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November 11, 1999

Ms. Joan Kessner
3190 George Washington Way
Richland, WA 99352
MSIN: H9-03

Reference: P.O. #TRC-SBB-207925
Thermo Nutech N9-09-024-7193, SDG H0512

Dear Ms. Kessner:

Enclosed is the data report for seven solid samples designated under SAF No. B99-078 received at Thermo Nutech on September 2, 1999. The samples were analyzed according to the accompanying chain-of-custody documents. On October 11, 1999 Total Strontium was added to this SDG per written directive from BHI.

Please call if you have any questions concerning this report.

Sincerely,

N. Joseph Verville
Senior Program Manager

NJV/kcj

Enclosure: Data Package

NOV 1999
RECEIVED
Data
Log In

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0512 is composed of seven solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. The Gamma Scan results were reported to BHI via fax on October 20, 1999 while Total Strontium data was faxed to BHI on November 8, 1999.

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses. The LCS, duplicate and blank samples all received additional counts in order to generate bettr counting statistics.

NOV 1999
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

SAMPLE SUMMARY

SDG 7193
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BOW9J0	GP-6	SOLID		N909024-01	B99-078	B99-078-106	08/31/99 07:24
BOW9J1	GP-6	SOLID		N909024-02	B99-078	B99-078-106	08/31/99 07:32
BOW9J2	GP-6	SOLID		N909024-03	B99-078	B99-078-106	08/31/99 07:42
BOW9J3	GP-6	SOLID		N909024-04	B99-078	B99-078-106	08/31/99 07:50
BOW9J4	GP-6	SOLID		N909024-05	B99-078	B99-078-106	08/31/99 08:00
BOW9J5	GP-6	SOLID		N909024-06	B99-078	B99-078-106	08/31/99 08:12
BOW9J6	GP-6	SOLID		N909024-07	B99-078	B99-078-106	08/31/99 08:35
Method Blank		SOLID		N909024-09	B99-078		
Method Blank		SOLID		N909024-12	B99-078		
Lab Control Sample		SOLID		N909024-08	B99-078		
Lab Control Sample		SOLID		N909024-11	B99-078		
Duplicate (N909024-01)	GP-6	SOLID		N909024-10	B99-078		08/31/99 07:24
Duplicate (N909024-01)	GP-6	SOLID		N909024-13	B99-078		08/31/99 07:24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

QC SUMMARY

SDG 7193
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7193	B99-078-106	BOW9J0	SOLID	90.1			09/02/99	2	N909024-01	7193-001
		BOW9J1	SOLID	95.0			09/02/99	2	N909024-02	7193-002
		BOW9J2	SOLID	96.7			09/02/99	2	N909024-03	7193-003
		BOW9J3	SOLID	95.7			09/02/99	2	N909024-04	7193-004
		BOW9J4	SOLID	96.4			09/02/99	2	N909024-05	7193-005
		BOW9J5	SOLID	95.7			09/02/99	2	N909024-06	7193-006
		BOW9J6	SOLID	95.7			09/02/99	2	N909024-07	7193-007
		Method Blank	SOLID						N909024-09	7193-009
		Method Blank	SOLID						N909024-12	7193-012
		Lab Control Sample	SOLID						N909024-08	7193-008
		Lab Control Sample	SOLID						N909024-11	7193-011
		Duplicate (N909024-01)	SOLID	90.1			09/02/99	2	N909024-10	7193-010
		Duplicate (N909024-01)	SOLID				09/02/99	2	N909024-13	7193-013

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

SDG 7193
Contact Kevin C. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Beta Counting												
SR	SOLID	Total Strontium in Soil	6893-144	10.0	7			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6893-144	15.0	7			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

WORK SUMMARY

SDG 7193
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
BOW9J0			N909024-01	7193-001	GAM		10/13/99	10/20/99	NJV	Gamma Scan
GP-6		SOLID	08/31/99	7193-001	SR		11/02/99	11/08/99	NJV	Total Strontium in Soil
B99-078-106	B99-078		09/02/99							
BOW9J1			N909024-02	7193-002	GAM		10/13/99	10/20/99	NJV	Gamma Scan
GP-6		SOLID	08/31/99	7193-002	SR		11/02/99	11/08/99	NJV	Total Strontium in Soil
B99-078-106	B99-078		09/02/99							
BOW9J2			N909024-03	7193-003	GAM		10/13/99	10/20/99	NJV	Gamma Scan
GP-6		SOLID	08/31/99	7193-003	SR		11/02/99	11/08/99	NJV	Total Strontium in Soil
B99-078-106	B99-078		09/02/99							
BOW9J3			N909024-04	7193-004	GAM		10/13/99	10/20/99	NJV	Gamma Scan
GP-6		SOLID	08/31/99	7193-004	SR		11/02/99	11/08/99	NJV	Total Strontium in Soil
B99-078-106	B99-078		09/02/99							
BOW9J4			N909024-05	7193-005	GAM		10/13/99	10/20/99	NJV	Gamma Scan
GP-6		SOLID	08/31/99	7193-005	SR		11/02/99	11/08/99	NJV	Total Strontium in Soil
B99-078-106	B99-078		09/02/99							
BOW9J5			N909024-06	7193-006	GAM		10/13/99	10/20/99	NJV	Gamma Scan
GP-6		SOLID	08/31/99	7193-006	SR		11/02/99	11/08/99	NJV	Total Strontium in Soil
B99-078-106	B99-078		09/02/99							
BOW9J6			N909024-07	7193-007	GAM		10/15/99	10/20/99	NJV	Gamma Scan
GP-6		SOLID	08/31/99	7193-007	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-106	B99-078		09/02/99							
Method Blank			N909024-09	7193-009	GAM		10/14/99	10/20/99	NJV	Gamma Scan
		SOLID								
	B99-078									
Method Blank			N909024-12	7193-012	SR		11/04/99	11/08/99	NJV	Total Strontium in Soil
		SOLID								
	B99-078									
Lab Control Sample			N909024-08	7193-008	GAM		10/14/99	10/20/99	NJV	Gamma Scan
		SOLID								
	B99-078									

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

SDG 7193
Contact Kevin C. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample	B99-078	SOLID	N909024-11	7193-011	SR		11/06/99	11/08/99	NJV	Total Strontium in Soil
Duplicate (N909024-01) GP-6	B99-078	SOLID	N909024-10 08/31/99 09/02/99	7193-010	GAM		10/14/99	10/20/99	NJV	Gamma Scan
Duplicate (N909024-01) GP-6	B99-078	SOLID	N909024-13 08/31/99 09/02/99	7193-013	SR		11/05/99	11/08/99	NJV	Total Strontium in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
GAM	B99-078	Gamma Scan	GAMMAHI	7			1	1	1	10
SR	B99-078	Total Strontium in Soil	SRTOTAL	7			1	1	1	10
TOTALS				14			2	2	2	20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-09 Method Blank

METHOD BLANK

SDG	7193	Client/Case no	Hanford	SDG-H0512
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925	
Lab sample id	N909024-09	Client sample id	Method Blank	
Dept sample id	7193-009	Material/Matrix		SOLID
		SAF No	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		0.30		U	GAM
Cobalt 60	10198-40-0	U		0.008	0.050	U	GAM
Cesium 137	10045-97-3	U		0.008	0.10	U	GAM
Europium 152	14683-23-9	U		0.030	0.10	U	GAM
Europium 154	15585-10-1	U		0.026	0.10	U	GAM
Europium 155	14391-16-3	U		0.040	0.10	U	GAM
Radium 226	13982-63-3	U		0.018	0.10	U	GAM
Radium 228	15262-20-1	U		0.042	0.20	U	GAM
Thorium 228	14274-82-9	U		0.018		U	GAM
Thorium 232	TH-232	U		0.042		U	GAM
Americium 241	14596-10-2	U		0.069		U	GAM
Uranium 238	U-238	U		1.2		U	GAM
Uranium 235	15117-96-1	U		0.055		U	GAM

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 31872
QC-BLANK 31873

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-12

Method Blank

METHOD BLANK

SDG	7193	Client/Case no	Hanford	SDG-H0512	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909024-12	Client sample id	Method Blank		
Dept sample id	7193-012	Material/Matrix		SOLID	
		SAF No	B99-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	-0.053	0.096	0.17	1.0	U	SR

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 32148

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-08

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7193

Contact Kevin C. Johnson

Client/Case no Hanford SDG-H0512

Case no TRB-SBB-207925

Lab sample id N909024-08

Dept sample id 7193-008

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B99-078

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Cobalt 60	0.331	0.023	0.012	0.050		GAM	0.337	0.013	98	75-125	80-120
Cesium 137	0.371	0.021	0.013	0.10		GAM	0.365	0.015	102	75-125	80-120

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 31872

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-11 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7193
Contact Kevin C. Johnson

Client/Case no Hanford SDG-H0512
Case no TRB-SBB-207925

Lab sample id N909024-11
Dept sample id 7193-011

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-078

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Strontium	11.9	0.41	0.23	1.0		SR	10.9	0.44	109	82-118	

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 32147

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-10 BOW9J0

DUPLICATE

SDG	7193	Client/Case no	Hanford SDG-H0512
Contact	Kevin C. Johnson	Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL	
Lab sample id	N909024-10	Lab sample id	N909024-01
Dept sample id	7193-010	Dept sample id	7193-001
		Received	09/02/99
% solids	90.1	% solids	90.1
Client sample id	BOW9J0		
Location/Matrix	GP-6 SOLID		
Collected	08/31/99 07:24		
Custody/SAF No	B99-078-106 B99-078		

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Potassium 40	12.6	2.0	0.25			GAM	11.7	0.45	0.20		7	41	
Cobalt 60	U		0.026	0.050	U	GAM	U		0.022	U	-		
Cesium 137	187	0.40	0.12	0.10		GAM	178	0.40	0.091		5	32	
Europium 152	U		0.38	0.10	U	GAM	U		0.35	U	-		
Europium 154	U		0.18	0.10	U	GAM	U		0.085	U	-		
Europium 155	U		0.20	0.10	U	GAM	U		0.23	U	-		
Radium 226	U		0.18	0.10	U	GAM	0.665	0.13	0.16		115	87	
Radium 228	U		0.18	0.20	U	GAM	0.894	0.099	0.096		133	69	
Thorium 228	U		0.18		U	GAM	0.755	0.14	0.19		123	82	
Thorium 232	U		0.18		U	GAM	0.894	0.099	0.096		133	69	
Americium 241	U		0.10		U	GAM	U		0.26	U	-		
Uranium 238	U		3.1		U	GAM	U		2.9	U	-		
Uranium 235	U		0.38		U	GAM	U		0.35	U	-		

200 Area Source chrctztn-200-CW-1 OU

QC-DUP#1 31874

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-13 BOW9J0

DUPLICATE

SDG	7193			Client/Case no	Hanford SDG-H0512
Contact	Kevin C. Johnson			Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL			
Lab sample id	N909024-13	Lab sample id	N909024-01	Client sample id	BOW9J0
Dept sample id	7193-013	Dept sample id	7193-001	Location/Matrix	GP-6 SOLID
		Received	09/02/99	Collected	08/31/99 07:24
		% solids	90.1	Custody/SAF No	B99-078-106 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Total Strontium	0.202	0.61	0.34	1.0	U	SR	0.161	0.096	0.12	J	23	511	

200 Area Source chrctztn-200-CW-1 OU

QC-DUP#1 32149

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-01 BOW9J0

DATA SHEET

SDG	7193	Client/Case no	Hanford	SDG-H0512	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909024-01	Client sample id	BOW9J0		
Dept sample id	7193-001	Location/Matrix	GP-6	SOLID	
Received	09/02/99	Collected	08/31/99 07:24		
% solids	90.1	Custody/SAF No	B99-078-106	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.161	0.096	0.12	1.0	J	SR
Potassium 40	13966-00-2	11.7	0.45	0.20			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	178	0.40	0.091	0.10		GAM
Europium 152	14683-23-9	U		0.35	0.10	U	GAM
Europium 154	15585-10-1	U		0.085	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Radium 226	13982-63-3	0.665	0.13	0.16	0.10		GAM
Radium 228	15262-20-1	0.894	0.099	0.096	0.20		GAM
Thorium 228	14274-82-9	0.755	0.14	0.19			GAM
Thorium 232	TH-232	0.894	0.099	0.096			GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	U		0.35		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-02 BOW9J1

