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1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1033 was composed of one solid (soil) sample designated under SAF No. B00-029 with a Project Designation of: 100 F Area – Quick Turn.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on October 8, 2000.

2.0 ANALYSIS NOTES

2.1 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Plutonium Analyses

The Pu-238 LCS percent recovery (82%) was below the 3-sigma limits (87-113%), but within the laboratory protocol units of 80 – 120%.

No other problems were encountered during the course of the analyses.

2.7 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.8 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

SAMPLE SUMMARY

SDG 7493
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1033

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B10165	100-F-19	SOLID		R009107-01	B00-029	B00-029-032	09/14/00 09:30
Method Blank		SOLID		R009107-03	B00-029		
Lab Control Sample		SOLID		R009107-02	B00-029		
Duplicate (R009107-01)	100-F-19	SOLID		R009107-04	B00-029		09/14/00 09:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

SDG 7493
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1033

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7493	B00-029-032	B10165	SOLID	98.6			09/19/00	5	R009107-01	7493-001
		Method Blank	SOLID						R009107-03	7493-003
		Lab Control Sample	SOLID						R009107-02	7493-002
		Duplicate (R009107-01)	SOLID	98.6			09/19/00	5	R009107-04	7493-004

Lab id TMANC
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Report date 10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

SDG 7493
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1033

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6955-072	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6955-072	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6955-072	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6955-072	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6955-072	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6955-072	15.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	6955-072	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Soil	6955-072	10.0	1			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

WORK SUMMARY

SDG 7493
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1033

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B10165			R009107-01	7493-001	AM		10/02/00	10/08/00	MCM	Americium 241 in Soil
100-F-19		SOLID	09/14/00	7493-001	C		09/30/00	10/08/00	MCM	Carbon 14 in Soil
B00-029-032	B00-029		09/19/00	7493-001	GAM		09/26/00	10/08/00	MCM	Gamma Scan
				7493-001	NI_L		09/27/00	10/08/00	MCM	Nickel 63 in Soil
				7493-001	PU		10/03/00	10/08/00	MCM	Plutonium, Isotopic in Solids
				7493-001	SR		09/26/00	10/08/00	MCM	Total Strontium in Soil
				7493-001	TC		09/29/00	10/08/00	MCM	Technetium 99 in Soil
				7493-001	U		09/29/00	10/08/00	MCM	Uranium, Isotopic in Soil
Method Blank			R009107-03	7493-003	AM		10/03/00	10/08/00	MCM	Americium 241 in Soil
		SOLID		7493-003	C		09/29/00	10/08/00	MCM	Carbon 14 in Soil
	B00-029			7493-003	GAM		09/28/00	10/08/00	MCM	Gamma Scan
				7493-003	NI_L		09/27/00	10/08/00	MCM	Nickel 63 in Soil
				7493-003	PU		10/03/00	10/08/00	MCM	Plutonium, Isotopic in Solids
				7493-003	SR		09/26/00	10/08/00	MCM	Total Strontium in Soil
				7493-003	TC		10/02/00	10/08/00	MCM	Technetium 99 in Soil
				7493-003	U		09/29/00	10/08/00	MCM	Uranium, Isotopic in Soil
Lab Control Sample			R009107-02	7493-002	AM		10/02/00	10/08/00	MCM	Americium 241 in Soil
		SOLID		7493-002	C		09/30/00	10/08/00	MCM	Carbon 14 in Soil
	B00-029			7493-002	GAM		09/26/00	10/08/00	MCM	Gamma Scan
				7493-002	NI_L		09/27/00	10/08/00	MCM	Nickel 63 in Soil
				7493-002	PU		10/03/00	10/08/00	MCM	Plutonium, Isotopic in Solids
				7493-002	SR		09/26/00	10/08/00	MCM	Total Strontium in Soil
				7493-002	TC		09/29/00	10/08/00	MCM	Technetium 99 in Soil
				7493-002	U		09/29/00	10/08/00	MCM	Uranium, Isotopic in Soil
Duplicate (R009107-01)			R009107-04	7493-004	AM		10/03/00	10/08/00	MCM	Americium 241 in Soil
100-F-19		SOLID	09/14/00	7493-004	C		09/30/00	10/08/00	MCM	Carbon 14 in Soil
	B00-029		09/19/00	7493-004	GAM		09/26/00	10/08/00	MCM	Gamma Scan
				7493-004	NI_L		09/27/00	10/08/00	MCM	Nickel 63 in Soil
				7493-004	PU		10/03/00	10/08/00	MCM	Plutonium, Isotopic in Solids
				7493-004	SR		09/26/00	10/08/00	MCM	Total Strontium in Soil
				7493-004	TC		10/03/00	10/08/00	MCM	Technetium 99 in Soil
				7493-004	U		09/29/00	10/08/00	MCM	Uranium, Isotopic in Soil

Lab id TMANC
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Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

SDG 7493
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1033

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B00-029	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
C	B00-029	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1	4
GAM	B00-029	Gamma Scan	GAMMA_GS	1			1	1	1	4
NI_L	B00-029	Nickel 63 in Soil	NI63_LSC	1			1	1	1	4
PU	B00-029	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	B00-029	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TC	B00-029	Technetium 99 in Soil	TC99_TR_SEP_LSC	1			1	1	1	4
U	B00-029	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1			1	1	1	4
TOTALS				8			8	8	8	32

