

H0542-TMA/RECRA
RECEIVED
JAN 18 2000

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Thermo Nutech
W.O. No. N9-09-172-7218

EDMC

Bechtel Hanford Inc.
SDG H0542

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0542 is composed of two solid (soil) samples designated under SAF No. B99-075 with a Project Designation of: 105-DR FSB-Soil. The remainder of the sample was shipped to RECRA on September 27, 1999 after enough material was removed to perform the NUC chemistry.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. The results were reported to BHI via fax on October 18, 1999.

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.4 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.5 Americium-241 Analyses

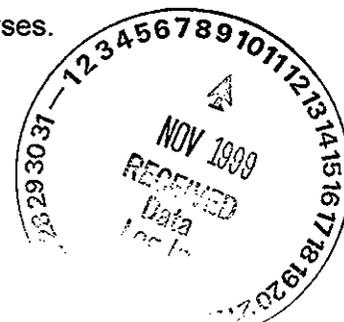
No problems were encountered during the course of the analyses.

2.6 Technetium-99 Analyses

No problems were encountered during the course of the analyses. A recount was performed on sample B0WCJ2 and the Blank. The Tc99 activity observed in the blank sample was slightly greater than the blank sample MDA however was less than the RDL.

2.7 Nickel-63 Analyses

No problems were encountered during the course of the analyses.



TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0542

SDG 7218
 Contact Kevin C. Johnson

SAMPLE SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0542

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0WCH9	105 DR	SOLID		N909172-01	B99-075	B99-075-16	09/22/99 12:50
B0WCJ2	105 DR	SOLID		N909172-02	B99-075	B99-075-17	09/22/99 13:10
Method Blank		SOLID		N909154-03	B99-075		
Method Blank		SOLID		N909172-04	B99-075		
Lab Control Sample		SOLID		N909154-02	B99-075		
Lab Control Sample		SOLID		N909172-03	B99-075		
Duplicate (N909172-01)	105 DR	SOLID		N909172-05	B99-075		09/22/99 12:50

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CS
 Version 3.06
 Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

SDG 7218
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0542

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7215		Method Blank	SOLID						N909154-03	7215-003
		Lab Control Sample	SOLID						N909154-02	7215-002
7218	B99-075-16	BOWCH9	SOLID	97.5			09/24/99 2		N909172-01	7218-001
	B99-075-17	BOWCJ2	SOLID	92.9			09/24/99 2		N909172-02	7218-002
		Method Blank	SOLID						N909172-04	7218-004
		Lab Control Sample	SOLID						N909172-03	7218-003
		Duplicate (N909172-01)	SOLID	97.5			09/24/99 2		N909172-05	7218-005

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

PREP BATCH SUMMARY

SDG 7218
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0542

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-		
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS	DUP/ORIG
Alpha Spectroscopy											
AM	SOLID	Americium 241 in Soil	6904-023	5.0	2			1	1	1/1	
PU	SOLID	Plutonium, Isotopic in Solids	6904-023	5.0	2			1	1	1/1	
U	SOLID	Uranium, Isotopic in Soil	6904-023	5.0	2			1	1	1/1	
Beta Counting											
TC	SOLID	Technetium 99 in Soil	6904-023	10.0	2			1	1	1/1	
Gamma Spectroscopy											
GAM	SOLID	Gamma Scan	6904-034	15.0	2			1	1	1/1	X
Liquid Scintillation Counting											
C	SOLID	Carbon 14 in Soil	6904-023	10.0	2			1	1	1/1	
NI_L	SOLID	Nickel 63 in Soil	6904-023	10.0	2			1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
 Blank and LCS plachets 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 10/19/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0542

WORK SUMMARY

SDG 7218
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

CLIENT SAMPLE ID		LAB SAMPLE ID								
LOCATION	MATRIX	COLLECTED		SUP-						
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
B0WCJ9		N909172-01	7218-001	AM		10/15/99	10/18/99	NJV	Americium 241 in Soil	
105 DR	SOLID	09/22/99	7218-001	C		10/09/99	10/18/99	NJV	Carbon 14 in Soil	
B99-075-16	B99-075	09/24/99	7218-001	GAM		10/07/99	10/18/99	NJV	Gamma Scan	
			7218-001	NI_L		10/11/99	10/18/99	NJV	Nickel 63 in Soil	
			7218-001	PU		10/10/99	10/18/99	NJV	Plutonium, Isotopic in Solids	
			7218-001	TC		10/14/99	10/18/99	NJV	Technetium 99 in Soil	
			7218-001	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
B0WCJ2		N909172-02	7218-002	AM		10/15/99	10/18/99	NJV	Americium 241 in Soil	
105 DR	SOLID	09/22/99	7218-002	C		10/10/99	10/18/99	NJV	Carbon 14 in Soil	
B99-075-17	B99-075	09/24/99	7218-002	GAM		10/07/99	10/18/99	NJV	Gamma Scan	
			7218-002	NI_L		10/11/99	10/18/99	NJV	Nickel 63 in Soil	
			7218-002	PU		10/10/99	10/18/99	NJV	Plutonium, Isotopic in Solids	
			7218-002	TC		10/11/99	10/18/99	NJV	Technetium 99 in Soil	
			7218-002	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
Method Blank		N909154-03	7215-003	AM		10/15/99	10/18/99	NJV	Americium 241 in Soil	
	SOLID		7215-003	C		10/09/99	10/13/99	NJV	Carbon 14 in Soil	
	B99-075		7215-003	NI_L		10/11/99	10/18/99	NJV	Nickel 63 in Soil	
			7215-003	PU		10/10/99	10/13/99	NJV	Plutonium, Isotopic in Solids	
			7215-003	TC		10/12/99	10/18/99	NJV	Technetium 99 in Soil	
			7215-003	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
Method Blank		N909172-04	7218-004	GAM		10/07/99	10/18/99	NJV	Gamma Scan	
	SOLID									
	B99-075									
Lab Control Sample		N909154-02	7215-002	AM		10/15/99	10/18/99	NJV	Americium 241 in Soil	
	SOLID		7215-002	C		10/10/99	10/13/99	NJV	Carbon 14 in Soil	
	B99-075		7215-002	NI_L		10/11/99	10/18/99	NJV	Nickel 63 in Soil	
			7215-002	PU		10/10/99	10/13/99	NJV	Plutonium, Isotopic in Solids	
			7215-002	TC		10/11/99	10/18/99	NJV	Technetium 99 in Soil	
			7215-002	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
Lab Control Sample		N909172-03	7218-003	GAM		10/07/99	10/18/99	NJV	Gamma Scan	
	SOLID									
	B99-075									

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

SDG 7218
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0542

WORK SUMMARY, cont.

CLIENT SAMPLE ID	LAB SAMPLE ID	LOCATION	MATRIX	COLLECTED	SUF-	REVIEWED	BY	METHOD
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED		
Duplicate (N909172-01)	N909172-05	7218-005		AM		10/15/99	10/18/99	NJV Americium 241 in Soil
105 DR	SOLID	09/22/99	7218-005	C		10/10/99	10/18/99	NJV Carbon 14 in Soil
	B99-075	09/24/99	7218-005	GAM		10/07/99	10/18/99	NJV Gamma Scan
			7218-005	NI_L		10/11/99	10/18/99	NJV Nickel 63 in Soil
			7218-005	PU		10/11/99	10/18/99	NJV Plutonium, Isotopic in Solids
			7218-005	TC		10/14/99	10/18/99	NJV Technetium 99 in Soil
			7218-005	U		10/14/99	10/18/99	NJV Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	B99-075	Americium 241 in Soil	AM/CMPLATE	2			1	1	1		5
C	B99-075	Carbon 14 in Soil	C14COXLSC	2			1	1	1		5
GAM	B99-075	Gamma Scan	GAMMAHI	2			1	1	1		5
NI_L	B99-075	Nickel 63 in Soil	NI63LSC	2			1	1	1		5
PU	B99-075	Plutonium, Isotopic in Solids	PUPLATE	2			1	1	1		5
TC	B99-075	Technetium 99 in Soil	TC99TRLSC	2			1	1	1		5
U	B99-075	Uranium, Isotopic in Soil	UPLATE	2			1	1	1		5
TOTALS				14			7	7	7		35

WORK SUMMARY

Page 2

SUMMARY DATA SECTION

Page 7

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 10/19/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

