Eberline Services
W.O. No. R2-05-156-7289

Bechtel Hanford Inc.
SDG H1794

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1794 was composed of nine solid (soil) samples designated under SAF No. B00-030 with a Project Designation of: 100 F Area – Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on June 20, 2002.

2.0 ANALYSIS NOTES

2.1 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion — 6/25/02

Melissa C. Mannion
Program Manager

Date

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AUG 19 2002
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E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H1794

SDG	7289
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG_H1794

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

About this section	1
Sample Summaries	3
Prep Batch Summary	5
Work Summary	6
Method Blanks	8
Lab Control Samples	9
Duplicates	10
Data Sheets	11
Method Summaries	20
Report Guides	24
End of Section	38

Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

SDG 7289
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H1794

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

SDG 7289
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1794

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B14RJ1	116-F-2 Shallow Zone	SOLID		R205156-01	B00-030	B00-030-058	05/28/02 08:05
B14RJ2	116-F-2 Shallow Zone	SOLID		R205156-02	B00-030	B00-030-058	05/28/02 08:23
B14RJ3	116-F-2 Shallow Zone	SOLID		R205156-03	B00-030	B00-030-058	05/28/02 08:32
B14RJ4	116-F-2 Shallow Zone	SOLID		R205156-04	B00-030	B00-030-058	05/28/02 08:44
B14RJ5	116-F-2 Shallow Zone	SOLID		R205156-05	B00-030	B00-030-058	05/28/02 08:53
B14RJ6	116-F-2 Shallow Zone	SOLID		R205156-06	B00-030	B00-030-058	05/28/02 09:05
B14RJ7	116-F-2 Shallow Zone	SOLID		R205156-07	B00-030	B00-030-058	05/28/02 09:17
B14RJ8	116-F-2 Shallow Zone	SOLID		R205156-08	B00-030	B00-030-058	05/28/02 09:26
B14RJ9	116-F-2 Shallow Zone	SOLID		R205156-09	B00-030	B00-030-058	05/28/02 08:05
Method Blank		SOLID		R205156-11	B00-030		
Lab Control Sample		SOLID		R205156-10	B00-030		
Duplicate (R205156-07)	116-F-2 Shallow Zone	SOLID		R205156-12	B00-030		05/28/02 09:17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 06/20/02

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SAMPLE DELIVERY GROUP H1794

QC SUMMARY

SDG 7289
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1794

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
7289	B00-030-058	B14RJ1	SOLID	96.6	1702 g		05/30/02	2	R205156-01	7289-001
		B14RJ2	SOLID	96.5	1715 g		05/30/02	2	R205156-02	7289-002
		B14RJ3	SOLID	94.5	1742 g		05/30/02	2	R205156-03	7289-003
		B14RJ4	SOLID	96.8	1622 g		05/30/02	2	R205156-04	7289-004
		B14RJ5	SOLID	96.7	1820 g		05/30/02	2	R205156-05	7289-005
		B14RJ6	SOLID	97.4	1761 g		05/30/02	2	R205156-06	7289-006
		B14RJ7	SOLID	96.2	1664 g		05/30/02	2	R205156-07	7289-007
		B14RJ8	SOLID	97.7	1786 g		05/30/02	2	R205156-08	7289-008
		B14RJ9	SOLID	97.0	1825 g		05/30/02	2	R205156-09	7289-009
		Method Blank	SOLID						R205156-11	7289-011
		Lab Control Sample	SOLID						R205156-10	7289-010
		Duplicate (R205156-07)	SOLID	96.2	1664 g		05/30/02	2	R205156-12	7289-012

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

PREP BATCH SUMMARY

SDG 7289
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1794

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7036-088	15.0	9			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7036-088	10.0	9			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 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

WORK SUMMARY

SDG 7289
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1794

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B14RJ1			R205156-01	7289-001	C		06/12/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-001	GAM		06/14/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ2			R205156-02	7289-002	C		06/12/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-002	GAM		06/17/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ3			R205156-03	7289-003	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-003	GAM		06/17/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ4			R205156-04	7289-004	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-004	GAM		06/17/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ5			R205156-05	7289-005	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-005	GAM		06/17/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ6			R205156-06	7289-006	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-006	GAM		06/17/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ7			R205156-07	7289-007	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-007	GAM		06/17/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ8			R205156-08	7289-008	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-008	GAM		06/19/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
B14RJ9			R205156-09	7289-009	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-009	GAM		06/17/02	06/20/02	MCM	Gamma Scan
B00-030-058	B00-030		05/30/02							
Method Blank			R205156-11	7289-011	C		06/12/02	06/20/02	MCM	Carbon 14 in Soil
		SOLID		7289-011	GAM		06/17/02	06/20/02	MCM	Gamma Scan
	B00-030									