Lab id TMANC
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H1033

R009107-03 Method Blank

METHOD BLANK

SDG	7493	Client/Case no	Hanford	SDG H1033	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R009107-03	Client sample id	Method Blank		
Dept sample id	7493-003	Material/Matrix		SOLID	
		SAF No	B00-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.939	2.7	4.5	50	U	C
Nickel 63	13981-37-8	-0.963	1.1	2.0	30	U	NI_L
Total Strontium	SR-RAD	-0.026	0.13	0.18	1.0	U	SR
Technetium 99	14133-76-7	0.023	0.30	0.82	20	U	TC
Uranium 233	U-233/234	0	0.073	0.28	1.0	U	U
Uranium 235	15117-96-1	0	0.088	0.34	1.0	U	U
Uranium 238	U-238	0	0.073	0.28	1.0	U	U
Plutonium 238	13981-16-3	0	0.026	0.054	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.009	0.026	0.067	1.0	U	PU
Americium 241	14596-10-2	-0.008	0.023	0.055	1.0	U	AM
Potassium 40	13966-00-2	U		2.8		U	GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.10	0.10	U	GAM
Radium 226	13982-63-3	U		0.18	0.10	U	GAM
Radium 228	15262-20-1	U		0.49	0.20	U	GAM
Europium 152	14683-23-9	U		0.22	0.10	U	GAM
Europium 154	15585-10-1	U		0.35	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	U		0.12		U	GAM
Thorium 232	TH-232	U		0.49		U	GAM
Uranium 235	15117-96-1	U		0.30		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.097		U	GAM

100 F Area - Quick Turn

QC-BLANK 35940

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

R009107-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7493

Contact Melissa C. Mannion

Client/Case no Hanford SDG H1033

Case no TRC-SBB-207925

Lab sample id R009107-02

Dept sample id 7493-002

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B00-029

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	10200	100	14	50		C	11300	450	90	85-115	80-120
Nickel 63	139	3.4	2.0	30		NI_L	146	5.8	95	84-116	80-120
Total Strontium	13.1	0.71	0.28	1.0		SR	12.2	0.49	107	81-119	80-120
Technetium 99	59.2	3.2	1.1	20		TC	56.7	2.3	104	81-119	80-120
Uranium 233	10.6	1.7	0.73	1.0		U	9.66	0.39	110	72-128	80-120
Uranium 235	7.42	1.3	0.26	1.0		U	7.84	0.31	95	73-127	80-120
Uranium 238	10.7	1.7	0.69	1.0		U	10.5	0.42	102	74-126	80-120
Plutonium 238	10.2	0.78	0.038	1.0		PU	12.4	0.50	82	87-113	80-120
Plutonium 239/240	11.8	0.88	0.031	1.0		PU	13.2	0.53	89	87-113	80-120
Americium 241	9.80	3.0	1.5	1.0		AM	11.5	0.46	85	60-140	80-120
Cobalt 60	1.59	0.28	0.15	0.050		GAM	1.71	0.068	93	67-133	80-120
Cesium 137	2.04	0.26	0.17	0.10		GAM	1.97	0.079	104	69-131	80-120

100 F Area - Quick Turn

QC-LCS 35939

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

R009107-04

B10165

DUPLICATE

SDG	7493			Client/Case no	Hanford SDG H1033
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
DUPLICATE		ORIGINAL			
Lab sample id	R009107-04	Lab sample id	R009107-01	Client sample id	B10165
Dept sample id	7493-004	Dept sample id	7493-001	Location/Matrix	100-F-19 SOLID
		Received	09/19/00	Collected	09/14/00 09:30
% solids	98.6	% solids	98.6	Custody/SAF No	B00-029-032 B00-029

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Carbon 14	6.40	2.6	4.1	50	J	C	7.69	2.8	4.4	J	18	84	
Nickel 63	-0.558	1.2	2.0	30	U	NI_L	-0.332	1.2	2.0	U	-		
Total Strontium	46.1	1.3	0.26	1.0		SR	46.5	0.91	0.19		1	22	
Technetium 99	0.115	0.27	0.75	20	U	TC	0.068	0.41	0.94	U	-		
Uranium 233	0.510	0.19	0.14	1.0	J	U	0.152	0.15	0.19	U	108	110	
Uranium 235	0	0.044	0.17	1.0	U	U	0.061	0.062	0.23	U	-		
Uranium 238	0.601	0.22	0.14	1.0	J	U	0.303	0.15	0.19	J	66	89	
Plutonium 238	0.020	0.040	0.065	1.0	U	PU	-0.018	0.044	0.082	U	-		
Plutonium 239/240	0	0.024	0.058	1.0	U	PU	0.025	0.029	0.045	U	-		
Americium 241	0.038	0.038	0.061	1.0	U	AM	0.032	0.020	0.019	J	17	184	
Potassium 40	2.36	1.0	0.95			GAM	U		3.3	U	33	186	
Cobalt 60	U		0.069	0.050	U	GAM	U		0.10	U	-		
Cesium 137	1.27	0.12	0.082	0.10		GAM	1.27	0.14	0.12		0	39	
Radium 226	0.189	0.12	0.14	0.10		GAM	0.217	0.18	0.20		14	163	
Radium 228	0.395	0.26	0.23	0.20		GAM	U		0.63	U	46	202	
Europium 152	U		0.20	0.10	U	GAM	U		0.28	U	-		
Europium 154	U		0.23	0.10	U	GAM	U		0.34	U	-		
Europium 155	U		0.25	0.10	U	GAM	U		0.23	U	-		
Thorium 228	0.226	0.076	0.089			GAM	0.140	0.13	0.12		47	128	
Thorium 232	0.395	0.26	0.23			GAM	U		0.63	U	46	202	
Uranium 235	U		0.35		U	GAM	U		0.38	U	-		
Uranium 238	U		8.7		U	GAM	U		12	U	-		
Americium 241	U		0.39		U	GAM	U		0.15	U	-		

100 F Area - Quick Turn

QC-DUP#1 35941

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	10/08/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1033

