN3B20	N/A	04/06/01	04/06/01
NITRATE NITRITE	MB1 BS	W	01LN3B20	N/A	04/06/01	04/06/01
TOTAL DISSOLVED SOLI	MB1	W	01LSS049	N/A	03/23/01	03/26/01
TOTAL DISSOLVED SOLI	MB1 BS	W	01LSS049	N/A	03/23/01	03/26/01
TOTAL DISSOLVED SOLI	MB1 BSD	W	01LSS049	N/A	03/23/01	03/26/01
TOTAL ORGANIC HALIDE	LCS BS	W	01LX010	N/A	03/26/01	03/26/01
TOTAL ORGANIC HALIDE	MB1	W	01LX010	N/A	03/26/01	03/26/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD C01-024 H1291
LVL#: 0103L345

W.O.#: 11343-606-001-9999-00
Date Received: 03-22-01

INORGANIC NARRATIVE

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

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate, Nitrite and Phosphate that were received past hold and Bromide, Chloride, Fluoride and Sulfate that were analyzed past hold

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

5. The method blanks (MB) were within the method criteria with the exception of 01LAKA20-MB1 for Alkalinity and 01LSS049-MB1 for Total Dissolved Solids (TDS) that were above the reporting limits; result for TDS MB 01LSS049-MB1 may be attributed to isolated contamination of the analysis glassware. Sample results associated with MB 01LAKA20-MB1 and 01LSS049-MB1 were greater than 10 times the reporting limits.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

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

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

9. 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 package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

05-07-01
Date

njp\i03-345

The results presented in this report relate to the analytical testing and conditions of the samples upon 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 18 pages.

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

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
✓ Alkalinity ___ Bicarbonate ___ Carbonate	✓ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chromatography:			
✓ Bromide ✓ Chloride ✓ Fluoride	✓ 300.0	___ 9056	
✓ Nitrate ✓ Nitrite ✓ Phosphate	✓ 300.0	___ 9056	
✓ Sulfate ___ Formate ___ Acetate ___ Oxalate	✓ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chlorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B ___ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b)
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
✓ Nitrate-Nitrite ___ Nitrate ___ Nitrite	✓ 353.2		
Ammonia	___ 350.3		
Total___ Kjeldahl ___ Organic Nitrogen	___ 351.3		
Total___ Organic ___ Inorganic Carbon	___ 415.1	___ 9060	
Oil & Grease	___ 413.1	___ 9070	
___ pH ____ pH; paper	___ 150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 ___ 420.2	___ 9065 ___ 9066	
___ Ortho ___ Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1	___ 9030B/9034 (acid soluble)	
Reactive ___ Cyanide ___ Sulfide		___ Section 7.3 (___9014___9030B)	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach		___ 1312	
Total ✓ Dissolved ___ Suspended ___ Solids	160 ✓.1	___.2 ___.3	
Total Organic Halides	___ 450.1	✓ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
___ Total ___ Dissolved ___ Suspended	___ 160.4		

Other: **Method:**

002 1/13/10

L-WI-034/A-01/01

Lionville Laboratory Incorporated

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.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/20/01

CLIENT: TNUHANFORD C01-024 H1291

LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B11DF2	Alkalinity	144		MG/L	2.0	1.0
		Bromide by IC	1.2	u	MG/L	1.2	5.0
		Chloride by IC	27.6		MG/L	1.2	5.0
		Fluoride by IC	2.5	u	MG/L	2.5	5.0
		Nitrite by IC	1.25	u	MG/L	1.25	5.0
		Nitrate by IC	159		MG/L	5.00	20.0
		Phosphate by IC	1.2	u	MG/L	1.2	5.0
		Sulfate by IC	39.5		MG/L	1.2	5.0
		Nitrate Nitrite	31.3		MG/L	1.0	50.0
		Total Dissolved Solids	436		MG/L	5.00	1.0
		Total Organic Halides	20.0	u	UG/L	20.0	1.0
-005	B11DF0	Alkalinity	152		MG/L	2.0	1.0
		Bromide by IC	1.2	u	MG/L	1.2	5.0
		Chloride by IC	22.3		MG/L	1.2	5.0
		Fluoride by IC	2.5	u	MG/L	2.5	5.0
		Nitrite by IC	1.25	u	MG/L	1.25	5.0
		Nitrate by IC	155		MG/L	5.00	20.0
		Phosphate by IC	1.2	u	MG/L	1.2	5.0
		Sulfate by IC	37.8		MG/L	1.2	5.0
		Nitrate Nitrite	32.2		MG/L	1.0	50.0
		Total Dissolved Solids	349		MG/L	5.00	1.0
		Total Organic Halides	20.0	u	UG/L	20.0	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/20/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LAKA20-MB1	Alkalinity	1.0	MG/L	0.50	1.0
BLANK10	01LIC026-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	01LN3B20-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	01LSS049-MB1	Total Dissolved Solids	31.0	MG/L	5.00	1.0
BLANK1	01LX010-MB1	Total Organic Halides	12.0 u	UG/L	12.0	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 04/20/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	B11DF2	Bromide by IC	48.0	0.00	50.0	96.1	10.0
		Chloride by IC	74.9	27.6	50.0	94.6	10.0
		Fluoride by IC	52.7	0.14	50.0	105.2	5.0
		Nitrite by IC	25.0	1.25u	25.0	99.8	5.0
		Nitrate by IC	407	159	250	99.4	50.0
		Phosphate by IC	23.9	1.2 u	25.0	95.4	5.0
		Sulfate by IC	88.7	39.5	50.0	98.4	10.0
		Nitrate Nitrite	85.1	31.3	50.0	107.6	100
-005	B11DF0	Total Organic Halides	83.9	3.9	83.3	96.0	1.0
BLANK10	01LAKA20-MB1	Alkalinity	97.0	1.0	100	96.0	1.0
		Alkalinity MSD	97.0	1.0	100	96.0	1.0
BLANK10	01LIC026-MB1	Bromide by IC	4.9	0.25u	5.0	97.9	1.0
		Chloride by IC	4.6	0.25u	5.0	92.8	1.0
		Fluoride by IC	10.8	0.50u	10.0	107.5	1.0
		Nitrite by IC	4.91	0.25u	5.00	98.2	1.0
		Nitrate by IC	5.03	0.25u	5.00	100.5	1.0
		Phosphate by IC	5.0	0.25u	5.0	101.0	1.0
		Sulfate by IC	4.9	0.25u	5.0	98.4	1.0
BLANK10	01LN3B20-MB1	Nitrate Nitrite	0.54	0.02u	0.50	107.8	1.0
BLANK10	01LSS049-MB1	Total Dissolved Solids	88.0	0.000	100	88.0	1.0
		Total Dissolved Solids	95.0	0.000	100	95.0	1.0
LCSS	01LX010-LCS	Total Organic Halides	51.6	12.0 u	50.0	103.2	1.0