DATA SHEET

SDG	7193	Client/Case no	Hanford	SDG-H0512	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909024-02	Client sample id	BOW9J1		
Dept sample id	7193-002	Location/Matrix	GP-6	SOLID	
Received	09/02/99	Collected	08/31/99 07:32		
% solids	95.0	Custody/SAF No	B99-078-106	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.085	0.085	0.11	1.0	U	SR
Potassium 40	13966-00-2	11.2	0.49	0.21			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	8.77	0.10	0.038	0.10		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.074	0.10	U	GAM
Europium 155	14391-16-3	U		0.13	0.10	U	GAM
Radium 226	13982-63-3	0.434	0.053	0.058	0.10		GAM
Radium 228	15262-20-1	0.619	0.10	0.098	0.20		GAM
Thorium 228	14274-82-9	0.514	0.042	0.054			GAM
Thorium 232	TH-232	0.619	0.10	0.098			GAM
Americium 241	14596-10-2	U		0.29		U	GAM
Uranium 238	U-238	U		2.7		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-03 BOW9J2

DATA SHEET

SDG	7193	Client/Case no	Hanford	SDG-H0512	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909024-03	Client sample id	BOW9J2		
Dept sample id	7193-003	Location/Matrix	GP-6	SOLID	
Received	09/02/99	Collected	08/31/99 07:42		
% solids	96.7	Custody/SAF No	B99-078-106	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.135	0.085	0.11	1.0	J	SR
Potassium 40	13966-00-2	9.29	1.4	0.18			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	1.80	0.039	0.022	0.10		GAM
Europium 152	14683-23-9	U		0.051	0.10	U	GAM
Europium 154	15585-10-1	U		0.054	0.10	U	GAM
Europium 155	14391-16-3	U		0.042	0.10	U	GAM
Radium 226	13982-63-3	U		0.053	0.10	U	GAM
Radium 228	15262-20-1	U		0.11	0.20	U	GAM
Thorium 228	14274-82-9	U		0.045		U	GAM
Thorium 232	TH-232	U		0.11		U	GAM
Americium 241	14596-10-2	U		0.022		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Uranium 235	15117-96-1	U		0.070		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-04 BOW9J3

DATA SHEET

SDG	7193	Client/Case no	Hanford SDG-H0512
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909024-04	Client sample id	BOW9J3
Dept sample id	7193-004	Location/Matrix	GP-6 SOLID
Received	09/02/99	Collected	08/31/99 07:50
% solids	95.7	Custody/SAF No	B99-078-106 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.026	0.085	0.12	1.0	U	SR
Potassium 40	13966-00-2	U		0.76		U	GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	U		0.039	0.10	U	GAM
Europium 152	14683-23-9	U		0.044	0.10	U	GAM
Europium 154	15585-10-1	U		0.047	0.10	U	GAM
Europium 155	14391-16-3	U		0.091	0.10	U	GAM
Radium 226	13982-63-3	U		0.043	0.10	U	GAM
Radium 228	15262-20-1	U		0.090	0.20	U	GAM
Thorium 228	14274-82-9	U		0.045		U	GAM
Thorium 232	TH-232	U		0.090		U	GAM
Americium 241	14596-10-2	U		0.11		U	GAM
Uranium 238	U-238	U		1.6		U	GAM
Uranium 235	15117-96-1	U		0.074		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-05 BOW9J4

DATA SHEET

SDG	7193	Client/Case no	Hanford	SDG-H0512	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909024-05	Client sample id	BOW9J4		
Dept sample id	7193-005	Location/Matrix	GP-6	SOLID	
Received	09/02/99	Collected	08/31/99 08:00		
% solids	96.4	Custody/SAF No	B99-078-106	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.042	0.11	0.13	1.0	U	SR
Potassium 40	13966-00-2	11.0	1.5	0.17			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	3.91	0.053	0.025	0.10		GAM
Europium 152	14683-23-9	U		0.058	0.10	U	GAM
Europium 154	15585-10-1	U		0.052	0.10	U	GAM
Europium 155	14391-16-3	U		0.046	0.10	U	GAM
Radium 226	13982-63-3	U		0.057	0.10	U	GAM
Radium 228	15262-20-1	U		0.11	0.20	U	GAM
Thorium 228	14274-82-9	U		0.048		U	GAM
Thorium 232	TH-232	U		0.11		U	GAM
Americium 241	14596-10-2	U		0.025		U	GAM
Uranium 238	U-238	U		2.1		U	GAM
Uranium 235	15117-96-1	U		0.077		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-06 BOW9J5

DATA SHEET

SDG	7193	Client/Case no	Hanford	SDG-H0512	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909024-06	Client sample id	BOW9J5		
Dept sample id	7193-006	Location/Matrix	GP-6	SOLID	
Received	09/02/99	Collected	08/31/99 08:12		
% solids	95.7	Custody/SAF No	B99-078-106	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.038	0.090	0.12	1.0	U	SR
Potassium 40	13966-00-2	U		0.66		U	GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	3.87	0.15	0.016	0.10		GAM
Europium 152	14683-23-9	U		0.057	0.10	U	GAM
Europium 154	15585-10-1	U		0.043	0.10	U	GAM
Europium 155	14391-16-3	U		0.064	0.10	U	GAM
Radium 226	13982-63-3	U		0.041	0.10	U	GAM
Radium 228	15262-20-1	U		0.082	0.20	U	GAM
Thorium 228	14274-82-9	U		0.044		U	GAM
Thorium 232	TH-232	U		0.082		U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	U		1.6		U	GAM
Uranium 235	15117-96-1	U		0.083		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

N909024-07 BOW9J6

DATA SHEET

SDG	7193	Client/Case no	Hanford SDG-H0512
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909024-07	Client sample id	BOW9J6
Dept sample id	7193-007	Location/Matrix	GP-6 SOLID
Received	09/02/99	Collected	08/31/99 08:35
% solids	95.7	Custody/SAF No	B99-078-106 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.017	0.082	0.11	1.0	U	SR
Potassium 40	13966-00-2	11.7	0.63	0.26			GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Cesium 137	10045-97-3	1.17	0.050	0.032	0.10		GAM
Europium 152	14683-23-9	U		0.072	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.502	0.063	0.057	0.10		GAM
Radium 228	15262-20-1	0.641	0.16	0.14	0.20		GAM
Thorium 228	14274-82-9	0.604	0.036	0.038			GAM
Thorium 232	TH-232	0.641	0.16	0.14			GAM
Americium 241	14596-10-2	U		0.044		U	GAM
Uranium 238	U-238	U		3.5		U	GAM
Uranium 235	15117-96-1	U		0.10		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