R009107-01 B10165

DATA SHEET

SDG	7493	Client/Case no	Hanford	SDG_H1033	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R009107-01	Client sample id	B10165		
Dept sample id	7493-001	Location/Matrix	100-F-19	SOLID	
Received	09/19/00	Collected	09/14/00 09:30		
% solids	98.6	Custody/SAF No	B00-029-032	B00-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	7.69	2.8	4.4	50	J	C
Nickel 63	13981-37-8	-0.332	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	46.5	0.91	0.19	1.0		SR
Technetium 99	14133-76-7	0.068	0.41	0.94	20	U	TC
Uranium 233	U-233/234	0.152	0.15	0.19	1.0	U	U
Uranium 235	15117-96-1	0.061	0.062	0.23	1.0	U	U
Uranium 238	U-238	0.303	0.15	0.19	1.0	J	U
Plutonium 238	13981-16-3	-0.018	0.044	0.082	1.0	U	PU
Plutonium 239/240	PU-239/240	0.025	0.029	0.045	1.0	U	PU
Americium 241	14596-10-2	0.032	0.020	0.019	1.0	J	AM
Potassium 40	13966-00-2	U		3.3		U	GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	1.27	0.14	0.12	0.10		GAM
Radium 226	13982-63-3	0.217	0.18	0.20	0.10		GAM
Radium 228	15262-20-1	U		0.63	0.20	U	GAM
Europium 152	14683-23-9	U		0.28	0.10	U	GAM
Europium 154	15585-10-1	U		0.34	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Thorium 228	14274-82-9	0.140	0.13	0.12			GAM
Thorium 232	TH-232	U		0.63		U	GAM
Uranium 235	15117-96-1	U		0.38		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.15		U	GAM

100 F Area - Quick Turn

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Test AM Matrix SOLID
SDG 7493
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1033

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6955-072					
B10165	R009107-01			7493-001	0.032 J
BLK (QC ID=35940)	R009107-03			7493-003	U
LCS (QC ID=35939)	R009107-02			7493-002	ok
Duplicate (R009107-01)	R009107-04			7493-004	ok U
Nominal values and limits from method				RDLs (pCi/g)	1.0
100 F Area - Quick Turn					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072	2σ prep error 5.0 %				Reference Lab Notebook 6955 pg. 072											
B10165	R009107-01			0.019	0.500			76		1271			18	09/29/00	10/02	SS-044
BLK (QC ID=35940)	R009107-03			0.055	0.500			57		1025				09/29/00	10/03	SS-036
LCS (QC ID=35939)	R009107-02			1.5	0.500			59		1271				09/29/00	10/02	SS-045
Duplicate (R009107-01) (QC ID=35941)	R009107-04			0.061	0.500			53		750			19	09/29/00	10/03	SS-027
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 2
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 3
	CP-940	Plutonium Separation and Purification, rev 2
	CP-960	Americium-Curium Purification, Large Aliquot, rev 4
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.41 ± 1.5
YIELD 61 ± 20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

Test PU	Matrix SOLID
SDG 7493	
Contact Melissa C. Mannion	

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRC-SBB-207925	
Contract SDG H1033	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6955-072								
B10165	R009107-01			7493-001	U		U	
BLK (QC ID=35940)	R009107-03			7493-003	U		U	
LCS (QC ID=35939)	R009107-02			7493-002	LOW		ok	
Duplicate (R009107-01)	R009107-04			7493-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
100 F Area - Quick Turn								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072	2σ prep error 5.0 %				Reference Lab Notebook 6955 pg. 072											
B10165	R009107-01			0.082	0.500			85		750			19	09/28/00	10/03	SS-029
BLK (QC ID=35940)	R009107-03			0.067	0.500			72		750				09/28/00	10/03	SS-032
LCS (QC ID=35939)	R009107-02			0.038	0.500			74		750				09/28/00	10/03	SS-031
Duplicate (R009107-01) (QC ID=35941)	R009107-04			0.065	0.500			77		750			19	09/28/00	10/03	SS-033
Nominal values and limits from method				1.0	0.500			20-105		50	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 2
	CP-940	Plutonium Separation and Purification, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD	MDA	0.063	± 0.037
FOR 4 SAMPLES	YIELD	77	± 11

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

Test U	Matrix SOLID
SDG 7493	
Contact Melissa C. Mannion	

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRC-SBB-207925	
Contract SDG H1033	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1+3	2σ	2+3	2σ
Preparation batch 6955-072											
B10165	R009107-01			7493-001	U	U	0.303 J	50	55	20	23
BLK (QC ID=35940)	R009107-03			7493-003	U	U	U				
LCS (QC ID=35939)	R009107-02			7493-002	ok	ok	ok				
Duplicate (R009107-01)	R009107-04			7493-004	ok J	- U	ok J	85	44	0	7
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
100 F Area - Quick Turn							Averages	68		10	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072	2σ prep error 5.0 %				Reference Lab Notebook 6955 pg. 072											
B10165	R009107-01			0.23	0.500			79		157			15	09/26/00	09/29	SS-020
BLK (QC ID=35940)	R009107-03			0.34	0.500			58		157				09/26/00	09/29	SS-022
LCS (QC ID=35939)	R009107-02			0.73	0.500			71		157				09/26/00	09/29	SS-021
Duplicate (R009107-01) (QC ID=35941)	R009107-04			0.17	0.500			99		157			15	09/26/00	09/29	SS-023
Nominal values and limits from method				1.0	0.500			20-105		150	100		180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	0.37	±	0.50	
YIELD	77	±	34	