Lionville Lababoratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 04/20/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	01LAKA20-MB1	Alkalinity	96.0	96.0	0.00
BLANK10	01LSS049-MB1	Total Dissolved Solids	88.0	95.0	7.7

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 04/20/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-003REP	B11DF2	Alkalinity	144	144	0.00	1.0
		Bromide by IC	1.2 u	1.2 u	NC	5.0
		Chloride by IC	27.6	26.7	3.2	5.0
		Fluoride by IC	2.5 u	2.5 u	NC	5.0
		Nitrite by IC	1.25u	1.25u	NC	5.0
		Nitrate by IC	159	157	0.89	20.0
		Phosphate by IC	1.2 u	1.2 u	NC	5.0
		Sulfate by IC	39.5	39.9	0.99	5.0
		Nitrate Nitrite	31.3	32.6	3.9	50.0
		Total Dissolved Solids	436	409	6.4	1.0
-005REP	B11DF0	Total Organic Halides	20.0 u	20.0 u	NC	1.0

Lionville Laboratory Use Only

01031345

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI Lionville Laboratory Inc.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD C01-024

Est. Final Proj. Sampling Date:

Project #: 11343-0000-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OS

QC: Spec Del: Std TAT: 30day

Date Rec'd: 3-22-01 Date Due: 4-21-01

		ABC							D		E	F	G	H	I
Refrigerator #		1							2		2	1	2	2	2
#/Type Container	Liquid	3AG				1PL			1PL		1PL	1AG	1PL	1PL	1PL
	Solid														
Volume	Liquid	40				20			500		1L	500	500	250	500
	Solid														
Preservatives		HCl/H2SO4				Cool 5-22-01			H2SO3		—	H2SO4	—	—	H2SO4

ANALYSES REQUESTED →

ORGANIC					INORG						
VOA	BNA	Pest/PCB	Herb	ACTIVITY SCAN	Metal	CN	TDS	TOX	IC Anions	Alkalinity	NO2/NO3

Lionville Laboratory Use Only

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OC24H							Met(1)		ITDS	ITOX	IC(1)	IALKL	IN3N2
S - Soil	001	B11L91			W	3-19-01	0730	X													
SE - Sediment	002	B11L90				3-19-01	0730	X													
SO - Solid	003	B11DF2				3-19-01	1203	X							X		X	X	X	X	X
SL - Sludge	004	B11DF1				3-19-01	1203								X						
W - Water	005	B11DF0				3-19-01	1203	X							X		X	X	X	X	X
O - Oil	006	B11DD9				3-19-01	1203								X						
A - Air																					
DS - Drum Solids																					
DL - Drum Liquids																					
L - EP/TCLP Leachate																					
WI - Wipe																					
X - Other																					
F - Fish																					

Special Instructions: Saf C01-024
Run Matrix QC

DATE/REVISIONS:
Met(1) 1. As, Ba, Cr, Pb, Sr, V, Zn, Sn
IC(1) 2. Br, Cl, Fl, NO2, NO3, PO4, SO4
3.
4.
5.
6.

Lionville Laboratory 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) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or (N) Not Rec'd

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

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 8245 1391 1586

Relinquished by	Received by	Date	Time
FED EX	Carlos Hernandez	3-22-01	10:00

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C.O.C. # C01-024-14

Page 1 of 1

12

Collector: K.J. YOUNG	Contact/Requester	Telephone No. MSIN FAX
SAF No. C01-024	Sampling Origin	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFSNW-SAWS-H43	Ice Chest No. SML 533 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment	Bill of Lading/Air Bill No. 4235-7954-3109
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11L91		W	3-19-01	0730	3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11L91		W	↓	↓	1x20-mL P	Activity Scan	None

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG	3-19-01 1315	Fed Ex	3-19-01
FED EXPRESS	3-20-01 10 AM	E. SEGURO E. Segura	3-20-01 10 AM
E. Segura	3-21-01 16:30	FED. EXPRESS	3-21-01 16:30
FED EX 3-22-01	10:00	Carlos Hernandez	3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG 41291

C.O.C. # C01-024-13

Page 1 of 1

13

Collector K.J. YOUNG	Contact/Requester	Telephone No. MSIN FAX
SAF No. C01-024	Sampling Origin	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFS NW-SRWS-11 4J	Ice Chest No. SINL188 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment	Bill of Lading/Air Bill No. 4235-7954-3094
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11L90 ✓		W	3-19-01	0730	(3)x40-mL aGs*	VOA - 8240A (TCL) ✓	HCl or H2SO4 to pH <2 Cool 4C
B11L90 ✓		W	↓	↓	1x20-mL P	Activity Scan ✓	None