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 06/20/02

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SAMPLE DELIVERY GROUP H1794

SDG 7289
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1794

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			R205156-10	7289-010	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
		SOLID		7289-010	GAM		06/17/02	06/20/02	MCM	Gamma Scan
	B00-030									
Duplicate (R205156-07)			R205156-12	7289-012	C		06/13/02	06/20/02	MCM	Carbon 14 in Soil
116-F-2 Shallow Zone		SOLID	05/28/02	7289-012	GAM		06/17/02	06/20/02	MCM	Gamma Scan
	B00-030		05/30/02							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
C	B00-030	Carbon 14 in Soil	C14_COX_LSC	9			1	1	1	12
GAM	B00-030	Gamma Scan	GAMMA_GS	9			1	1	1	12
TOTALS				18			2	2	2	24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 06/20/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-11 **Method Blank**

METHOD BLANK

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-11	Client sample id	Method Blank
Dept sample id	7289-011	Material/Matrix	SOLID
		SAF No	B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-0.974	2.3	4.0	50	U	C
Potassium 40	13966-00-2	U		0.38		U	GAM
Cobalt 60	10198-40-0	U		0.038	0.050	U	GAM
Cesium 137	10045-97-3	U		0.036	0.10	U	GAM
Radium 226	13982-63-3	U		0.079	0.10	U	GAM
Radium 228	15262-20-1	U		0.15	0.20	U	GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	U		0.059		U	GAM
Thorium 232	TH-232	U		0.15		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Americium 241	14596-10-2	U		0.15		U	GAM

100 F Area - Full Protocol

QC-BLANK 42052

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-10

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7289
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1794
Case no No. 630

Lab sample id R205156-10
Dept sample id 7289-010

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B00-030

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	10000	200	24	50		C	10700	430	93	84-116	80-120
Cobalt 60	4.14	0.33	0.19	0.050		GAM	4.21	0.17	98	74-126	80-120
Cesium 137	5.59	0.32	0.22	0.10		GAM	5.18	0.21	108	73-127	80-120

100 F Area - Full Protocol

QC-LCS 42051

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-12

B14RJ7

DUPLICATE

SDG 7289
Contact Melissa C. Mannion

DUPLICATE
Lab sample id R205156-12
Dept sample id 7289-012
% solids 96.2

ORIGINAL
Lab sample id R205156-07
Dept sample id 7289-007
Received 05/30/02
% solids 96.2

Client/Case no Hanford SDG H1794
Case no No. 630
Client sample id B14RJ7
Location/Matrix 116-F-2 Shallow Zone SOLID
Collected/Weight 05/28/02 09:17 1664 g
Custody/SAF No B00-030-058 B00-030

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Carbon 14	-1.66	2.0	3.5	50	U	C	-1.55	1.9	3.2	U	-	
Potassium 40	13.9	0.69	0.28			GAM	12.2	0.86	0.54		13	34
Cobalt 60	U		0.11	0.050	U	GAM	U		0.062	U	-	
Cesium 137	0.126	0.034	0.040	0.10		GAM	0.156	0.049	0.053		21	71
Radium 226	0.499	0.062	0.064	0.10		GAM	0.503	0.088	0.089		1	45
Radium 228	0.709	0.15	0.15	0.20		GAM	0.682	0.20	0.21		4	63
Europium 152	0.838	0.070	0.075	0.10		GAM	0.804	0.083	0.095		4	38
Europium 154	U		0.15	0.10	U	GAM	U		0.14	U	-	
Europium 155	U		0.11	0.10	U	GAM	U		0.11	U	-	
Thorium 228	0.644	0.037	0.038			GAM	0.751	0.050	0.055		15	35
Thorium 232	0.709	0.15	0.15			GAM	0.682	0.20	0.21		4	63
Uranium 235	U		0.15		U	GAM	U		0.15	U	-	
Uranium 238	U		4.2		U	GAM	U		5.7	U	-	
Americium 241	U		0.23		U	GAM	U		0.14	U	-	

100 F Area - Full Protocol

QC-DUP#7 42053

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 06/20/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-01 **B14RJ1**