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

Test SR	Matrix SOLID
SDG 7493	
Contact Melissa C. Mannion	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRC-SBB-207925	
Contract SDG H1033	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6955-072					
B10165	R009107-01			7493-001	46.5
BLK (QC ID=35940)	R009107-03			7493-003	U
LCS (QC ID=35939)	R009107-02			7493-002	ok
Duplicate (R009107-01)	R009107-04			7493-004	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
100 F Area - Quick Turn					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072	2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 072															
B10165	R009107-01			0.19	1.00			91		400			12	09/26/00	09/26	GRB-217
BLK (QC ID=35940)	R009107-03			0.18	1.00			89		400				09/26/00	09/26	GRB-219
LCS (QC ID=35939)	R009107-02			0.28	1.00			89		400				09/26/00	09/26	GRB-218
Duplicate (R009107-01) (QC ID=35941)	R009107-04			0.26	1.00			95		400			12	09/26/00	09/26	GRB-221
Nominal values and limits from method				1.0	1.00			30-105		100			180			

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

AVERAGES ± 2 SD	MDA	0.23	± 0.10
FOR 4 SAMPLES	YIELD	91	± 6

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

Test	TC
Matrix	SOLID
SDG	7493
Contact	Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1033

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6955-072						
B10165	R009107-01			7493-001	U	
BLK (QC ID=35940)	R009107-03			7493-003	U	
LCS (QC ID=35939)	R009107-02			7493-002	ok	
Duplicate (R009107-01)	R009107-04			7493-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	20	
100 F Area - Quick Turn						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072	2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 072															
B10165	R009107-01			0.94	1.01			37		101			15	09/27/00	09/29	GRB-223
BLK (QC ID=35940)	R009107-03			0.82	1.00			45		101				09/27/00	10/02	GRB-229
LCS (QC ID=35939)	R009107-02			1.1	1.00			30		101				09/27/00	09/29	GRB-224
Duplicate (R009107-01) (QC ID=35941)	R009107-04			0.75	1.02			37		145			19	09/27/00	10/03	GRB-232
Nominal values and limits from method				20	1.00			20-105		50			180			

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

AVERAGES ± 2 SD	MDA	0.90	±	0.31
FOR 4 SAMPLES	YIELD	37	±	12

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

Test GAM Matrix SOLID
SDG 7493
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1033

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137
Preparation batch 6955-072							
B10165	R009107-01			7493-001	U		1.27
BLK (QC ID=35940)	R009107-03			7493-003	U		U
LCS (QC ID=35939)	R009107-02			7493-002	ok		ok
Duplicate (R009107-01)	R009107-04			7493-004	-	U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10
100 F Area - Quick Turn							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072 2σ prep error 15.0 % Reference Lab Notebook 6955 pg. 072																
B10165	R009107-01			0.27	141					117			12	09/21/00	09/26	MB,07,00
BLK (QC ID=35940)	R009107-03			0.21	141					106				09/21/00	09/28	MB,07,00
LCS (QC ID=35939)	R009107-02			0.15	141					88				09/21/00	09/26	01,01,00
Duplicate (R009107-01) (QC ID=35941)	R009107-04			0.16	141					103			12	09/21/00	09/26	02,04,00
Nominal values and limits from method				0.050	141					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 2
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.20	±	0.11
	YIELD		±	

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

Test C	Matrix SOLID
SDG 7493	
Contact Melissa C. Mannion	

METHOD SUMMARY

CARBON 14 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford	
Contract TRC-SBB-207925	
Contract SDG H1033	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6955-072						
B10165	R009107-01			7493-001	7.69	J
BLK (QC ID=35940)	R009107-03			7493-003	U	
LCS (QC ID=35939)	R009107-02			7493-002	ok	
Duplicate (R009107-01)	R009107-04			7493-004	ok	J

Nominal values and limits from method RDLs (pCi/g) 50

100 F Area - Quick Turn

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072	2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 072															
B10165	R009107-01			4.4	0.209			100		100			16	09/27/00	09/30	LSC-007
BLK (QC ID=35940)	R009107-03			4.5	0.200			100		100				09/27/00	09/29	LSC-007
LCS (QC ID=35939)	R009107-02			14	0.200			100		12				09/27/00	09/30	LSC-007
Duplicate (R009107-01) (QC ID=35941)	R009107-04			4.1	0.223			100		100			16	09/27/00	09/30	LSC-007
Nominal values and limits from method				50	0.200					25			180			

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-060	Soil Preparation, rev 2
	CP-251	Tritium/Carbon-14 Oxidation, rev 2

AVERAGES ± 2 SD	MDA	6.8	±	9.7
FOR 4 SAMPLES	YIELD	100	±	0

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	10/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1033

Test NI L Matrix SOLID
SDG 7493
Contact Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1033

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 6955-072						
B10165	R009107-01			7493-001	U	
BLK (QC ID=35940)	R009107-03			7493-003	U	
LCS (QC ID=35939)	R009107-02			7493-002	ok	
Duplicate (R009107-01)	R009107-04			7493-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	30	
100 F Area - Quick Turn						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6955-072	2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 072															
B10165	R009107-01			2.0	0.500			93		100			13	09/26/00	09/27	LSC-007
BLK (QC ID=35940)	R009107-03			2.0	0.500			94		100				09/26/00	09/27	LSC-007
LCS (QC ID=35939)	R009107-02			2.0	0.500			93		100				09/26/00	09/27	LSC-007
Duplicate (R009107-01) (QC ID=35941)	R009107-04			2.0	0.500			92		100			13	09/26/00	09/27	LSC-007
Nominal values and limits from method				30	0.500			30-105		10			180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 2
	RP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2.0 ± 0
YIELD 93 ± 2

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/08/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-032	Page 2 of 2

Collector: R. Nielson/M. Stankovich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Price Code: 2E	Data Turnaround: 15 days	Air Quality ☐	
Project Designation: 100 F Area - Quick Turn	Sampling Location: 100-F-19 H1033 (7493)	SAF No.: B00-029	
Ice Chest No.: ERC99.051 (1OF1)	Field Logbook No.: EL-1500-3	COA: R10F192600	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A0003306	Bill of Lading/Air Bill No.: 42357953-9047	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None											
Type of Container	X											
No. of Container(s)	1											
Volume	500mL											
SAMPLE ANALYSIS	See item (1) in Special Instructions.											