Test SR	Matrix SOLID
SDG 7193	
Contact Kevin C. Johnson	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG-H0512	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6893-144					
BOW9J0	N909024-01			7193-001	0.161 J
BOW9J1	N909024-02			7193-002	U
BOW9J2	N909024-03			7193-003	0.135 J
BOW9J3	N909024-04			7193-004	U
BOW9J4	N909024-05			7193-005	U
BOW9J5	N909024-06			7193-006	U
BOW9J6	N909024-07			7193-007	U
BLK (QC ID=32148)	N909024-12			7193-012	U
LCS (QC ID=32147)	N909024-11			7193-011	ok
Duplicate (N909024-01)	N909024-13			7193-013	ok U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source chrctztn-200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6893-144 · 2σ prep error 10.0 % Reference Lab Notebook 6893 pg.144																
BOW9J0	N909024-01			0.12	1.02			87		400			63	11/01/99	11/02	GRB-217
BOW9J1	N909024-02			0.11	1.01			92		400			63	11/01/99	11/02	GRB-218
BOW9J2	N909024-03			0.11	1.05			94		400			63	11/01/99	11/02	GRB-219
BOW9J3	N909024-04			0.12	1.04			90		400			63	11/01/99	11/02	GRB-220
BOW9J4	N909024-05			0.13	1.07			90		400			63	11/01/99	11/02	GRB-225
BOW9J5	N909024-06			0.12	1.03			95		400			63	11/01/99	11/02	GRB-227
BOW9J6	N909024-07			0.11	1.08			91		400			62	11/01/99	11/01	GRB-228
BLK (QC ID=32148)	N909024-12			0.17	1.04			72		200				11/01/99	11/04	GRB-217
LCS (QC ID=32147)	N909024-11			0.23	1.04			73		400				11/01/99	11/06	GRB-209
Duplicate (N909024-01) (QC ID=32149)	N909024-13			0.34	1.02			86		200			66	11/01/99	11/05	GRB-223
Nominal values and limits from method				1.0	1.04					100			180			

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

Test SR	Matrix SOLID
SDG 7193	
Contact Kevin C. Johnson	

METHOD SUMMARY, cont.

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG-H0512	

PROCEDURES	REFERENCE	SRTOTAL
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD	MDA	0.16	±	0.15
FOR 10 SAMPLES	YIELD	87	±	16

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

Test GAM Matrix SOLID
SDG 7193
Contact Kevin C. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6893-144						
BOW9J0	N909024-01			7193-001	U	178
BOW9J1	N909024-02			7193-002	U	8.77
BOW9J2	N909024-03			7193-003	U	1.80
BOW9J3	N909024-04			7193-004	U	U
BOW9J4	N909024-05			7193-005	U	3.91
BOW9J5	N909024-06			7193-006	U	3.87
BOW9J6	N909024-07			7193-007	U	1.17
BLK (QC ID=31873)	N909024-09			7193-009	U	U
LCS (QC ID=31872)	N909024-08			7193-008	ok	ok
Duplicate (N909024-01)	N909024-10			7193-010	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.10
200 Area Source chrctztn-200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6893-144	2σ prep error 15.0 % Reference Lab Notebook 6893 pg.144															
BOW9J0	N909024-01			0.061	632					246			43	09/22/99	10/13	02,04,00
BOW9J1	N909024-02			0.063	789					248			43	09/22/99	10/13	MB,05,00
BOW9J2	N909024-03			0.039	867					248			43	09/22/99	10/13	MB,07,00
BOW9J3	N909024-04			0.036	765					248			43	09/22/99	10/13	MB,08,00
BOW9J4	N909024-05			0.038	813					280			43	09/22/99	10/13	MB,07,00
BOW9J5	N909024-06			0.031	814					280			43	09/22/99	10/13	MB,08,00
BOW9J6	N909024-07			0.094	755					279			45	09/22/99	10/15	02,01,00
BLK (QC ID=31873)	N909024-09			0.020	775					201				09/22/99	10/14	MB,08,00
LCS (QC ID=31872)	N909024-08			0.012	775					201				09/22/99	10/14	01,04,00
Duplicate (N909024-01) (QC ID=31874)	N909024-10			0.058	632					216			44	09/22/99	10/14	MB,07,00
Nominal values and limits from method				0.050	775					100			180			

Lab id TMANC
Protocol Hanford
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0512

Test	GAM
Matrix	SOLID
SDG	7193
Contact	Kevin C. Johnson

METHOD SUMMARY, cont.

GAMMA SCAN

GAMMA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0512

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

AVERAGES ± 2 SD	MDA	0.045	±	0.048
FOR 10 SAMPLES	YIELD		±	

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	11/08/99

SDG 7193
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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SDG 7193
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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.

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SDG 7193
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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
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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.

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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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).

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SDG 7193
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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.

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SDG 7193
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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 11/08/99

SDG 7193
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/08/99

SDG 7193
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/08/99

SDG 7193
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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SDG 7193
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/08/99

SDG 7193
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/08/99

SDG 7193
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0512

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'

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Protocol Hanford
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SDG 7193
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Contract TRB-SBB-207925
Case no SDG-H0512

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.

* Prepareation 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.

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Case no SDG-H0512

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

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Case no SDG-H0512

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 11/08/99

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-106	Page 1 of 2 BTB 8-31-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-6	SAF No.: B99-078	HOS12
Ice Chest No.: ERC 96-017	Field Logbook No.: EL-1511	Method of Shipment: gov vehicle FEDEX	
Shipped To: TMA/RECRA BTB 8-31-99	Offsite Property No.: A990238	Bill of Lading/Air Bill No.: 4235 7952 8944	
		COA: B20CW167IC	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	Cool 4C	None								
	Type of Container	aG	aG								
Special Handling and/or Storage	No. of Container(s)	1	1								
	Volume	500mL	1000mL								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.								