N909154-03

Method Blank

METHOD BLANK

SDG <u>7218</u>	Client/Case no <u>Hanford</u>	SDG <u>H0542</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N909154-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7215-003</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>B99-075</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	1.82	2.7	4.5	50	U	C
Technetium 99	14133-76-7	0.478	0.27	0.40	15	J	TC
Uranium 233/234	U-233/234	0.004	0.012	0.025	1.0	U	U
Uranium 235	15117-96-1	-0.002	0.005	0.019	1.0	U	U
Uranium 238	U-238	0.002	0.004	0.016	1.0	U	U
Plutonium 238	13981-16-3	0.010	0.015	0.028	1.0	U	PU
Plutonium 239/240	PU-239/240	0.003	0.020	0.041	1.0	U	PU
Nickel 63	13981-37-8	0.483	1.2	2.1	30	U	NI_L
Americium 241	14596-10-2	0	0.050	0.10	1.0	U	AM
Potassium 40	13966-00-2	N.A.					GAM
Barium 133	13981-41-4	N.A.					GAM
Cobalt 60	10198-40-0	N.A.			0.050		GAM
Cesium 137	10045-97-3	N.A.			0.10		GAM
Europium 152	14683-23-9	N.A.			0.10		GAM
Europium 154	15585-10-1	N.A.			0.10		GAM
Europium 155	14391-16-3	N.A.			0.10		GAM
Radium 226	13982-63-3	N.A.			0.10		GAM
Radium 228	15262-20-1	N.A.			0.20		GAM
Thorium 228	14274-82-9	N.A.					GAM
Thorium 232	TH-232	N.A.					GAM
Americium 241	14596-10-2	N.A.					GAM
Uranium 238	U-238	N.A.					GAM
Uranium 235	15117-96-1	N.A.					GAM

105-DR FSB-Soil

QC-BLANK 31900

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

Page 8

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DS
 Version 3.06
 Report date 10/19/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

N909172-04

Method Blank

METHOD BLANK

SDG <u>7218</u>	Client/Case no <u>Hanford</u>	SDG <u>H0542</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N909172-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7218-004</u>	Material/Matrix _____	<u>SOLID</u>
SAF No <u>B99-075</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	U		1.2		U	GAM
Barium 133	13981-41-4	U		6.6		UX	GAM
Cobalt 60	10198-40-0	U		0.037	0.050	U	GAM
Cesium 137	10045-97-3	U		0.043	0.10	U	GAM
Europium 152	14683-23-9	U		<u>0.11</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.13</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.080	0.10	U	GAM
Radium 226	13982-63-3	U		0.093	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.21</u>	0.20	U	GAM
Thorium 228	14274-82-9	U		0.057		U	GAM
Thorium 232	TH-232	U		0.21		U	GAM
Americium 241	14596-10-2	U		0.041		U	GAM
Uranium 238	U-238	U		5.1		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

105-DR FSB-Soil

QC-BLANK 31963

METHOD BLANKS

Page 2

SUMMARY DATA SECTION

Page 9

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-DS

Version 3.06

Report date 10/19/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0542

N909154-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7218</u> Contact <u>Kevin C. Johnson</u> Lab sample id <u>N909154-02</u> Dept sample id <u>7215-002</u>	Client/Case no <u>Hanford</u> <u>SDG H0542</u> Case no <u>TRB-SBB-207925</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B99-075</u>
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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 (TOTAL)	IMTS LIMITS	PROTOCOL LIMITS
Carbon 14	9730	200	28	50	C	10600	420	92	85-115		
Technetium 99	50.4	1.7	0.58	15	TC	54.6	2.2	92	84-116	80-120	
Uranium 233/234	5.23	0.67	0.31	1.0	U	4.64	0.19	113	76-124	80-120	
Uranium 235	4.00	0.57	0.092	1.0	U	3.77	0.15	106	75-125	80-120	
Uranium 238	5.15	0.67	0.30	1.0	U	5.04	0.20	102	78-122	80-120	
Plutonium 238	12.7	0.82	0.028	1.0	PU	12.5	0.50	102	86-114	80-120	
Plutonium 239/240	12.7	0.82	0.023	1.0	PU	13.2	0.53	96	87-113	80-120	
Nickel 63	134	3.6	1.9	30	NI_L	134	5.4	100	83-117		
Americium 241	9.65	0.66	0.059	1.0	AM	9.58	0.38	101	86-114	80-120	
Cobalt 60	N.A.			0.050	GAM					80-120	
Cesium 137	N.A.			0.10	GAM					80-120	

105-DR FSB-Soil

QC-LCS 31899

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 10/19/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0542

N909172-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7218</u> Contact <u>Kevin C. Johnson</u> Lab sample id <u>N909172-03</u> Dept sample id <u>7218-003</u>	Client/Case no <u>Hanford</u> <u>SDG H0542</u> Case no <u>TRB-SBB-207925</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B99-075</u>
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ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIBERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMDS (TOTAL)	PROTOCOL LIMITS
Cobalt 60	1.55	0.12	<u>0.063</u>	0.050	GAM	1.55	0.062	100	74-126	80-120
Cesium 137	1.61	0.10	0.072	0.10	GAM	1.59	0.064	101	75-125	80-120

105-DR FSB-Soil

QC-LCS 31962

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 10/19/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0542

N909172-05

BOWCH9

DUPLICATE

SDG <u>7218</u>		Client/Case no <u>Hanford</u>		SDG <u>H0542</u>
Contact <u>Kevin C. Johnson</u>		Case no <u>TRB-SBB-207925</u>		
DUPLICATE		ORIGINAL		
Lab sample id <u>N909172-05</u>	Lab sample id <u>N909172-01</u>	Client sample id <u>BOWCH9</u>		
Dept sample id <u>7218-005</u>	Dept sample id <u>7218-001</u>	Location/Matrix <u>105 DR</u> <u>SOLID</u>		
	Received <u>09/24/99</u>	Collected <u>09/22/99 12:50</u>		
% solids <u>97.5</u>	% solids <u>97.5</u>	Custody/SAF No <u>B99-075-16</u> <u>B99-075</u>		

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	TEST	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	PROT
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	LIMIT
Carbon 14	14.1	3.7	5.7	50	J	C	15.8	3.2	4.9	J	11	53	
Technetium 99	0.450	0.33	0.44	15	JB	TC	0.098	0.39	0.53	U	128	281	
Uranium 233/234	0.314	0.11	0.081	1.0	J	U	0.282	0.11	0.065	J	11	79	
Uranium 235	0.051	0.041	0.079	1.0	U	U	0.031	0.041	0.079	U	-	-	
Uranium 238	0.314	0.11	0.065	1.0	J	U	0.308	0.11	0.065	J	2	76	
Plutonium 238	0.013	0.019	0.030	1.0	U	PU	0.021	0.028	0.046	U	-	-	
Plutonium 239/240	1.28	0.15	0.030	1.0		PU	1.23	0.15	0.033		4	28	
Nickel 63	99.4	3.7	2.5	30		NI_L	102	4.1	3.1		3	23	
Americium 241	0.242	0.10	0.098	1.0	J	AM	0.269	0.084	0.087	J	11	77	
Potassium 40	9.38	0.90	0.63			GAM	9.23	0.69	0.44		2	37	
Barium 133	U		0.10		UX	GAM	U		0.085	UX	-	-	
Cobalt 60	4.64	0.17	<u>0.097</u>	0.050		GAM	4.29	0.12	<u>0.060</u>		8	33	
Cesium 137	10.8	0.22	<u>0.16</u>	0.10		GAM	9.92	0.16	<u>0.11</u>		8	32	
Europium 152	16.7	0.40	<u>0.36</u>	0.10		GAM	15.2	0.33	<u>0.29</u>		9	32	
Europium 154	2.36	0.30	<u>0.31</u>	0.10		GAM	2.24	0.24	<u>0.22</u>		5	41	
Europium 155	U		<u>0.31</u>	0.10	U	GAM	U		<u>0.21</u>	U	-	-	
Radium 226	0.332	0.17	<u>0.23</u>	0.10		GAM	0.189	0.11	<u>0.15</u>		55	121	
Radium 228	0.464	0.37	<u>0.51</u>	0.20	U	GAM	0.602	0.26	<u>0.34</u>		26	131	
Thorium 228	0.510	0.11	0.15			GAM	0.394	0.070	0.10		26	54	
Thorium 232	0.464	0.37	0.51		U	GAM	0.602	0.26	0.34		26	131	
Americium 241	U		0.26		U	GAM	U		0.24	U	-	-	
Uranium 238	U		17		U	GAM	U		13	U	-	-	
Uranium 235	U		0.37		U	GAM	U		0.25	U	-	-	

105-DR FSB-Soil

QC-DUP#1 31964

DUPLICATES

Page 1

SUMMARY DATA SECTION

Page 12

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DUP
 Version 3.06
 Report date 10/19/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

