H0886

0053958

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0886 was composed of one solid (soil) sample designated under SAF No. B00-054 with a Project Designation of: 116-N-3 Process Control and Variance Sample Analysis.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on July 6th and 8th, 2000.

ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Tritium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.5 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.6 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

JUL 2000
RECEIVED

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

SAMPLE SUMMARY

SDG 7798
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0886

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0YHL7	116-N-3 Size Reduc. Pit	SOLID		R006123-01	B00-054	B00-054-010	06/19/00 10:30
Method Blank		SOLID		R006123-03	B00-054		
Lab Control Sample		SOLID		R006123-02	B00-054		
Duplicate (R006123-01)	116-N-3 Size Reduc. Pit	SOLID		R006123-04	B00-054		06/19/00 10:30
Spike (R006123-01)	116-N-3 Size Reduc. Pit	SOLID		R006123-05	B00-054		06/19/00 10:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

SDG 7798
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0886

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
7798	B00-054-010	B0YHL7	SOLID	97.1			06/23/00	4	R006123-01	7798-001
		Method Blank	SOLID						R006123-03	7798-003
		Lab Control Sample	SOLID						R006123-02	7798-002
		Duplicate (R006123-01)	SOLID				06/23/00	4	R006123-04	7798-004
		Spike (R006123-01)	SOLID				06/23/00	4	R006123-05	7798-005

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

SDG 7798
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0886

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	6916-117	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6916-117	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6916-117	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6916-117	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6916-117	15.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	6916-117	10.0	1			1	1	1/1	1/1	
NI_L	SOLID	Nickel 63 in Soil	6916-117	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 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

WORK SUMMARY

SDG 7798
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0886

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0YHL7			R006123-01	7798-001	AM		06/29/00	07/06/00	MCM	Americium 241 in Soil
116-N-3 Size Reduc. Pit		SOLID	06/19/00	7798-001	GAM		07/06/00	07/08/00	MCM	Gamma Scan
B00-054-010	B00-054		06/23/00	7798-001	H		07/02/00	07/08/00	MCM	Tritium in Soil
				7798-001	NI_L		06/29/00	07/06/00	MCM	Nickel 63 in Soil
				7798-001	PU		06/30/00	07/06/00	MCM	Plutonium, Isotopic in Solids
				7798-001	SR		06/26/00	07/06/00	MCM	Total Strontium in Soil
				7798-001	U		06/30/00	07/06/00	MCM	Uranium, Isotopic in Soil
Method Blank			R006123-03	7798-003	AM		06/29/00	07/06/00	MCM	Americium 241 in Soil
		SOLID		7798-003	GAM		06/29/00	07/08/00	MCM	Gamma Scan
	B00-054			7798-003	H		07/03/00	07/08/00	MCM	Tritium in Soil
				7798-003	NI_L		06/29/00	07/06/00	MCM	Nickel 63 in Soil
				7798-003	PU		06/30/00	07/06/00	MCM	Plutonium, Isotopic in Solids
				7798-003	SR		06/26/00	07/06/00	MCM	Total Strontium in Soil
				7798-003	U		06/30/00	07/06/00	MCM	Uranium, Isotopic in Soil
Lab Control Sample			R006123-02	7798-002	AM		07/02/00	07/06/00	MCM	Americium 241 in Soil
		SOLID		7798-002	GAM		06/29/00	07/08/00	MCM	Gamma Scan
	B00-054			7798-002	H		07/02/00	07/08/00	MCM	Tritium in Soil
				7798-002	NI_L		06/29/00	07/06/00	MCM	Nickel 63 in Soil
				7798-002	PU		06/30/00	07/06/00	MCM	Plutonium, Isotopic in Solids
				7798-002	SR		06/26/00	07/06/00	MCM	Total Strontium in Soil
				7798-002	U		06/30/00	07/06/00	MCM	Uranium, Isotopic in Soil
Duplicate (R006123-01)			R006123-04	7798-004	AM		06/29/00	07/06/00	MCM	Americium 241 in Soil
116-N-3 Size Reduc. Pit		SOLID	06/19/00	7798-004	GAM		06/30/00	07/08/00	MCM	Gamma Scan
	B00-054		06/23/00	7798-004	H		07/03/00	07/08/00	MCM	Tritium in Soil
				7798-004	NI_L		06/29/00	07/06/00	MCM	Nickel 63 in Soil
				7798-004	PU		06/30/00	07/06/00	MCM	Plutonium, Isotopic in Solids
				7798-004	SR		06/26/00	07/06/00	MCM	Total Strontium in Soil
				7798-004	U		06/30/00	07/06/00	MCM	Uranium, Isotopic in Soil
Spike (R006123-01)			R006123-05	7798-005	H		07/03/00	07/08/00	MCM	Tritium in Soil
116-N-3 Size Reduc. Pit		SOLID	06/19/00							
	B00-054		06/23/00							

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

SDG 7798
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0886

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	B00-054	Americium 241 in Soil	AM/CMPLATE	1			1	1	1		4
GAM	B00-054	Gamma Scan	GAMMAHI	1			1	1	1		4
H	B00-054	Tritium in Soil	EPA906.0	1			1	1	1	1	5
NI_L	B00-054	Nickel 63 in Soil	NI63LSC	1			1	1	1		4
PU	B00-054	Plutonium, Isotopic in Solids	PUPLATE	1			1	1	1		4
SR	B00-054	Total Strontium in Soil	SRTOTAL	1			1	1	1		4
U	B00-054	Uranium, Isotopic in Soil	UPLATE	1			1	1	1		4
TOTALS				7			7	7	7	1	29