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-01	Client sample id	B14RJ1
Dept sample id	7289-001	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 08:05 1702 g
% solids	96.6	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.056	2.1	3.6	50	U	C
Potassium 40	13966-00-2	13.1	0.93	0.41			GAM
Cobalt 60	10198-40-0	U		0.054	0.050	U	GAM
Cesium 137	10045-97-3	0.318	0.056	0.051	0.10		GAM
Radium 226	13982-63-3	0.429	0.066	0.065	0.10		GAM
Radium 228	15262-20-1	0.786	0.19	0.17	0.20		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.18	0.10	U	GAM
Europium 155	14391-16-3	U		0.080	0.10	U	GAM
Thorium 228	14274-82-9	0.557	0.047	0.046			GAM
Thorium 232	TH-232	0.786	0.19	0.17			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	U		6.4		U	GAM
Americium 241	14596-10-2	U		0.054		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-02 **B14RJ2**

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-02	Client sample id	B14RJ2
Dept sample id	7289-002	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 08:23 1715 g
% solids	96.5	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-2.48	1.9	3.3	50	U	C
Potassium 40	13966-00-2	16.8	1.0	0.32			GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Cesium 137	10045-97-3	0.419	0.043	0.041	0.10		GAM
Radium 226	13982-63-3	0.580	0.067	0.061	0.10		GAM
Radium 228	15262-20-1	0.829	0.14	0.14	0.20		GAM
Europium 152	14683-23-9	U		0.23	0.10	U	GAM
Europium 154	15585-10-1	U		0.26	0.10	U	GAM
Europium 155	14391-16-3	U		0.068	0.10	U	GAM
Thorium 228	14274-82-9	0.740	0.040	0.035			GAM
Thorium 232	TH-232	0.829	0.14	0.14			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.8		U	GAM
Americium 241	14596-10-2	U		0.044		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-03 **B14RJ3**

DATA SHEET

SDG	7289	Client/Case no	Hanford	SDG_H1794	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R205156-03	Client sample id	B14RJ3		
Dept sample id	7289-003	Location/Matrix	116-F-2 Shallow Zone	SOLID	
Received	05/30/02	Collected/Weight	05/28/02 08:32	1742 g	
% solids	94.5	Custody/SAF No	B00-030-058	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-2.08	1.9	3.3	50	U	C
Potassium 40	13966-00-2	12.9	1.1	0.64			GAM
Cobalt 60	10198-40-0	U		0.051	0.050	U	GAM
Cesium 137	10045-97-3	U		0.068	0.10	U	GAM
Radium 226	13982-63-3	0.655	0.10	0.10	0.10		GAM
Radium 228	15262-20-1	0.814	0.24	0.25	0.20		GAM
Europium 152	14683-23-9	U		0.26	0.10	U	GAM
Europium 154	15585-10-1	U		0.19	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.730	0.055	0.059			GAM
Thorium 232	TH-232	0.814	0.24	0.25			GAM
Uranium 235	15117-96-1	U		0.17		U	GAM
Uranium 238	U-238	U		5.6		U	GAM
Americium 241	14596-10-2	U		0.17		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-04 **B14RJ4**

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-04	Client sample id	B14RJ4
Dept sample id	7289-004	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 08:44 1622 g
% solids	96.8	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-2.50	2.1	3.7	50	U	C
Potassium 40	13966-00-2	10.8	0.56	0.23			GAM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 137	10045-97-3	0.076	0.035	0.034	0.10	J	GAM
Radium 226	13982-63-3	0.414	0.060	0.053	0.10		GAM
Radium 228	15262-20-1	0.445	0.15	0.15	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.707	0.060	0.055			GAM
Thorium 232	TH-232	0.445	0.15	0.15			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		3.7		U	GAM
Americium 241	14596-10-2	U		0.14		U	GAM

100 F Area - Full Protocol

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-05 **B14RJ5**

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG_H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-05	Client sample id	B14RJ5
Dept sample id	7289-005	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 08:53 1820 g
% solids	96.7	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-1.86	2.3	4.0	50	U	C
Potassium 40	13966-00-2	12.6	1.6	0.73			GAM
Cobalt 60	10198-40-0	U		0.073	0.050	U	GAM
Cesium 137	10045-97-3	0.260	0.075	0.079	0.10		GAM
Radium 226	13982-63-3	0.400	0.14	0.15	0.10		GAM
Radium 228	15262-20-1	0.416	0.30	0.35	0.20		GAM
Europium 152	14683-23-9	U		0.22	0.10	U	GAM
Europium 154	15585-10-1	U		0.29	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Thorium 228	14274-82-9	0.604	0.13	0.14			GAM
Thorium 232	TH-232	0.416	0.30	0.35			GAM
Uranium 235	15117-96-1	U		0.32		U	GAM
Uranium 238	U-238	U		9.7		U	GAM
Americium 241	14596-10-2	U		0.32		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-06 **B14RJ6**