N909172-01

BOWCH9

DATA SHEET

SDG <u>7218</u>	Client/Case no <u>Hanford</u>	SDG <u>H0542</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N909172-01</u>	Client sample id <u>BOWCH9</u>	
Dept sample id <u>7218-001</u>	Location/Matrix <u>105 DR</u>	<u>SOLID</u>
Received <u>09/24/99</u>	Collected <u>09/22/99 12:50</u>	
% solids <u>97.5</u>	Custody/SAF No <u>B99-075-16</u>	<u>B99-075</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	15.8	3.2	4.9	50	J	C
Technetium 99	14133-76-7	0.098	0.39	0.53	15	U	TC
Uranium 233/234	U-233/234	0.282	0.11	0.065	1.0	J	U
Uranium 235	15117-96-1	0.031	0.041	0.079	1.0	U	U
Uranium 238	U-238	0.308	0.11	0.065	1.0	J	U
Plutonium 238	13981-16-3	0.021	0.028	0.046	1.0	U	PU
Plutonium 239/240	PU-239/240	1.23	0.15	0.033	1.0		PU
Nickel 63	13981-37-8	102	4.1	3.1	30		NI_L
Americium 241	14596-10-2	0.269	0.084	0.087	1.0	J	AM
Potassium 40	13966-00-2	9.23	0.69	0.44			GAM
Barium 133	13981-41-4	U		0.085		UX	GAM
Cobalt 60	10198-40-0	4.29	0.12	<u>0.060</u>	0.050		GAM
Cesium 137	10045-97-3	9.92	0.16	<u>0.11</u>	0.10		GAM
Europium 152	14683-23-9	15.2	0.33	<u>0.29</u>	0.10		GAM
Europium 154	15585-10-1	2.24	0.24	<u>0.22</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.21</u>	0.10	U	GAM
Radium 226	13982-63-3	0.189	0.11	<u>0.15</u>	0.10		GAM
Radium 228	15262-20-1	0.602	0.26	<u>0.34</u>	0.20		GAM
Thorium 228	14274-82-9	0.394	0.070	0.10			GAM
Thorium 232	TH-232	0.602	0.26	0.34			GAM
Americium 241	14596-10-2	U		0.24		U	GAM
Uranium 238	U-238	U		13		U	GAM
Uranium 235	15117-96-1	U		0.25		U	GAM

105-DR FSB-Soil

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/19/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

N909172-02

B0WCJ2

DATA SHEET

SDG <u>7218</u>	Client/Case no <u>Hanford</u>	SDG <u>H0542</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N909172-02</u>	Client sample id <u>B0WCJ2</u>	
Dept sample id <u>7218-002</u>	Location/Matrix <u>105 DR</u>	<u>SOLID</u>
Received <u>09/24/99</u>	Collected <u>09/22/99 13:10</u>	
% solids <u>92.9</u>	Custody/SAF No <u>B99-075-17</u>	<u>B99-075</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	5.10	2.8	4.5	50	J	C
Technetium 99	14133-76-7	-0.188	0.27	0.41	15	U	TC
Uranium 233/234	U-233/234	0.557	0.16	0.089	1.0	J	U
Uranium 235	15117-96-1	0.067	0.045	0.086	1.0	U	U
Uranium 238	U-238	0.390	0.13	0.071	1.0	J	U
Plutonium 238	13981-16-3	0.013	0.021	0.035	1.0	U	PU
Plutonium 239/240	PU-239/240	0.206	0.053	0.038	1.0	J	PU
Nickel 63	13981-37-8	32.3	2.3	2.4	30		NI_L
Americium 241	14596-10-2	0.071	0.047	0.070	1.0	J	AM
Potassium 40	13966-00-2	9.56	1.1	0.74			GAM
Barium 133	13981-41-4	U		0.13		UX	GAM
Cobalt 60	10198-40-0	0.675	0.13	<u>0.10</u>	0.050		GAM
Cesium 137	10045-97-3	17.4	0.30	<u>0.11</u>	0.10		GAM
Europium 152	14683-23-9	2.68	0.34	<u>0.40</u>	0.10		GAM
Europium 154	15585-10-1	0.582	0.28	<u>0.29</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.22</u>	0.10	U	GAM
Radium 226	13982-63-3	0.334	0.18	<u>0.22</u>	0.10		GAM
Radium 228	15262-20-1	0.526	0.36	<u>0.42</u>	0.20		GAM
Thorium 228	14274-82-9	0.504	0.12	0.15			GAM
Thorium 232	TH-232	0.526	0.36	0.42			GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	U		15		U	GAM
Uranium 235	15117-96-1	U		0.32		U	GAM

105-DR FSB-Soil

DATA SHEETS

Page 2

SUMMARY DATA SECTION

Page 14

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/19/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Test AM Matrix SOLID

SDG 7218

Contact Kevin C. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG H0542

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Americium 241
Preparation batch 6904-023				
BOWCH9	N909172-01	7218-001		0.269 J
BOWCJ2	N909172-02	7218-002		0.071 J
BLK (QC ID=31900)	N909154-03	7215-003		U
LCS (QC ID=31899)	N909154-02	7215-002		ok
Duplicate (N909172-01)	N909172-05	7218-005		ok J

Nominal values and limits from method RDLs (pCi/g) 1.0
105-DR FSB-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 6904-023 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 023															
BOWCH9	N909172-01		0.087	0.500				76		744		23	10/15/99	10/15	SS-033
BOWCJ2	N909172-02		0.070	0.500				80		744		23	10/15/99	10/15	SS-034
BLK (QC ID=31900)	N909154-03		0.10	0.500				37		744			10/15/99	10/15	SS-031
LCS (QC ID=31899)	N909154-02		0.059	0.500				88		744			10/15/99	10/15	SS-029
Duplicate (N909172-01)	N909172-05		0.098	0.500				43		744		23	10/15/99	10/15	SS-035
	(QC ID=31964)														

Nominal values and limits from method 1.0 0.500 20-105 700 100 180

PROCEDURES	REFERENCE	AM/CMPLATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-940		Plutonium Purification, rev 0
EP-960		Americium-Curium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD MDA 0.083 ± 0.036
FOR 5 SAMPLES YIELD 65 ± 46

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

Page 15

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Test PU Matrix SOLID
SDG 7218
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 6904-023						
BOWCH9	N909172-01			7218-001	U	1.23
BOWCJ2	N909172-02			7218-002	U	0.206 J
BLK (QC ID=31900)	N909154-03			7215-003	U	U
LCS (QC ID=31899)	N909154-02			7215-002	ok	ok
Duplicate (N909172-01)	N909172-05			7218-005	- U	ok
Nominal values and limits from method						
105-DR FSB-Soil			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 %	EPF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-023 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 023																
BOWCH9	N909172-01			0.046	0.500			63		1089			18	10/09/99	10/10	SS-058
BOWCJ2	N909172-02			0.038	0.500			81		1088			18	10/09/99	10/10	SS-062
BLK (QC ID=31900)	N909154-03			0.041	0.500			82		1086				10/09/99	10/10	SS-010
LCS (QC ID=31899)	N909154-02			0.028	0.500			74		1089				10/09/99	10/10	SS-056
Duplicate (N909172-01) (QC ID=31964)	N909172-05			0.030	0.500			80		953			19	10/09/99	10/11	SS-008
Nominal values and limits from method																
				1.0	0.500			20-105		10	100		180			

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

AVERAGES ± 2 SD	MDA	0.037 ± 0.015
FOR 5 SAMPLES	YIELD	76 ± 16

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

Page 16

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test U Matrix SOLID

SDG 7218

Contact Kevin C. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG H0542

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	1: Uranium		2: Uranium		3: Uranium		RESULT RATIOS (%)						
				233/234	235	238	238	1+3	2σ	2+3	2σ					
Preparation batch 6904-023																
BOWCH9	N909172-01		7218-001	0.282 J	U		0.308 J			92	48	10	14			
BOWCJ2	N909172-02		7218-002	0.557 J	U		0.390 J			143	63	17	13			
BLK (QC ID=31900)	N909154-03		7215-003	U	U		U									
LCS (QC ID=31899)	N909154-02		7215-002	ok	ok		ok									
Duplicate (N909172-01)	N909172-05		7218-005	ok J	- U		ok J			100	50	16	14			
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0			100		4				
105-DR FSB-Soil										Averages 111		14				

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL-	
													PREPARED	YZED
Preparation batch 6904-023													2σ prep error 5.0 %	Reference Lab Notebook 6904 pg. 023
BOWCH9	N909172-01		0.079	1.00			85	155.			22	10/13/99	10/14	SS-031
BOWCJ2	N909172-02		0.089	1.00			79	155			22	10/13/99	10/14	SS-032
BLK (QC ID=31900)	N909154-03		0.025	1.00			82	686				10/13/99	10/14	SS-050
LCS (QC ID=31899)	N909154-02		0.31	1.00			74	155				10/13/99	10/14	SS-027
Duplicate (N909172-01)	N909172-05		0.081	1.00			89	155			22	10/13/99	10/14	SS-033
(QC ID=31964)														
Nominal values and limits from method			1.0	1.00			30-105	150	100	180				

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

AVERAGES ± 2 SD	MDA	0.12 ± 0.22
FOR 5 SAMPLES	YIELD	82 ± 11

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

Page 17

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

Client Hanford

Contract TRB-SBB-207925

Case no SDG H0542

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Test TC Matrix SOLID
SDG 7218
Contact Kevin C. Johnson

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	Technetium 99 PLANCHET
Preparation batch 6904-023				
B0WCH9	N909172-01			7218-001 U
B0WCJ2	N909172-02			7218-002 U
BLK (QC ID=31900)	N909154-03			7215-003 <u>0.478</u> J
LCS (QC ID=31899)	N909154-02			7215-002 ok
Duplicate (N909172-01)	N909172-05			7218-005 ok J

Nominal values and limits from method RDLs (pCi/g) 15
105-DR FSB-Soil

METHOD PERFORMANCE.

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 6904-023 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 023															
B0WCH9	N909172-01			0.53	1.00			67	101			22	10/07/99	10/14	GRB-207
B0WCJ2	N909172-02			0.41	1.00			88	101			19	10/07/99	10/11	GRB-231
BLK (QC ID=31900)	N909154-03			0.40	1.00			87	101				10/07/99	10/12	GRB-228
LCS (QC ID=31899)	N909154-02			0.58	1.00			58	101				10/07/99	10/11	GRB-224
Duplicate (N909172-01)	N909172-05			0.44	1.00			88	101			22	10/07/99	10/14	GRB-208
	(QC ID=31964)														

Nominal values and limits from method 15 1.00 20-105 50 180

PROCEDURES	REFERENCE	TC99TRLSC
EP-060		Soil Preparation, rev 0
EP-020		Sample Leach For Technetium-99, rev 0
EP-540		Technetium-99 Purification, rev 0

AVERAGES ± 2 SD MDA 0.47 ± 0.16
FOR 5 SAMPLES YIELD 78 ± 28

METHOD SUMMARIES

Page 4

SUMMARY DATA SECTION

Page 18

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
 SDG 7218
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0542

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6904-034					
BOWCH9	N909172-01		7218-001	4.29	9.92
BOWCJ2	N909172-02		7218-002	0.675	17.4
BLK (QC ID=31963)	N909172-04		7218-004	U	U
LCS (QC ID=31962)	N909172-03		7218-003	ok	ok
Duplicate (N909172-01)	N909172-05		7218-005	ok	ok
Nominal values and limits from method		RDLs (pCi/g)		0.050	0.10
105-DR FSB-Soil					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6904-034 2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 034																
BOWCH9	N909172-01		<u>0.31</u>	171						422			15	09/27/99	10/07	JR,04,00
BOWCJ2	N909172-02		<u>0.30</u>	<u>154</u>						397			15	09/27/99	10/07	JR,01,00
BLK (QC ID=31963)	N909172-04		<u>0.076</u>	162						437				09/27/99	10/07	JR,07,00
LCS (QC ID=31962)	N909172-03		<u>0.063</u>	162						399				09/27/99	10/07	JR,03,00
Duplicate (N909172-01)	N909172-05		<u>0.40</u>	171						582			15	09/27/99	10/07	JR,03,00
(QC ID=31964)																
Nominal values and limits from method			0.050 162							100				180		

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

AVERAGES ± 2 SD	MDA <u>0.23</u> ± <u>0.30</u>
FOR 5 SAMPLES	YIELD _____ ± _____

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

METHOD SUMMARY

CARBON 14 IN SOIL

LIQUID SCINTILLATION COUNTING

Test C Matrix SOLID
 SDG 7218
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0542

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Carbon 14
Preparation batch 6904-023				
BOWCH9	N909172-01	7218-001		15.8 J
BOWCJ2	N909172-02	7218-002		5.10 J
BLK (QC ID=31900)	N909154-03	7215-003		U
LCS (QC ID=31899)	N909154-02	7215-002		ok
Duplicate (N909172-01)	N909172-05	7218-005		ok J

Nominal values and limits from method RDLs (pCi/g) 50
 105-DR FSB-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 6904-023 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 023															
BOWCH9	N909172-01		4.9	0.203				100		100			17	10/06/99	10/09 LSC-004
BOWCJ2	N909172-02		4.5	0.216				100		100			18	10/06/99	10/10 LSC-004
BLK (QC ID=31900)	N909154-03		4.5	0.214				100		100				10/06/99	10/09 LSC-004
LCS (QC ID=31899)	N909154-02		28	0.214				100		3				10/06/99	10/10 LSC-004
Duplicate (N909172-01) (QC ID=31964)	N909172-05		5.7	0.210				100		100			18	10/06/99	10/10 LSC-004

Nominal values and limits from method 50 0.210 25 180

PROCEDURES	REFERENCE	C14COXLSC
	EP-060	Soil Preparation, rev 0
	EP-251	Tritium / Carbon-14 Oxidation, rev 0

AVERAGES ± 2 SD	MDA <u>9.5</u> ± <u>21</u>
FOR 5 SAMPLES	YIELD <u>100</u> ± <u>0</u>

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 10/19/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0542

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID

SDG 7218

Contact Kevin C. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG H0542

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	PLANCHET	Nickel 63
Preparation batch 6904-023				
B0WCH9	N909172-01		7218-001	102
B0WCJ2	N909172-02		7218-002	32.3
BLK (QC ID=31900)	N909154-03		7215-003	U
LCS (QC ID=31899)	N909154-02		7215-002	ok
Duplicate (N909172-01)	N909172-05		7218-005	ok

Nominal values and limits from method RDLs (pCi/g) 30
105-DR FSB-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 6904-023 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 023														
B0WCH9	N909172-01		3.1	0.500			59	100				19	10/09/99	10/11 LSC-005
B0WCJ2	N909172-02		2.4	0.500			74	100				19	10/09/99	10/11 LSC-005
BLK (QC ID=31900)	N909154-03		2.1	0.500			85	100					10/09/99	10/11 LSC-005
LCS (QC ID=31899)	N909154-02		1.9	0.500			89	100					10/09/99	10/11 LSC-005
Duplicate (N909172-01) (QC ID=31964)	N909172-05		2.5	0.500			69	100				19	10/09/99	10/11 LSC-005

Nominal values and limits from method 30 0.500 10 180

PROCEDURES REFERENCE NI63LSC
EP-060 Soil Preparation, rev 0
EP-431 Nickel-63 Purification, rev 0

AVERAGES ± 2 SD MDA 2.4 ± 0.92
FOR 5 SAMPLES YIELD 75 ± 24

METHOD SUMMARIES

Page 7

SUMMARY DATA SECTION

Page 21

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 10/19/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

Page 24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 1. A fixed percentage specified in the protocol.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG_H0542

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

REPORT GUIDES

Page 9

SUMMARY DATA SECTION

Page 30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 31

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG_H0542

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

REPORT GUIDES

Page 11

SUMMARY DATA SECTION

Page 32

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

SDG 7218
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

SDG 7218
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES

Page 13

SUMMARY DATA SECTION

Page 34

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

SDG 7218
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0542

SDG 7218
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0542

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/19/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-075-16	Page 1 of 1
Collector Fahlberg/Behnke		Company Contact Jason Adler		Telephone No. 373-4316		Project Coordinator TRENT, SJ	
Project Designation 105-DR FSB - Soil		Sampling Location 105 DR		SAF No. B99-075		Price Code 8L Data Turnaround 21 Days	
Ice Chest No. SML 596		Field Logbook No. EL-1281		Method of Shipment FedEx			
Shipped To TMA/RECRA RF 9.22.99		Offsite Property No. A990270		Bill of Lading/Air Bill No. 087952 423579529734 COA R105D42800			

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	None						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
Special Handling and/or Storage	Volume	60mL	60mL	60mL	500mL						
SAMPLE ANALYSIS		Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
B0WCH9	Soil	9.22.99	1250								Bowles
B0WCH0	Soil	_____	_____								
B0WCH1	Soil	_____	9.22.99								

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By K. Fahlberg		Date/Time 1535 9.22.99		Received By Ref 1-C		Date/Time 9.22.99		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Americium-241; Carbon-14; Nickel-63; Technetium-99 Entire contents of sample sent to TMA in one 500 ml bottle. TMA will place media in 60ml bottles provided and send to RECRA, After their analysis, COLLECTOR UNAVAILABLE TO SIGN COC				Soil Water Vapor Other Solid Other Liquid	
Relinquished By Ref 4-C		Date/Time 9.23.99 11:30		Received By C. Chico		Date/Time 9/23/99 11:30							
Relinquished By C. Chico		Date/Time 9.23.99 1400		Received By FEDEX		Date/Time 9/23/99 1400							
Relinquished By FedEx		Date/Time 10:00 9-24-99		Received By TNU M. Goldsteinberg		Date/Time 9-24-99							
LABORATORY SECTION		Received By				Disposed By				Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method				Disposal Method				Date/Time			

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-075-17

Page 1 of 1.

Collector Fahlberg/Behnke	Company Contact Jason Adler	Telephone No. 373-4316	Project Coordinator TRENT, SJ	Price Code 8L	Data Turnaround 21 Days
Project Designation 105-DR FSB - Soil	Sampling Location 105 DR	SAF No. B99-075			
Ice Chest No. RF 923/99 RF 923/99 SML 596	Field Logbook No. EL-1281	Method of Shipment Fed Ex			
Shipped To TMA/RECRA RF 9.22.99	Offsite Property No. A990269	Bill of Lading/Air Bill No. 423579529734			
COA R105 D42800					

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	None				
		Type of Container	aG	aG	aG	aG			
Special Handling and/or Storage	No. of Container(s)	1	1	1	1				
	Volume	60mL	60mL	60mL	500mL				

SAMPLE ANALYSIS	Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time							
B0WCJ2	Soil	9.22.99	1310					X		B0WCJ2
B0WCJ3	Soil	RF								
B0WCJ4	Soil	9.22.99								
B0WCJ5	Soil									

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg	1535 9.22.99	RF IC	1535 9.22.99
Relinquished By	Date/Time	Received By	Date/Time
RF IC	9/23/99 1130	CAVIC	9/23/99 1130
Relinquished By	Date/Time	Received By	Date/Time
C. Mice	9/23/99 1400	FEDEX	9/23/99 1400
Relinquished By	Date/Time	Received By	Date/Time
Fed Ex	10:00 9-24-99	TNU M. Goldenberg	10100 9-24-99
		COLLECTOR UNAVAILABLE TO SIGN COC	

LABORATORY SECTION	Received By	Disposal Method	Disposed By
FINAL SAMPLE DISPOSITION			

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Beechtel Hanford Inc Date/Time received 9-24-99 10:00
CoC No. B 99-075-17, 16
Container I.D. No. SMC596 Requested TAT (Days) 21 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: 3
- 7. Number of containers per sample: _____ (Or see CoC)
- 8. Paperwork agrees with samples? Yes [] No []
- 9. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
- 10. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
- 11. Describe any anomalies: On coc B99-075-16
sample TID BOWCHS soil 3x60mL, but we
received empty containers
- 13. Was P.M. notified of any anomalies? Yes [] No [] Date 9-24-99
- 14. Received by M. Goldenberg Date: 9-24-99 Time: 10:00

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
Analytical Report**

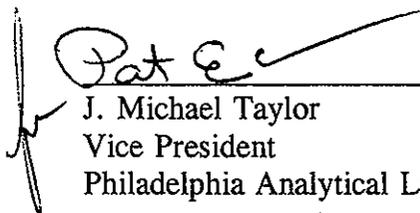


Client : TNU-HANFORD B99-075
RFW# : 9909L208
SDG# : H0542
SAF# : B99-075

W.O. # : 10985-001-001-9999-00
Date Received: 09-28-99

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 recoveries for Chromium VI 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.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-28-99
Date

njp\i09-208

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

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	___ D2216-80		
% Moisture	___ D2216-80		___ ILMO4.0 (e)
% Solids	___		✓ 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)
Oxygne 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 Prpearation 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 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-001	B0WCH9	% Solids	97.2	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/08/99

CLIENT: TNU-HANFORD B99-075
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI069-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recre LabNet - Lionville

INORGANICS ACCURACY REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B0WCH9	Soluble Chromium VI	4.4	0.41u	4.1	106.5	1.0
		Insoluble Chromium VI	1180	0.41u	1180	99.8	100
BLANK10	99LVI069-MB1	Chromium VI	4.1	0.40u	4.0	101.4	1.0
		Chromium VI MSD	1180	0.40u	1160	101.3	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE RPD		FACTOR (REP)
*****	*****	*****	*****	*****	*****	*****
-001REP	BOWCH9	* Solids	97.2	97.2	0.051	1.0
		Chromium VI	0.41u	0.41u	NC	1.0

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-075

DATE RECEIVED: 09/28/99

RFW LOT # :9909L208

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWCH9						
% SOLIDS	001	S	99L%S128	09/22/99	10/01/99	10/03/99
% SOLIDS	001 REP	S	99L%S128	09/22/99	10/01/99	10/03/99
CHROMIUM VI	001	S	99LVI069	09/22/99	10/07/99	10/07/99
CHROMIUM VI	001 REP	S	99LVI069	09/22/99	10/07/99	10/07/99
CHROMIUM VI	001 MS	S	99LVI069	09/22/99	10/07/99	10/07/99
CHROMIUM VI	001 MSD	S	99LVI069	09/22/99	10/07/99	10/07/99

LAB QC:

CHROMIUM VI	MB1	S	99LVI069	N/A	10/07/99	10/07/99
CHROMIUM VI	MB1 BS	S	99LVI069	N/A	10/07/99	10/07/99
CHROMIUM VI	MB1 BSD	S	99LVI069	N/A	10/07/99	10/07/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-075-16	Page 1 of 1
Collector Fahlberg/Behnke		Company Contact Jason Adler		Telephone No. 373-4316		Project Coordinator TRENT, SJ	
Project Designation 105-DR FSB - Soil		Sampling Location 105 DR		SAF No. B99-075		Price Code 8L EUU SDG H0542	
Ice Chest No. SML 596		Field Logbook No. EL-1281		Method of Shipment Fed Ex			
Shipped To EPA/RECRA 9.22.99		Offsite Property No. A990270		Bill of Lading/Air Bill No. 4235 7952 9734			
				COA R105 D4 2800			

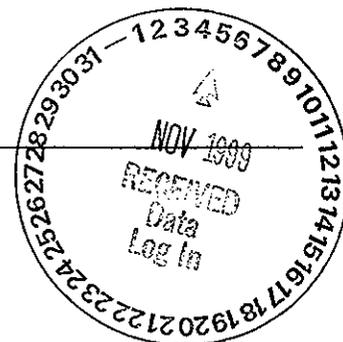
POSSIBLE SAMPLE HAZARDS/REMARKS SDG# H0542	Preservation	Cool 4C	Cool 4C	None	None						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
	Special Handling and/or Storage	Volume	60mL	60mL	60mL	500mL					

SAMPLE ANALYSIS				Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.						
-----------------	--	--	--	---------------------	----------------------------	-----------------------------------------------------------	---------------------------------------	--	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time										
BOWCH9	Soil	9-22-99	1250	X	X	X							BOWCC8
BOWCJO	Soil	9-22-99											
BOWCJI	Soil	9-22-99											

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By R. Fahlberg	Date/Time 9-22-99 1535	Received By Ref 1-C	Date/Time 9-22-99 1535	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Americium-241; Carbon-14; Nickel-63; Technetium-99				Soil Water Vapor Other Solid Other Liquid			
Relinquished By Ref 1-C	Date/Time 9-23-99 11:30	Received By Chris	Date/Time 9/23/99 1130								
Relinquished By Chris	Date/Time 9/23/99 1400	Received By FEDEX	Date/Time 9/23/99 1400								
Relinquished By FEDEX	Date/Time 9-28-99/0945	Received By D. Spivey	Date/Time 9-28-99/0945								
LABORATORY SECTION	Received By	Title				COLLECTOR UNABLE TO SIGN LOC				Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method				Disposed By				Date/Time		

010



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-075
RFW# : 9909L208
SDG/SAF# : H0542/B99-075

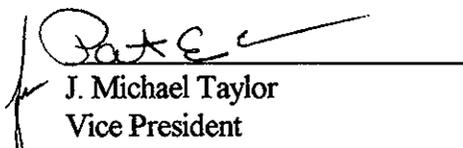
W.O.# : 10985-001-001-9999-00
Date Received: 09-28-99

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.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

mld/m09-208

10-8-99
Date



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Recra Lot#: 9909L208

Leaching Procedure: 1310 1311 1312 Other: _____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A 3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Antimony	<u> </u> 6010B <u> </u> 7041 ⁵	<u> </u> 200.7 <u> </u> 204.2			<u> </u> 99
Arsenic	<u> </u> 6010B <u> </u> 7060A ⁵	<u> </u> 200.7 <u> </u> 206.2	<u> </u> 3113B		<u> </u> 99
Barium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Beryllium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Bismuth	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Boron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Cadmium	<u> </u> 6010B <u> </u> 7131A ⁵	<u> </u> 200.7 <u> </u> 213.2			<u> </u> 99
Calcium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Chromium	<u> </u> 6010B <u> </u> 7191 ⁵	<u> </u> 200.7 <u> </u> 218.2			<u> </u> SS17
Cobalt	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Copper	<u> </u> 6010B <u> </u> 7211 ⁵	<u> </u> 200.7 <u> </u> 220.2			<u> </u> 99
Iron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Lead	<input checked="" type="checkbox"/> 6010B <u> </u> 7421 ⁵	<u> </u> 200.7 <u> </u> 239.2	<u> </u> 3113B		<u> </u> 99
Lithium	<u> </u> 6010B <u> </u> 7430 ⁴	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Magnesium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Manganese	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Mercury	<u> </u> 7470A ³ <input checked="" type="checkbox"/> 7471A ³	<u> </u> 245.1 ² <u> </u> 245.5 ²			<u> </u> 99
Molybdenum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Nickel	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Potassium	<u> </u> 6010B <u> </u> 7610 ⁴	<u> </u> 200.7 <u> </u> 258.1 ⁴			<u> </u> 99
Rare Earths	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Selenium	<u> </u> 6010B <u> </u> 7740 ⁵	<u> </u> 200.7 <u> </u> 270.2	<u> </u> 3113B		<u> </u> 99
Silicon	<u> </u> 6010B ¹	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silica	<u> </u> 6010B	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silver	<u> </u> 6010B <u> </u> 7761 ⁵	<u> </u> 200.7 <u> </u> 272.2			<u> </u> 99
Sodium	<u> </u> 6010B <u> </u> 7770 ⁴	<u> </u> 200.7 <u> </u> 273.1 ⁴			<u> </u> 99
Strontium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Thallium	<u> </u> 6010B <u> </u> 7841 ⁵	<u> </u> 200.7 <u> </u> 279.2 <u> </u> 200.9			<u> </u> 99
Tin	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Titanium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Uranium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Vanadium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zinc	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zirconium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99

Other: _____

Method: _____

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 10/08/99

CLIENT: TNU-HANFORD B99-075
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B0WCH9	Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Lead, Total	3.1 u	MG/KG	3.1	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/08/99

CLIENT: TNU-HANFORD B99-075
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK1	99C0290-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0
BLANK1	99L0660-MB1	Lead, Total	3.1 u	MG/KG	3.1	1.0

Recre LabNet - Lionville

INORGANICS ACCURACY REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	BOWCH9	Mercury, Total	0.16	0.01u	0.15	108.2	1.0
		Lead, Total	47.7	3.1 u	50.4	94.6	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
*****	*****	*****	*****	*****	*****	
-001REP	BOWCH9	Mercury, Total	0.01u	0.01u	NC	1.0
		Lead, Total	3.1 u	2.8 u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L208

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
*****	*****	*****	*****	*****	*****	*****
LCS1	99C0290-LC1	Mercury, LCS	1.0	1.0	MG/KG	102.5
LCS1	99L0660-LC1	Lead, LCS	246	250	MG/KG	98.3

Recre LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-075

DATE RECEIVED: 09/28/99

RFW LOT # :9909L208

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWCH9						
MERCURY, TOTAL	001	S	99C0290	09/22/99	10/06/99	10/07/99
MERCURY, TOTAL	001 REP	S	99C0290	09/22/99	10/06/99	10/07/99
MERCURY, TOTAL	001 MS	S	99C0290	09/22/99	10/06/99	10/07/99
LEAD, TOTAL	001	S	99L0660	09/22/99	09/29/99	10/01/99
LEAD, TOTAL	001 REP	S	99L0660	09/22/99	09/29/99	10/01/99
LEAD, TOTAL	001 MS	S	99L0660	09/22/99	09/29/99	10/01/99

LAB QC:

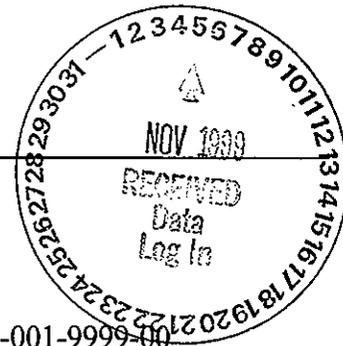
MERCURY LABORATORY	LC1 BS	S	99C0290	N/A	10/06/99	10/07/99
MERCURY, TOTAL	MB1	S	99C0290	N/A	10/06/99	10/07/99
LEAD LABORATORY	LC1 BS	S	99L0660	N/A	09/29/99	10/01/99
LEAD, TOTAL	MB1	S	99L0660	N/A	09/29/99	10/01/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-075-16	Page 1 of 1
Collector Fahlberg/Behatz		Company Contact Jason Adler		Telephone No. 373-4316		Project Coordinator TRENT, SJ
Project Designation 105-DR FSB - Soil		Sampling Location 105 DR		SAF No. B99-075		Price Code 8L EUU SDG H0542
Ice Chest No. SML 596		Field Logbook No. EL-1281		Method of Shipment Fed Ex		
Shipped To EPA/RECRA 9.22.99		Offsite Property No. A990270		Bill of Lading/Air Bill No. 4235 7952 9734		
		COA R105 D4 2800				

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	None					
	Type of Container	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1					
	Volume	60mL	60mL	60mL	500mL					
Special Handling and/or Storage SDG# H0542										
SAMPLE ANALYSIS		Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.					
Sample No.	Matrix *	Sample Date	Sample Time							
BOWCH9	Soil	9-22-99	1250	X	X	X				Bowch9
BOWCJ0	Soil									
BOWCJ1	Soil	9-22-99								

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By R. Fahlberg		Date/Time 9-22-99 1535		Received By Ref 1-C		Date/Time 9-22-99 1535		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Americium-241; Carbon-14; Nickel-63; Technetium-99	
Relinquished By Ref 1-C		Date/Time 9-23-99 11:30		Received By Chris		Date/Time 9/23/99 1130			
Relinquished By Chris		Date/Time 9/23/99 1400		Received By FEDEX		Date/Time 9/23/99 1400			
Relinquished By FedEx		Date/Time 9-28-99/0945		Received By D. Y. [Signature]		Date/Time 9-28-99/0945			
LABORATORY SECTION		Received By		COLLECTOR UNABLE TO SIGN LOC				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	

012



**Recra LabNet Philadelphia
Analytical Report**

Client: TNU-HANFORD B99-075
RFW#: 9909L208
SDG/SAF#: H0542/B99-075

W.O.#: 10985-001-001-9999-00
Date Received: 09-28-99

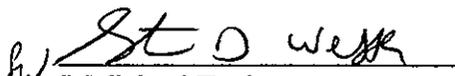
PCB

One (1) soil sample was collected on 09-22-99.

The sample and its associated QC samples were extracted on 10-06-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 12-08-99. 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 and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-22-99
Date

pefr:\group\data\pest\09L-208.pcb

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 7 pages.

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: 10/19/99 16:53

RFW Batch Number: 9909L208

Client: TNU-HANFORD B99-075

Work Order: 10985001001 Page: 1

004

Sample Information	Cust ID:	BOWCH9	BOWCH9	BOWCH9	PBLKWH	PBLKWH BS
	RFW#:	001	001 MS	001 MSD	99LE1208-MB1	99LE1208-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	100 %	105 %	115 %	112 %	115 %
	Decachlorobiphenyl	86 %	96 %	105 %	103 %	106 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====						
Aroclor-1016		34 U	68 U	68 U	33 U	33 U
Aroclor-1221		67 U	140 U	140 U	67 U	67 U
Aroclor-1232		34 U	68 U	68 U	33 U	33 U
Aroclor-1242		34 U	68 U	68 U	33 U	33 U
Aroclor-1248		34 U	68 U	68 U	33 U	33 U
Aroclor-1254		34 U	90 %	98 %	33 U	83 %
Aroclor-1260		34 U	68 U	68 U	33 U	33 U

Handwritten signature
10-20-99

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 B99-075

DATE RECEIVED: 09/28/99

RFW LOT # :9909L208

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWCH9	001	S	99LE1208	09/22/99	10/06/99	10/12/99
BOWCH9	001 MS	S	99LE1208	09/22/99	10/06/99	10/12/99
BOWCH9	001 MSD	S	99LE1208	09/22/99	10/06/99	10/12/99

LAB QC:

PBLKWH	MB1	S	99LE1208	N/A	10/06/99	10/11/99
PBLKWH	MB1 BS	S	99LE1208	N/A	10/06/99	10/11/99

all
10-20-99

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-075-16

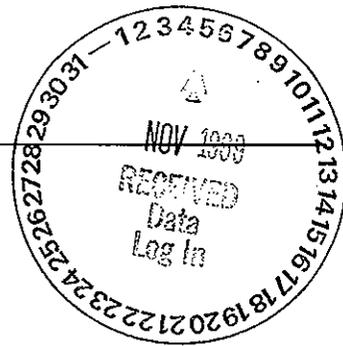
Page 1 of 1

Collector Fahlberg/Behnke	Company Contact Jason Adler	Telephone No. 373-4316	Project Coordinator TRENT, SJ	Price Code 8L EUU SDG H0542	Data Turnaround 21 Days
Project Designation 105-DR FSB - Soil	Sampling Location 105 DR	Field Logbook No. EL-1281	SAF No. B99-075	Method of Shipment Fed Ex	
Ice Chest No. SML 594	Offsite Property No. A990270	Bill of Lading/Air Bill No. 4235 7952 9734			
Shipped To EMA/RECRA 9.22.99	COA R105 D4 2800				

POSSIBLE SAMPLE HAZARDS/REMARKS SDG# H0542	Preservation	Cool 4C	Co:14C	None	None						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
	Special Handling and/or Storage	Volume 60mL	60mL	60mL	500mL						
SAMPLE ANALYSIS		Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add- on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
B0WC9	Soil	9.22.99	1250	X	X	X					B0WC8
B0WC0	Soil										
B0WC1	Soil	9.22.99									

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By 15-fall / J. Behnke	Date/Time 9.22.99 1535	Received By Ref 1-C	Date/Time 9.22.99 1130	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Americium-241; Carbon-14; Nickel-63; Technetium-99				Soil Water Vapor Other Solid Other Liquid	
Relinquished By Ref 1-C	Date/Time 9.23.99 11:30	Received By Chris	Date/Time 9/23/99 1130						
Relinquished By Chris	Date/Time 9/23/99 1400	Received By FEDEX	Date/Time 9/23/99 1400						
Relinquished By FedEx	Date/Time 9.28.99/0945	Received By D. Spindel	Date/Time 9.28.99/0945						
LABORATORY SECTION	Received By	Title		COLLECTOR UNABLE TO SIGN LOC				Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time	

100



**Recra LabNet Philadelphia
Analytical Report
REVISION**

Client : TNU-HANFORD B99-075
RFW# : 9909L173
SDG/SAF# : H0542/B99-075

W.O.# : 10985-001-001-9999-00
Date Received: 09-24-99

*original
received 10/26/99
Daves
11/9/99*

METALS CASE NARRATIVE

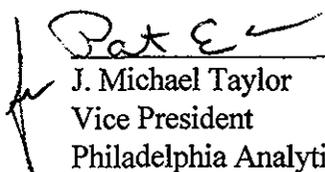
This narrative was revised to correct the SDG number.

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. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. When the Mercury matrix spike is out-of-control a serial dilution is performed.
12. The duplicate analysis for Mercury was outside the 20% Relative Percent Difference (RPD)

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control limits. Refer to the Inorganics Precision Report.

13. 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.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

ml/d/m09-173

11-3-99
Date



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Recra Lot#: 9909L173

Leaching Procedure: 1310 1311 1312 Other:_____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A /3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Antimony	<u> 6010B </u> <u> 7041⁵ </u>	<u> 200.7 </u> <u> 204.2 </u>			<u> 99 </u>
Arsenic	<u> 6010B </u> <u> 7060A⁵ </u>	<u> 200.7 </u> <u> 206.2 </u>	<u> 3113B </u>		<u> 99 </u>
Barium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Beryllium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Bismuth	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>
Boron	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Cadmium	<u> 6010B </u> <u> 7131A⁵ </u>	<u> 200.7 </u> <u> 213.2 </u>			<u> 99 </u>
Calcium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Chromium	<u> 6010B </u> <u> 7191⁵ </u>	<u> 200.7 </u> <u> 218.2 </u>			<u> SS17 </u>
Cobalt	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Copper	<u> 6010B </u> <u> 7211⁵ </u>	<u> 200.7 </u> <u> 220.2 </u>			<u> 99 </u>
Iron	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Lead	<u> 6010B </u> <u> 7421⁵ </u>	<u> 200.7 </u> <u> 239.2 </u>	<u> 3113B </u>		<u> 99 </u>
Lithium	<u> 6010B </u> <u> 7430⁴ </u>	<u> 200.7 </u>		<u> 1620 </u>	<u> 99 </u>
Magnesium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Manganese	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Mercury	<u> 7470A³ </u> <u> 7471A³ </u>	<u> 245.1² </u> <u> 245.5² </u>			<u> 99 </u>
Molybdenum	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Nickel	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Potassium	<u> 6010B </u> <u> 7610⁴ </u>	<u> 200.7 </u> <u> 258.1⁴ </u>			<u> 99 </u>
Rare Earths	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>
Selenium	<u> 6010B </u> <u> 7740⁵ </u>	<u> 200.7 </u> <u> 270.2 </u>	<u> 3113B </u>		<u> 99 </u>
Silicon	<u> 6010B¹ </u>	<u> 200.7 </u>		<u> 1620 </u>	<u> 99 </u>
Silica	<u> 6010B </u>	<u> 200.7 </u>		<u> 1620 </u>	<u> 99 </u>
Silver	<u> 6010B </u> <u> 7761⁵ </u>	<u> 200.7 </u> <u> 272.2 </u>			<u> 99 </u>
Sodium	<u> 6010B </u> <u> 7770⁴ </u>	<u> 200.7 </u> <u> 273.1⁴ </u>			<u> 99 </u>
Strontium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Thallium	<u> 6010B </u> <u> 7841⁵ </u>	<u> 200.7 </u> <u> 279.2 </u> <u> 200.9 </u>			<u> 99 </u>
Tin	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Titanium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Uranium	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>
Vanadium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Zinc	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Zirconium	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>

Other: _____

Method: _____

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L173

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-001	B0WCJ2	Mercury, Total	0.05	MG/KG	0.02	1.0
		Lead, Total	2.9 u	MG/KG	2.9	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/08/99

CLIENT: TNU-HANFORD B99-075

RECRA LOT #: 9909L173

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99C0290-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0
BLANK1	99L0660-MB1	Lead, Total	3.1 u	MG/KG	3.1	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075

RECRA LOT #: 9909L173

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B0WCJ2	Mercury, Total	0.27	0.05	0.17	131.2	1.0
		Lead, Total	48.1	2.9 u	51.3	93.8	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075

RECRA LOT #: 9909L173

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	B0WCJ2	Mercury, Total	0.05	0.07	45.4	1.0
		Lead, Total	2.9 u	3.2 u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L173

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	99C0290-LC1	Mercury, LCS	1.0	1.0	MG/KG	102.5
LCS1	99L0660-LC1	Lead, LCS	246	250	MG/KG	98.3

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-075

DATE RECEIVED: 09/24/99

RFW LOT # :9909L173

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWCJ2						
MERCURY, TOTAL	001	S	99C0290	09/22/99	10/06/99	10/07/99
MERCURY, TOTAL	001 REP	S	99C0290	09/22/99	10/06/99	10/07/99
MERCURY, TOTAL	001 MS	S	99C0290	09/22/99	10/06/99	10/07/99
LEAD, TOTAL	001	S	99L0660	09/22/99	09/29/99	10/01/99
LEAD, TOTAL	001 REP	S	99L0660	09/22/99	09/29/99	10/01/99
LEAD, TOTAL	001 MS	S	99L0660	09/22/99	09/29/99	10/01/99

LAB QC:

MERCURY LABORATORY	LC1 BS	S	99C0290	N/A	10/06/99	10/07/99
MERCURY, TOTAL	MB1	S	99C0290	N/A	10/06/99	10/07/99
LEAD LABORATORY	LC1 BS	S	99L0660	N/A	09/29/99	10/01/99
LEAD, TOTAL	MB1	S	99L0660	N/A	09/29/99	10/01/99

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-075-17

Page 1 of 1

Collector Fahlberg/Behnke	Company Contact Jason Adler	Telephone No. 373-4316	Project Coordinator TRENT, SJ	Price Code 8L	Data Turnaround 21 Days
Project Designation 105-DR FSB - Soil	Sampling Location 105 DR	Field Logbook No. EL-1281	SAF No. B99-075		
Ice Chest No. ERC-99-005	Offsite Property No. A990269	Method of Shipment Fed Express			
Shipped To FMA/RECRA 9.22.99	Bill of Lading/Air Bill No. 423579529745			COA R05D42800	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	None					
	Type of Container	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1					
	Special Handling and/or Storage	60mL	60mL	60mL	500mL					

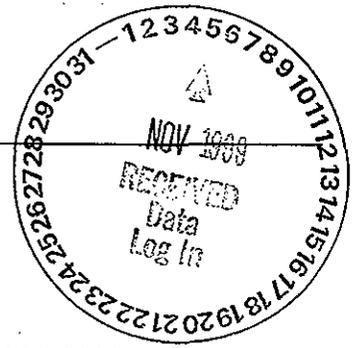
173

SAMPLE ANALYSIS	Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.	
-----------------	---------------------	----------------------------	-----------------------------------------------------------	---------------------------------------	--

Sample No.	Matrix *	Sample Date	Sample Time								
BOWCJ2	Soil	9.22.99	1310	X	X	X					BOWCJ9
BOWCJ3	Soil	9.22.99									
BOWCJ4	Soil	9.22.99									
BOWCJ5	Soil										

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>R. Behnke</i>	Date/Time 9-22-99 1535	Received By <i>Ref 1-C</i>	Date/Time 9-22-99 1535
Relinquished By <i>Ref 1-C</i>	Date/Time 9/23/99 130	Received By <i>Ch...</i>	Date/Time 9/23/99 1130
Relinquished By <i>Ch...</i>	Date/Time 9/23/99 1400	Received By <i>FEDEX</i>	Date/Time 9/23/99 1400
Relinquished By <i>Decker</i>	Date/Time 9/24/99 0930	Received By <i>Jenson</i>	Date/Time 9/24/99 0930
LABORATORY SECTION	Received By	SPECIAL INSTRUCTIONS (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Americium-241; Carbon-14; Nickel-63; Technetium-99	
FINAL SAMPLE DISPOSITION	Disposal Method	COLLECTOR UNAVAILABLE TO SIGN COA	

012



**Recra LabNet Philadelphia
Analytical Report
REVISION**

Client: TNU-HANFORD B99-075
RFW#: 9909L173
SDG/SAF#: H0542/B99-075

W.O.#: 10985-001-001-9999-00
Date Received: 09-24-99

*Original
received 10/26/99
Daynes 11/9/99*

PCB

This narrative was revised to correct the SDG number.

One (1) solid sample was collected on 09-22-99.

The sample and its associated QC samples were extracted on 10-05-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 10-08-99. 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 and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

J. Michael Taylor

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-3-99
Date

pefr:\group\data\pest\09L-173.pcb

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

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GLOSSARY OF PESTICIDE/PCB DATA

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- 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: 10/13/99 13:34

RFW Batch Number: 9909L173

Client: TNU-HANFORD B99-075

Work Order: 10985001001 Page: 1

004700

Sample Information	Cust ID:	B0WCJ2	B0WCJ2	B0WCJ2	PBLKVY	PBLKVY BS
RFW#:	001	001 MS	001 MSD	99LE1200-MB1	99LE1200-MB1	
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	82 %	95 %	88 %	100 %	110 %
	Decachlorobiphenyl	87 %	98 %	96 %	96 %	102 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====						
Aroclor-1254		36 U	80 %	74 %	33 U	84 %

ml
10-13-99

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 B99-075

DATE RECEIVED: 09/24/99

RFW LOT # :9909L173

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWCJ2	001	S	99LE1200	09/22/99	10/05/99	10/08/99
BOWCJ2	001 MS	S	99LE1200	09/22/99	10/05/99	10/08/99
BOWCJ2	001 MSD	S	99LE1200	09/22/99	10/05/99	10/08/99

LAB QC:

PBLKVY	MB1	S	99LE1200	N/A	10/05/99	10/08/99
PBLKVY	MB1 BS	S	99LE1200	N/A	10/05/99	10/08/99

gw
10-13-99

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-075-17

Page 1 of 1

Collector Fahlberg/Behnke	Company Contact Jason Adler	Telephone No. 373-4316	Project Coordinator TRENT, SJ	Price Code 8L	Data Turnaround 21 Days
Project Designation 105-DR FSB - Soil	Sampling Location 105 DR	Field Logbook No. EL-1281	SAF No. B99-075		
Ice Chest No. ERC-99-005	Offsite Property No. A990269	Method of Shipment Fed Express			
Shipped To FMA/RECRA 9.22.99	Bill of Lading/Air Bill No. 423579529745				
			COA	R05D42800	

100

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	None						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
	Volume	60mL	60mL	60mL	500mL						
SAMPLE ANALYSIS		Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.						
Special Handling and/or Storage	(173)										

Sample No.	Matrix *	Sample Date	Sample Time								
B0WCJ2	Soil	9.22.99	1310	X	X	X					B0WCJ2
B0WCJ3	Soil	9.22.99									
B0WCJ4	Soil	9.22.99									
B0WCJ5	Soil										

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>R. Behnke</i>	Date/Time 9-22-99 1535	Received By <i>Ref 1-C</i>	Date/Time 9-22-99 1535
Relinquished By <i>Ref 1-C</i>	Date/Time 9/23/99 130	Received By <i>Ch...</i>	Date/Time 9/23/99 1130
Relinquished By <i>Ch...</i>	Date/Time 9/23/99 1400	Received By <i>FEDEX</i>	Date/Time 9/23/99 1400
Relinquished By <i>Decker</i>	Date/Time 9/24/99 0930	Received By <i>Jenson</i>	Date/Time 9/24/99 0930
LABORATORY SECTION	Received By	SPECIAL INSTRUCTIONS (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Americium-241; Carbon-14; Nickel-63; Technetium-99 COLLECTOR UNAVAILABLE TO SIGN COC	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time



**Recra LabNet Philadelphia
Analytical Report
REVISION**

**Client : TNU-HANFORD B99-075
RFW# : 9909L173
SDG# : H0542
SAF# : B99-075**

**W.O. # : 10985-001-001-9999-00
Date Received: 09-24-99**

*Original received
10/26/99
Daynes
11/9/99*

INORGANIC CASE NARRATIVE

This narrative was revised to correct the SDG number.

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 recoveries for Chromium VI 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.

J. Michael Taylor

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-3-99
Date

njp&pef\09-173

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
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 10/08/99

CLIENT: TNU-HANFORD B99-075
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L173

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B0WCJ2	% Solids	91.9	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/08/99

CLIENT: TNU-HANFORD B99-075
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L173

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK10	99LVI068-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L173

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	BOWCJ2	Soluble Chromium VI	4.4	0.44u	4.4	101.5	1.0
		Insoluble Chromium VI	1280	0.44u	1190	107.6	100
BLANK10	99LV1068-ME1	Soluble Chromium VI	4.0	0.40u	4.0	99.9	1.0
		Insoluble Chromium VI	1180	0.40u	1160	101.3	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/08/99

CLIENT: TNU-HANFORD B99-075
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9909L173

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	B0WCJ2	% Solids	91.9	92.2	0.28	1.0
		Chromium VI	0.44u	0.44u	NC	1.0

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-075

DATE RECEIVED: 09/24/99

RFW LOT # :9909L173

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWCJ2						
% SOLIDS	001	S	99L%S128	09/22/99	10/01/99	10/03/99
% SOLIDS	001 REP	S	99L%S128	09/22/99	10/01/99	10/03/99
CHROMIUM VI	001	S	99LVI068	09/22/99	10/05/99	10/05/99
CHROMIUM VI	001 REP	S	99LVI068	09/22/99	10/05/99	10/05/99
CHROMIUM VI	001 MS	S	99LVI068	09/22/99	10/05/99	10/05/99
CHROMIUM VI	001 MSD	S	99LVI068	09/22/99	10/05/99	10/05/99

LAB QC:

CHROMIUM VI	MB1	S	99LVI068	N/A	10/05/99	10/05/99
CHROMIUM VI	MB1 BS	S	99LVI068	N/A	10/05/99	10/05/99
CHROMIUM VI	MB1 BSD	S	99LVI068	N/A	10/05/99	10/05/99

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-075-17

Page 1 of 1

010

Collector Fahlberg/Behnke	Company Contact Jason Adler	Telephone No. 373-4316	Project Coordinator TRENT, SJ	Price Code 8L	Data Turnaround 21 Days
Project Designation 105-DR FSB - Soil	Sampling Location 105 DR	SAF No. B99-075			
Ice Chest No. ERC-99-005	Field Logbook No. EL-1281	Method of Shipment Fed Express			
Shipped To FMA/RECRA 9.22.99	Offsite Property No. A9902169	Bill of Lading/Air Bill No. 423579529745			
COA R05D42800					

POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage 173	Preservation	Cool 4C	Cool 4C	None	None					
	Type of Container	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1					
	Volume	60mL	60mL	60mL	500mL					

SAMPLE ANALYSIS	Chromium Hex - 7196	PCBs - 8080 (Aroclor-1254)	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.						
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Sample No.	Matrix *	Sample Date	Sample Time							
B0WCJ2	Soil	9.22.99	1310	X	X	X				B0WCJ2
B0WCJ3	Soil	9.22.99								
B0WCJ4	Soil	9.22.99								
B0WCJ5	Soil									

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>R. Fahlberg</i>	Date/Time 9-22-99 1535	Received By <i>Ref 1-C</i>	Date/Time 9-22-99 1535
Relinquished By <i>Ref 1-C</i>	Date/Time 9/23/99 130	Received By <i>Ch...</i>	Date/Time 9/23/99 1130
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Relinquished By <i>Decker</i>	Date/Time 9/24/99 0930	Received By <i>Jenson</i>	Date/Time 9/24/99 0930

COLLECTOR UNAVAILABLE TO SIGN COPY

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