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG	1315 3-19-01	Fed Ex	3-19-01
Relinquished By: FED. EXPRESS	10 AM 3-20-01	Received By: E. SEGURO E. Segure	10 AM 3-20-01
Relinquished By: E. Segure	16:30 3-21-01	Received By: FED. EXPRESS	16:30 3-21-01
Relinquished By: FED EX	3-22-01 10:00	Received By: Carlos Hernandez	3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDGH1291

C.O.C. # C01-024-8

SAF No. C01-024

Contact/Requestor JH KESSNER

Telephone No. (509) 375-4688

MSIN

FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF2		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF2		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF2		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF2		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. YOUNG		Jan Young	3-19-01 1315	Fed Ex			3-19-01
FED EXPRESS			3-20-01 10AM	E. SEGURO		E. Segura	3-20-01 10:AM
E. Segura			3-21-01 16:20	FED. EXPRESS			3-21-01 16:20
FED EX			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C01-024-8

Collector: K.J. YOUNG	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-024	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ERDF GW MONITORING, MARCH 2001	Logbook No.: DESNW-5 ALUS-H43	Ice Chest No.: SDA1533 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235-7954-3109
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF1 (F)		W	3/20/01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF2		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF2		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF2		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF2		W			1x20-mL P	Activity Scan	None
B11DF2		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF2		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF2		W			1x1000-mL G/P	Carbon-14	None
B11DF2		W			4x1000-mL G/P	Iodine-129	None
B11DF2		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG	3-19-01 1315	Fed Ex	3-19-01
FED. EXPRESS	3-20-01 10 AM	E. SEGURO / E. Segura	3-20-01 10 AM
E. Segura	3-21-01 16:30	FED. EXPRESS	3-21-01 16:30
FED Ex	3-22-01 10:00	Carlos Hernandez	3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By: Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C01-024-7

Collector K.J. YOUNG	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-024	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFSNW-SAWS-1143	Ice Chest No. SML188 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235-7954-3094
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DD9 (F)		W	3-19-01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) (Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Tin)	HNO3 to pH <2
B11DF0		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF0		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) (Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Tin)	HNO3 to pH <2
B11DF0		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF0		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF0		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF0		W			1x20-mL P	Activity Scan	None
B11DF0		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF0		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF0		W			1x1000-mL G/P	Carbon-14	None
B11DF0		W			4x1000-mL G/P	Iodine-129	None
B11DF0		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG	3-19-01 1315	Fed Ex	3-19-01
FED EXPRESS	3-20-01 10AM	E. SEGURO	3-20-01 10:00 AM
~~FED~~ ELVIE SEGURO	3-21-01 16:30	FED. EXPRESS	3-21-01 16:30
FED Ex 3-22-01 10:00		Carlos Hernandez 3-22-01 10:00	

Matrix *

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

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C01-024-7

SAF No. C01-024

Contact/Requestor: JH KESSNER

Telephone No. (509) 375-4688

MSIN

FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF0		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF0		W	↓	↓	1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF0		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF0		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	K.J. YOUNG	[signature]	3-19-01 / 1315		Fed Ex		3-19-01
Relinquished By			Date/Time	Received By			Date/Time
FED. EXPRESS			3-20-01 10 AM	E. SEGURO			3-20-01
Relinquished By			Date/Time	Received By			Date/Time
E. Segure			3-21-01 16:30	FED. EXPRESS			3-21-01
Relinquished By			Date/Time	Received By			Date/Time
FED Ex			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

Figure 1. Sample Check-in List

Date/Time Received: 3-22-01 1000

SDG#: 01036349

Work Order Number: —

SAF# C01-024

Shipping Container ID: _____

Chain of Custody # C01-024-14,13,8,7

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 3°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 26
7. Sample holding times exceeded? NO2 NO3 PO4 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: Thompson / LULI Date: 3-22-01

Telephoned to: _____ On _____ By _____

MAY 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-024 H1291

DATE RECEIVED: 03/22/01 LVL LOT # :0103L345

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11DF2						
ARSENIC, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
ARSENIC, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
ARSENIC, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
BARIUM, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
BARIUM, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
BARIUM, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
CHROMIUM, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
CHROMIUM, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
CHROMIUM, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
LEAD, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
LEAD, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
LEAD, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
SELENIUM, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
SELENIUM, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
SELENIUM, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
TIN, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
TIN, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
TIN, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
VANADIUM, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
VANADIUM, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
VANADIUM, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
ZINC, TOTAL	003	W	01L0216	03/19/01	04/25/01	04/25/01
ZINC, TOTAL	003 REP	W	01L0216	03/19/01	04/25/01	04/25/01
ZINC, TOTAL	003 MS	W	01L0216	03/19/01	04/25/01	04/25/01
B11DF1						
ARSENIC, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01
BARIUM, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01
CHROMIUM, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01
LEAD, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01
SELENIUM, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01
TIN, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01
VANADIUM, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01
ZINC, TOTAL	004	W	01L0216	03/19/01	04/25/01	04/25/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-024 H1291

DATE RECEIVED: 03/22/01 LVL LOT # :0103L345

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11DF0						
ARSENIC, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
BARIUM, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
CHROMIUM, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
LEAD, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
SELENIUM, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
TIN, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
VANADIUM, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
ZINC, TOTAL	005	W	01L0216	03/19/01	04/25/01	04/25/01
B11DD9						
ARSENIC, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01
BARIUM, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01
CHROMIUM, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01
LEAD, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01
SELENIUM, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01
TIN, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01
VANADIUM, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01
ZINC, TOTAL	006	W	01L0216	03/19/01	04/25/01	04/25/01