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-06	Client sample id	B14RJ6
Dept sample id	7289-006	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 09:05 1761 g
% solids	97.4	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-1.33	1.8	3.0	50	U	C
Potassium 40	13966-00-2	15.8	0.92	0.29			GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Cesium 137	10045-97-3	U		0.061	0.10	U	GAM
Radium 226	13982-63-3	0.471	0.056	0.053	0.10		GAM
Radium 228	15262-20-1	0.834	0.12	0.11	0.20		GAM
Europium 152	14683-23-9	0.181	0.038	0.053	0.10		GAM
Europium 154	15585-10-1	U		0.092	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.691	0.035	0.029			GAM
Thorium 232	TH-232	0.834	0.12	0.11			GAM
Uranium 235	15117-96-1	U		0.091		U	GAM
Uranium 238	U-238	U		3.3		U	GAM
Americium 241	14596-10-2	U		0.035		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-07 **B14RJ7**

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-07	Client sample id	B14RJ7
Dept sample id	7289-007	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 09:17 1664 g
% solids	96.2	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-1.55	1.9	3.2	50	U	C
Potassium 40	13966-00-2	12.2	0.86	0.54			GAM
Cobalt 60	10198-40-0	U		0.062	0.050	U	GAM
Cesium 137	10045-97-3	0.156	0.049	0.053	0.10		GAM
Radium 226	13982-63-3	0.503	0.088	0.089	0.10		GAM
Radium 228	15262-20-1	0.682	0.20	0.21	0.20		GAM
Europium 152	14683-23-9	0.804	0.083	0.095	0.10		GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	0.751	0.050	0.055			GAM
Thorium 232	TH-232	0.682	0.20	0.21			GAM
Uranium 235	15117-96-1	U		0.15		U	GAM
Uranium 238	U-238	U		5.7		U	GAM
Americium 241	14596-10-2	U		0.14		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-08	Client sample id	B14RJ8
Dept sample id	7289-008	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 09:26 1786 g
% solids	97.7	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-2.43	1.9	3.3	50	U	C
Potassium 40	13966-00-2	11.5	2.0	1.5			GAM
Cobalt 60	10198-40-0	U		0.18	0.050	U	GAM
Cesium 137	10045-97-3	U		0.20	0.10	U	GAM
Radium 226	13982-63-3	0.440	0.21	0.23	0.10		GAM
Radium 228	15262-20-1	0.780	0.43	0.47	0.20		GAM
Europium 152	14683-23-9	1.02	0.24	0.24	0.10		GAM
Europium 154	15585-10-1	U		0.39	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	0.764	0.15	0.15			GAM
Thorium 232	TH-232	0.780	0.43	0.47			GAM
Uranium 235	15117-96-1	U		0.36		U	GAM
Uranium 238	U-238	U		15		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

R205156-09 **B14RJ9**

DATA SHEET

SDG	7289	Client/Case no	Hanford SDG H1794
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205156-09	Client sample id	B14RJ9
Dept sample id	7289-009	Location/Matrix	116-F-2 Shallow Zone SOLID
Received	05/30/02	Collected/Weight	05/28/02 08:05 1825 g
% solids	97.0	Custody/SAF No	B00-030-058 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-1.47	1.9	3.2	50	U	C
Potassium 40	13966-00-2	14.8	0.74	0.31			GAM
Cobalt 60	10198-40-0	U		0.035	0.050	U	GAM
Cesium 137	10045-97-3	0.360	0.039	0.036	0.10		GAM
Radium 226	13982-63-3	0.514	0.057	0.057	0.10		GAM
Radium 228	15262-20-1	0.790	0.14	0.14	0.20		GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.702	0.038	0.036			GAM
Thorium 232	TH-232	0.790	0.14	0.14			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		4.0		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM

100 F Area - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

Test GAM Matrix SOLID
SDG 7289
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1794