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

R006123-03 Method Blank

METHOD BLANK

SDG	7798	Client/Case no	Hanford	SDG H0886	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	R006123-03	Client sample id	Method Blank		
Dept sample id	7798-003	Material/Matrix		SOLID	
		SAF No	B00-054		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.008	0.14	0.24	400	U	H
Nickel 63	13981-37-8	-3.62	6.3	11	30	U	NI_L
Total Strontium	SR-RAD	0.142	0.91	1.7	1.0	U	SR
Uranium 233	U-233/234	0	0.029	0.070	1.0	U	U
Uranium 235	15117-96-1	0.027	0.036	0.068	1.0	U	U
Uranium 238	U-238	0	0.015	0.056	1.0	U	U
Plutonium 238	13981-16-3	-0.047	0.19	0.45	1.0	U	PU
Plutonium 239/240	PU-239/240	0.047	0.095	0.36	1.0	U	PU
Americium 241	14596-10-2	0.086	0.10	0.13	1.0	U	AM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 134	13967-70-9	U		0.031		U	GAM
Cesium 137	10045-97-3	U		0.030	0.10	U	GAM
Radium 226	13982-63-3	U		0.054	0.10	U	GAM
Europium 152	14683-23-9	U		0.076	0.10	U	GAM
Europium 154	15585-10-1	U		0.080	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.7		U	GAM
Americium 241	14596-10-2	U		0.077	1.0	U	GAM

116-N-3 Process Control & Variance

QC-BLANK 34902

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

R006123-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7798

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0886

Case no TRB-SBB-207925

Lab sample id R006123-02

Dept sample id 7798-002

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B00-054

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	10.9	0.37	0.23	400	J	H	12.2	0.49	89	85-115	80-120
Nickel 63	840	19	11	30		NI_L	833	33	101	83-117	80-120
Total Strontium	116	5.1	2.0	1.0		SR	111	4.4	104	82-118	80-120
Uranium 233	9.62	0.76	0.35	1.0		U	9.28	0.37	104	84-116	80-120
Uranium 235	7.57	0.66	0.066	1.0		U	7.54	0.30	100	84-116	80-120
Uranium 238	10.4	0.80	0.33	1.0		U	10.1	0.40	103	85-115	80-120
Plutonium 238	50.1	3.7	0.33	1.0		PU	49.8	2.0	101	85-115	80-120
Plutonium 239/240	55.1	4.0	0.33	1.0		PU	52.9	2.1	104	85-115	80-120
Americium 241	42.0	7.6	1.4	1.0		AM	47.8	1.9	88	75-125	80-120
Cobalt 60	1.05	0.063	0.039	0.050		GAM	1.06	0.042	99	75-125	80-120
Cesium 137	1.11	0.054	0.044	0.10		GAM	1.18	0.047	94	77-123	80-120

116-N-3 Process Control & Variance

QC-LCS 34901

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

R006123-04 B0YHL7

DUPLICATE

SDG 7798
Contact Melissa C. Mannion

DUPLICATE
Lab sample id R006123-04
Dept sample id 7798-004

ORIGINAL
Lab sample id R006123-01
Dept sample id 7798-001
Received 06/23/00
% solids 97.1

Client/Case no Hanford SDG H0886
Case no TRB-SBB-207925
Client sample id B0YHL7
Location/Matrix 116-N-3 Size Reduc. Pit SOLID
Collected 06/19/00 10:30
Custody/SAF No B00-054-010 B00-054

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	-0.002	0.052	0.089	400	U	H	0.012	0.052	0.088	U	-	
Nickel 63	-0.890	2.7	4.6	30	U	NI_L	0	2.9	4.9	U	-	
Total Strontium	0.364	1.0	1.9	1.0	U	SR	1.39	1.2	1.9	U	-	
Uranium 233	0.262	0.089	0.056	1.0	J	U	0.165	0.076	0.083	J	45	83
Uranium 235	0.009	0.018	0.067	1.0	U	U	0.009	0.018	0.070	U	-	
Uranium 238	0.182	0.074	0.056	1.0	J	U	0.113	0.060	0.057	J	47	97
Plutonium 238	0	0.091	0.35	1.0	U	PU	0	0.088	0.34	U	-	
Plutonium 239/240	0.091	0.091	0.35	1.0	U	PU	0.176	0.18	0.34	U	-	
Americium 241	0.157	0.14	0.17	1.0	U	AM	0.116	0.13	0.16	U	-	
Potassium 40	8.23	1.4	0.34			GAM	8.15	0.92	0.53		1	44
Cobalt 60	0.030	0.029	0.034	0.050	U	GAM	0.065	0.037	0.040		74	152
Cesium 134	U		0.043		U	GAM	U		0.063	U	-	
Cesium 137	U		0.035	0.10	U	GAM	U		0.048	U	-	
Radium 226	0.342	0.075	0.068	0.10		GAM	0.354	0.094	0.094		3	61
Radium 228	0.426	0.15	0.15	0.20		GAM	0.501	0.19	0.21		16	85
Europium 152	U		0.077	0.10	U	GAM	U		0.10	U	-	
Europium 154	U		0.11	0.10	U	GAM	U		0.14	U	-	
Europium 155	U		0.059	0.10	U	GAM	U		0.10	U	-	
Thorium 228	0.591	0.072	0.059			GAM	0.400	0.065	0.069		39	44
Thorium 232	0.426	0.15	0.15			GAM	0.501	0.19	0.21		16	85
Uranium 235	U		0.10		U	GAM	U		0.15	U	-	
Uranium 238	U		3.7		U	GAM	U		5.9	U	-	
Americium 241	U		0.030	1.0	U	GAM	U		0.11	U	-	

116-N-3 Process Control & Variance

QC-DUP#1 34903

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

R006123-05 B0YHL7

MATRIX SPIKE

SDG	7798			Client/Case no	Hanford SDG H0886
Contact	Melissa C. Mannion			Case no	TRB-SBB-207925
MATRIX SPIKE		ORIGINAL			
Lab sample id	R006123-05	Lab sample id	R006123-01	Client sample id	B0YHL7
Dept sample id	7798-005	Dept sample id	7798-001	Location/Matrix	116-N-3 Size Reduc. Pit SOLID
		Received	06/23/00	Collected	06/19/00 10:30
		% solids	97.1	Custody/SAF No	B00-054-010 B00-054