LAB QC:

ARSENIC LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01
ARSENIC, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01
BARIUM LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01
BARIUM, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01
CHROMIUM LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01
CHROMIUM, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01
LEAD LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01
LEAD, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01
SELENIUM LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01
SELENIUM, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01
TIN LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01
TIN, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01
VANADIUM LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-024 H1291

DATE RECEIVED: 03/22/01 LVL LOT # :0103L345

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01
ZINC LABORATORY	LC1 BS	W	01L0216	N/A	04/25/01	04/25/01
ZINC, TOTAL	MB1	W	01L0216	N/A	04/25/01	04/25/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD C01-024
LVL#: 0103L345
SDG/SAF#: H1291/C01-024

W.O.#: 11343-606-001-9999-00
Date Received: 03-22-01

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 water samples.

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.

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

7. The preparation/method blank for 1 analyte was outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a.) The MB result for Zinc was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and samples B11DF1 and B11DD9 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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

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

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

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 19 pages.

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

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

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 Incorporated. Some forms may still reference Recra LabNet Philadelphia.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

05-07-01
Date

jjw/m03-345

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0103L345

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

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

Other:_____ Method:_____

L-WI-033/M-11/99

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B11DF2	Arsenic, Total	2.4		UG/L	2.3	1.0
		Barium, Total	72.3		UG/L	0.20	1.0
		Chromium, Total	21.5		UG/L	0.90	1.0
		Lead, Total	3.1		UG/L	2.6	1.0
		Selenium, Total	2.6	u	UG/L	2.6	1.0
		Tin, Total	3.5	u	UG/L	3.5	1.0
		Vanadium, Total	28.1		UG/L	0.70	1.0
		Zinc, Total	208		UG/L	0.30	1.0
-004	B11DF1	Arsenic, Total	3.2		UG/L	2.3	1.0
		Barium, Total	68.1		UG/L	0.20	1.0
		Chromium, Total	3.8		UG/L	0.90	1.0
		Lead, Total	2.6	u	UG/L	2.6	1.0
		Selenium, Total	3.6		UG/L	2.6	1.0
		Tin, Total	3.5	u	UG/L	3.5	1.0
		Vanadium, Total	25.0		UG/L	0.70	1.0
		Zinc, Total	17.4		UG/L	0.30	1.0
-005	B11DF0	Arsenic, Total	2.3	u	UG/L	2.3	1.0
		Barium, Total	69.6		UG/L	0.20	1.0
		Chromium, Total	31.2		UG/L	0.90	1.0
		Lead, Total	4.5		UG/L	2.6	1.0
		Selenium, Total	3.1		UG/L	2.6	1.0
		Tin, Total	3.5	u	UG/L	3.5	1.0
		Vanadium, Total	27.4		UG/L	0.70	1.0
		Zinc, Total	211		UG/L	0.30	1.0
-006	B11DD9	Arsenic, Total	4.5		UG/L	2.3	1.0
		Barium, Total	69.9		UG/L	0.20	1.0
		Chromium, Total	4.5		UG/L	0.90	1.0
		Lead, Total	2.6	u	UG/L	2.6	1.0
		Selenium, Total	2.6	u	UG/L	2.6	1.0
		Tin, Total	3.5	u	UG/L	3.5	1.0
		Vanadium, Total	25.3		UG/L	0.70	1.0
		Zinc, Total	17.5		UG/L	0.30	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/26/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0216-MB1	Arsenic, Total	2.3	u	UG/L	2.3	1.0
		Barium, Total	0.25		UG/L	0.20	1.0
		Chromium, Total	0.90	u	UG/L	0.90	1.0
		Lead, Total	2.6	u	UG/L	2.6	1.0
		Selenium, Total	2.6	u	UG/L	2.6	1.0
		Tin, Total	3.5	u	UG/L	3.5	1.0
		Vanadium, Total	0.70	u	UG/L	0.70	1.0
		Zinc, Total	1.3		UG/L	0.30	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 04/26/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	B11DF2	Arsenic, Total	1960	2.4	2000	97.9	1.0
		Barium, Total	1970	72.3	2000	95.1	1.0
		Chromium, Total	224	21.5	200	101.1	1.0
		Lead, Total	485	3.1	500	96.4	1.0
		Selenium, Total	1960	2.6 u	2000	98.0	1.0
		Tin, Total	1030	3.5 u	1000	102.5	1.0
		Vanadium, Total	531	28.1	500	100.5	1.0
		Zinc, Total	700	208	500	98.5	1.0

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 04/26/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-003REP	B11DF2	Arsenic, Total	2.4	4.3	56.7	1.0
		Barium, Total	72.3	70.6	2.4	1.0
		Chromium, Total	21.5	25.8	18.2	1.0
		Lead, Total	3.1	2.6 u	~~NC~~ 200	1.0
		Selenium, Total	2.6 u	2.6 u	NC	1.0
		Tin, Total	3.5 u	3.5 u	NC	1.0
		Vanadium, Total	28.1	27.9	0.71	1.0
		Zinc, Total	208	206	0.82	1.0