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7036-088						
B14RJ1	R205156-01			7289-001	U	0.318
B14RJ2	R205156-02			7289-002	U	0.419
B14RJ3	R205156-03			7289-003	U	U
B14RJ4	R205156-04			7289-004	U	0.076 J
B14RJ5	R205156-05			7289-005	U	0.260
B14RJ6	R205156-06			7289-006	U	U
B14RJ7	R205156-07			7289-007	U	0.156
B14RJ8	R205156-08			7289-008	U	U
B14RJ9	R205156-09			7289-009	U	0.360
BLK (QC ID=42052)	R205156-11			7289-011	U	U
LCS (QC ID=42051)	R205156-10			7289-010	ok	ok
Duplicate (R205156-07)	R205156-12			7289-012	- U	ok
Nominal values and limits from method 100 F Area - Full Protocol				RDLs (pCi/g)	0.050	0.10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

Test GAM Matrix SOLID
SDG 7289
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1794

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-088	2σ prep error 15.0 %	Reference Lab Notebook 7036 pg. 088														
B14RJ1	R205156-01			0.34	800					120			17	06/14/02	06/14	02,01,00
B14RJ2	R205156-02			0.25	782					111			20	06/14/02	06/17	MB,07,00
B14RJ3	R205156-03			0.43	790					111			20	06/14/02	06/17	02,03,00
B14RJ4	R205156-04			0.24	843					111			20	06/14/02	06/17	02,04,00
B14RJ5	R205156-05			0.66	187					111			20	06/14/02	06/17	JR,05,00
B14RJ6	R205156-06			0.20	773					149			20	06/14/02	06/17	MB,07,00
B14RJ7	R205156-07			0.37	853					149			20	06/14/02	06/17	02,03,00
B14RJ8	R205156-08			0.95	183					122			22	06/14/02	06/19	JR,03,00
B14RJ9	R205156-09			0.26	771					149			20	06/14/02	06/17	MB,05,00
BLK (QC ID=42052)	R205156-11			0.33	183					145				06/14/02	06/17	01,04,00
LCS (QC ID=42051)	R205156-10			0.19	183					145				06/14/02	06/17	01,03,00
Duplicate (R205156-07) (QC ID=42053)	R205156-12			0.27	853					145			20	06/14/02	06/17	MB,05,00
Nominal values and limits from method				0.050	183					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 3
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD FOR 12 SAMPLES
MDA 0.37 ± 0.44
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

Test C Matrix SOLID
SDG 7289
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1794

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 7036-088						
B14RJ1	R205156-01			7289-001	U	
B14RJ2	R205156-02			7289-002	U	
B14RJ3	R205156-03			7289-003	U	
B14RJ4	R205156-04			7289-004	U	
B14RJ5	R205156-05			7289-005	U	
B14RJ6	R205156-06			7289-006	U	
B14RJ7	R205156-07			7289-007	U	
B14RJ8	R205156-08			7289-008	U	
B14RJ9	R205156-09			7289-009	U	
BLK (QC ID=42052)	R205156-11			7289-011	U	
LCS (QC ID=42051)	R205156-10			7289-010	ok	
Duplicate (R205156-07)	R205156-12			7289-012	-	U

Nominal values and limits from method — RDLs (pCi/g) 50
100 F Area - Full Protocol

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/20/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1794

Test C Matrix SOLID
SDG 7289
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1794

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-088	2σ prep error 10.0 %	Reference Lab Notebook 7036 pg. 088														
B14RJ1	R205156-01			3.6	0.236			100		100			15	06/11/02	06/12	LSC-005
B14RJ2	R205156-02			3.3	0.260			100		100			15	06/11/02	06/12	LSC-005
B14RJ3	R205156-03			3.3	0.256			100		100			16	06/11/02	06/13	LSC-005
B14RJ4	R205156-04			3.7	0.230			100		100			16	06/11/02	06/13	LSC-005
B14RJ5	R205156-05			4.0	0.212			100		100			16	06/11/02	06/13	LSC-005
B14RJ6	R205156-06			3.0	0.277			100		100			16	06/11/02	06/13	LSC-005
B14RJ7	R205156-07			3.2	0.260			100		100			16	06/11/02	06/13	LSC-005
B14RJ8	R205156-08			3.3	0.256			100		100			16	06/11/02	06/13	LSC-005
B14RJ9	R205156-09			3.2	0.262			100		100			16	06/11/02	06/13	LSC-005
BLK (QC ID=42052)	R205156-11			4.0	0.212			100		100				06/11/02	06/12	LSC-005
LCS (QC ID=42051)	R205156-10			24	0.212			100		3				06/11/02	06/13	LSC-005
Duplicate (R205156-07) (QC ID=42053)	R205156-12			3.5	0.238			100		100			16	06/11/02	06/13	LSC-005
Nominal values and limits from method				50	0.212					50			180			

PROCEDURES

REFERENCE	
C14_COX_LSC	
CP-060	Soil Preparation, rev 3
CP-251	Tritium/Carbon-14 Oxidation, rev 3

AVERAGES ± 2 SD FOR 12 SAMPLES

MDA 5.2 ± 12
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

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).