Sample No.	Matrix *	Sample Date	Sample Time	
B10165	SOIL	9/14/00	0930	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R Nielson	9/14/00 1520	RJN 9/14/00	1520
Relinquished By: RT 9-18-00	Date/Time 0900	Received By: R Thorsen	Date/Time 0900
Removed from Ref #1A 9-18-00		R. Thorsen 9-18-00	
Relinquished By: R Thorsen 9-18-00	Date/Time 0900	Received By: FEDEX	Date/Time 09/18/00
Relinquished By: FEDEX.	Date/Time 9/19/00	Received By: G. Segura	Date/Time 9/19/00
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

TIETO
BK024

Samples stored in Ref. #1A at the 3728 Shipping Facility on 9/14/00
Collector not available to relinquish samples on 9/18/00 for shipment.
RT 9-18-00

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-032	Page 1 of 2

Collector: R. Nielson/M. Stankovich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Quick Turn	Sampling Location: 100-F-19 H1033 (7493)		SAF No.: B00-029
Ice Chest No.: ERC99-051 (1 of 1)	Field Logbook No.: EL-1500-3	COA: R10F192600	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A0000306		Bill of Lading/Air Bill No.: 4235795 3 - 9047

Price Code: 2E
Air Quality: ☐
Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Sample No.	Matrix *	Sample Date	Sample Time	Chromium Hex - 7196	PCBs - 8082	Carbon-14	See item (1) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	Technetium-99	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.
Preservation				Cool 4C	Cool 4C	None	None	None	None	None	Cool 4C	None	None
Type of Container				aG	aG	aG	aG	aG	aG	aG	aG	aG	Marinelli
No. of Container(s)				1	1	1	1	1	1	1		1	1
Volume				60mL	60mL	59mL	60mL	60mL	60mL	60mL	60mL	1[illegible]mL	[illegible]0mL
SAMPLE ANALYSIS													
B10165	SOIL	9/14/00	0950	X	X	X	X	X	X	X			
				RT 9-18-00			RT 9-18-00				RT 9-18-00		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson	9/14/00 1520	STORED IN REF. # 1A	9/14/00 1520
RT 9.18.00 Removed from Ref 1A 9-18-00	0900	R. Thoren	9-18-00 0900
R. Thoren	9-18-00 0900	FEDEX	09/18/00
FED. EXPRESS	9/19/00 10.00	E Segura	9/19/00 10.00 AM

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Chromium, Lead}; Mercury - 7471 - (CV)
(2) Metals by ICP (TCLP) - 1311/6010 (Chromium, Lead); Mercury (TCLP) - 1311/7470
(3) Gamma Spectroscopy - Screen (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

TIE TO B1024

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 9/14/00
Collector not available to relinquish samples on 9/18/00 for shipment.. RT 9-18-00

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

LABORATORY SECTION: Received By | Title | Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

BHI-EE-011 (10/99)

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: BECHTEL HANFORD INC. Date/Time received 09/19/01 10:AM

CoC No. BUD-029-032

Container I.D. No. ERC 99-051 Requested TAT (Days) 15 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1
7. Number of containers per sample: 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: 09/19/01 Time: 10:AM

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

OCT 2000
RECEIVED

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B00-029
RFW# : 0009L670
SDG# : H1033
SAF# : B00-029

W.O. # : 10985-001-001-9999-00
Date Received: 09-19-00

INORGANIC CASE NARRATIVE

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

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

3. Sample holding times as required by the method and/or contract were met.

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

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike recovery for Solible Chromium VI was below the 75-125% control limits; the significant background color of the sample extract required a 100 times dilution and evidence of the fortification was non-detectable.

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

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

10. Due to the significant background color of the sample extract a 100 times dilution was necessary to allow light to pass through and resulted in an elevated detection limit for Chromium VI.

11. 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.

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

10/30/00
Date

njp\i09-670

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

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		9095A	

Other: **Method:**

Other: **Method**

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/11/00

CLIENT: TNU-HANFORD B00-029

RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10165	% Solids	91.4		%	0.01	1.0
		Chromium VI	43.8	u	MG/KG	43.8	100

4

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/11/00

CLIENT: TNU-HANFORD B00-029 RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LVI054-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

5

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/11/00

CLIENT: TNU-HANFORD B00-029 RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10165	Soluble Chromium VI	43.8 u	0.0	4.4	NC	100
BLANK10	00LVI054-MB1	Soluble Chromium VI	4.3	0.40u	4.0	108.5	1.0
		Insoluble Chromium VI	1140	0.40u	1160	98.5	100

6

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/11/00

CLIENT: TNU-HANFORD B00-029 RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10165	% Solids	91.4	86.1	6.0	1.0
		Chromium VI	43.8 u	43.8 u	NC	100

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-029

DATE RECEIVED: 09/19/00 RFW LOT # :0009L670

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10165						
% SOLIDS	001	S	00L%S153	09/14/00	09/28/00	09/29/00
% SOLIDS	001 REP	S	00L%S153	09/14/00	09/28/00	09/29/00
CHROMIUM VI	001	S	00LVI054	09/14/00	10/04/00	10/04/00
CHROMIUM VI	001 REP	S	00LVI054	09/14/00	10/04/00	10/04/00
CHROMIUM VI	001 MS	S	00LVI054	09/14/00	10/04/00	10/04/00
LAB QC:						
CHROMIUM VI	MB1	S	00LVI054	N/A	10/04/00	10/04/00
CHROMIUM VI	MB1 BS	S	00LVI054	N/A	10/04/00	10/04/00
CHROMIUM VI	MB1 BSD	S	00LVI054	N/A	10/04/00	10/04/00

RECRA LabNet Use Only
0009L670

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TRU-Hanford 300-029
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: DS
QC: Spec Del: Std TAT: 15 day
Date Rec'd: 9-19-00 Date Due: 10-4-00
Account #:

Refrigerator #				4					4		4					
#/Type Container	Liquid															
	Solid			1AG					1AG		1AG					
Volume	Liquid															
	Solid			60					60		60					
Preservatives				-					-		-					
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
				RECRA LabNet Use Only												
				OPCB					AS CD PB		ICP/9					

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													
001	B1016	✓	✓	S	9-14-00	0930			✓					✓		✓			

Special Instructions: SAF 300-029

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 5.1 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 4235 7953 9036

Relinquished by	Received by	Date	Time
FedEx	TRoppel	9-19-00	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-032	Page 1 of 2

Collector: R. Nielson/M. Stankovich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Quick Turn	Sampling Location: 100-F-19		SAF No.: B00-029
Ice Chest No.: Sml-10 (1 of 1)	Field Logbook No.: EL-1500-3	COA: R10F192600	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A000307		Bill of Lading/Air Bill No.: 4235 7453-9036

Price Code: 2E
Air Quality: ☐
Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	None	None	None	None	None	Cool 4C	None	None
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG	sG	Marinelli
No. of Container(s)	1	1	1	1	1	1	1		1	1
Volume	60mL	60mL	50mL	60mL	60mL	60mL	60mL	60mL	1[illegible]mL	[illegible]0mL
SAMPLE ANALYSIS	Chromium Hex - 7196	PCBs - 8082	Carbon-14	See item (1) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	Technetium-99	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B10165	SOIL	9/14/00	0950	X	X	X	X	X	X	X	X		
						RT 9.18.00		RT 9.18.00					

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By: R. Nielson	1520 9/14/00	Received By: R.N. 9/14/00	1520
Relinquished By: RT 9.18.00	0900	Received By: STORED IN REF. # 1A 9/14/00	0900
Removed from Ref 1A 9/18/00		R. Thoren 9.18.00	
Relinquished By: R Thoren 9.18.00	0900	Received By: FEDEX	
Relinquished By		Received By	
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)
(2) Metals by ICP (TCLP) - 1311/6010 (Chromium, Lead); Mercury (TCLP) - 1311/7470
(3) *Gamma Spectroscopy - Screen* (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

TICTO B1024

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 9/14/00.
Collector not available to relinquish samples on 9/18/00 for shipment. RT 9.18.00

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

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

BHI-EE-011 (10/99)

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

OCT 2000
RECEIVED

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-029
RFW#: 0009L670
SDG/SAF#: H1033/B99-029

W.O.#: 10985-001-001-9999-00
Date Received: 09-19-00

METALS CASE NARRATIVE

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

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

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

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

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

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

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

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

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

10. The matrix spike (MS) recovery for Mercury was outside the 75-125% control limits (216%). It was not certain if the sample had been double-spiked, so a serial dilution was performed regardless. Refer to the Inorganics Accuracy Report.

11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision 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 12 pages.

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

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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-25-00
Date

jjw/m09-670

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0009L670

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: __3005A __3010A __3015 __3020A X3050B __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	X6010B	__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	X6010B	__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	X6010B	__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]	X7471A [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.

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/11/00

CLIENT: TNU-HANFORD B00-029

RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10165	Arsenic, Total	1.0	MG/KG	0.35	1.0
		Chromium, Total	5.2	MG/KG	0.09	1.0
		Mercury, Total	0.16	MG/KG	0.02	1.0
		Lead, Total	34.0	MG/KG	0.21	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/11/00

CLIENT: TNU-HANFORD B00-029 RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1607-MB1	Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Chromium, Total	0.09 u	MG/KG	0.09	1.0
		Lead, Total	0.21 u	MG/KG	0.21	1.0
BLANK1	00C0320-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/11/00

CLIENT: TNU-HANFORD B00-029

RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10165	Arsenic, Total	192	1.0	203	94.1	1.0
		Chromium, Total	29.3	5.2	20.3	118.7	1.0
		Mercury, Total	0.56	0.16	0.18	216.5	1.0
		Lead, Total	86.9	34.0	50.6	104.5	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/11/00

CLIENT: TWU-HANFORD B00-029 RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10165	Arsenic, Total	1.0	1.1	9.5	1.0
		Chromium, Total	5.2	7.5	36.2	1.0
		Mercury, Total	0.16	0.16	3.1	1.0
		Lead, Total	34.0	38.1	11.4	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/11/00

CLIENT: TMU-HANFORD B00-029 RECRA LOT #: 0009L670

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1607-LC1	Arsenic, LCS	979	1000	MG/KG	97.9
		Chromium, LCS	51.2	50.0	MG/KG	102.4
		Lead, LCS	253	250	MG/KG	101.3
LCS1	00C0320-LC1	Mercury, LCS	0.80	0.7	MG/KG	112.8