Sample No.	Matrix *	Sample Date	Sample Time										
B0W9J0	Soil	8-31-99	0724		X		6'-7'			B0W5M7			
B0W9J1	Soil	8-31-99	0732		X		8.5'-9.5'			B0W5L8			
B0W9J2	Soil	8-31-99	0742		X		11'-12'						
B0W9J3	Soil	8-31-99	0750		X		14'-15'						
B0W9J4	Soil	8-31-99	0800		X		16'-17'						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: 8-31-99/1230	Received By: Ref 1B — Date/Time: 8-31-99/1230		
Relinquished By: Ref 1B 8/1/99 — Date/Time: 10:00	Received By: Cearlock — Date/Time: 9/1/99 10:00		
Relinquished By: Cearlock — Date/Time: 9-1-99 1400	Received By: FEDEX — Date/Time: 9-1-99 1400		
Relinquished By: FedEx — Date/Time: 9-2-99 10:00	Received By: TNV McGoldenberg 10:00 — Date/Time: 9-2-99		
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Matrix *

Soil
Water
Vapor
Other Solid
Other Liquid

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-106	Page 1 of 2 DTB 8-31-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-6	SAF No.: B99-078	HOS12
Ice Chest No.: ERC 96-017	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ FEDEX	
Shipped To: TMA/RECRA DTD 8-31-99	Offsite Property No.: A99 0238	Bill of Lading/Air Bill No.: 4235 7952 8944	
		COA: B20CW1 6716	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	Cool 4C	None								
	Type of Container	aG	aG								
Special Handling and/or Storage	No. of Container(s)	1	1								
	Volume	500mL	1000mL								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.								

Sample No.	Matrix *	Sample Date	Sample Time									
✓ B0W9J5	Soil	8-31-99	0812		X		21'-22'			Bow 5 L8		
✓ B0W9J6	Soil	8-31-99	0835		X		24-25'			↓		
B0W9J7	Soil											
B0W9J8 DTB 8-31-99	Soil											
B0W9J9	Soil											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 8-31-99 / 1230	Received By: Bob B	Date/Time: 8-31-99 / 1230
Relinquished By: Bob B	Date/Time: 9-1-99 / 11:00	Received By: Chris	Date/Time: 9-1-99 11:00
Relinquished By: Chris	Date/Time: 9-1-99 1400	Received By: FEDEX	Date/Time: 9-9-99 14:00
Relinquished By: FedEx	Date/Time: 9-2-99 10:00	Received By: TNV M. Goldenberg	Date/Time: 9-2-99 10:00

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR NA TO SIGN COCS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 9-2-99 10:00

CoC No. B99-078-106

Container I.D. No. ERC 96-017 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [ ]
6. Number of samples in shipping container: 7
7. Number of containers per sample: 1 (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by M. Goldenberg Date: 9-2-99 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 _____

SDR # B00-010
Revision #: 0
Date Initiated: 10/11/99

SAMPLE DISPOSITION RECORD

SAF: B99-078
OU: 200-CW-1
Project ID: 200-CW-1
Task ID: 1
Sampling Event: 200 Area Source Characterization 200-CW-1 OU

Laboratory: TMA/RECRA

Task Manager: M.E. Todd

Sampling Information:
Number of Samples: 33
ID Numbers: See Attachment
Matrix: Soil
Collection Date: 08/31/99 - 09/07/99

Issue Background:

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

Type: Addition of Analyses

Description: Perform Total Radioactive Strontium Analysis

Disposition:

Description: The 200-CW-1 Characterization project requested that the laboratory perform a total radioactive strontium analysis on the listed samples.

Justification: Total radioactive strontium data was determined to be needed subsequent to collection of the listed samples.

Approval Signatures:

S. J. Trent 10/11/99
Project Coordinator (Print/Sign Name) Date

M. E. Todd
Task Manager (Print/Sign Name) Date

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

OCT 1999 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L968
SDG/SAF# : B99-078/H0512

W.O.# : 10985-001-001-9999-00
Date Received: 09-02-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (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. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 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

10-1-99
Date

mld/m09-968

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9909L968

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	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-03/98

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 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W9J0	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.5	MG/KG	0.25	1.0
		Barium, Total	95.8	MG/KG	0.02	1.0
		Beryllium, Total	0.34	MG/KG	0.008	1.0
		Cadmium, Total	0.42	MG/KG	0.02	1.0
		Chromium, Total	11.0	MG/KG	0.06	1.0
		Copper, Total	21.3	MG/KG	0.09	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	10.2	MG/KG	0.09	1.0
		Lead, Total	6.0	MG/KG	0.16	1.0
		Selenium, Total	0.81	MG/KG	0.28	1.0
		Vanadium, Total	78.2	MG/KG	0.05	1.0
		Zinc, Total	84.7	MG/KG	0.06	1.0
-002	B0W9J1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	2.4	MG/KG	0.28	1.0
		Barium, Total	59.0	MG/KG	0.03	1.0
		Beryllium, Total	0.24	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	6.3	MG/KG	0.07	1.0
		Copper, Total	17.3	MG/KG	0.10	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	9.9	MG/KG	0.10	1.0
		Lead, Total	3.5	MG/KG	0.18	1.0
		Selenium, Total	0.81	MG/KG	0.32	1.0
		Vanadium, Total	74.5	MG/KG	0.05	1.0
		Zinc, Total	54.7	MG/KG	0.07	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B0W9J2	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.7	MG/KG	0.28	1.0
		Barium, Total	34.3	MG/KG	0.03	1.0
		Beryllium, Total	0.15	MG/KG	0.008	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	4.6	MG/KG	0.07	1.0
		Copper, Total	14.8	MG/KG	0.10	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	7.2	MG/KG	0.10	1.0
		Lead, Total	2.2	MG/KG	0.18	1.0
		Selenium, Total	0.81	MG/KG	0.31	1.0
		Vanadium, Total	71.4	MG/KG	0.05	1.0
		Zinc, Total	49.7	MG/KG	0.07	1.0
-004	B0W9J3	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.3	MG/KG	0.26	1.0
		Barium, Total	42.8	MG/KG	0.02	1.0
		Beryllium, Total	0.35	MG/KG	0.008	1.0
		Cadmium, Total	0.02 u	MG/KG	0.02	1.0
		Chromium, Total	4.6	MG/KG	0.06	1.0
		Copper, Total	14.6	MG/KG	0.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	7.3	MG/KG	0.1	1.0
		Lead, Total	3.1	MG/KG	0.17	1.0
		Selenium, Total	0.73	MG/KG	0.29	1.0
		Vanadium, Total	67.8	MG/KG	0.05	1.0
		Zinc, Total	49.2	MG/KG	0.06	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	B0W9J4	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.4	MG/KG	0.25	1.0
		Barium, Total	51.2	MG/KG	0.02	1.0
		Beryllium, Total	0.23	MG/KG	0.008	1.0
		Cadmium, Total	0.02 u	MG/KG	0.02	1.0
		Chromium, Total	4.6	MG/KG	0.06	1.0
		Copper, Total	14.9	MG/KG	0.09	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	7.3	MG/KG	0.09	1.0
		Lead, Total	2.9	MG/KG	0.16	1.0
		Selenium, Total	0.61	MG/KG	0.28	1.0
		Vanadium, Total	61.5	MG/KG	0.05	1.0
		Zinc, Total	44.9	MG/KG	0.06	1.0
-006	B0W9J5	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.2	MG/KG	0.24	1.0
		Barium, Total	64.2	MG/KG	0.02	1.0
		Beryllium, Total	0.31	MG/KG	0.007	1.0
		Cadmium, Total	0.02 u	MG/KG	0.02	1.0
		Chromium, Total	5.6	MG/KG	0.06	1.0
		Copper, Total	15.8	MG/KG	0.09	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Nickel, Total	8.3	MG/KG	0.09	1.0
		Lead, Total	3.4	MG/KG	0.15	1.0
		Selenium, Total	0.59	MG/KG	0.27	1.0
		Vanadium, Total	74.6	MG/KG	0.04	1.0
		Zinc, Total	52.7	MG/KG	0.06	1.0

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INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	B0W9J6	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	1.8	MG/KG	0.30	1.0
		Barium, Total	41.0	MG/KG	0.03	1.0
		Beryllium, Total	0.31	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	4.8	MG/KG	0.07	1.0
		Copper, Total	14.1	MG/KG	0.11	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	6.2	MG/KG	0.11	1.0
		Lead, Total	3.0	MG/KG	0.19	1.0
		Selenium, Total	0.66	MG/KG	0.33	1.0
		Vanadium, Total	63.0	MG/KG	0.05	1.0
		Zinc, Total	44.9	MG/KG	0.07	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0649-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	0.04	MG/KG	0.03	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.13	MG/KG	0.08	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Nickel, Total	0.13	MG/KG	0.12	1.0
		Lead, Total	0.37	MG/KG	0.21	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.09	MG/KG	0.08	1.0
BLANK1	99C0269-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0W9J0	Silver, Total	3.3	0.08u	3.8	86.8	1.0
		Arsenic, Total	140	2.5	151	90.5	1.0
		Barium, Total	234	95.8	151	91.5	1.0
		Beryllium, Total	3.9	0.34	3.8	93.7	1.0
		Cadmium, Total	3.7	0.42	3.8	86.3	1.0
		Chromium, Total	26.5	11.0	15.1	102.6	1.0
		Copper, Total	39.3	21.3	18.9	95.2	1.0
		Mercury, Total	0.17	0.02u	0.16	107.5	1.0
		Nickel, Total	44.2	10.2	37.8	89.9	1.0
		Lead, Total	40.0	6.0	37.8	89.9	1.0
		Selenium, Total	134	0.81	151	87.8	1.0
		Vanadium, Total	118	78.2	37.8	106.3	1.0
		Zinc, Total	121	84.7	37.8	96.8	1.0

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INORGANICS PRECISION REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0W9J0	Silver, Total	0.08u	0.09u	NC	1.0
		Arsenic, Total	2.5	2.6	3.9	1.0
		Barium, Total	95.8	96.5	0.73	1.0
		Beryllium, Total	0.34	0.46	31.3	1.0
		Cadmium, Total	0.42	0.30	33.2	1.0
		Chromium, Total	11.0	12.1	9.5	1.0
		Copper, Total	21.3	21.1	0.94	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Nickel, Total	10.2	10.7	4.8	1.0
		Lead, Total	6.0	6.4	6.5	1.0
		Selenium, Total	0.81	0.66	20.8	1.0
		Vanadium, Total	78.2	81.7	4.4	1.0
		Zinc, Total	84.7	87.5	3.3	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0649-LC1	Silver, LCS	48.8	50.0	MG/KG	97.6
		Arsenic, LCS	954	1000	MG/KG	95.4
		Barium, LCS	489	500	MG/KG	97.7
		Beryllium, LCS	24.1	25.0	MG/KG	96.4
		Cadmium, LCS	23.9	25.0	MG/KG	95.6
		Chromium, LCS	49.0	50.0	MG/KG	98.0
		Copper, LCS	122	125	MG/KG	97.8
		Nickel, LCS	191	200	MG/KG	95.7
		Lead, LCS	238	250	MG/KG	95.1
		Selenium, LCS	926	1000	MG/KG	92.6
		Vanadium, LCS	251	250	MG/KG	100.5
		Zinc, LCS	94.1	100	MG/KG	94.1
LCS1	99C0269-LC1	Mercury, LCS	0.98	1.0	MG/KG	98.3

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/02/99 RFW LOT # :9909L968

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9J0						
SILVER, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
SILVER, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
SILVER, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
MERCURY, TOTAL	001	S	99C0269	08/31/99	09/12/99	09/12/99
MERCURY, TOTAL	001 REP	S	99C0269	08/31/99	09/12/99	09/12/99
MERCURY, TOTAL	001 MS	S	99C0269	08/31/99	09/12/99	09/12/99
NICKEL, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
NICKEL, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
NICKEL, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/02/99 RFW LOT # :9909L968

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	001	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	001 REP	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	001 MS	S	99L0649	08/31/99	09/23/99	09/28/99
B0W9J1						
SILVER, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
MERCURY, TOTAL	002	S	99C0269	08/31/99	09/12/99	09/12/99
NICKEL, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	002	S	99L0649	08/31/99	09/23/99	09/28/99
B0W9J2						
SILVER, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
MERCURY, TOTAL	003	S	99C0269	08/31/99	09/12/99	09/12/99
NICKEL, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	003	S	99L0649	08/31/99	09/23/99	09/28/99
B0W9J3						
SILVER, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/02/99 RFW LOT # :9909L968

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
MERCURY, TOTAL	004	S	99C0269	08/31/99	09/12/99	09/12/99
NICKEL, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	004	S	99L0649	08/31/99	09/23/99	09/28/99
B0W9J4						
SILVER, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
MERCURY, TOTAL	005	S	99C0269	08/31/99	09/12/99	09/12/99
NICKEL, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	005	S	99L0649	08/31/99	09/23/99	09/28/99
B0W9J5						
SILVER, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/02/99 RFW LOT # :9909L968

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	006	S	99C0269	08/31/99	09/12/99	09/12/99
NICKEL, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	006	S	99L0649	08/31/99	09/23/99	09/28/99
B0W9J6						
SILVER, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
ARSENIC, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
BARIUM, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
CADMIUM, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
CHROMIUM, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
COPPER, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
MERCURY, TOTAL	007	S	99C0269	08/31/99	09/12/99	09/12/99
NICKEL, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
LEAD, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
SELENIUM, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
VANADIUM, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99
ZINC, TOTAL	007	S	99L0649	08/31/99	09/23/99	09/28/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
SILVER, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
ARSENIC LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
ARSENIC, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
BARIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
BARIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
BERYLLIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
BERYLLIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
CADMIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
CADMIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
CHROMIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
CHROMIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
COPPER LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/02/99 RFW LOT # :9909L968

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COPPER, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
MERCURY LABORATORY	LC1 BS	S	99C0269	N/A	09/12/99	09/12/99
MERCURY, TOTAL	MB1	S	99C0269	N/A	09/12/99	09/12/99
NICKEL LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
NICKEL, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
LEAD LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
LEAD, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
SELENIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
SELENIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
VANADIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
VANADIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
ZINC LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
ZINC, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99

RECRA LabNet Use Only

9909L968

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10986-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 9/2/99 Date Due: 10/2/99
Account #:

Refrigerator #																		
#/Type Container	Liquid																	
	Solid																	
Volume	Liquid																	
	Solid																	
Preservatives																		
ANALYSES REQUESTED		ORGANIC								INORG								
		VOA	BNA	Pest/PCB	Herb					Metal	CN							
		RECRA LabNet Use Only																
										6								
										10g								
										500								
										IPH	ICR6	Met①						

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	IPH	ICR6	Met①
001	BØW9JØ			S	8/31/99	0724	✓	✓	✓
2	1					0732			
3	2					0742			
4	3					0750			
5	4					0800			
6	5					0812			
7	6					0835			

Special Instructions:
Saf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:
1. Run matrix QC
2. Met① = As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu,
3. Ni, V, Zn, Hg
4.
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.2 C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
*423579528922

Relinquished by	Received by	Date	Time
FedEx	Johnson	9/2/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-106	Page 1 of 2

Collector Bowers/Porter/Nielson	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ
Price Code 8N	Data Turnaround 45 Days		
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location GP-6		SAF No. B99-078
Ice Chest No. 96-006	Field Logbook No. EL-1511		Method of Shipment ~~gov vehicle~~ FEDEX
Shipped To TMA/RECRA	Offsite Property No. A99 0239		Bill of Lading/Air Bill No. 4235 7952 8922
			COA B20CW1 67/C

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None	cool 4C								
	Type of Container	aG	aG	aG								
Special Handling and/or Storage	No. of Container(s)	1	1	8								
	Volume	500mL	1000mL	500ml								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) below								

Sample No.	Matrix *	Sample Date	Sample Time										
B0W9J0	Soil	8-31-99	0724	X		X		6'-7'				B0W5M1	
B0W9J1	Soil	8-31-99	0732	X				8.5'-9.5'				B0W5L8	
B0W9J2	Soil	8-31-99	0742	X				11'-12'					
B0W9J3	Soil	8-31-99	0750	X				14'-15'					
B0W9J4	Soil	8-31-99	0800	X				16'-17'					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers	Date/Time 8-31-99/1230	Received By RCF 1B	Date/Time 8-31-99/1230
Relinquished By Ref 1B	Date/Time 9-1-99 11:00	Received By C Fuca	Date/Time 9-1-99 11:00
Relinquished By C Fuca	Date/Time 9-1-99 1400	Received By FEDEX	Date/Time 9-1-99 1400
Relinquished By	Date/Time FedEx	Received By Jameson	Date/Time 9/2/99 0930

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.
COLLECTOR UNAVAILABLE TO SIGN COC
(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}
(3) Preform ph from 500ml ICP jar

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

019

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-106	Page 2 of 2 DJB 8-31-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-6		SAF No.: B99-078
Ice Chest No.: 96-0006	Field Logbook No.: EL-1511		Method of Shipment: ~~gov vehicle~~ / CT FEDEX
Shipped To: TMA/RECRA DJB 8-31-99	Offsite Property No.: A99 0239		Bill of Lading/Air Bill No.: 4235 7952 8922
			COA: B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
Special Handling and/or Storage	No. of Container(s)	1	1									
	Volume	500mL	1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
B0W9J5	Soil	8-31-99	0812	X			21'-22'			B0W5L8			
B0W9J6	Soil	8-31-99	0835	X			24'-25'			↓			
B0W9J7	Soil												
B0W9J8 DJB 8-31-99	Soil												
B0W9J9	Soil												

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 8-31-99/1230	Received By: D.P. IB	Date/Time: 8-31-99/1230
Relinquished By: D.P. IB	Date/Time: 9-1-99 11:00	Received By: C. Nielson	Date/Time: 9-1-99 11:00
Relinquished By: C. Nielson	Date/Time: 9-1-99 1400	Received By: FEDEX	Date/Time: 9/1/99 14:00
Relinquished By:	Date/Time: FedEx	Received By: Jenson	Date/Time: 9/2/99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR U/A TO SIGN COCS:

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

020

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

OCT 1999 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L968
SDG# : H0512
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 09-02-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

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

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

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.

Pat E.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-8-99
Date

njp\i09-968

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	__		✓ ILMO4.0 (e)
% Volatile Soilids	__ 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**

L-WI-034/B-06/99

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 10/07/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W9J0	% Solids	87.5	%	0.01	1.0
		Chromium VI	0.46 u	MG/KG	0.46	1.0
		pH	6.5	SOIL PH	0.01	1.0
-002	B0W9J1	% Solids	94.7	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-003	B0W9J2	% Solids	96.3	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-004	B0W9J3	% Solids	94.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-005	B0W9J4	% Solids	96.2	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-006	B0W9J5	% Solids	95.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-007	B0W9J6	% Solids	95.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/07/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI062-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/07/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0W9J0	Soluble Chromium VI	4.7	0.46u	4.6	106.6	1.0
		Insoluble Chromium VI	1430	0.46u	1260	113.6	100
BLANK10	99LVI062-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.8	1.0
		Insoluble Chromium VI	1100	0.40u	1160	94.3	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/07/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L968

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0W9J0	Chromium VI	0.46u	0.46u	NC	1.0
		pH	6.5	6.5	0.3	1.0
-006REP	B0W9J5	% Solids	95.6	95.4	0.18	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/02/99 RFW LOT # :9909L968

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9J0						
% SOLIDS	001	S	99L%S124	08/31/99	09/08/99	09/09/99
CHROMIUM VI	001	S	99LVI062	08/31/99	09/08/99	09/08/99
CHROMIUM VI	001 REP	S	99LVI062	08/31/99	09/08/99	09/08/99
CHROMIUM VI	001 MS	S	99LVI062	08/31/99	09/08/99	09/08/99
CHROMIUM VI	001 MSD	S	99LVI062	08/31/99	09/08/99	09/08/99
PH	001	S	99LPH105	08/31/99	10/01/99	10/01/99
PH	001 REP	S	99LPH105	08/31/99	10/01/99	10/01/99
B0W9J1						
% SOLIDS	002	S	99L%S124	08/31/99	09/08/99	09/09/99
CHROMIUM VI	002	S	99LVI062	08/31/99	09/08/99	09/08/99
B0W9J2						
% SOLIDS	003	S	99L%S124	08/31/99	09/08/99	09/09/99
CHROMIUM VI	003	S	99LVI062	08/31/99	09/08/99	09/08/99
B0W9J3						
% SOLIDS	004	S	99L%S124	08/31/99	09/08/99	09/09/99
CHROMIUM VI	004	S	99LVI062	08/31/99	09/08/99	09/08/99
B0W9J4						
% SOLIDS	005	S	99L%S124	08/31/99	09/08/99	09/09/99
CHROMIUM VI	005	S	99LVI062	08/31/99	09/08/99	09/08/99
B0W9J5						
% SOLIDS	006	S	99L%S124	08/31/99	09/08/99	09/09/99
% SOLIDS	006 REP	S	99L%S124	08/31/99	09/08/99	09/09/99
CHROMIUM VI	006	S	99LVI062	08/31/99	09/08/99	09/08/99
B0W9J6						
% SOLIDS	007	S	99L%S124	08/31/99	09/08/99	09/09/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/02/99 RFW LOT # :9909L968

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	007	S	99LVI062	08/31/99	09/08/99	09/08/99

LAB QC:

CHROMIUM VI	MB1	S	99LVI062	N/A	09/08/99	09/08/99
CHROMIUM VI	MB1 BS	S	99LVI062	N/A	09/08/99	09/08/99
CHROMIUM VI	MB1 BSD	S	99LVI062	N/A	09/08/99	09/08/99

RECRA LabNet Use Only

9909L968

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B99-078

Est. Final Proj. Sampling Date:

Project #: 10986-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 9/2/99 Date Due: 10/2/99

Account #:

Refrigerator #																
#/Type Container	Liquid								6							
	Solid								1g							
Volume	Liquid															
	Solid								500							
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
RECRA LabNet Use Only							1PH	ICP6	metO							

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
001	BØW9JØ			S	8/31/99	0724
2	1					0732
3	2					0742
4	3					0750
5	4					0800
6	5					0812
7	6					0835

Special Instructions:

Sof # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. metO2 = As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu,
3. Ni, V, Zn, Hg
4.
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

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

2) Unbroken on Outer Package Y or N

3) Present on Sample Y or N

4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 5.2 C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

*423579528922

Relinquished by	Received by	Date	Time
FedEx	Johnson	9/2/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-106	Page 1 of 2

Collector Bowers/Porter/Nielson	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location GP-6		SAF No. B99-078
Ice Chest No. 96-006	Field Logbook No. EL-1511		Method of Shipment ~~gov vehicle~~ FEDEX
Shipped To TMA/RECRA	Offsite Property No. A99 0239		Bill of Lading/Air Bill No. 4235 7952 8922 - 5.2
			COA B20CW1 67/C

Price Code 8N

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None	Cool 4C								
Type of Container	aG	aG	aG								
No. of Container(s)	1	1	1								
Volume	500mL	1000mL	500ml								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) below								

Sample No.	Matrix *	Sample Date	Sample Time										
B0W9J0	Soil	8-31-99	0724	X		X		6'-7'				B0W5J1	
B0W9J1	Soil	8-31-99	0732	X				8.5'-9.5'				B0W5J8	
B0W9J2	Soil	8-31-99	0742	X				11'-12'					
B0W9J3	Soil	8-31-99	0750	X				14'-15'					
B0W9J4	Soil	8-31-99	0800	X				16'-17'					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers	Date/Time 8.31.99/1230	Received By RCF ID	Date/Time 8.31.99/1230
Relinquished By Rel 1B	Date/Time 9.1.99 11:00	Received By CAlice	Date/Time 9.1.99 11:00
Relinquished By CAlice	Date/Time 9.1.99 1400	Received By FEDEX	Date/Time 9.1.99 1400
Relinquished By	Date/Time FedEx	Received By Jackson	Date/Time 9/2/99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

(3) Preform pH from 500ml ICP jar

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-106	Page 2 of ~~2~~ 2 DJB 8-31-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-6		SAF No.: B99-078
Ice Chest No.: 96-0006	Field Logbook No.: EL-1511		Method of Shipment: ~~gov vehicle~~ / CT FEDEX
Shipped To: TMA/RECRA DJB 8-31-99	Offsite Property No.: A99 0239		Bill of Lading/Air Bill No.: 4235 7952 8922
			COA: B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
Special Handling and/or Storage	No. of Container(s)	1	1									
	Volume	500mL	1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
B0W9J5	Soil	8-31-99	0812	X			21-221			B0W528			
B0W9J6	Soil	8-31-99	0835	X			241-251			↓			
B0W9J7	Soil												
B0W9J8	Soil												
B0W9J9	Soil												

DJB 8-31-99

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 8-31-99 / 1230	Received By: B.P. IB	Date/Time: 8-31-99 / 1230
Relinquished By: B.P. IB	Date/Time: 9-1-99 11:00	Received By: C Shue	Date/Time: 9-1-99 11:00
Relinquished By: C Shue	Date/Time: 9-1-99 1400	Received By: FEDEX	Date/Time: 9/1/99 14:00
Relinquished By:	Date/Time: FedEx	Received By: Jackson	Date/Time: 9/2/99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR W/A TO SIGN COCS.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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