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

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.

SDG 7289
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1794

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 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

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 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

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 06/20/02

SDG 7289
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1794

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

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 06/20/02

SDG 7289
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1794

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 06/20/02

SDG 7289
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1794

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'

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/20/02

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.

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

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.

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-030-058	Page 1 of 2
Collector: M T Stankoviich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-2 Shallow Zone H1794 (7289)		SAF No.: B00-030	Air Quality: ☐
Ice Chest No.: SML 437	Field Logbook No.: EL-1535-5	COA: R116F22000	Method of Shipment: FedEx	
Shipped To: TMA/RECRA	Offsite Property No.: A Q 20130		Bill of Lading/Air Bill No.: 7905 3386 0125	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive Tie To B117P2

Special Handling and/or Storage

None

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation: Cool 4C	None	None								
				Type of Container: aG	P	aG								
				No. of Container(s): 1	1	1								
				Volume: 125mL	1000mL	60mL								
				Chromium Hex - 7196	See item (1) in Special Instructions.	[redacted] Carbon-14	NO 5-23-02							
B14RJ1	SOIL	5-28-02	0805		✓	✓								A1
B14RJ2	SOIL	5-28-02	0823		✓	✓								A2
B14RJ3	SOIL	5-28-02	0832		✓	✓								A3
B14RJ4	SOIL	5-28-02	0844		✓	✓								A4
B14RJ5	SOIL	5-28-02	0853		✓	✓								B5

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M T Stankovich	5-28-02 1500	3A/3728	5-28-02 1500
Ref 3A	5-29-02 0900	R Fahlberg	5-29-02 0900
ERC R Fahlberg	5-29-02 0900	FED EX	5-29-02
Fed Ex	5-30-02 10:00	ARCarro / ARCarro	5-30-02 10:0

SPECIAL INSTRUCTIONS

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

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

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

BHI-EE-011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-030-058	Page 2 of 2
Collector: M T Stankoviich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-2 Shallow Zone H1794 (7289)		SAF No.: B00-030	Air Quality ☐
Ice Chest No.: SIML 437	Field Logbook No.: EL-1535-5	COA: R116F22000	Method of Shipment: FedEx	
Shipped To: TMA/RECRA	Offsite Property No.: A02 0130		Bill of Lading/Air Bill No.: 7905 3386 0125	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive Tie To B117P2

Special Handling and/or Storage

None

Preservation	Cool 4C	None	None									
Type of Container	aG	P	aG									
No. of Container(s)	1	1	1									
Volume	125mL	1000mL	60mL									
SAMPLE ANALYSIS	Chromium Hex - 7196 5-29-02	See item (1) in Special Instructions.	[redacted] Carbon-14	NO 5-23-02								
Sample No.	Matrix *	Sample Date	Sample Time									
B14RJ6	SOIL	5-28-02	0905		✓	✓						B6
B14RJ7	SOIL	5-28-02	0917		✓	✓						B7
B14RJ8	SOIL	5-28-02	0926		✓	✓						B8
B14RJ9	SOIL	5-28-02	0805		✓	✓						D
B14RK0	SOIL	MO 5-24-02										

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M T Stankovich	5-28-02 1500	SB/3728	5-28-02 1500
Ref SB 3728	5-29-02 0900	R. Fahlberg R. Fahlberg	5-29-02 0900
R. Fahlberg R. Fahlberg	5-29-02 ERC 0900	FED Ex	5-29-02
Fed Ex	5-30-02 10:00	JR Corso JR Corso	5-30-02 10:00

SPECIAL INSTRUCTIONS

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

Matrix *

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

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

BHI-EE-011 (03/01/2002)

EBERLINE SERVICES **ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 5-30-02 10:00

CoC No. B00-030-058

Container I.D. No. SML 437 Requested TAT (Days) 21 P.O. Received Yes [✓] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [✓]	