MW 5/3/01

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/26/01

CLIENT: TNUHANFORD C01-024 H1291 LVL LOT #: 0103L345

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0216-LC1	Arsenic, LCS	9600	10000	UG/L	96.0
		Barium, LCS	4740	5000	UG/L	94.7
		Chromium, LCS	492	500	UG/L	98.3
		Lead, LCS	2450	2500	UG/L	98.0
		Selenium, LCS	9660	10000	UG/L	96.6
		Tin, LCS	5010	5000	UG/L	100.1
		Vanadium, LCS	2510	2500	UG/L	100.4
		Zinc, LCS	989	1000	UG/L	98.9

Lionville Laboratory Use Only

0103L345

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD C01-024

Est. Final Proj. Sampling Date:

Project #: 11343-0006-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OS

QC: Spec Del: Std TAT: 30day

Date Rec'd: 3-22-01 Date Due: 4-21-01

		ABC							D		E	F	G	H	I	
Refrigerator #		1							2		2	1	2	2	2	
#/Type Container	Liquid	3AG				1PL			1PL		1PL	1AG	1PL	1PL	1PL	
	Solid															
Volume	Liquid	40				20			500		1L	500	500	250	500	
	Solid															
Preservatives	HCl/H2SO4					Cd 5-22-01			4/03		—	H2SO4	—	—	H2SO4	
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb	Activity SCAN			INORG: Metal	CN	TDS	TOX	IC Anions	Alkalinity	NO2/NO3	
Lionville Laboratory Use Only		OC24H							Met(1)		TTDS	TTOX	IC(1)	TALKL	Inorg2	

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	OC24H							Met(1)		TTDS	TTOX	IC(1)	TALKL	Inorg2	
001	B11L91			W	3-19-01	0730	X														
002	B11L90				3-19-01	0730	X														
003	B11DF2				3-19-01	1203	X							X		X	X	X	X	X	
004	B11DF1				3-19-01	1203								X							
005	B11DF0				3-19-01	1203	X							X		X	X	X	X	X	
006	B11DD9				3-19-01	1203								X							

Special Instructions: Saf C01-024
Run Matrix QC

DATE/REVISIONS:
Met(1) 1. As, Ba, Cr, Pb, Sr, V, Zn, Sn
IC(1) 2. Br, Cl, Fl, NO2, NO3, PO4, SO4
3.
4.
5.
6.

Lionville Laboratory 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) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

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

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
8245 1391 1586

Relinquished by	Received by	Date	Time
FED EX	Carlos Hernandez	3-22-01	10:00

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C.O.C. # C01-024-14

Page 1 of 1

014

Collector K.J. YOUNG	Contact/Requester	Telephone No. MSIN FAX
SAF No. C01-024	Sampling Origin	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFS NW- SAWS-H43	Ice Chest No. SML 533 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment	Bill of Lading/Air Bill No. 4235-7954-3109
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11L91		W	3-19-01	0730	3x40-mL aGs*	VOA - 8240A (TCL) ✓	HCl or H2SO4 to pH <2 Cool 4C
B11L91		W	↓	↓	1x20-mL P	Activity Scan ✓	None

Relinquished By	Print / Sign	Date/Time	Received By	Print / Sign	Date/Time
K.J. YOUNG	K.J. Young	3-19-01 1315	Fed Ex		3-19-01
FED EXPRESS		3-20-01 10 AM	E. SEGURO	E. Segurw	3-20-01 10 AM
E. Segurw		3-21-01 16:30	FED. EXPRESS		3-21-01 16:30
FED EX	3-22-01	10:00	Carlos Hernandez		3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG 41291

C.O.C. # C01-024

Page 1 of 1

015

Collector K.J. YOUNG	Contact/Requester	Telephone No. MSIN FAX
SAF No. C01-024	Sampling Origin	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFS NW-SAWS-11 43	Ice Chest No. SINI 188 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment	Bill of Lading/Air Bill No. 4235-7954-3094
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ✓ No

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11L90 ✓		W	3-19-01	0730	(3)x40-mL aGs*	VOA - 8240A (TCL) ✓	HCl or H2SO4 to pH <2 Cool 4C
B11L90 ✓		W	↓	↓	1x20-mL P	Activity Scan ✓	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	K.J. YOUNG	[signature]	1315 3-19-01		Fed Ex		3-19-01
Relinquished By			Date/Time	Received By			Date/Time
FED. EXPRESS			10:AM 3-20-01		E. SEGURO E. Segure		10:AM 3-20-01
Relinquished By			Date/Time	Received By			Date/Time
E. Segure			16:30 3-21-01		FED. EXPRESS		16:30 3-21-01
Relinquished By			Date/Time	Received By			Date/Time
FED EX			3-22-01 10:00		Carlos Hernandez		3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

Page 1

016

Collector K.J. YOUNG	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-024	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFSNW-SAWS-H43	Ice Chest No. SDL533 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235-7954-3109
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF1 (F)		W	3-1-01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF2		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF2		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF2		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF2		W			1x20-mL P	Activity Scan	None
B11DF2		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF2		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF2		W			1x1000-mL G/P	Carbon-14	None
B11DF2		W			4x1000-mL G/P	Iodine-129	None
B11DF2		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. YOUNG			3-19-01 1315		Fed Ex		3-19-01
FED. EXPRESS			3-20-01 10 AM	E. SEGURO			3-20-01 10 AM
E. Segura			3-21-01 16:30	FED. EXPRESS			3-21-01 16:30
FED Ex			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDGH1291

C.O.C. # C01-0_ 017

Page 2 of 2

SAF No. C01-024

Contact/Requestor JH KESSNER

Telephone No. (509) 375-4688

MSIN

FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF2		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF2		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF2		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF2		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. YOUNG		Jon Young	3-19-01 1315		Fed Ex		3-19-01
FED EXPRESS			3-20-01 10 AM	E. SEGURO		E. Segura	3-20-01 10 AM
E. Segura			3-21-01 16:20	FED. EXPRESS			3-21-01 16:20
FED EX			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