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	39.5	0.41	0.088	400	J	H	45.9	1.8	0.012	0.052	86	86-114	60-140

116-N-3 Process Control & Variance

QC-MS#1 34904

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

R006123-01 B0YHL7

DATA SHEET

SDG	7798	Client/Case no	Hanford	SDG H0886	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	R006123-01	Client sample id	B0YHL7		
Dept sample id	7798-001	Location/Matrix	116-N-3 Size Reduc. Pit	SOLID	
Received	06/23/00	Collected	06/19/00 10:30		
% solids	97.1	Custody/SAF No	B00-054-010	B00-054	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.012	0.052	0.088	400	U	H
Nickel 63	13981-37-8	0	2.9	4.9	30	U	NI_L
Total Strontium	SR-RAD	1.39	1.2	1.9	1.0	U	SR
Uranium 233	U-233/234	0.165	0.076	0.083	1.0	J	U
Uranium 235	15117-96-1	0.009	0.018	0.070	1.0	U	U
Uranium 238	U-238	0.113	0.060	0.057	1.0	J	U
Plutonium 238	13981-16-3	0	0.088	0.34	1.0	U	PU
Plutonium 239/240	PU-239/240	0.176	0.18	0.34	1.0	U	PU
Americium 241	14596-10-2	0.116	0.13	0.16	1.0	U	AM
Potassium 40	13966-00-2	8.15	0.92	0.53			GAM
Cobalt 60	10198-40-0	0.065	0.037	0.040	0.050		GAM
Cesium 134	13967-70-9	U		0.063		U	GAM
Cesium 137	10045-97-3	U		0.048	0.10	U	GAM
Radium 226	13982-63-3	0.354	0.094	0.094	0.10		GAM
Radium 228	15262-20-1	0.501	0.19	0.21	0.20		GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.400	0.065	0.069			GAM
Thorium 232	TH-232	0.501	0.19	0.21			GAM
Uranium 235	15117-96-1	U		0.15		U	GAM
Uranium 238	U-238	U		5.9		U	GAM
Americium 241	14596-10-2	U		0.11	1.0	U	GAM

116-N-3 Process Control & Variance

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

Test	AM
Matrix	SOLID
SDG	7798
Contact	Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Contract	SDG H0886

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 6916-117						
B0YHL7	R006123-01			7798-001	U	
BLK (QC ID=34902)	R006123-03			7798-003	U	
LCS (QC ID=34901)	R006123-02			7798-002	ok	
Duplicate (R006123-01)	R006123-04			7798-004	-	U
Nominal values and limits from method 116-N-3 Process Control & Variance				RDLs (pCi/g)	1.0	

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 6916-117	2σ prep error 5.0 %				Reference Lab Notebook 6916 pg. 117											
B0YHL7	R006123-01			0.16	0.100			98		739			10	06/28/00	06/29	SS-055
BLK (QC ID=34902)	R006123-03			0.13	0.100			92		739				06/28/00	06/29	SS-057
LCS (QC ID=34901)	R006123-02			1.4	0.100			97		1083				06/28/00	07/02	SS-051
Duplicate (R006123-01) (QC ID=34903)	R006123-04			0.17	0.100			93		739			10	06/28/00	06/29	SS-058
Nominal values and limits from method				1.0	0.100			20-105		700	100		180			

PROCEDURES	REFERENCE	AM/CMPLATE
	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	0.46	± 1.2
	YIELD	95	± 6

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

Test PU	Matrix SOLID
SDG 7798	
Contact Melissa C. Mannion	

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Contract SDG H0886	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6916-117								
B0YHL7	R006123-01			7798-001	U		U	
BLK (QC ID=34902)	R006123-03			7798-003	U		U	
LCS (QC ID=34901)	R006123-02			7798-002	ok		ok	
Duplicate (R006123-01)	R006123-04			7798-004	-	U	-	U
Nominal values and limits from method 116-N-3 Process Control & Variance				RDLs (pCi/g)	1.0		1.0	

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 6916-117 2σ prep error 5.0 % Reference Lab Notebook 6916 pg. 117																
B0YHL7	R006123-01			0.34	0.100			81		336			11	06/28/00	06/30	SS-055
BLK (QC ID=34902)	R006123-03			0.45	0.100			75		336				06/28/00	06/30	SS-058
LCS (QC ID=34901)	R006123-02			0.33	0.100			80		336				06/28/00	06/30	SS-057
Duplicate (R006123-01) (QC ID=34903)	R006123-04			0.35	0.100			73		336			11	06/28/00	06/30	SS-059
Nominal values and limits from method				1.0	0.100			20-105		50	100		180			

PROCEDURES	REFERENCE	PUPLATE
	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	0.37	± 0.11
FOR 4 SAMPLES	YIELD	77	± 8

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

Test U	Matrix SOLID
SDG 7798	
Contact Melissa C. Mannion	

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Contract SDG H0886	

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 6916-117											
B0YHL7	R006123-01			7798-001	0.165 J	U	0.113 J	146	103	8	16
BLK (QC ID=34902)	R006123-03			7798-003	U	U	U				
LCS (QC ID=34901)	R006123-02			7798-002	ok	ok	ok				
Duplicate (R006123-01)	R006123-04			7798-004	ok J	- U	ok J	144	76	5	10
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
116-N-3 Process Control & Variance							Averages	145		6	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6916-117	2σ prep error 5.0 %				Reference Lab Notebook 6916 pg. 117											
B0YHL7	R006123-01			0.083	0.500			92		341			11	06/29/00	06/30	SS-039
BLK (QC ID=34902)	R006123-03			0.070	0.500			93		341				06/29/00	06/30	SS-042
LCS (QC ID=34901)	R006123-02			0.35	0.500			99		341				06/29/00	06/30	SS-041
Duplicate (R006123-01) (QC ID=34903)	R006123-04			0.067	0.500			91		347			11	06/29/00	06/30	SS-043
Nominal values and limits from method				1.0	0.500			20-105		150	100		180			

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

AVERAGES ± 2 SD	MDA	0.14	± 0.28
FOR 4 SAMPLES	YIELD	94	± 7

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

Test SR	Matrix SOLID
SDG 7798	
Contact Melissa C. Mannion	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Contract SDG H0886	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6916-117						
B0YHL7	R006123-01			7798-001	1.39	U
BLK (QC ID=34902)	R006123-03			7798-003	U	
LCS (QC ID=34901)	R006123-02			7798-002	ok	
Duplicate (R006123-01)	R006123-04			7798-004	-	U
Nominal values and limits from method 116-N-3 Process Control & Variance				RDLs (pCi/g)	1.0	

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 6916-117 2σ prep error 10.0 % Reference Lab Notebook 6916 pg. 117																
B0YHL7	R006123-01			1.9	0.100			93		150			7	06/26/00	06/26	GRB-221
BLK (QC ID=34902)	R006123-03			1.7	0.100			94		150				06/26/00	06/26	GRB-222
LCS (QC ID=34901)	R006123-02			2.0	0.100			94		150				06/26/00	06/26	GRB-218
Duplicate (R006123-01) (QC ID=34903)	R006123-04			1.9	0.100			93		150			7	06/26/00	06/26	GRB-223
Nominal values and limits from method				1.0	0.100			30-105		100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA	1.9	±	0.25
	YIELD	94	±	1

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

Test GAM Matrix SOLID	Client Hanford
SDG 7798	Contract TRB-SBB-207925
Contact Melissa C. Mannion	Contract SDG H0886

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 6916-117								
B0YHL7	R006123-01			7798-001	0.065		U	
BLK (QC ID=34902)	R006123-03			7798-003	U		U	
LCS (QC ID=34901)	R006123-02			7798-002	ok		ok	
Duplicate (R006123-01)	R006123-04			7798-004	ok	U	-	U
Nominal values and limits from method 116-N-3 Process Control & Variance				RDLs (pCi/g)	0.050		0.10	

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 6916-117 2σ prep error 15.0 % Reference Lab Notebook 6916 pg. 117																
B0YHL7	R006123-01			0.040	215					405			17	06/24/00	07/06	JR,03,00
BLK (QC ID=34902)	R006123-03			0.034	215					458				06/24/00	06/29	JR,03,00
LCS (QC ID=34901)	R006123-02			0.039	215					458				06/24/00	06/29	JR,07,00
Duplicate (R006123-01) (QC ID=34903)	R006123-04			0.034	215					604			11	06/24/00	06/30	JR,07,00
Nominal values and limits from method				0.050	215					100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA 0.037	± 0.006
	YIELD	±

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

Test H Matrix SOLID
SDG 7798
Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Contract SDG H0886

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6916-117						
B0YHL7	R006123-01			7798-001	U	
BLK (QC ID=34902)	R006123-03			7798-003	U	
LCS (QC ID=34901)	R006123-02			7798-002	ok	J
Duplicate (R006123-01)	R006123-04			7798-004	-	U
Spike (R006123-01)	R006123-05			7798-005	ok	J
Nominal values and limits from method 116-N-3 Process Control & Variance				RDLs (pCi/g)	400	

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 6916-117 2σ prep error 10.0 % Reference Lab Notebook 6916 pg. 117																
B0YHL7	R006123-01			0.088	20.0			100		120			13	06/29/00	07/02	LSC-005
BLK (QC ID=34902)	R006123-03			0.24	20.0			37		120				06/29/00	07/03	LSC-005
LCS (QC ID=34901)	R006123-02			0.23	20.0			37		120				06/29/00	07/02	LSC-005
Duplicate (R006123-01) (QC ID=34903)	R006123-04			0.089	20.0			100		120			14	06/29/00	07/03	LSC-005
Spike (R006123-01) (QC ID=34904)	R006123-05			0.088	20.0			100		120			14	06/29/00	07/03	LSC-005
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES	REFERENCE	EPA906.0
	CP-060	Soil Preparation, rev 2
	CP-216	Tritium in Solid Samples by Azeotropic Distillation, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.15 ± 0.16
YIELD 75 ± 69

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0886

Test	NI L
Matrix	SOLID
SDG	7798
Contact	Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Contract	SDG H0886

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 6916-117						
B0YHL7	R006123-01			7798-001	U	
BLK (QC ID=34902)	R006123-03			7798-003	U	
LCS (QC ID=34901)	R006123-02			7798-002	ok	
Duplicate (R006123-01)	R006123-04			7798-004	-	U
Nominal values and limits from method 116-N-3 Process Control & Variance				RDLs (pCi/g)	30	

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 6916-117 2σ prep error 10.0 % Reference Lab Notebook 6916 pg. 117																
B0YHL7	R006123-01			4.9	0.250			88		100			10	06/27/00	06/29	LSC-004
BLK (QC ID=34902)	R006123-03			11	0.100			96		100				06/27/00	06/29	LSC-004
LCS (QC ID=34901)	R006123-02			11	0.100			97		99				06/27/00	06/29	LSC-004
Duplicate (R006123-01) (QC ID=34903)	R006123-04			4.6	0.250			93		100			10	06/27/00	06/29	LSC-004
Nominal values and limits from method				30	0.100			30-105		10			180			

PROCEDURES	REFERENCE	NI63LSC
	CP-060	Soil Preparation, rev 2
	RP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA	7.9	± 7.2
	YIELD	94	± 8

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	07/08/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-054-010	Page 1 of 1

Collector RB Kerkow	Company Contact RB Kerkow FAX:372-8655	Telephone No. 531-0635	Project Coordinator TRENT, SJ
Price Code 9J	Data Turnaround 7 day	Air Quality ☐	
Project Designation 116-N-3 Process Control and Variance Sample Analysis - So	Sampling Location 116-N-3 "Size reduction pit" HD886 (7798)	SAF No. B00-054	
Ice Chest No. 22100 SM1 461	Field Logbook No. EL-1524	COA R1325N2600	Method of Shipment Government Vehicle / FEDEX
Shipped To TMA/REGRA pk 6/19/00	Offsite Property No. 1A00210		Bill of Lading/Air Bill No. 42357953 66667

POSSIBLE SAMPLE HAZARDS/REMARKS
~~Potentially Radioactive~~ R.T. 6/22/00

Special Handling and/or Storage
None

Preservation	None	None	None pk 6/19/00							
Type of Container	G	GP	~~G~~ P							
No. of Container(s)	1	1	1							
Volume	15g	125g	500g							
SAMPLE ANALYSIS	Mercury - 7471 - (CV) pk 6/19/00	See item (1) in Special Instructions. pk 6/19/00	See item (2) in Special Instructions.						TIETO	

Sample No.	Matrix *	Sample Date	Sample Time										
B0YHL7	SOIL	6-19-00	1030			X					B0YHK9		2

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By RB Kerkow	Date/Time 1630 6/19/00	Received By REF IC	Date/Time 1659 6/19/00
Relinquished By Ref IC	Date/Time 6/22/00 1030	Received By R. Thomas	Date/Time 6/22/00 1030
Relinquished By R. Thomas	Date/Time 6/22/00 1430	Received By FED EX	Date/Time 6-22-00
Relinquished By Fed Ex	Date/Time 6-23-00 10:15	Received By JR Corso	Date/Time 6-23-00 10:15
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
LAB COA: R1325N2F00
R.T. 6/22/00
(1) IC Anions - 300.0 (Nitrate, Nitrite); NO2/NO3 - 353.1; Chromium Hex - 7196; ICP Metals - 6010A (FAL) (Chromium)
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Isotopic Plutonium; Americium-241; Strontium-89,90 -- Total Sr; Nickel-63; Tritium - H3; Isotopic Uranium

FAXED 6/23/00

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)

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 6-23-00 10:15

CoC No. BOD-054-010

Container I.D. No. SML 461 Requested TAT (Days) [redacted] 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: 1 (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 6-23-00
14. Received by W P Corso Date: 6-23-00 Time: 10:15

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 LabNet Philadelphia
208 Welsh Pool Road
Lionville, PA 19341-1333

AUG 2000
RECEIVED

Analytical Report

Client : TNU-HANFORD B00-054
RFW# : 0006L674
SDG# : H0886
SAF# : B00-054

W.O. # : 10985-001-001-9999-00
Date Received: 06-23-00

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 indicated on the attached glossary.

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

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

5. The method blanks were within method criteria.

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

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

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

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

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

7/24/00
Date

njp\i06-674

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

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

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

Other: Nitrite and Nitrate **Method:** EPA 300.0

Other: Nitrate Nitrite **Method** EPA 353.2

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 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0YHL7	% Solids	97.7		%	0.01	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	2.4		MG/KG	1.3	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Nitrate Nitrite	0.73		MG/KG	0.20	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LIC036-MB1	Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	00LVI034-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	00LN3A34-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0YHL7	Nitrite by IC	27	1.3 u	26	104.0	1.0
		Nitrate by IC	28	2.4	26	102.1	1.0
		Soluble Chromium VI	3.9	0.41u	4.1	96.2	1.0
		Insoluble Chromium VI	1000	0.41u	1180	85.1	100
		Nitrate Nitrite	5.6	0.73	4.9	98.1	1.0
BLANK10	00LIC036-MB1	Nitrite by IC	25	1.2 u	25	100.5	1.0
		Nitrate by IC	25	1.2 u	25	98.1	1.0
BLANK10	00LVI034-MB1	Soluble Chromium VI	4.2	0.40u	4.0	103.8	1.0
		Insoluble Chromium VI	1100	0.40u	1160	94.7	100
BLANK10	00LN3A34-MB1	Nitrate Nitrite	5.1	0.20u	5.0	101.8	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0YHL7	% Solids	97.7	97.7	0.010	1.0
		Nitrite by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	2.4	2.6	8.5	1.0
		Chromium VI	0.41u	0.41u	NC	1.0
		Nitrate Nitrite	0.73	0.70	4.5	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-054

DATE RECEIVED: 06/23/00 RFW LOT # :0006L674

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0YHL7						
% SOLIDS	001	S	00L%S091	06/19/00	06/26/00	06/27/00
% SOLIDS	001 REP	S	00L%S091	06/19/00	06/26/00	06/27/00
NITRITE BY IC	001	S	00LIC036	06/19/00	06/30/00	06/30/00
NITRITE BY IC	001 REP	S	00LIC036	06/19/00	06/30/00	06/30/00
NITRITE BY IC	001 MS	S	00LIC036	06/19/00	06/30/00	06/30/00
NITRATE BY IC	001	S	00LIC036	06/19/00	06/30/00	06/30/00
NITRATE BY IC	001 REP	S	00LIC036	06/19/00	06/30/00	06/30/00
NITRATE BY IC	001 MS	S	00LIC036	06/19/00	06/30/00	06/30/00
CHROMIUM VI	001	S	00LVI034	06/19/00	06/28/00	06/28/00
CHROMIUM VI	001 REP	S	00LVI034	06/19/00	06/28/00	06/28/00
CHROMIUM VI	001 MS	S	00LVI034	06/19/00	06/28/00	06/28/00
CHROMIUM VI	001 MSD	S	00LVI034	06/19/00	06/28/00	06/28/00
NITRATE NITRITE	001	S	00LN3A34	06/19/00	06/27/00	06/27/00
NITRATE NITRITE	001 REP	S	00LN3A34	06/19/00	06/27/00	06/27/00
NITRATE NITRITE	001 MS	S	00LN3A34	06/19/00	06/27/00	06/27/00

LAB QC:

NITRITE BY IC	MB1	S	00LIC036	N/A	06/30/00	06/30/00
NITRITE BY IC	MB1 BS	S	00LIC036	N/A	06/30/00	06/30/00
NITRATE BY IC	MB1	S	00LIC036	N/A	06/30/00	06/30/00
NITRATE BY IC	MB1 BS	S	00LIC036	N/A	06/30/00	06/30/00
CHROMIUM VI	MB1	S	00LVI034	N/A	06/28/00	06/28/00
CHROMIUM VI	MB1 BS	S	00LVI034	N/A	06/28/00	06/28/00
CHROMIUM VI	MB1 BSD	S	00LVI034	N/A	06/28/00	06/28/00
NITRATE NITRITE	MB1	S	00LN3A34	N/A	06/27/00	06/27/00
NITRATE NITRITE	MB1 BS	S	00LN3A34	N/A	06/27/00	06/27/00

RECRA LabNet Use Only

D0061674

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-Hanford B00-054

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 7 day

Date Rec'd: 6-23-00 Date Due: 6-30-00

Account #:

Refrigerator #										2		2					
#/Type Container	Liquid																
	Solid									1G		1G					
Volume	Liquid																
	Solid									159		125					
Preservatives										–		–	–	–	–		
ANALYSES REQUESTED →		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					Metal	CN						
		RECRA LabNet Use Only															
								TKN2300	MCRTO MHGTO			ICNO2 ICNO3	ICRLO	MCRTO	INO2		

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	B0YHL7	✓	✓	S	6/19/00	1030							✓		✓	✓	✓	✓			

Special Instructions: Soil B00-054

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. 9.4 °C

Relinquished by	Received by	Date	Time
Fed Ex	Inergystultzfw	6-23-00	930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES: 4235 7953 6688

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-054-010	Page 1 of 1

Collector RB Kerkow	Company Contact RB Kerkow FAX:372-8655	Telephone No. 531-0635	Project Coordinator TRENT, SJ	Price Code 9J	Data Turnaround
Project Designation 116-N-3 Process Control and Variance Sample Analysis - So	Sampling Location 116-N-3 "Size reduction pit"		SAF No. B00-054	Air Quality ☐	7day
Ice Chest No. ERC 99-063	Field Logbook No. EL-1524	COA R1325N2600	Method of Shipment Government Vehicle		
Shipped To ~~TMA~~/RECRA	Offsite Property No. A000229		Bill of Lading/Air Bill No. 42357953 66668		

RK 6/19/00

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially Radioactive

Special Handling and/or Storage
None

Preservation	Cool 4°C ~~None~~ RK 6/19/00	Cool 4°C ~~None~~ RK 6/19/00	None								
Type of Container	G	G/P	G								
No. of Container(s)	1	1	1								
Volume	15g	125g	500g								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	See item (1) in Special Instructions.	See item (2) in Special Instructions.							TIETO	
Sample No.	Matrix *	Sample Date	Sample Time								
B0YHL7	SOIL	6-19-00	1030	X	X					B0YHK9	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
RB Kerkow	1650 6/19/00	REF IC	1650 6/19/00
REF IC	6/22/00 0930	R. Thoren	6/22/00 0930
R. Thoren	6/22/00 1430	FED EX	
FedEx	6-23-00 930	Inez Stoltzfus	6-23-00 930

SPECIAL INSTRUCTIONS
LAB COA: R1325N2F00

(1) IC Anions - 300.0 (Nitrate, Nitrite); NO2/NO3 - 353.1; Chromium Hex - 7196; ICP Metals - 6010A (TAL) (Chromium)
~~(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155);~~ Gamma Spec - Add-on (Americium-241); ~~Isotopic Plutonium;~~ Americium-241; Strontium-89,90 -- Total Sr; Nickel-63; Tritium - H3; Isotopic Uranium

RT 6/22/00

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 LabNet Philadelphia
208 Welsh Pool Road
Lionville, PA 19341-1333
Analytical Report

AUG 2000
RECEIVED

Client : TNU-HANFORD B00-054
RFW# : 0006L674
SDG/SAF# : H0886/B00-054

W.O.# : 10985-001-001-9999-00
Date Received: 06-23-00

METALS CASE NARRATIVE

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

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

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

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

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

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

7. All preparation/method blanks (MB) were within 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.

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

11. All duplicate analyses were within 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.

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
mld/m06-674

08-03-00
Date

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0006L674

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.

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0YHL7	Chromium, Total	4.6	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1358-MB1	Chromium, Total	0.06 u	MG/KG	0.06	1.0
BLANK1	00C0196-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0YHL7	Chromium, Total	24.7	4.6	20.3	99.0	1.0
		Mercury, Total	0.17	0.02u	0.16	109.0	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0YHL7	Chromium, Total	4.6	3.8	19.0	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/30/00

CLIENT: TNU-HANFORD B00-054 RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1358-LC1	Chromium, LCS	49.2	50.0	MG/KG	98.4
LCS1	00C0196-LC1	Mercury, LCS	0.74	0.7	MG/KG	104.6

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-054

DATE RECEIVED: 06/23/00 RFW LOT # :0006L674

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0YHL7						
CHROMIUM, TOTAL	001	S	99L1358	06/19/00	06/28/00	06/28/00
CHROMIUM, TOTAL	001 REP	S	99L1358	06/19/00	06/28/00	06/28/00
CHROMIUM, TOTAL	001 MS	S	99L1358	06/19/00	06/28/00	06/28/00
MERCURY, TOTAL	001	S	00C0196	06/19/00	06/26/00	06/27/00
MERCURY, TOTAL	001 REP	S	00C0196	06/19/00	06/26/00	06/27/00
MERCURY, TOTAL	001 MS	S	00C0196	06/19/00	06/26/00	06/27/00

LAB QC:

CHROMIUM LABORATORY	LC1 BS	S	99L1358	N/A	06/28/00	06/28/00
CHROMIUM, TOTAL	MB1	S	99L1358	N/A	06/28/00	06/28/00
MERCURY LABORATORY	LC1 BS	S	00C0196	N/A	06/26/00	06/27/00
MERCURY, TOTAL	MB1	S	00C0196	N/A	06/26/00	06/27/00

RECRA LabNet Use Only

00061674

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU - Hanford B00-054

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-999900

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 7 day

Date Rec'd: 6-23-00 Date Due: 6-30-00

Account #:

Refrigerator #										2		2			
#/Type Container	Liquid														
	Solid									1G		1G			
Volume	Liquid														
	Solid									159		125			
Preservatives										–		–	–	–	–
ANALYSES REQUESTED		ORGANIC								INORG					
		VOA	BNA	Pest/PCB	Herb					Metal	CN				
		RECRA LabNet Use Only													
								TKU2300	AACRTO	MKGTO		ICNO2	ICNO3	ICRLO	MCRTO	INSN2

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	BOYHL7	✓	✓	S	6/19/00	1030								✓		✓	✓	✓	✓	

Special Instructions: SOF B00-054

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. 9.4 C

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

NOTES: 4235 7953 6688

Relinquished by	Received by	Date	Time
Fed Ex	Inregstutzfw	6-23-00	930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-054-010	Page 1 of 1

Collector RB Kerkow	Company Contact RB Kerkow FAX:372-8655	Telephone No. 531-0635	Project Coordinator TRENT, SJ
Project Designation 116-N-3 Process Control and Variance Sample Analysis - So	Sampling Location 116-N-3 "Size reduction pit"		SAF No. B00-054
Ice Chest No. ERC 99-063	Field Logbook No. EL-1524	COA R1325N2600	Method of Shipment Government Vehicle
Shipped To ~~TMA~~/RECRA	Offsite Property No. A000229		Bill of Lading/Air Bill No. 42357953 66668

Price Code 9J

Data Turnaround 7 day

Air Quality ☐

RK 6/19/00

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive

Special Handling and/or Storage

None

Preservation	Cool 4°C ~~None~~ RK 6/19/00	Cool 4°C ~~None~~ RK 6/19/00	None								
Type of Container	G	G/P									
No. of Container(s)	1	1	1								
Volume	15g	125g	500g								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	See item (1) in Special Instructions.	See item (2) in Special Instructions.							TIETO	
Sample No. / Matrix * / Sample Date / Sample Time											
B0YHL7 / SOIL / 6-19-00 / 1030	X	X								B0YHK9	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
RB Kerkow	1650 6/19/00	REF IC	1650 6/19/00
REF IC	6/22/00 0930	R Thorson	6/22/00 0930
R Thorson	6/22/00 1430	FED EX	
FedEx	6-23-00 930	Inez Stoltz	6-23-00 930

SPECIAL INSTRUCTIONS

LAB COA: R1325N2F00

(1) IC Anions - 300.0 (Nitrate, Nitrite); NO2/NO3 - 353.1; Chromium Hex - 7196; ICP Metals - 6010A (TAL) (Chromium)

(2) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155);~~ Gamma Spec - Add-on (Americium-241); ~~Isotopic Plutonium;~~ Americium-241; Strontium-89,90 -- Total Sr; Nickel-63; Tritium - H3; Isotopic Uranium

RT 6/22/00

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)

H0886

AUG 2000 RECEIVED

Recra LabNet Philadelphia
208 Welsh Pool Road
Lionville, PA 19341-1333
Analytical Report

Client : TNU-HANFORD B00-054
RFW# : 0006L674
SDG/SAF# : H0886/B00-054

W.O.# : 10985-001-001-9999-00
Date Received: 06-23-00

REVISION

METALS CASE NARRATIVE

Cadmium JP 8/21/00

This report has been revised to include ~~Chromium~~ and Lead as per client request.

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

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

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

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

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

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

7. All preparation/method blanks (MB) were within 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.

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. 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 12 pages.

11. The duplicate analysis for Lead was 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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

08-17-00
Date

mld/m06-674r

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0006L674

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.

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/17/00

CLIENT: TNU-HANFORD B00-054

RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0YHL7	Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	4.6	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.9	MG/KG	0.23	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/17/00

CLIENT: TNU-HANFORD B00-054

RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1358-MB1	Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.06 u	MG/KG	0.06	1.0
		Lead, Total	0.23 u	MG/KG	0.23	1.0
BLANK1	00C0196-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 08/17/00

CLIENT: TNU-HANFORD B00-054

RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0YHL7	Cadmium, Total	4.9	0.04u	5.1	96.1	1.0
		Chromium, Total	24.7	4.6	20.3	99.0	1.0
		Mercury, Total	0.17	0.02u	0.16	109.0	1.0
		Lead, Total	54.4	4.9	50.6	97.8	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 08/17/00

CLIENT: TNU-HANFORD B00-054

RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0YHL7	Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	4.6	3.8	19.0	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Lead, Total	4.9	3.3	39.0	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 08/17/00

CLIENT: TNU-HANFORD B00-054

RECRA LOT #: 0006L674

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1358-LC1	Cadmium, LCS	24.3	25.0	MG/KG	97.2
		Chromium, LCS	49.2	50.0	MG/KG	98.4
		Lead, LCS	246	250	MG/KG	98.3
LCS1	00C0196-LC1	Mercury, LCS	0.74	0.7	MG/KG	104.6

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-054

DATE RECEIVED: 06/23/00 RFW LOT # :0006L674

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0YHL7						
CADMIUM, TOTAL	001	S	99L1358	06/19/00	06/28/00	06/28/00
CADMIUM, TOTAL	001 REP	S	99L1358	06/19/00	06/28/00	06/28/00
CADMIUM, TOTAL	001 MS	S	99L1358	06/19/00	06/28/00	06/28/00
CHROMIUM, TOTAL	001	S	99L1358	06/19/00	06/28/00	06/28/00
CHROMIUM, TOTAL	001 REP	S	99L1358	06/19/00	06/28/00	06/28/00
CHROMIUM, TOTAL	001 MS	S	99L1358	06/19/00	06/28/00	06/28/00
MERCURY, TOTAL	001	S	00C0196	06/19/00	06/26/00	06/27/00
MERCURY, TOTAL	001 REP	S	00C0196	06/19/00	06/26/00	06/27/00
MERCURY, TOTAL	001 MS	S	00C0196	06/19/00	06/26/00	06/27/00
LEAD, TOTAL	001	S	99L1358	06/19/00	06/28/00	06/28/00
LEAD, TOTAL	001 REP	S	99L1358	06/19/00	06/28/00	06/28/00
LEAD, TOTAL	001 MS	S	99L1358	06/19/00	06/28/00	06/28/00

LAB QC:

CADMIUM LABORATORY	LC1 BS	S	99L1358	N/A	06/28/00	06/28/00
CADMIUM, TOTAL	MB1	S	99L1358	N/A	06/28/00	06/28/00
CHROMIUM LABORATORY	LC1 BS	S	99L1358	N/A	06/28/00	06/28/00
CHROMIUM, TOTAL	MB1	S	99L1358	N/A	06/28/00	06/28/00
MERCURY LABORATORY	LC1 BS	S	00C0196	N/A	06/26/00	06/27/00
MERCURY, TOTAL	MB1	S	00C0196	N/A	06/26/00	06/27/00
LEAD LABORATORY	LC1 BS	S	99L1358	N/A	06/28/00	06/28/00
LEAD, TOTAL	MB1	S	99L1358	N/A	06/28/00	06/28/00

RECRA LabNet Use Only

00061674

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(9) Met Dig

RECRA LabNet

Client: TNU - Hanford B00-054

Est. Final Proj. Sampling Date:

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

Project Contact/Phone #:

RECRA Project Manager: OS

QC: Spec Del: Std TAT: 7 day

Date Rec'd: 6-23-00 Date Due: 6-30-00

Account #:

Refrigerator #																	
#/Type Container	Liquid									2		2					
	Solid									1G		1G					
Volume	Liquid																
	Solid									159		125					
Preservatives										–		–	–	–	–		
ANALYSES REQUESTED →		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					Metal	CN						
RECRA LabNet Use Only									TKN 2300	AA-ETO MHG-TO		IC NO2	IC NO3	IC PO4	MC RTO	IC SO4	

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	BOYHL7	✓	✓	S	6/9/00	1030								✓		✓	✓	✓	✓		

Special Instructions: SAP B00-054

DATE/REVISIONS:
8-9-00 1. Cd, Pb added per client request
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'd (Y) or N

Cooler Temp 9.4 C

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

NOTES: 4235 7953 6688

Relinquished by	Received by	Date	Time
Fed Ex	Inter State Hz fw	6-23-00	930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-054-010	Page 1 of 1

Collector RB Kerkow	Company Contact RB Kerkow FAX:372-8655	Telephone No. 531-0635	Project Coordinator TRENT, SJ	Price Code 9J	Data Turnaround
Project Designation 116-N-3 Process Control and Variance Sample Analysis - So	Sampling Location 116-N-3 "Size reduction pit"		SAF No. B00-054	Air Quality ☐	7day
Ice Chest No. ERC 99-063	Field Logbook No. EL-1524	COA R1325N2600	Method of Shipment Government Vehicle		
Shipped To ~~TMA~~/RECRA	Offsite Property No. A000229		BHI of Lading/Air Bill No. 42357953 66668		

RK 6/19/00

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially Radioactive

Special Handling and/or Storage
None

Preservation	Cool/4°C ~~None~~ RK 6/19/00	Cool/4°C ~~None~~ RK 6/19/00	None								
Type of Container	G	G/P	G								
No. of Container(s)	1	1	1								
Volume	15g	125g	500								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	See item (1) in Special Instructions.	See item (2) in Special Instructions.							TIETO	
Sample No.	Matrix *	Sample Date	Sample Time								
B0YHL7	SOIL	6-19-00	1030	X	X					B0YHK9	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
RB Kerkow	1650 6/19/00	REF IC	1650 6/19/00
REF IC	6/22/00 0930	R. Thoren	6/22/00 0930
R. Thoren	6/22/00 1430	FEDEX	
FedEx	6-23-00 930	Inez Stoltz-fw	6-23-00 930

SPECIAL INSTRUCTIONS
LAB COA: R1325N2F00

(1) IC Anions - 300.0 (Nitrate, Nitrite); NO2/NO3 - 353.1; Chromium Hex - 7196; ICP Metals - 6010A (TAL) (Chromium)
~~(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Isotopic Plutonium; Americium-241; Strontium-89,90 -- Total Sr; Nickel-63; Tritium - H3; Isotopic Uranium~~ RT 6/22/00

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

12

BHI-EE-011 (10/99)

ORIGINAL Dayes

SDR # B00-118
Revision #: 0
Date Initiated: 008/09/00

SAMPLE DISPOSITION RECORD

SAF: B00-054
OU: 100-NR-1
Project ID: 100-NR-1
Task ID: 1
Sampling Event: 116-N-3 Process Control and Variance Sample Analysis

Laboratory: TMA/RECRA

Task Manager: Roth, J.K.

Sampling Information:
Number of Samples: 3
ID Numbers: B0YHL7, B0YK13, and B0YK14
Matrix: soil
Collection Date: 6/19/00 - 8/02/00

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: 1) Addition of analysis

Description: Laboratory is directed to add the ICP metals, cadmium and lead, to the list of requested analyses.

Disposition:

Description: Laboratory is directed to add cadmium and lead to the list of requested analyses.

Justification: Project requires cadmium and lead data for waste designation purposes.

Approval Signatures:

S. J. Trent DWJhen (for SJ Trent) 8/10/00
Project Coordinator (Print/Sign Name) Date

J.K. Roth JKRoth 8/14/00
Task Manager (Print/Sign Name) Date