6. Number of samples in shipping container: 9

7. Number of containers per sample: 2 (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 5-30-02

14. Received by M Corso Date: 5-30-02 Time: 10:00

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

Ion Chamber Ser. No. _____ Calibration date _____

Alpha meter Ser. No. _____ Calibration date _____

Survey Meter Ser. No. _____ Calibration date _____

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1794

DATE RECEIVED: 05/30/02 LVL LOT # :0205L802

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14RJ1						
% SOLIDS	001	S	02L%S058	05/28/02	06/06/02	06/07/02
% SOLIDS	001 REP	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	001	S	02LVI018	05/28/02	06/12/02	06/12/02
CHROMIUM VI	001 REP	S	02LVI018	05/28/02	06/12/02	06/12/02
CHROMIUM VI	001 MS	S	02LVI018	05/28/02	06/12/02	06/12/02
CHROMIUM VI	001 MSD	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ2						
% SOLIDS	002	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	002	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ3						
% SOLIDS	003	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	003	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ4						
% SOLIDS	004	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	004	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ5						
% SOLIDS	005	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	005	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ6						
% SOLIDS	006	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	006	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ7						
% SOLIDS	007	S	02L%S058	05/28/02	06/06/02	06/07/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1794

DATE RECEIVED: 05/30/02 LVL LOT # :0205L802

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	007	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ8						
% SOLIDS	008	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	008	S	02LVI018	05/28/02	06/12/02	06/12/02
B14RJ9						
% SOLIDS	009	S	02L%S058	05/28/02	06/06/02	06/07/02
CHROMIUM VI	009	S	02LVI018	05/28/02	06/12/02	06/12/02

LAB QC:

CHROMIUM VI	MB1	S	02LVI018	N/A	06/12/02	06/12/02
CHROMIUM VI	MB1 BS	S	02LVI018	N/A	06/12/02	06/12/02
CHROMIUM VI	MB1 BSD	S	02LVI018	N/A	06/12/02	06/12/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B00-030 H1794
LVL#: 0205L802

W.O.#: 11343-6016-001-9999-00
Date Received: 05-30-02

INORGANIC NARRATIVE

1. This narrative covers the analyses of 9 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. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Chromium VI was within the 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 Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

06-25-02
Date

njp\i05-802

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

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

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/20/02

CLIENT: TNUHANFORD B00-030 H1794
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0205L802

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B14RJ1	% Solids	96.3	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-002	B14RJ2	% Solids	93.9	%	0.01	1.0
		Chromium VI	0.75	MG/KG	0.43	1.0
-003	B14RJ3	% Solids	93.0	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
-004	B14RJ4	% Solids	95.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-005	B14RJ5	% Solids	92.3	%	0.01	1.0
		Chromium VI	1.6	MG/KG	0.43	1.0
-006	B14RJ6	% Solids	94.1	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-007	B14RJ7	% Solids	95.4	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-008	B14RJ8	% Solids	94.7	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-009	B14RJ9	% Solids	96.6	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/20/02

CLIENT: TNUHANFORD B00-030 H1794 LVL LOT #: 0205L802

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	02LVI018-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/20/02

CLIENT: TNUHANFORD B00-030 H1794 LVL LOT #: 0205L802

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B14RJ1	Soluble Chromium VI	3.9	0.42u	4.2	94.8	1.0
		Insoluble Chromium VI	1170	0.42u	1140	102.8	100
BLANK10	02LVI018-MB1	Soluble Chromium VI	3.6	0.40u	4.0	91.0	1.0
		Insoluble Chromium VI	1250	0.40u	1220	102.5	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/20/02

CLIENT: TNUHANFORD B00-030 H1794 LVL LOT #: 0205L802

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B14RJ1	% Solids	96.3	96.2	0.10	1.0
		Chromium VI	0.42u	0.42u	NC	1.0

Lionville Laboratory Use Only: 0205L802

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI LIONVILLE LABORATORY INC

10

Client: TNU-HANFORD SAF NO. B00-030
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: 05
QC: SPEC Del: STD TAT: 21 day
Date Rec'd: 5-30-02 Date Due: 6-20-02

Refrigerator #						6 (A)
#/Type Container	Liquid					
	Solid					1 4g (environ. grind)
Volume	Liquid					
	Solid					125
Preservatives						
ANALYSES REQUESTED →	ORGANIC: VOA	BNA	Pest/PCB	Herb	INORG: Metal	CN	Chrom. Hex