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-029

DATE RECEIVED: 09/19/00 RFW LOT # :0009L670

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10165						
ARSENIC, TOTAL	001	S	99L1607	09/14/00	10/06/00	10/07/00
ARSENIC, TOTAL	001 REP	S	99L1607	09/14/00	10/06/00	10/07/00
ARSENIC, TOTAL	001 MS	S	99L1607	09/14/00	10/06/00	10/07/00
CHROMIUM, TOTAL	001	S	99L1607	09/14/00	10/06/00	10/07/00
CHROMIUM, TOTAL	001 REP	S	99L1607	09/14/00	10/06/00	10/07/00
CHROMIUM, TOTAL	001 MS	S	99L1607	09/14/00	10/06/00	10/07/00
MERCURY, TOTAL	001	S	00C0320	09/14/00	10/04/00	10/04/00
MERCURY, TOTAL	001 REP	S	00C0320	09/14/00	10/04/00	10/04/00
MERCURY, TOTAL	001 MS	S	00C0320	09/14/00	10/04/00	10/04/00
LEAD, TOTAL	001	S	99L1607	09/14/00	10/06/00	10/07/00
LEAD, TOTAL	001 REP	S	99L1607	09/14/00	10/06/00	10/07/00
LEAD, TOTAL	001 MS	S	99L1607	09/14/00	10/06/00	10/07/00

LAB QC:

ARSENIC LABORATORY	LC1 BS	S	99L1607	N/A	10/06/00	10/07/00
ARSENIC, TOTAL	MB1	S	99L1607	N/A	10/06/00	10/07/00
CHROMIUM LABORATORY	LC1 BS	S	99L1607	N/A	10/06/00	10/07/00
CHROMIUM, TOTAL	MB1	S	99L1607	N/A	10/06/00	10/07/00
MERCURY LABORATORY	LC1 BS	S	00C0320	N/A	10/04/00	10/04/00
MERCURY, TOTAL	MB1	S	00C0320	N/A	10/04/00	10/04/00
LEAD LABORATORY	LC1 BS	S	99L1607	N/A	10/06/00	10/07/00
LEAD, TOTAL	MB1	S	99L1607	N/A	10/06/00	10/07/00

RECRA LabNet Use Only

0009L670

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TRU-Hanford 300-029

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 15 day

Date Rec'd: 9-19-00 Date Due: 10-4-00

Account #:

Refrigerator #				4					4		4					
#/Type Container	Liquid															
	Solid			1PG					1PG		1PG					
Volume	Liquid															
	Solid			60					60		60					
Preservatives				-					-		-					
ANALYSES REQUESTED →				ORGANIC					INORG							
				VOA	BNA	Pest/PCB	Herb		Metal	CN						
				RECRA LabNet Use Only												
						OPCB			AS CR PB HG		ICRLO					

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															
001	B101L5	✓	✓	S	9-14-00	0930			✓				✓		✓						

Special Instructions: SAF 300-029

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 5.1 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7953 9036

Relinquished by	Received by	Date	Time
FedEx	TRappel	9-19-00	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-032	Page 1 of 2

Collector: R. Nielson/M. Stankovich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Quick Turn	Sampling Location: 100-F-19		SAF No.: B00-029
Ice Chest No.: Sml-10 (1 of 1)	Field Logbook No.: EL-1500-3	COA: R10F192600	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A00D307		Bill of Lading/Air Bill No.: 4235 7453-9036

Price Code: 2E
Air Quality: ☐
Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	None	None	None	None	None	Cool 4C	None	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	Marinelli
No. of Container(s)	1	1	1	1	1	1	1		1	1
Volume	60mL	60mL	50mL	60mL	60mL	60mL	60mL	60mL	1[illegible]mL	[illegible]0mL
SAMPLE ANALYSIS	Chromium Hex - 7196	PCBs - 8082	Carbon-14	See item (1) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	Technetium-99	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B10165	SOIL	9/14/00	0950	X	X	X	X	X	X	X	X		
						RT 9.18.00		RT 9.18.00					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson	9/14/00 1520	R. Nielson	9/14/00 1520
RT 9.18.00	0900	STORED IN REF. # 1A 9/14/00	
Removed from Ref 1A 9/18/00		R. Thoren	9.18.00 0900
R Thoren	9.18.00 0900	FEDEX	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Chromium, Lead}; Mercury - 7471 - (CV)
(2) Metals by ICP (TCLP) - 1311/6010 {Chromium, Lead}; Mercury (TCLP) - 1311/7470
(3) Gamma Spectroscopy - Screen {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

TICTO B1024

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 9/14/00.
Collector not available to relinquish samples on 9/18/00 for shipment. RT 9.18.00

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

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

BHI-EE-011 (10/99)

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

OCT 2000
RECEIVED

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD B00-029
RFW#: 0009L670
SDG/SAF#: H1033/B00-029

W.O.#: 10985-001-001-9999-00
Date Received: 09-19-00

PCB

One (1) soil sample was collected on 09-14-00.

The sample and its associated QC samples were extracted on 09-22-00 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 10-12,13-00. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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

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

2. All required holding times for extraction and analysis have been met.

3. The sample and its associated QC samples received a sulfuric acid cleanup.

4. The method blank was below the reporting limits for all target compounds.

5. One (1) of eight (8) surrogate recoveries was outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).

6. No blank spike was reported because it was lost on the water bath during extraction. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. Matrix spike recoveries were unobtainable due to the high concentration of analytes.

8. The sample required a ten-fold instrument dilution due to high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.

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

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

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

12. Patterns for Aroclors 1254 and 1248 were identified in these samples. The reported Aroclor was chosen based on the best pattern match and fit. Quantitation was performed using congeners common to both Aroclors to give the best overall total PCB concentration.

11. 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.

pg J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

10-25-00
Date

pef\r:\group\data\pest\09L-670.pcb

RECRA **Sample Discrepancy Report (SDR)** SDR #: 00 EX133

Initiator: F Kiger Batch: 00094670 Parameter: PCB
Date: Samples: 001 ~~[illegible]~~ Th 9/27/00 Matrix: S
Client: TNU Method: SW846/MCAWW/CLP/ Prep Batch: 1189

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

X Missing Sample/Extract __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

Blank Spike lost on batch

2. Known or Probable Causes(s) (To be used for trend analysis)

___ Lack of Organization
___ Lack of Training
___ Lack of Discipline
___ Lack of Resources
___ Lack of Time
___ Lack of Management Support
X Other (Please explain): KD broke

3. Discussion and Proposed Action Other Description:

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

report + narrate

4. Project Manager Instructions...signature/date: [signature] 9/27/00

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

5. Final Action...signature/date: [signature] 10-2-00 Other Explanation:

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

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

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

L-WI-006/E-08/00

RECRA **Sample Discrepancy Report (SDR)** SDR #: 00Gr-C234

Initiator: M. Kobel Batch: 00091670 Parameter: OPCB
Date: 10/16/00 Samples: 001 MS, 001 MSD Matrix: Soil
Client: TNU-Hanford Method: SW846/MCAWW/CLP/ Prep Batch: 00LE1189

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

The spike recoveries were diluted out in the MS + MSD. They were not able to be seen due to there being a hit in the sample and this hit needing a 10-fold dilution.

2. Known or Probable Causes(s) (To be used for trend analysis)

___ Lack of Organization
___ Lack of Training
___ Lack of Discipline
___ Lack of Resources
___ Lack of Time
___ Lack of Management Support
___ Other (Please explain):

3. Discussion and Proposed Action Other Description:

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

report + narrate

4. Project Manager Instructions...signature/date: Trevor Johnson 10/16/00

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

5. Final Action...signature/date: Mike Kobel Other Explanation:

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

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

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

L-WI-006/E-08/00

Recra LabNet Philadelphia

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

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

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

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

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

I = Interference.

ABBREVIATIONS

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

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

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

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P	=	This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 10/19/00 19:01

RFW Batch Number: 0009L670 Client: TNU-HANFORD B00-029 Work Order: 10985001001 Page: 1

	Cust ID:	B10165	B10165	B10165	PBLKAT
Sample Information	RFW#:	001	001 MS	001 MSD	00LE1189-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	10.0	10.0	10.0	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		45 %	48 %	48 %	25 * %
Decachlorobiphenyl		90 %	101 %	88 %	60 %
Aroclor-1016		2200 U	3500 U	4100 U	33 U
Aroclor-1221		4400 U	7100 U	8100 U	67 U
Aroclor-1232		2200 U	3500 U	4100 U	33 U
Aroclor-1242		2200 U	3500 U	4100 U	33 U
Aroclor-1248		2200 U	3500 U	4100 U	33 U
Aroclor-1254		4300	D %	D %	33 U
Aroclor-1260		2200 U	3500 U	4100 U	33 U

gw 10-20-00

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

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-029

DATE RECEIVED: 09/19/00 RFW LOT # :0009L670

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10165	001	S	00LE1189	09/14/00	09/22/00	10/13/00
B10165	001 MS	S	00LE1189	09/14/00	09/22/00	10/13/00
B10165	001 MSD	S	00LE1189	09/14/00	09/22/00	10/13/00

LAB QC:

PBLKAT	MB1	S	00LE1189	N/A	09/22/00	10/12/00

gw 10-20-00

RECRA LabNet Use Only

00091670

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-Hanford B00-029

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: DS

QC: Spec Del: Std TAT: 15 day

Date Rec'd: 9-19-00 Date Due: 10-4-00

Account #:

Refrigerator #				4					4		4							
#/Type Container	Liquid																	
	Solid			1AG					1AG		1AG							
Volume	Liquid																	
	Solid			100					100		100							
Preservatives				-					-		-							
ANALYSES REQUESTED		ORGANIC							INORG									
		VOA	BNA	Pest/PCB	Herb				Metal	CN								

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only													
									OCB					AS CR PB HG		ICRLO				
001	B101L6	✓	✓	S	9-14-00	0930			✓					✓		✓				

Special Instructions: Saf B00-029

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # See below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

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

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

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

Cooler Temp. 5.1 °C

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

NOTES: 4235 7953 9036

Relinquished by	Received by	Date	Time
FedEx	TRappel	9-19-00	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-032	Page 1 of 2

Collector: R. Nielson/M. Stankovich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Quick Turn	Sampling Location: 100-F-19		SAF No.: B00-029
Ice Chest No.: Sml-10 (1 of 1)	Field Logbook No.: EL-1500-3	COA: R10F192600	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A0000307		Bill of Lading/Air Bill No.: 4235 7953-903

Price Code: 2E
Air Quality: ☐
Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	None	None	None	None	None	Cool 4C	None	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	Marinelli
No. of Container(s)	1	1	1	1	1	1	1		1	1
Volume	60mL	60mL	50mL	60mL	60mL	60mL	60mL	60mL	[illegible]mL	[illegible]0mL
SAMPLE ANALYSIS	Chromium Hex - 7196	PCBs - 8082	Carbon-14	See item (1) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	Technetium-99	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B10165	SOIL	9/14/00	0930	X	X	X	X	X	X	X	9.18.00		
						RT 9.18.00		RT 9.18.00					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson	9/14/00 1520	STORED IN REF. # 1A	9/14/00 1520
RT 9.18.00	0900	R. Thoren	9.18.00 0900
R. Thoren	9.18.00 0900	FEDEX	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)
(2) Metals by ICP (TCLP) - 1311/6010 (Chromium, Lead); Mercury (TCLP) - 1311/7470
(3) Gamma Spectroscopy - Screen (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

TICTO B1024

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 9/14/00.
Collector not available to relinquish samples on 9/18/00 for shipment. RT 9.18.00

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

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

BHI-EE-011 (10/99)

010