Page 1

018

Collector K.J. YOUNG	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-024	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFSNW-SAWS-H43	Ice Chest No. SML188 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235-7954-3094
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DD9 (F)		W	3-19-01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) (Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Tin)	HNO3 to pH <2
B11DF0		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF0		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) (Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Tin)	HNO3 to pH <2
B11DF0		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF0		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF0		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF0		W			1x20-mL P	Activity Scan	None
B11DF0		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF0		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF0		W			1x1000-mL G/P	Carbon-14	None
B11DF0		W			4x1000-mL G/P	Iodine-129	None
B11DF0		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. YOUNG		[signature]	3-19-01 1315	Fed Ex			3-19-01
FED EXPRESS			3-20-01 10:00	E. SEGURO		[signature]	3-20-01 10:00
ELVIE SEGURO			3-21-01 16:30	FED. EXPRESS			3-21-01 16:30
FED Ex			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C.O.C. # C01-02

019

SAF No. C01-024

Contact/Requestor: JH KESSNER

Telephone No. (509) 375-4688

MSIN

FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF0		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF0		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF0		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF0		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	K.J. YOUNG	[signature]	3-19-01 / 1315		FED EX		3-19-01
Relinquished By			Date/Time	Received By			Date/Time
FED. EXPRESS			3-20-01 10AM	E. SEGURO			3-20-01
Relinquished By			Date/Time	Received By			Date/Time
E. Segurd			3-21-01 16:30	FED. EXPRESS			3-21-01
Relinquished By			Date/Time	Received By			Date/Time
FED Ex			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-024 H1291

DATE RECEIVED: 03/22/01 LVL LOT # :0103L345

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11L91	001	W	01LVH103	03/19/01	N/A	03/27/01
B11L90	002	W	01LVH103	03/19/01	N/A	03/27/01
B11DF2	003	W	01LVH103	03/19/01	N/A	03/27/01
B11DF0	005	W	01LVH103	03/19/01	N/A	03/27/01
B11DF0	005 MS	W	01LVH103	03/19/01	N/A	03/27/01
B11DF0	005 MSD	W	01LVH103	03/19/01	N/A	03/27/01
LAB QC:						
VBLKSO	MB1	W	01LVH103	N/A	N/A	03/27/01
VBLKSO	MB1 BS	W	01LVH103	N/A	N/A	03/27/01
VBLKSO	MB1 BSD	W	01LVH103	N/A	N/A	03/27/01

MAY 2001
RECEIVED

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD C01-024
RFW #: 0103L345
SDG/SAF #: H1291/C01-024

W.O. #: 11343-606-001-9999-00
Date Received: 03-22-2001

GC/MS VOLATILE

Four (4) water samples were collected on 03-19-2001.

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 TCL Volatile target compounds on 03-27-2001.

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 temperatures upon receipt have been recorded on the chain-of-custody.

2. Samples were analyzed within required holding time.

3. Non-target compounds were detected in sample B11L91.

4. All surrogate recoveries were within EPA QC limits.

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

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

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

8. Internal standard area and retention time criteria were met.

9. "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."

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

J. Michael Taylor
President
Lionville Laboratory Incorporated

5/9/01
Date

som\group\data\voa\tnu-hanford-0103-345.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 2 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

Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 05/04/01 18:55

RFW Batch Number: **0103L345** Client: **TNUHANFORD C01-024 H1291** Work Order: 11343606001 Page: 1a

	Cust ID:	B11L91		B11L90		B11DF2		B11DF0		B11DF0		B11DF0	
Sample Information	RFW#:	001		002		003		005		005 MS		005 MSD	
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate Recovery	Toluene-d8	100	%	99	%	98	%	99	%	95	%	94	%
	Bromofluorobenzene	106	%	106	%	105	%	106	%	102	%	101	%
	1,2-Dichloroethane-d4	102	%	100	%	102	%	102	%	98	%	95	%
			fl		fl		fl		fl		fl		fl
Chloromethane		10	U	10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U	10	U
Methylene Chloride		2	JB	4	JB	1	JB	3	JB	6	B	2	JB
Acetone		10	U	10	U	10	U	10	U	10	U	10	U
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	5	U	5	U	5	U	83	%	84	%
1,1-Dichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	5	U	5	U	5	U
Chloroform		5	U	5	U	1	J	1	J	1	J	1	J
1,2-Dichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5		6		5		5	
Bromodichloromethane		5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	5	U	5	U	5	U	91	%	88	%
Dibromochloromethane		5	U	5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
Benzene		5	U	5	U	5	U	5	U	100	%	97	%
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	5	U	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	5	U	5	U	5	U
Toluene		5	U	5	U	5	U	5	U	101	%	99	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0103L345** Client: **TNUHANFORD C01-024 H1291** Work Order: 11343606001 Page: 1b

Cust ID:	B11L91	B11L90	B11DF2	B11DF0	B11DF0	B11DF0
RFW#:	001	002	003	005	005 MS	005 MSD
Chlorobenzene	5 U	5 U	5 U	5 U	102 %	100 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List
Report Date: 05/04/01 18:55

RFW Batch Number: **0103L345** Client: **TNUHANFORD C01-024 H1291** Work Order: 11343606001 Page: 2a

	Cust ID:	**VBLKSO**		**VBLKSO BS**		**VBLKSO BSD**	
Sample Information	RFW#:	**01LVH103-MB1**		**01LVH103-MB1**		**01LVH103-MB1**	
	Matrix:	WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L	
Surrogate Recovery	Toluene-d8	95	%	95	%	92	%
	Bromofluorobenzene	102	%	104	%	98	%
	1,2-Dichloroethane-d4	98	%	97	%	96	%
Chloromethane		10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U
Methylene Chloride		4	J	4	JB	10	B
Acetone		10	U	10	U	10	U
Carbon Disulfide		5	U	5	U	5	U
1,1-Dichloroethene		5	U	84	%	83	%
1,1-Dichloroethane		5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U
Chloroform		5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U
Bromodichloromethane		5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U
Trichloroethene		5	U	90	%	88	%
Dibromochloromethane		5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U
Benzene		5	U	97	%	97	%
Trans-1,3-Dichloropropene		5	U	5	U	5	U
Bromoform		5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U
Tetrachloroethene		5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U
Toluene		5	U	96	%	97	%

*= Outside of EPA CLP QC limits.

Cust ID:	**VBLKSO**	**VBLKSO BS**	**VBLKSO BSD**
RFW#:	**01LVH103-MB1**	**01LVH103-MB1**	**01LVH103-MB1**
Chlorobenzene	5 U	96 %	98 %
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B11L91

Lab Name: Lionville Labs, Inc. Contract: 11343606001

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

Matrix: (soil/water) WATER Lab Sample ID: 0103L345-001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: h032708

Level: (low/med) LOW Date Received: 03/22/01

% Moisture: not dec. _____ Date Analyzed: 03/27/01

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	22.280	20	J
2.	SILOXANE	25.548	40	J

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B11L90

Lab Name: Lionville Labs, Inc. Contract: 11343606001

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

Matrix: (soil/water) WATER Lab Sample ID: 0103L345-002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: h032709

Level: (low/med) LOW Date Received: 03/22/01

% Moisture: not dec. _____ Date Analyzed: 03/27/01

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B11DF2

Lab Name: Lionville Labs, Inc. Contract: 11343606001

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

Matrix: (soil/water) WATER Lab Sample ID: 0103L345-003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: h032710

Level: (low/med) LOW Date Received: 03/22/01

% Moisture: not dec. _____ Date Analyzed: 03/27/01

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B11DF0

Lab Name: Lionville Labs, Inc. Contract: 11343606001

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

Matrix: (soil/water) WATER Lab Sample ID: 0103L345-005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: h032711

Level: (low/med) LOW Date Received: 03/22/01

% Moisture: not dec. _____ Date Analyzed: 03/27/01

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKSO

Lab Name: Lionville Labs, Inc. Contract: 11343606001

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

Matrix: (soil/water) WATER Lab Sample ID: 01LVH103-MB1

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: h032704

Level: (low/med) LOW Date Received: 03/27/01

% Moisture: not dec. _____ Date Analyzed: 03/27/01

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

FORM 1 VOA-TIC 1/87 Rev.

Lionville Laboratory Use Only

01031345

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD C01-024

Est. Final Proj. Sampling Date:

Project #: 11343-0006-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OS

QC: Spec Del: Std TAT: 30day

Date Rec'd: 3-22-01 Date Due: 4-21-01

		ABC							D		E	F	G	H	I
Refrigerator #		1							2		2	1	2	2	2
#/Type Container	Liquid	3AG				1PL			1PL		1PL	1AG	1PL	1PL	1PL
	Solid														
Volume	Liquid	40				20			500		1L	500	500	250	500
	Solid														
Preservatives		HCL/H2SO4				Activity Cal 3-22-01			H2O3		—	H2SO4	—	—	H2SO4
ANALYSES REQUESTED →		ORGANIC							INORG						
		VOA	BNA	Pest/PCB	Herb	SCAN			Metal	CN	TDS	TOX	IC Anions	Alkalinity	NO2/NO3
Lionville Laboratory Use Only		OC24H							Met(1)		ITDS	ITOX	IC(1)	IALKL	INO2N3

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OC24H	Met(1)	ITDS	ITOX	IC(1)	IALKL	INO2N3
S - Soil	001	B11L91			W	3-19-01	0730	X						
SE - Sediment	002	B11L90				3-19-01	0730	X						
SO - Solid	003	B11DF2				3-19-01	1203	X	X	X	X	X	X	X
SL - Sludge	004	B11DF1				3-19-01	1203		X					
W - Water	005	B11DF0				3-19-01	1203	X	X	X	X	X	X	X
O - Oil	006	B11DD9				3-19-01	1203		X					
A - Air														
DS - Drum Solids														
DL - Drum Liquids														
L - EP/TCLP Leachate														
WI - Wipe														
X - Other														
F - Fish														

Special Instructions: Saf C01-024

Run Matrix QC

DATE/REVISIONS:

Met(1) 1. As, Ba, Cr, Pb, Se, V, Zn, Sn

IC(1) 2. Br, Cl, Fl, NO2, NO3, PO4, SO4

3.

4.

5.

6.

Lionville Laboratory 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) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N NO2 NO3 PO4

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 3 °C

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

NOTES: 8245 1391 1586

Relinquished by	Received by	Date	Time
FED EX	Carlos Hernandez	3-22-01	10:00

Relinquished by	Received by	Date	Time

COMPOSITE WASTE

ORIGINAL REWRITTEN

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C.O.C. # C01-024-14

Page 1 of 1

Collector: K.J. YOUNG	Contact/Requester	Telephone No. MSIN FAX
SAF No. C01-024	Sampling Origin	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFSNW-SAWS-H43	Ice Chest No. SML 533 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment	Bill of Lading/Air Bill No. 4235-7954-3109
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11L91		W	3-19-01	0730	3x40-mL aGs*	VOA - 8240A (TCL) ✓	HCl or H2SO4 to pH <2 Cool 4C
B11L91		W	↓	↓	1x20-mL P	Activity Scan ✓	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. YOUNG			3-19-01 1315	FED EX			3-19-01
FED EXPRESS			3-20-01 10 AM	E. SEGURO			3-20-01 10 AM
E. Segura			3-21-01 16:30	FED. EXPRESS			3-21-01 16:30
FED Ex			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG 41291

C.O.C. # C01-024-13

Page 1 of 1

Collector K.J. YOUNG	Contact/Requester	Telephone No. MSIN FAX
SAF No. C01-024	Sampling Origin	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFS NW-SAWS-11 43	Ice Chest No. SINI 188 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment	Bill of Lading/Air Bill No. 4235-7954-3094
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11L90 ✓		W	3-19-01	0730	3x40-mL aGs*	VOA - 8240A (TCL) ✓	HCl or H2SO4 to pH <2 Cool 4C
B11L90 ✓		W	↓	↓	1x20-mL P	Activity Scan ✓	None

Relinquished By	Date/Time	Received By	Date/Time
Print: K.J. YOUNG Sign: [signature]	1315 3-19-01	Print: Fed Ex Sign:	3-19-01
Relinquished By: FED. EXPRESS	Date/Time 10 AM 3-20-01	Received By: E. SEGURO E. Segurro	Date/Time 10 AM 3-20-01
Relinquished By: E. Segurro	Date/Time 16:30 3-21-01	Received By: FED. EXPRESS	Date/Time 16:30 3-21-01
Relinquished By: FED EX	Date/Time 3-22-01 10:00	Received By: Carlos Hernandez	Date/Time 3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDGH1291

C.O.C. # C01-024-8

SAF No. C01-024

Contact/Requestor JH KESSNER

Telephone No. (509) 375-4688 MSIN FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF2		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF2		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF2		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF2		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.J. YOUNG		Jon Young	3-19-01 1315		Fed Ex		3-19-01
FED EXPRESS			3-20-01 10AM	E. SEGURO		E. Segura	3-20-01 10AM
E. Segura			3-21-01 16:20	FED. EXPRESS			3-21-01 16:20
FED EX			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C.O.C. # C01-024

Collector: K.J. YOUNG	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-024	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ERDF GW MONITORING, MARCH 2001	Logbook No.: DFSNW-5 ACWS-H43	Ice Chest No.: SMI533 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235-7954-3109
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF1 (F)		W	3/1/01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF2		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) {Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Tin}	HNO3 to pH <2
B11DF2		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF2		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF2		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF2		W			1x20-mL P	Activity Scan	None
B11DF2		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF2		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF2		W			1x1000-mL G/P	Carbon-14	None
B11DF2		W			4x1000-mL G/P	Iodine-129	None
B11DF2		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG	3-19-01 1315	Fed Ex	3-19-01
FED EXPRESS	3-20-01 10AM	E. SEGURO E. Segura	3-20-01 10AM
E. Segura	3-21-01 16:30	FED EXPRESS	3-21-01 16:30
FED Ex	3-22-01 10:00	Carlos Hernandez	3-22-01 10:00

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C.O.C. # C01-024-7

Collector K.J. YOUNG	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-024	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title ERDF GW MONITORING, MARCH 2001	Logbook No. DFSNW-SMWS-1143	Ice Chest No. SML188 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235-7954-3094
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)
Submit deliverable & invoices to JH Kessner, BHI

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DD9 (F)		W	3-19-01	1203	1x500-mL G/P	ICP Metals - 6010A (SW-846) (Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Tin)	HNO3 to pH <2
B11DF0		W			3x40-mL aGs*	VOA - 8240A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B11DF0		W			1x500-mL G/P	ICP Metals - 6010A (SW-846) (Arsenic, Barium, Chromium, Lead, Selenium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Tin)	HNO3 to pH <2
B11DF0		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B11DF0		W			1x250-mL G/P	Alkalinity - 310.1	Cool 4C
B11DF0		W			1x500-mL G/P	NO2/NO3 - 353.1	H2SO4 to pH <2 Cool 4C
B11DF0		W			1x20-mL P	Activity Scan	None
B11DF0		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B11DF0		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B11DF0		W			1x1000-mL G/P	Carbon-14	None
B11DF0		W			4x1000-mL G/P	Iodine-129	None
B11DF0		W			2x1000-mL G/P	Radium -226	HNO3 to pH <2

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
K.J. YOUNG	3-19-01 1315	Fed Ex	3-19-01 10:00
FED EXPRESS	3-20-01 10:30	E. SEGURO	3-20-01
~~FED~~ ELVIE SEGURO	3-21-01 16:30	FED. EXPRESS	3-21-01 16:30
FED Ex	3-22-01 10:00	Carlos Hernandez	3-22-01 10:00

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wipe	
W = Water		L = Liquid	
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FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SDG H1291

C.O.C. # C01-024-7

SAF No. C01-024

Contact/Requestor: JH KESSNER

Telephone No. (509) 375-4688

MSIN

FAX

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B11DF0		W	3-19-01	1203	1x1000-mL G/P	Technetium-99	HCl to pH <2
B11DF0		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2
B11DF0		W			1x500-mL G/P	TDS - 160.1	Cool 4C
B11DF0		W			1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	K.J. YOUNG		3-19-01 / 1315		Fed Ex		3-19-01
FED EXPRESS			3-20-01 10:00	E. SEGURO			3-20-01
E. Segurro			3-21-01 16:30	FED EXPRESS			3-21-01
FED EX			3-22-01 10:00	Carlos Hernandez			3-22-01 10:00

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wipe	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
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FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time