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	Chrom. Hex (Lionville Laboratory Use Only: ICR6)
001	B14RJ1			S	5-28-02	0805	1
002	2					0823	1
003	3					0832	1
004	4					0844	1
005	5					0853	1
006	6					0905	1
007	7					0917	1
008	8					0926	1
009	9					0805	1

Special Instructions: SAF # B00-030
Run Matrix QC

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

Relinquished by	Received by	Date	Time
FedEx	Cal [signature]	5-30-02	1415

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 7920 4209 2383

Lionville Laboratory Use Only

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-030-058	Page 1 of 2

Collector M T Stankoviich	**Company Contact** Mike Stankovich **Telephone No.** 531-7620	**Project Coordinator** TRENT, SJ	**Price Code** 8L **Data Turnaround** 21 Days
Project Designation 100 F Area - Full Protocol	**Sampling Location** 116-F-2 Shallow Zone	**SAF No.** B00-030	**Air Quality** ☐
Ice Chest No. ERC 99-023	**Field Logbook No.** EL-1535-5 **COA** R116F22000	**Method of Shipment** FedEx	
Shipped To TMA/RECRA	**Offsite Property No.** AQ 20142	**Bill of Lading/Air Bill No.** 7920 4209 2383	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive Tie To B117P2

Special Handling and/or Storage
Cool 4°c

Preservation	Cool 4C	None	None									
Type of Container	aG	P	aG									
No. of Container(s)	1	1	1									
Volume	125mL	1000mL	60mL									
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions.	[redacted] Carbon-14	MD 5-23-02 RF 5-29-02								

Sample No.	Matrix *	Sample Date	Sample Time										
B14RJ1	SOIL	5-28-02	0805	✓									A1
B14RJ2	SOIL	5-28-02	0823	✓									A2
B14RJ3	SOIL	5-28-02	0832	✓									A3
B14RJ4	SOIL	5-28-02	0844	✓									A4
B14RJ5	SOIL	5-28-02	0853	✓									B5

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M T Stankovich	5-28-02 1500	3B/3728	5-28-02 1500
Ref 3B 3728	5-29-02 0900	R. Fahlberg	5-29-02 0900
R. Fahlberg	5-29-02 0900	Fed Ex	
FEDEX	5-30-02 1415	Carl Henry	5-30-02 1415

SPECIAL INSTRUCTIONS

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

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

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

BHI-EE-011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-030-058	Page 2 of 2
Collector: M T Stankoviich	Company Contact: Mike Stankovich; Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-2 Shallow Zone	SAF No.: B00-030	Air Quality ☐
Ice Chest No.: ERC99-023	Field Logbook No.: EL-1535-5; COA: R116F22000	Method of Shipment: FedEx	
Shipped To: TMA/RECRA	Offsite Property No.: AQ20142	Bill of Lading/Air Bill No.: 7920 4209 2383	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive Tie To B117P2

Special Handling and/or Storage

~~None~~ RG 5.29.02

Cool 4°C

Preservation	Cool 4C	None	None									
Type of Container	aG	P	aG									
No. of Container(s)	1	1	1									
Volume	125mL	1000mL	60mL									
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions. RG 5.28.02	[redacted] Carbon-14 5.28.02	NO 5-23-02								

Sample No.	Matrix *	Sample Date	Sample Time										
B14RJ6	SOIL	5-28-02	0905	✓									B6
B14RJ7	SOIL	5-28-02	0917	✓									B7
B14RJ8	SOIL	5-28-02	0926	✓									B8
B14RJ9	SOIL	5-28-02	0805	✓									D
~~B14RK0~~	~~SOIL~~	MO 5-24-02											

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible] M STANKOVICH	5-28-02 1500	3B/3728	5-28-02 1500
Relinquished By/Removed From: Ref 3B 3728	5.29.02 0900	Received By/Stored In: R Fahlberg	R. Fahlberg 5.29.02 0900
Relinquished By/Removed From: ERC R. Fahlberg	5.29.02 0900	Received By/Stored In: FED EX	Date/Time
Relinquished By/Removed From: FEDEX	5-30-02 1415	Received By/Stored In	5.30.02 1415
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

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

Matrix *

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

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

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU-Hanford

DATE: 5-30-02

Purchase Order/Project:

SAF# / SOW# / Release #: B00-030

Laboratory SDG #: 0205L802

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☐ Yes	☐ No	☑ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp and Comments:

2C99-023 - 4°C

Laboratory Sample Custodian: Carla Hernandez

Laboratory Project Manager: