EBERLINE SERVICES

0060741

September 19, 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R3-08-042-7562, SDG H2307

Dear Mr. Trent:

Enclosed is the data report for three solid samples designated under SAF No. F03-006 received at Eberline Services on August 8, 2003. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Program Manager

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MCM

Enclosure: Data Package

SEP 2003
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Analytical Services
2030 Wright Avenue
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(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2307 was composed of three solid (soil) samples designated under SAF No. F03-006 with a Project Designation of: 200-PW-2/200-PW-4 OU – Borehole Soil Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium 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.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.8 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.9 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.10 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.11 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.11 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.12 Gamma Spectroscopy 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

Melissa C. Mannion
Program Manager

9/19/3

Date

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 H2307

SDG	7562
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG_H2307

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

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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	09/19/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2307

SDG 7562
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2307

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.

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SDG 7562
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2307

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.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

LAB SAMPLE SUMMARY

SDG 7562
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2307

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R308042-01	B173W0	216-A-36B (C4160)	SOLID		F03-006	F03-006-201	07/31/03 07:30
R308042-02	B173W1	216-A-36B (C4160)	SOLID		F03-006	F03-006-201	07/31/03 07:30
R308042-03	B173W2	216-A-36B (C4160)	SOLID		F03-006	F03-006-201	08/04/03 11:25
R308042-04	Lab Control Sample		SOLID		F03-006		
R308042-05	Method Blank		SOLID		F03-006		
R308042-06	Duplicate (R308042-01)	216-A-36B (C4160)	SOLID		F03-006		07/31/03 07:30
R308042-07	Spike (R308042-01)	216-A-36B (C4160)	SOLID		F03-006		07/31/03 07:30

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SAMPLE DELIVERY GROUP H2307

QC SUMMARY

SDG 7562
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2307

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
7562	F03-006-201	B173W0	SOLID	95.8	264.3 g		08/08/03	8	R308042-01	7562-001
		B173W1	SOLID	96.1	260.2 g		08/08/03	8	R308042-02	7562-002
		B173W2	SOLID	97.2	290.8 g		08/08/03	4	R308042-03	7562-003
		Method Blank	SOLID						R308042-05	7562-005
		Lab Control Sample	SOLID						R308042-04	7562-004
		Duplicate (R308042-01)	SOLID	95.8	264.3 g		08/08/03	8	R308042-06	7562-006
		Spike (R308042-01)	SOLID	95.8	264.3 g		08/08/03	8	R308042-07	7562-007

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

PREP BATCH SUMMARY

SDG 7562
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2307

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	7071-203	5.0	3			1	1	1/1		
NP	SOLID	Neptunium in Soil	7071-203	5.0	3			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7071-203	5.0	3			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7071-203	5.0	3			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	7071-203	5.0	3			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7071-203	10.0	3			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	7071-203	10.0	3			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7071-203	15.0	3			1	1	1/1		
I	SOLID	Iodine 129 in Soil	7071-203	10.0	3			1	1	1/1		
Kinetic Phosphorimetry (KPA)												
U_T	SOLID	Uranium, Total in Soil	7071-203	9.0	3			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7071-203	10.0	3			1	1	1/1		
H	SOLID	Tritium in Soil	7071-203	10.0	3			1	1	1/1	1/1	X
NI_L	SOLID	Nickel 63 in Soil	7071-203	10.0	3			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.

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SAMPLE DELIVERY GROUP H2307

SDG 7562
Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2307

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R308042-01	B173W0			7562-001	AM		08/29/03	09/17/03	MWT	Americium 241 in Soil
07/31/03	216-A-36B (C4160)		SOLID	7562-001	C		09/03/03	09/17/03	MWT	Carbon 14 in Soil
08/08/03	F03-006-201	F03-006		7562-001	GAM		09/02/03	09/17/03	MWT	Gamma Scan
				7562-001	H		09/06/03	09/17/03	MWT	Tritium in Soil
				7562-001	I		09/09/03	09/17/03	MWT	Iodine 129 in Soil
				7562-001	NI_L		09/03/03	09/17/03	MWT	Nickel 63 in Soil
				7562-001	NP		08/29/03	09/17/03	MWT	Neptunium in Soil
				7562-001	PU		09/03/03	09/17/03	MWT	Plutonium, Isotopic in Solids
				7562-001	SR		09/04/03	09/17/03	MWT	Total Strontium in Soil
				7562-001	TC		09/12/03	09/17/03	MWT	Technetium 99 in Soil
				7562-001	TH		08/29/03	09/17/03	MWT	Thorium, Isotopic in Soil
				7562-001	U		08/28/03	09/17/03	MWT	Uranium, Isotopic in Soil
				7562-001	U_T		08/27/03	09/17/03	MWT	Uranium, Total in Soil
R308042-02	B173W1			7562-002	AM		08/29/03	09/17/03	MWT	Americium 241 in Soil
07/31/03	216-A-36B (C4160)		SOLID	7562-002	C		09/03/03	09/17/03	MWT	Carbon 14 in Soil
08/08/03	F03-006-201	F03-006		7562-002	GAM		09/02/03	09/17/03	MWT	Gamma Scan
				7562-002	H		09/06/03	09/17/03	MWT	Tritium in Soil
				7562-002	I		09/10/03	09/17/03	MWT	Iodine 129 in Soil
				7562-002	NI_L		09/03/03	09/17/03	MWT	Nickel 63 in Soil
				7562-002	NP		08/29/03	09/17/03	MWT	Neptunium in Soil
				7562-002	PU		09/02/03	09/17/03	MWT	Plutonium, Isotopic in Solids
				7562-002	SR		09/04/03	09/17/03	MWT	Total Strontium in Soil
				7562-002	TC		09/12/03	09/17/03	MWT	Technetium 99 in Soil
				7562-002	TH		08/29/03	09/17/03	MWT	Thorium, Isotopic in Soil
				7562-002	U		08/28/03	09/17/03	MWT	Uranium, Isotopic in Soil
				7562-002	U_T		08/27/03	09/17/03	MWT	Uranium, Total in Soil

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SDG 7562
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2307

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R308042-03	B173W2			7562-003	AM		08/29/03	09/17/03	MWT	Americium 241 in Soil
08/04/03	216-A-36B (C4160)		SOLID	7562-003	C		09/03/03	09/17/03	MWT	Carbon 14 in Soil
08/08/03	F03-006-201	F03-006		7562-003	GAM		09/02/03	09/17/03	MWT	Gamma Scan
				7562-003	H		09/06/03	09/17/03	MWT	Tritium in Soil
				7562-003	I		09/11/03	09/17/03	MWT	Iodine 129 in Soil
				7562-003	NI_L		09/04/03	09/17/03	MWT	Nickel 63 in Soil
				7562-003	NP		08/29/03	09/17/03	MWT	Neptunium in Soil
				7562-003	PU		09/04/03	09/17/03	MWT	Plutonium, Isotopic in Solids
				7562-003	SR		09/04/03	09/17/03	MWT	Total Strontium in Soil
				7562-003	TC		09/12/03	09/17/03	MWT	Technetium 99 in Soil
				7562-003	TH		08/29/03	09/17/03	MWT	Thorium, Isotopic in Soil
				7562-003	U		08/28/03	09/17/03	MWT	Uranium, Isotopic in Soil
				7562-003	U_T		08/27/03	09/17/03	MWT	Uranium, Total in Soil
R308042-04	Lab Control Sample			7562-004	AM		08/29/03	09/17/03	MWT	Americium 241 in Soil
			SOLID	7562-004	C		09/03/03	09/17/03	MWT	Carbon 14 in Soil
		F03-006		7562-004	GAM		09/02/03	09/17/03	MWT	Gamma Scan
				7562-004	H		09/06/03	09/17/03	MWT	Tritium in Soil
				7562-004	I		09/12/03	09/17/03	MWT	Iodine 129 in Soil
				7562-004	NI_L		09/04/03	09/17/03	MWT	Nickel 63 in Soil
				7562-004	NP		08/29/03	09/17/03	MWT	Neptunium in Soil
				7562-004	PU		09/02/03	09/17/03	MWT	Plutonium, Isotopic in Solids
				7562-004	SR		09/04/03	09/17/03	MWT	Total Strontium in Soil
				7562-004	TC		09/12/03	09/17/03	MWT	Technetium 99 in Soil
				7562-004	TH		08/29/03	09/17/03	MWT	Thorium, Isotopic in Soil
				7562-004	U		08/28/03	09/17/03	MWT	Uranium, Isotopic in Soil
				7562-004	U_T		08/27/03	09/17/03	MWT	Uranium, Total in Soil

Lab id EBRLNE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

SDG 7562
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2307

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R308042-05	Method Blank			7562-005	AM		08/29/03	09/17/03	MWT	Americium 241 in Soil
			SOLID	7562-005	C		09/02/03	09/17/03	MWT	Carbon 14 in Soil
		F03-006		7562-005	GAM		09/10/03	09/17/03	MWT	Gamma Scan
				7562-005	H		09/06/03	09/17/03	MWT	Tritium in Soil
				7562-005	I		09/15/03	09/17/03	MWT	Iodine 129 in Soil
				7562-005	NI_L		09/04/03	09/17/03	MWT	Nickel 63 in Soil
				7562-005	NP		08/29/03	09/17/03	MWT	Neptunium in Soil
				7562-005	PU		09/02/03	09/17/03	MWT	Plutonium, Isotopic in Solids
				7562-005	SR		09/04/03	09/17/03	MWT	Total Strontium in Soil
				7562-005	TC		09/16/03	09/17/03	MWT	Technetium 99 in Soil
				7562-005	TH		08/29/03	09/17/03	MWT	Thorium, Isotopic in Soil
				7562-005	U		08/28/03	09/17/03	MWT	Uranium, Isotopic in Soil
				7562-005	U_T		08/27/03	09/17/03	MWT	Uranium, Total in Soil
R308042-06	Duplicate (R308042-01)			7562-006	AM		08/29/03	09/17/03	MWT	Americium 241 in Soil
07/31/03	216-A-36B (C4160)		SOLID	7562-006	C		09/03/03	09/17/03	MWT	Carbon 14 in Soil
08/08/03		F03-006		7562-006	GAM		09/11/03	09/17/03	MWT	Gamma Scan
				7562-006	H		09/07/03	09/17/03	MWT	Tritium in Soil
				7562-006	I		09/16/03	09/17/03	MWT	Iodine 129 in Soil
				7562-006	NI_L		09/04/03	09/17/03	MWT	Nickel 63 in Soil
				7562-006	NP		08/29/03	09/17/03	MWT	Neptunium in Soil
				7562-006	PU		09/02/03	09/17/03	MWT	Plutonium, Isotopic in Solids
				7562-006	SR		09/04/03	09/17/03	MWT	Total Strontium in Soil
				7562-006	TC		09/16/03	09/17/03	MWT	Technetium 99 in Soil
				7562-006	TH		08/29/03	09/17/03	MWT	Thorium, Isotopic in Soil
				7562-006	U		08/28/03	09/17/03	MWT	Uranium, Isotopic in Soil
				7562-006	U_T		08/27/03	09/17/03	MWT	Uranium, Total in Soil
R308042-07	Spike (R308042-01)			7562-007	H		09/07/03	09/17/03	MWT	Tritium in Soil
07/31/03	216-A-36B (C4160)		SOLID							
08/08/03		F03-006								

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SDG 7562
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2307

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	F03-006	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	3			1	1	1		6
C	F03-006	Carbon 14 in Soil	C14_COX_LSC	3			1	1	1		6
GAM	F03-006	Gamma Scan	GAMMA_GS	3			1	1	1		6
H	F03-006	Tritium in Soil	906.0_H3_LSC	3			1	1	1	1	7
I	F03-006	Iodine 129 in Soil	I129_SEP_LEPS_GS	3			1	1	1		6
NI_L	F03-006	Nickel 63 in Soil	NI63_LSC	3			1	1	1		6
NP	F03-006	Neptunium in Soil	NP237_LLE_PLATE_AEA	3			1	1	1		6
PU	F03-006	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	3			1	1	1		6
SR	F03-006	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	3			1	1	1		6
TC	F03-006	Technetium 99 in Soil	TC99_TR_SEP_LSC	3			1	1	1		6
TH	F03-006	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	3			1	1	1		6
U	F03-006	Uranium, Isotopic in Soil	UISO_PLATE_AEA	3			1	1	1		6
U_T	F03-006	Uranium, Total in Soil	UTOT_KPA	3			1	1	1		6
TOTALS				39			13	13	13	1	79

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2307

7562-005

Method Blank

METHOD BLANK

SDG 7562 Client/Case no Hanford SDG H2307
Contact Melissa C. Mannion Contract No. 630

Lab sample id R308042-05 Client sample id Method Blank
Dept sample id 7562-005 Material/Matrix SOLID
SAF No F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.021	0.16	0.27	400	U	H
Carbon 14	14762-75-5	-0.172	1.7	2.9	50	U	C
Nickel 63	13981-37-8	-1.82	1.3	2.2	30	U	NI_L
Total Strontium	SR-RAD	-0.160	0.16	0.36	1.0	U	SR
Technetium 99	14133-76-7	-0.088	0.27	0.56	15	U	TC
Thorium 228	14274-82-9	0	0.071	0.27		U	TH
Thorium 230	14269-63-7	0.071	0.14	0.27	1.0	U	TH
Thorium 232	TH-232	0	0.071	0.27	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0.001	0.003	0.007	1.0	U	U_T
Uranium 233/234	U-233/234	0.032	0.064	0.24	1.0	U	U
Uranium 235	15117-96-1	0	0.077	0.30	1.0	U	U
Uranium 238	U-238	0	0.064	0.24	1.0	U	U
Neptunium 237	13994-20-2	0	0.10	0.15	1.0	U	NP
Plutonium 238	13981-16-3	0	0.081	0.31	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.081	0.31	1.0	U	PU
Americium 241	14596-10-2	-0.026	0.052	0.20	1.0	U	AM
Iodine 129	15046-84-1	-0.076	0.36	0.82	2.0	U	I
Potassium 40	13966-00-2	U		0.42		U	GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Tin 126	15832-50-5	U		0.033		U	GAM
Cesium 134	13967-70-9	U		0.037		U	GAM
Cesium 137	10045-97-3	U		0.029	0.10	U	GAM
Radium 226	13982-63-3	U		0.054		U	GAM
Radium 228	15262-20-1	U		0.12		U	GAM
Europium 152	14683-23-9	U		0.068	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.051	0.10	U	GAM
Thorium 228	14274-82-9	U		0.039		U	GAM
Thorium 232	TH-232	U		0.12		U	GAM

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/19/03

7562-005 **Method Blank**

BLANK, cont.

SDG	7562	Client/Case no	Hanford SDG H2307
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R308042-05	Client sample id	Method Blank
Dept sample id	7562-005	Material/Matrix	SOLID
		SAF No	F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 235	15117-96-1	U		0.082		U	GAM
Uranium 238	U-238	U		4.0		U	GAM
Americium 241	14596-10-2	U		0.061		U	GAM

200-PW-2/200-PW-4 OU-Borehole Soil

QC-BLANK 45507

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

7562-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7562
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2307
Contract No. 630

Lab sample id R308042-04
Dept sample id 7562-004

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No F03-006

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	13.4	0.43	0.27	400		H	13.6	0.54	99	83-117	80-120
Carbon 14	1770	36	8.9	50		C	1870	75	95	84-116	80-120
Nickel 63	264	5.6	2.7	30		NI_L	274	11	96	84-116	80-120
Total Strontium	23.3	0.99	0.32	1.0		SR	21.9	0.88	106	82-118	80-120
Technetium 99	120	2.8	0.53	15		TC	120	4.8	100	83-117	80-120
Thorium 230	44.3	4.2	0.25	1.0		TH	44.8	1.8	99	83-117	80-120
Total Uranium (ug/g)	18.4	2.2	0.072	1.0		U_T	18.1	0.72	102	76-124	80-120
Uranium 233/234	18.8	2.5	0.93	1.0		U	19.3	0.77	97	78-122	80-120
Uranium 235	14.6	2.1	0.24	1.0		U	15.7	0.63	93	78-122	80-120
Uranium 238	20.0	2.6	0.90	1.0		U	21.0	0.84	95	79-121	80-120
Neptunium 237	21.7	2.6	0.18	1.0		NP	21.8	0.87	100	80-120	80-120
Plutonium 238	27.3	2.8	0.24	1.0		PU	26.8	1.1	102	82-118	80-120
Plutonium 239/240	29.0	3.0	0.24	1.0		PU	29.0	1.2	100	82-118	80-120
Americium 241	21.0	2.0	0.19	1.0		AM	21.0	0.84	100	83-117	80-120
Iodine 129	134	1.5	1.9	2.0		I	127	5.1	106	83-117	80-120
Cobalt 60	3.25	0.17	0.10	0.050		GAM	3.07	0.12	106	74-126	80-120
Cesium 137	3.56	0.14	0.10	0.10		GAM	3.08	0.12	116	72-128	80-120

200-PW-2/200-PW-4 OU-Borehole Soil

QC-LCS 45506

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

7562-006 B173W0

DUPLICATE

SDG 7562 Client/Case no Hanford SDG H2307

Contact Melissa C. Mannion Contract No. 630

DUPLICATE		ORIGINAL			
Lab sample id	R308042-06	Lab sample id	R308042-01	Client sample id	B173W0
Dept sample id	7562-006	Dept sample id	7562-001	Location/Matrix	216-A-36B (C4160) SOLID
		Received	08/08/03	Collected/Weight	07/31/03 07:30 264.3 g
% solids	95.8	% solids	95.8	Custody/SAF No	F03-006-201 F03-006

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Tritium	11.1	0.40	0.26	400		H	10.0	0.36	0.24		10	23
Carbon 14	0.288	1.5	2.5	50	U	C	0.108	1.6	2.7	U	-	
Nickel 63	-2.50	1.4	2.5	30	U	NI_L	-0.786	1.3	2.2	U	-	
Total Strontium	103	2.2	0.38	1.0		SR	102	2.2	0.38		1	22
Technetium 99	0.044	0.37	0.58	15	U	TC	-0.042	0.23	0.56	U	-	
Thorium 228	0.594	0.27	0.25			TH	0.579	0.26	0.25		3	96
Thorium 230	0.791	0.34	0.25	1.0		TH	0.418	0.26	0.25		62	107
Thorium 232	0.824	0.34	0.25	1.0		TH	0.418	0.26	0.25		65	104
Total Uranium (ug/g)	2.53	0.29	0.007	1.0		U_T	2.52	0.29	0.007		0	31
Uranium 233/234	3.94	0.75	0.20	1.0		U	3.87	0.76	0.20		2	42
Uranium 235	0.125	0.13	0.24	1.0	U	U	0.096	0.13	0.25	U	-	
Uranium 238	1.83	0.46	0.20	1.0		U	1.56	0.46	0.20		16	59
Neptunium 237	0.146	0.19	0.15	1.0	U	NP	0.042	0.085	0.13	U	-	
Plutonium 238	0.075	0.10	0.19	1.0	U	PU	0.035	0.11	0.19	U	-	
Plutonium 239/240	0.251	0.15	0.19	1.0		PU	0.368	0.18	0.13		38	114
Americium 241	0.122	0.12	0.16	1.0	U	AM	0.194	0.15	0.19		46	183
Iodine 129	-0.312	0.44	1.0	2.0	U	I	-0.080	0.42	0.95	U	-	
Potassium 40	19.9	1.4	0.90			GAM	19.4	1.8	1.0		3	36
Cobalt 60	0.332	0.078	0.087	0.050		GAM	0.280	0.11	0.11		17	73
Tin 126	U		0.14		U	GAM	U		0.20	U	-	
Cesium 134	U		0.095		U	GAM	U		0.11	U	-	
Cesium 137	2.63	0.13	0.095	0.10		GAM	2.56	0.17	0.13		3	34
Radium 226	0.545	0.15	0.15			GAM	0.743	0.19	0.18		31	65
Radium 228	0.801	0.34	0.36			GAM	1.15	0.49	0.44		36	97
Europium 152	U		0.20	0.10	U	GAM	U		0.23	U	-	
Europium 154	U		0.24	0.10	U	GAM	U		0.30	U	-	
Europium 155	U		0.21	0.10	U	GAM	U		0.27	U	-	
Thorium 228	0.853	0.12	0.14			GAM	0.796	0.098	0.10		7	43

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
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7562-006

B173W0

DUPLICATE, cont.

SDG	7562			Client/Case no	Hanford SDG H2307
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R308042-06	Lab sample id	R308042-01	Client sample id	B173W0
Dept sample id	7562-006	Dept sample id	7562-001	Location/Matrix	216-A-36B (C4160) SOLID
		Received	08/08/03	Collected/Weight	07/31/03 07:30 264.3 g
% solids	95.8	% solids	95.8	Custody/SAF No	F03-006-201 F03-006

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
Thorium 232	0.801	0.34	0.36			GAM	1.15	0.49	0.44		36	97
Uranium 235	U		0.32		U	GAM	U		0.50	U	-	
Uranium 238	U		9.1		U	GAM	U		12	U	-	
Americium 241	U		0.25		U	GAM	U		0.33	U	-	

200-PW-2/200-PW-4 OU-Borehole Soil

QC-DUP#1 45508

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

7562-007

B173W0

MATRIX SPIKE

SDG 7562
Contact Melissa C. Mannion
MATRIX SPIKE
Lab sample id R308042-07
Dept sample id 7562-007
% solids 95.8

ORIGINAL
Lab sample id R308042-01
Dept sample id 7562-001
Received 08/08/03
% solids 95.8

Client/Case no Hanford SDG H2307
Contract No. 630
Client sample id B173W0
Location/Matrix 216-A-36B (C4160) SOLID
Collected/Weight 07/31/03 07:30 264.3 g
Custody/SAF No F03-006-201 F03-006

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	62.8	0.87	0.25	400	X	H	56.5	2.3	10.0	0.36	93	82-118	60-140

200-PW-2/200-PW-4 OU-Borehole Soil

QC-MS#1 45509

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2307

7562-001 B173W0

DATA SHEET

SDG	7562	Client/Case no	Hanford SDG H2307
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R308042-01	Client sample id	B173W0
Dept sample id	7562-001	Location/Matrix	216-A-36B (C4160) SOLID
Received	08/08/03	Collected/Weight	07/31/03 07:30 264.3 g
% solids	95.8	Custody/SAF No	F03-006-201 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	10.0	0.36	0.24	400		H
Carbon 14	14762-75-5	0.108	1.6	2.7	50	U	C
Nickel 63	13981-37-8	-0.786	1.3	2.2	30	U	NI_L
Total Strontium	SR-RAD	102	2.2	0.38	1.0		SR
Technetium 99	14133-76-7	-0.042	0.23	0.56	15	U	TC
Thorium 228	14274-82-9	0.579	0.26	0.25			TH
Thorium 230	14269-63-7	0.418	0.26	0.25	1.0		TH
Thorium 232	TH-232	0.418	0.26	0.25	1.0		TH
Total Uranium (ug/g)	7440-61-1	2.52	0.29	0.007	1.0		U_T
Uranium 233/234	U-233/234	3.87	0.76	0.20	1.0		U
Uranium 235	15117-96-1	0.096	0.13	0.25	1.0	U	U
Uranium 238	U-238	1.56	0.46	0.20	1.0		U
Neptunium 237	13994-20-2	0.042	0.085	0.13	1.0	U	NP
Plutonium 238	13981-16-3	0.035	0.11	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0.368	0.18	0.13	1.0		PU
Americium 241	14596-10-2	0.194	0.15	0.19	1.0		AM
Iodine 129	15046-84-1	-0.080	0.42	0.95	2.0	U	I
Potassium 40	13966-00-2	19.4	1.8	1.0			GAM
Cobalt 60	10198-40-0	0.280	0.11	0.11	0.050		GAM
Tin 126	15832-50-5	U		0.20		U	GAM
Cesium 134	13967-70-9	U		0.11		U	GAM
Cesium 137	10045-97-3	2.56	0.17	0.13	0.10		GAM
Radium 226	13982-63-3	0.743	0.19	0.18			GAM
Radium 228	15262-20-1	1.15	0.49	0.44			GAM
Europium 152	14683-23-9	U		0.23	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.27	0.10	U	GAM
Thorium 228	14274-82-9	0.796	0.098	0.10			GAM

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id	EBRLNE
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DATA SHEET, cont

SDG	7562	Client/Case no	Hanford	SDG H2307	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R308042-01	Client sample id	B173W0		
Dept sample id	7562-001	Location/Matrix	216-A-36B (C4160)	SOLID	
Received	08/08/03	Collected/Weight	07/31/03 07:30	264.3 g	
% solids	95.8	Custody/SAF No	F03-006-201	F03-006	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Thorium 232	TH-232	1.15	0.49	0.44			GAM
Uranium 235	15117-96-1	U		0.50		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.33		U	GAM

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id	EBRLNE
Protocol	Hanford
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

7562-002 B173W1

DATA SHEET

SDG	7562	Client/Case no	Hanford SDG H2307
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R308042-02	Client sample id	B173W1
Dept sample id	7562-002	Location/Matrix	216-A-36B (C4160) SOLID
Received	08/08/03	Collected/Weight	07/31/03 07:30 260.2 g
% solids	96.1	Custody/SAF No	F03-006-201 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	12.4	0.40	0.25	400		H
Carbon 14	14762-75-5	0.247	1.7	2.8	50	U	C
Nickel 63	13981-37-8	-1.68	1.4	2.4	30	U	NI_L
Total Strontium	SR-RAD	87.4	2.0	0.37	1.0		SR
Technetium 99	14133-76-7	0.089	0.27	0.57	15	U	TC
Thorium 228	14274-82-9	0.293	0.20	0.25			TH
Thorium 230	14269-63-7	0.520	0.26	0.25	1.0		TH
Thorium 232	TH-232	0.813	0.33	0.25	1.0		TH
Total Uranium (ug/g)	7440-61-1	1.49	0.17	0.007	1.0		U_T
Uranium 233/234	U-233/234	2.31	0.54	0.21	1.0		U
Uranium 235	15117-96-1	0.097	0.13	0.25	1.0	U	U
Uranium 238	U-238	1.02	0.34	0.21	1.0		U
Neptunium 237	13994-20-2	0	0.092	0.14	1.0	U	NP
Plutonium 238	13981-16-3	0.052	0.052	0.20	1.0	U	PU
Plutonium 239/240	PU-239/240	0.414	0.21	0.20	1.0		PU
Americium 241	14596-10-2	0.051	0.10	0.20	1.0	U	AM
Iodine 129	15046-84-1	-0.051	0.36	0.82	2.0	U	I
Potassium 40	13966-00-2	16.1	6.2	0.89			GAM
Cobalt 60	10198-40-0	0.246	0.10	0.10	0.050		GAM
Tin 126	15832-50-5	U		0.11		U	GAM
Cesium 134	13967-70-9	U		0.10		U	GAM
Cesium 137	10045-97-3	2.55	0.12	0.090	0.10		GAM
Radium 226	13982-63-3	0.456	0.24	0.16			GAM
Radium 228	15262-20-1	0.544	0.44	0.32			GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.26	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.753	0.19	0.14			GAM

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id	EBRLNE
Protocol	Hanford
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DATA SHEET, cont

SDG	7562	Client/Case no	Hanford	SDG H2307	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R308042-02	Client sample id	B173W1		
Dept sample id	7562-002	Location/Matrix	216-A-36B (C4160)	SOLID	
Received	08/08/03	Collected/Weight	07/31/03 07:30	260.2 g	
% solids	96.1	Custody/SAF No	F03-006-201	F03-006	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Thorium 232	TH-232	0.544	0.44	0.32			GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		9.6		U	GAM
Americium 241	14596-10-2	U		0.11		U	GAM

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2307

7562-003 B173W2

DATA SHEET

SDG	7562	Client/Case no	Hanford SDG H2307
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R308042-03	Client sample id	B173W2
Dept sample id	7562-003	Location/Matrix	216-A-36B (C4160) SOLID
Received	08/08/03	Collected/Weight	08/04/03 11:25 290.8 g
% solids	97.2	Custody/SAF No	F03-006-201 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	21.0	0.53	0.27	400		H
Carbon 14	14762-75-5	0.184	1.6	2.8	50	U	C
Nickel 63	13981-37-8	-2.05	1.3	2.4	30	U	NI_L
Total Strontium	SR-RAD	-0.085	0.14	0.32	1.0	U	SR
Technetium 99	14133-76-7	0.210	0.17	0.52	15	U	TC
Thorium 228	14274-82-9	0.822	0.34	0.25			TH
Thorium 230	14269-63-7	0.362	0.26	0.25	1.0		TH
Thorium 232	TH-232	0.953	0.34	0.25	1.0		TH
Total Uranium (ug/g)	7440-61-1	0.505	0.060	0.007	1.0		U_T
Uranium 233/234	U-233/234	0.846	0.30	0.22	1.0		U
Uranium 235	15117-96-1	0.034	0.068	0.26	1.0	U	U
Uranium 238	U-238	0.705	0.29	0.22	1.0		U
Neptunium 237	13994-20-2	0	0.077	0.12	1.0	U	NP
Plutonium 238	13981-16-3	-0.027	0.054	0.21	1.0	U	PU
Plutonium 239/240	PU-239/240	0.027	0.054	0.21	1.0	U	PU
Americium 241	14596-10-2	0	0.040	0.15	1.0	U	AM
Iodine 129	15046-84-1	0.069	0.39	0.88	2.0	U	I
Potassium 40	13966-00-2	18.2	1.4	0.72			GAM
Cobalt 60	10198-40-0	U		0.088	0.050	U	GAM
Tin 126	15832-50-5	U		0.30		U	GAM
Cesium 134	13967-70-9	U		0.093		U	GAM
Cesium 137	10045-97-3	0.132	0.056	0.074	0.10		GAM
Radium 226	13982-63-3	0.636	0.15	0.16			GAM
Radium 228	15262-20-1	1.13	0.35	0.36			GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.25	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Thorium 228	14274-82-9	0.903	0.083	0.076			GAM

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/19/03

SDG	7562	Client/Case no	Hanford SDG H2307
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R308042-03	Client sample id	B173W2
Dept sample id	7562-003	Location/Matrix	216-A-36B (C4160) SOLID
Received	08/08/03	Collected/Weight	08/04/03 11:25 290.8 g
% solids	97.2	Custody/SAF No	F03-006-201 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Thorium 232	TH-232	1.13	0.35	0.36			GAM
Uranium 235	15117-96-1	U		0.23		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.18		U	GAM

200-PW-2/200-PW-4 OU-Borehole Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test AM Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Americium 241	
Preparation batch 7071-203						
R308042-01			7562-001	B173W0	0.194	
R308042-02			7562-002	B173W1	U	
R308042-03			7562-003	B173W2	U	
R308042-04			7562-004	LCS (QC ID=45506)	ok	
R308042-05			7562-005	BLK (QC ID=45507)	U	
R308042-06			7562-006	Duplicate (R308042-01)	ok	U
Nominal values and limits from method 200-PW-2/200-PW-4 OU-Borehole Soil				RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 5.0 %	Reference Lab Notebook 7071 pg. 203												
R308042-01			B173W0	0.19	0.500			80		154			29	08/29/03	08/29	SS-063
R308042-02			B173W1	0.20	0.500			66		154			29	08/29/03	08/29	SS-064
R308042-03			B173W2	0.15	0.500			86		154			25	08/29/03	08/29	SS-065
R308042-04			LCS (QC ID=45506)	0.19	0.500			70		154				08/29/03	08/29	SS-066
R308042-05			BLK (QC ID=45507)	0.20	0.500			66		151				08/29/03	08/29	SS-051
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.16	0.500			79		151			29	08/29/03	08/29	SS-052
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-061	Determinatioin of Moisture Content in Solid Samples, rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 6 SAMPLES			
	MDA	0.18	± 0.043
	YIELD	74	± 17

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test NP Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Neptunium 237
Preparation batch 7071-203					
R308042-01			7562-001	B173W0	U
R308042-02			7562-002	B173W1	U
R308042-03			7562-003	B173W2	U
R308042-04			7562-004	LCS (QC ID=45506)	ok
R308042-05			7562-005	BLK (QC ID=45507)	U
R308042-06			7562-006	Duplicate (R308042-01)	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200-PW-2/200-PW-4 OU-Borehole Soil					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 5.0 %	Reference Lab Notebook 7071 pg. 203												
R308042-01			B173W0	0.13	0.500			57		112			29	08/28/03	08/29	SS-035
R308042-02			B173W1	0.14	0.500			54		113			29	08/28/03	08/29	SS-036
R308042-03			B173W2	0.12	0.500			61		113			25	08/28/03	08/29	SS-041
R308042-04			LCS (QC ID=45506)	0.18	0.500			39		114				08/28/03	08/29	SS-042
R308042-05			BLK (QC ID=45507)	0.15	0.500			44		113				08/28/03	08/29	SS-055
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.15	0.500			48		113			29	08/28/03	08/29	SS-056
Nominal values and limits from method				1.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	
	NP237_LLE_PLATE_AEA	
	CP-061	Determinatioin of Moisture Content in Solid Samples, rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-930	Neptunium from Solids and Water by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 6 SAMPLES		
	MDA	0.14 ± 0.041
	YIELD	50 ± 17

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test PU Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238		Plutonium 239/240
Preparation batch 7071-203							
R308042-01			7562-001	B173W0	U		0.368
R308042-02			7562-002	B173W1	U		0.414
R308042-03			7562-003	B173W2	U		U
R308042-04			7562-004	LCS (QC ID=45506)	ok		ok
R308042-05			7562-005	BLK (QC ID=45507)	U		U
R308042-06			7562-006	Duplicate (R308042-01)	-	U	ok
Nominal values and limits from method 200-PW-2/200-PW-4 OU-Borehole Soil				RDLs (pCi/g)	1.0		1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 5.0 %		Reference Lab Notebook 7071 pg. 203											
R308042-01			B173W0	0.19	0.500			61		247			34	09/02/03	09/03	SS-041
R308042-02			B173W1	0.20	0.500			72		150			33	09/02/03	09/02	SS-036
R308042-03			B173W2	0.21	0.500			74		129			31	09/02/03	09/04	SS-064
R308042-04			LCS (QC ID=45506)	0.24	0.500			57		149				09/02/03	09/02	SS-042
R308042-05			BLK (QC ID=45507)	0.31	0.500			44		149				09/02/03	09/02	SS-059
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.19	0.500			70		149			33	09/02/03	09/02	SS-060
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-061	Determinatioin of Moisture Content in Solid Samples, rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.22 ± 0.093
YIELD 63 ± 23

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test TH Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Thorium 230
Preparation batch 7071-203					
R308042-01			7562-001	B173W0	0.418
R308042-02			7562-002	B173W1	0.520
R308042-03			7562-003	B173W2	0.362
R308042-04			7562-004	LCS (QC ID=45506)	ok
R308042-05			7562-005	BLK (QC ID=45507)	U
R308042-06			7562-006	Duplicate (R308042-01)	ok
Nominal values and limits from method 200-PW-2/200-PW-4 OU-Borehole Soil				RDLs (pCi/g)	1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 5.0 %				Reference Lab Notebook 7071 pg. 203									
R308042-01			B173W0	0.25	0.250			91		180			29	08/29/03	08/29	SS-056
R308042-02			B173W1	0.25	0.250			92		180			29	08/29/03	08/29	SS-057
R308042-03			B173W2	0.25	0.250			91		181			25	08/29/03	08/29	SS-058
R308042-04			LCS (QC ID=45506)	0.25	0.250			90		180				08/29/03	08/29	SS-059
R308042-05			BLK (QC ID=45507)	0.27	0.250			82		181				08/29/03	08/29	SS-060
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.25	0.250			87		181			29	08/29/03	08/29	SS-061
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-061	Determinatioin of Moisture Content in Solid Samples, rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.25 ± 0.016
YIELD 89 ± 8

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test U Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7071-203											
R308042-01			7562-001	B173W0	3.87	U	1.56	248	88	6	9
R308042-02			7562-002	B173W1	2.31	U	1.02	226	92	10	13
R308042-03			7562-003	B173W2	0.846	U	0.705	120	65	5	10
R308042-04			7562-004	LCS (QC ID=45506)	ok	ok	ok				
R308042-05			7562-005	BLK (QC ID=45507)	U	U	U				
R308042-06			7562-006	Duplicate (R308042-01)	ok	- U	ok	215	68	7	7
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200-PW-2/200-PW-4 OU-Borehole Soil								Averages 202		7	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 5.0 %	Reference Lab Notebook 7071 pg. 203												
R308042-01			B173W0	0.25	0.500			91		113			28	08/28/03	08/28	SS-057
R308042-02			B173W1	0.25	0.500			90		113			28	08/28/03	08/28	SS-058
R308042-03			B173W2	0.26	0.500			84		112			24	08/28/03	08/28	SS-059
R308042-04			LCS (QC ID=45506)	0.93	0.500			91		113				08/28/03	08/28	SS-060
R308042-05			BLK (QC ID=45507)	0.30	0.500			72		113				08/28/03	08/28	SS-061
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.24	0.500			89		113			28	08/28/03	08/28	SS-062
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-061	Determinatioin of Moisture Content in Solid Samples, rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 6 SAMPLES				
	MDA	0.37	±	0.55
	YIELD	86	±	15

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test SR Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7071-203					
R308042-01			7562-001	B173W0	102
R308042-02			7562-002	B173W1	87.4
R308042-03			7562-003	B173W2	U
R308042-04			7562-004	LCS (QC ID=45506)	ok
R308042-05			7562-005	BLK (QC ID=45507)	U
R308042-06			7562-006	Duplicate (R308042-01)	ok
Nominal values and limits from method 200-PW-2/200-PW-4 OU-Borehole Soil				RDLs (pCi/g)	1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	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 7071-203 2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 203																
R308042-01			B173W0	0.38	1.00			90	100				35	09/04/03	09/04	GRB-217
R308042-02			B173W1	0.37	1.00			92	100				35	09/04/03	09/04	GRB-218
R308042-03			B173W2	0.32	1.00			89	100				31	09/04/03	09/04	GRB-217
R308042-04			LCS (QC ID=45506)	0.32	1.00			87	100					09/04/03	09/04	GRB-218
R308042-05			BLK (QC ID=45507)	0.36	1.00			81	100					09/04/03	09/04	GRB-219
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.38	1.00			93	100				35	09/04/03	09/04	GRB-232
Nominal values and limits from method				1.0	1.00			30-105	100				180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-381	Strontium in Solids, rev 1

AVERAGES ± 2 SD FOR 6 SAMPLES			
	MDA	0.36	± 0.056
	YIELD	89	± 9

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test TC Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Technetium 99	
Preparation batch 7071-203						
R308042-01			7562-001	B173W0	U	
R308042-02			7562-002	B173W1	U	
R308042-03			7562-003	B173W2	U	
R308042-04			7562-004	LCS (QC ID=45506)	ok	
R308042-05			7562-005	BLK (QC ID=45507)	U	
R308042-06			7562-006	Duplicate (R308042-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
200-PW-2/200-PW-4 OU-Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 203													
R308042-01			B173W0	0.56	1.03			90		50			43	09/09/03	09/12	GRB-217
R308042-02			B173W1	0.57	1.05			85		50			43	09/09/03	09/12	GRB-218
R308042-03			B173W2	0.52	1.04			93		50			39	09/09/03	09/12	GRB-220
R308042-04			LCS (QC ID=45506)	0.53	1.00			99		50				09/09/03	09/12	GRB-221
R308042-05			BLK (QC ID=45507)	0.56	1.00			91		50				09/09/03	09/16	GRB-220
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.58	1.03			88		50			47	09/09/03	09/16	GRB-230
Nominal values and limits from method				15	1.00			20-105		50			180			

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

LAB METHOD SUMMARY, cont.

TECHNETIUM 99 IN SOIL

BETA COUNTING

Test TC Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2307

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 2
	CP-002	Q.C. Preparation, rev 4
	CP-003	Addition of Carriers and Tracers, rev 5
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD	MDA	0.55	± 0.047
FOR 6 SAMPLES	YIELD	91	± 10

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test GAM Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 7071-203						
R308042-01			7562-001	B173W0	0.280	2.56
R308042-02			7562-002	B173W1	0.246	2.55
R308042-03			7562-003	B173W2	U	0.132
R308042-04			7562-004	LCS (QC ID=45506)	ok	ok
R308042-05			7562-005	BLK (QC ID=45507)	U	U
R308042-06			7562-006	Duplicate (R308042-01)	ok	ok
Nominal values and limits from method 200-PW-2/200-PW-4 OU-Borehole Soil				RDLs (pCi/g)	0.050	0.10

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	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 7071-203 2σ prep error 15.0 % Reference Lab Notebook 7071 pg. 203																
R308042-01			B173W0	0.82	82.4					401			33	08/27/03	09/02	PD,03,00
R308042-02			B173W1	0.64	89.5					401			33	08/27/03	09/02	PD,07,00
R308042-03			B173W2	0.55	97.8					429			29	08/27/03	09/02	PD,03,00
R308042-04			LCS (QC ID=45506)	0.10	82.4					428				08/27/03	09/02	PD,07,00
R308042-05			BLK (QC ID=45507)	0.25	82.4					410				08/27/03	09/10	PD,04,00
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.71	82.4					659			42	08/27/03	09/11	PD,03,00
Nominal values and limits from method				0.050	82.4					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-061	Determinatioin of Moisture Content in Solid Samples, rev 1
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD FOR 6 SAMPLES				
	MDA	0.51	±	0.56
	YIELD		±	

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test I Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

IODINE 129 IN SOIL
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129	
Preparation batch 7071-203						
R308042-01			7562-001	B173W0	U	
R308042-02			7562-002	B173W1	U	
R308042-03			7562-003	B173W2	U	
R308042-04			7562-004	LCS (QC ID=45506)	ok	
R308042-05			7562-005	BLK (QC ID=45507)	U	
R308042-06			7562-006	Duplicate (R308042-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	2.0	
200-PW-2/200-PW-4 OU-Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 203												
R308042-01			B173W0	0.95	1.00			62		1187			40	09/09/03	09/09	XSPEC-004
R308042-02			B173W1	0.82	1.00			64		1450			41	09/09/03	09/10	XSPEC-004
R308042-03			B173W2	0.88	1.00			64		1032			38	09/09/03	09/11	XSPEC-004
R308042-04			LCS (QC ID=45506)	1.9	1.00			93		603				09/09/03	09/12	XSPEC-004
R308042-05			BLK (QC ID=45507)	0.82	1.00			94		632				09/09/03	09/15	XSPEC-004
R308042-06			Duplicate (R308042-01) (QC ID=45508)	1.0	1.00			63		1336			47	09/09/03	09/16	XSPEC-004
Nominal values and limits from method				2.0	1.00			20-105		300			180			

PROCEDURES REFERENCE I129_SEP_LEPS_GS
CP-024 Iodine-129, Sample Dissolution, rev 3
CP-530 Iodine-129 Purification, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 1.1 ± 0.83
YIELD 73 ± 31

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test U T Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY (KPA)

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Uranium
Preparation batch 7071-203					
R308042-01			7562-001	B173W0	2.52
R308042-02			7562-002	B173W1	1.49
R308042-03			7562-003	B173W2	0.505
R308042-04			7562-004	LCS (QC ID=45506)	ok
R308042-05			7562-005	BLK (QC ID=45507)	U
R308042-06			7562-006	Duplicate (R308042-01)	ok
Nominal values and limits from method 200-PW-2/200-PW-4 OU-Borehole Soil				RDLs (ug/g)	1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-203			2σ prep error 9.0 %				Reference Lab Notebook 7071 pg. 203									
R308042-01			B173W0	0.007	0.100								27	08/27/03	08/27	KPA-001
R308042-02			B173W1	0.007	0.100								27	08/27/03	08/27	KPA-001
R308042-03			B173W2	0.007	0.100								23	08/27/03	08/27	KPA-001
R308042-04			LCS (QC ID=45506)	0.072	0.100									08/27/03	08/27	KPA-001
R308042-05			BLK (QC ID=45507)	0.007	0.100									08/27/03	08/27	KPA-001
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.007	0.100								27	08/27/03	08/27	KPA-001
Nominal values and limits from method				1.0	0.100								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD FOR 6 SAMPLES		
	MDA	0.018 ± 0.053
	YIELD	±

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test C Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14	
Preparation batch 7071-203						
R308042-01			7562-001	B173W0	U	
R308042-02			7562-002	B173W1	U	
R308042-03			7562-003	B173W2	U	
R308042-04			7562-004	LCS (QC ID=45506)	ok	
R308042-05			7562-005	BLK (QC ID=45507)	U	
R308042-06			7562-006	Duplicate (R308042-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	50	
200-PW-2/200-PW-4 OU-Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 203												
R308042-01			B173W0	2.7	0.354			100		100			34	09/02/03	09/03	LSC-004
R308042-02			B173W1	2.8	0.342			100		100			34	09/02/03	09/03	LSC-004
R308042-03			B173W2	2.8	0.354			100		100			30	09/02/03	09/03	LSC-004
R308042-04			LCS (QC ID=45506)	8.9	0.342			100		10				09/02/03	09/03	LSC-004
R308042-05			BLK (QC ID=45507)	2.9	0.342			100		100				09/02/03	09/02	LSC-004
R308042-06			Duplicate (R308042-01) (QC ID=45508)	2.5	0.392			100		100			34	09/02/03	09/03	LSC-004
Nominal values and limits from method				50	0.342					50			180			

PROCEDURES REFERENCE C14_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 5

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 3.8 ± 5.0
YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test H Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7071-203						
R308042-01			7562-001	B173W0	10.0	
R308042-02			7562-002	B173W1	12.4	
R308042-03			7562-003	B173W2	21.0	
R308042-04			7562-004	LCS (QC ID=45506)	ok	
R308042-05			7562-005	BLK (QC ID=45507)	U	
R308042-06			7562-006	Duplicate (R308042-01)	ok	
R308042-07			7562-007	Spike (R308042-01)	ok	X
Nominal values and limits from method				RDLs (pCi/g)	400	
200-PW-2/200-PW-4 OU-Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 203												
R308042-01			B173W0	0.24	20.8			35		120			37	09/05/03	09/06	LSC-005
R308042-02			B173W1	0.25	21.0			34		120			37	09/05/03	09/06	LSC-005
R308042-03			B173W2	0.27	20.6			33		120			33	09/05/03	09/06	LSC-005
R308042-04			LCS (QC ID=45506)	0.27	20.0			33		120				09/05/03	09/06	LSC-005
R308042-05			BLK (QC ID=45507)	0.27	20.0			33		120				09/05/03	09/06	LSC-005
R308042-06			Duplicate (R308042-01) (QC ID=45508)	0.26	20.7			34		120			38	09/05/03	09/07	LSC-005
R308042-07			Spike (R308042-01) (QC ID=45509)	0.25	20.5			34		120			38	09/05/03	09/07	LSC-005
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES REFERENCE 906.0_H3_LSC
CP-218 Tritium in Soil Samples by Azeotropic Distillation, rev 1

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.26 ± 0.024
YIELD 34 ± 2

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/19/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2307

Test NI_L Matrix SOLID
SDG 7562
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2307

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63	
Preparation batch 7071-203						
R308042-01			7562-001	B173W0	U	
R308042-02			7562-002	B173W1	U	
R308042-03			7562-003	B173W2	U	
R308042-04			7562-004	LCS (QC ID=45506)	ok	
R308042-05			7562-005	BLK (QC ID=45507)	U	
R308042-06			7562-006	Duplicate (R308042-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	30	
200-PW-2/200-PW-4 OU-Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	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 7071-203			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 203												
R308042-01			B173W0	2.2	0.500			91	100				34	09/03/03	09/03	LSC-004
R308042-02			B173W1	2.4	0.500			87	100				34	09/03/03	09/03	LSC-004
R308042-03			B173W2	2.4	0.500			89	100				31	09/03/03	09/04	LSC-004
R308042-04			LCS (QC ID=45506)	2.7	0.500			96	66					09/03/03	09/04	LSC-004
R308042-05			BLK (QC ID=45507)	2.2	0.500			96	100					09/03/03	09/04	LSC-004
R308042-06			Duplicate (R308042-01) (QC ID=45508)	2.5	0.500			85	100				35	09/03/03	09/04	LSC-004
Nominal values and limits from method				30	0.500			30-105	50				180			

PROCEDURES	REFERENCE	
	NI63_LSC	
	CP-061	Determinatioin of Moisture Content in Solid Samples, rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-280	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES			
	MDA	2.4	± 0.38
	YIELD	91	± 9

Lab id EBRLNE
Protocol Hanford
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Form DVD-LMS
Version 3.06
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SDG 7562
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2307

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 7562
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2307

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 7562
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2307

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 No. 630
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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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GUIDE, cont.

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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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GUIDE, cont.

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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.

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Protocol Hanford
Version Ver 1.0
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SDG 7562
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2307

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.

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SDG 7562
Contact Melissa C. Mannion

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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.

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D U P L I C A T E

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.

SDG 7562
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
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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 EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/19/03

SDG 7562
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2307

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 EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/19/03

SDG 7562
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2307

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 EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/19/03

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

SDG 7562
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2307

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 EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/19/03

7562 = H2307

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-201	Page 1 of 1

Collector Pope/Pfister/Hughes/Johansen	**Company Contact** LC Hulstrom **Telephone No.** 373-3928 H2307	**Project Coordinator** TRENT, SJ	**Price Code** 8N **Data Turnaround** 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	**Sampling Location** 7-31-03 216-A-36B ~~(C3248)~~ - 53.5-56' (C4160) (7562)	**SAF No.** F03-006	**Air Quality** ☐
Ice Chest No. ERC 01-063	**Field Logbook No.** HNF-N-3361 **COA** 117504ES10	**Method of Shipment** Federal Express	
Shipped To EBERLINE SERVICES (Formerly TMA)	**Offsite Property No.** A030 Q324 TCR 8-7-03	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
RADIOACTIVE TIE TO: B173V3, B173V4, B17495

Special Handling and/or Storage
None

Preservation	Cool 4C	None	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196 No 7A 01	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Tritium - H3							

Sample No.	Matrix *	Sample Date	Sample Time									
B173W0	SOIL	7-31-03	0730		X	X	X					
B173W1	SOIL	7-31-03	0730		X	X	X					

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. PFISTER	7/31/3 1030	SITE FRIG	7/31/3 1030
SITE FRIDGE	8-4-03/ 1320	JSPOPE/	8-4-03/ 1320
JSPOPE/	8-4-03/ 1510	FRIDGE # 2 ROOM	8-4-03/1510
SITE FRIDGE #2 ROOM 2026	8/7/03 0800	MJOHANSEN (PMC)	8/7/03 0800
MJOHANSEN (PMC)	8/7/03 0900	FED EX	8/7/03 0900
FED EX			8-8-03 1000

SPECIAL INSTRUCTIONS
The lab is to achieve a detection limit of 50.0 pCi/g for C-14. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Tin-126}; Total Uranium; Americium-241; Isotopic Plutonium; Isotopic Uranium
(2) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=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)

Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-202	Page 1 of 1
Hughes/Johansen	Company Contact: LC Hulstrom	Telephone No.: 373-3928 H2307	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Designation: W-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 7-10-03 1400 216-A-36B (~~C3248~~) - 89.5-92' (C4160) (7562		SAF No.: F03-006	Air Quality ☐
Ice Chest No.: ERC 01-063	Field Logbook No.: HNF-N-3361	COA: 117504ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA)	Offsite Property No.: A030 324		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

TLTD: B17496

Special Handling and/or Storage

None

Preservation	Cool 4C	None	None	None						
Type of Container	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1						
Volume	60mL	60mL	60mL	60mL						
SAMPLE ANALYSIS	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196 NC 4-07	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Tritium - H3						
Sample No.	Matrix *	Sample Date	Sample Time							
B173W2	SOIL	8-4-03	1125		X	X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JSPodo/[illegible]	8-4-03/1510	Fridge # 2 M0-026	8-4-03/1510
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fridge #2 M0-026 8-7-03	0800	JMJohansen/JMJohansen 8-7-03	0800
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JMJohansen/JMJohansen 8-7-03	0900	Fed Ex 8-7-03	0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex		[signature] 8-8-03	100
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

The lab is to achieve a detection limit of 50.0 pCi/g for C-14. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Tin-126}; Total Uranium; Americium-241; Isotopic Plutonium; Isotopic Uranium

(2) Technetium-99; Strontium-89,90 – Total Sr; Isotopic Thorium {Thorium-232}; Carbon-14; Iodine-129; Nickel-63; Neptunium-237

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

RICHMOND, CA LABORATORY
SAMPLE RECEIPT CHECKLIST

Client: FLR Date/Time received 1000 8-8-03

CoC No. F03-006-201, 202

Container I.D. No. ERC-01-063 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.	Packing material is:	Wet [ ]	Dry [✓]	
6.	Number of samples in shipping container: 3			
7.	Number of containers per sample: 3	(Or see CoC ____)		
8.	Samples are in correct container	Yes [✓]	No [ ]	
9.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
10.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]			
11.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
12.	Samples are: Preserved [ ] Not preserved [✓] pH N/A Preservative ____			
13.	Describe any anomalies: ____			
14.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date ____			
15.	Received by [signature] Date: 8-8-03 Time: 1000			

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
B 173W0	<40						
B 173W1	↓						
B 173W2							

Ion Chamber Ser. No. ____ Calibration date ____

Alpha Meter Ser. No. ____ Calibration date ____

Beta/Gamma Meter Ser. No. 100482 Calibration date 6-24-03

LIONVILLE LABORATORY INC.

15 September 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0308L133
SDG #	H2307
SAF #	F03-006
Date Received	8-08-03
# Samples	2
Matrix	Soil
Volatiles	
Semivolatiles	
Pest/PCB	
DRO/GRO/KRO	
Herbicides	
GC Alcohol	
Metals	
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2307

DATE RECEIVED: 08/08/03 LVL LOT # :0308L133

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B173W0						
% SOLIDS	001	S	03L%S104	07/31/03	08/11/03	08/11/03
CHROMIUM VI	001	S	08LVI062	07/31/03	08/19/03	08/19/03
NITRATE NITRITE	001	S	03LN3A48	07/31/03	08/29/03	08/29/03
NITRATE NITRITE	001 REP	S	03LN3A48	07/31/03	08/29/03	08/29/03
NITRATE NITRITE	001 MS	S	03LN3A48	07/31/03	08/29/03	08/29/03
OIL & GREASE BY GRAV	001	S	03LOG037	07/31/03	08/21/03	08/25/03
OIL AND GREASE BY GR	001 REP	S	03LOG037	07/31/03	08/21/03	08/25/03
OIL AND GREASE BY GR	001 MS	S	03LOG037	07/31/03	08/21/03	08/25/03
B173W1						
% SOLIDS	002	S	03L%S104	07/31/03	08/11/03	08/11/03
% SOLIDS	002 REP	S	03L%S104	07/31/03	08/11/03	08/11/03
CHROMIUM VI	002	S	08LVI062	07/31/03	08/19/03	08/19/03
NITRATE NITRITE	002	S	03LN3A48	07/31/03	08/29/03	08/29/03
OIL & GREASE BY GRAV	002	S	03LOG037	07/31/03	08/21/03	08/25/03
B173W2						
% SOLIDS	003	S	03L%S104	08/04/03	08/11/03	08/11/03
CHROMIUM VI	003	S	08LVI062	08/04/03	08/19/03	08/19/03
CHROMIUM VI	003 REP	S	08LVI062	08/04/03	08/19/03	08/19/03
CHROMIUM VI	003 MS	S	08LVI062	08/04/03	08/19/03	08/19/03
CHROMIUM VI	003 MSD	S	08LVI062	08/04/03	08/19/03	08/19/03
NITRATE NITRITE	003	S	03LN3A48	08/04/03	08/29/03	08/29/03
OIL & GREASE BY GRAV	003	S	03LOG037	08/04/03	08/21/03	08/25/03

LAB QC:

CHROMIUM VI	MB1	S	08LVI062	N/A	08/19/03	08/19/03
CHROMIUM VI	MB1 BS	S	08LVI062	N/A	08/19/03	08/19/03
CHROMIUM VI	MB1 BSD	S	08LVI062	N/A	08/19/03	08/19/03
NITRATE NITRITE	MB1	S	03LN3A48	N/A	08/29/03	08/29/03
NITRATE NITRITE	MB1 BS	S	03LN3A48	N/A	08/29/03	08/29/03
OIL & GREASE BY GRAV	MB1	S	03LOG037	N/A	08/21/03	08/25/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2307

DATE RECEIVED: 08/08/03 LVL LOT # :0308L133

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
OIL AND GREASE BY GR	MB1 BS	S	03LOG037	N/A	08/21/03	08/25/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006 H2307
LVL#: 0308L133

W.O.#: 11343-606-001-9999-00
Date Received: 08-08-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 soil samples.

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

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

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits with the exception of 03LOG037-MB1 for Oil and Grease that was below the control limits of 80-120% at 76.2% (the associated matrix spike recovery for Oil and Grease was at 102.0%).

7. The matrix spike recoveries for Nitrate Nitrite, Oil and Grease and Chromium VI were within the 75-125% control limits.

8. The replicate analyses for Nitrate Nitrite, Oil and Grease, 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

09-08-03
Date

njp\i08- 133

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.

03

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 (mod.)	✓ 413.1 (mod.)
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: Nitrate Nitrite	**Method:**	EPA 353.2 (mod.)	
Other:	**Method**		

Lionville Laboratory Incorporated

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 09/03/03

CLIENT: TNUHANFORD F03-006 H2307 LVL LOT #: 0308L133
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B173W0	% Solids	96.4		%	0.01	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Nitrate Nitrite	256		MG/KG	31.6	200
		Oil & Grease Gravimetri	692	u	MG/KG	692	1.0
-002	B173W1	% Solids	96.5		%	0.01	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Nitrate Nitrite	287		MG/KG	10.6	50.0
		Oil & Grease Gravimetri	691	u	MG/KG	691	1.0
-003	B173W2	% Solids	97.3		%	0.01	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Nitrate Nitrite	83.5		MG/KG	1.9	10.0
		Oil & Grease Gravimetri	685	u	MG/KG	685	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/03/03

CLIENT: TNUHANPORD F03-006 H2307 LVL LOT #: 0308L133
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	08LVI062-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	03LN3A48-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	03LOG037-MB1	Oil & Grease Gravimetri	667 u	MG/KG	667	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/03/03

CLIENT: TNUHANFORD F03-006 H2307 LVL LOT #: 0308L133

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B173W0	Nitrate Nitrite	1080	256	791	104.8	200
		Oil & Grease Gravimetr	6680	692 u	6550	102.0	1.0
-003	B173W2	Soluble Chromium VI	4.5	0.22	4.1	103.1	1.0
		Insoluble Chromium VI	1100	0.41u	1080	102.4	100
BLANK10	08LVI062-MB1	Soluble Chromium VI	4.4	0.40u	4.0	109.2	1.0
		Insoluble Chromium VI	1230	0.40u	1170	105.5	100
BLANK10	03LN3A48-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.6	1.0
BLANK10	03LOG037-MB1	Oil & Grease Gravimetr	4810	667 u	6310	76.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/03/03

CLIENT: TNUHANFORD F03-006 H2307 LVL LOT #: 0308L133

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B173W0	Nitrate Nitrite	256	251	2.0	200
		Oil & Grease Gravimetri	692 u	692 u	NC	1.0
-002REP	B173W1	% Solids	96.5	96.5	0.021	1.0
-003REP	B173W2	Chromium VI	0.41u	0.41u	NC	1.0

Lionville Laboratory Use Only

0308C133

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI 10 — LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

A

Client TWC HANFORD SAF# F03-006 (SAF# F03-006)

Est. Final Proj. Sampling Date

Project # 11343-606.001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPCC Del STD TAT 30 days

Date Rec'd 8-8-03 Date Due 9-7-03

Refrigerator #

#/Type Container		
	Liquid	3
	Solid	1AG — 1
Volume	Liquid	60 — 1
	Solid	— 1
Preservatives		

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; Nitrate, Hex Chrom

Lionville Laboratory Use Only

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	IN3N2	1664GR	ICR6
001	B173WO			S	7-31-03	0730	1	✓	✓
002	1 1 1			1	1	1	1	✓	✓
003	1 1 2			1	8-4-03	1125	1	✓	✓

Special Instructions: SAF # F03-006

Run Matrix QC

DATE/REVISIONS:

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

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # Sedex

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 (NA) or N; 4) Unbroken on Sample (Y) or N

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

Cooler Temp. 5-7 °C

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

NOTES: 792944253264 Cooler SAWS002

Relinquished by	Received by	Date	Time
Fed Ex		8/8/03	0930

Relinquished by	Received by	Date	Time
"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-201	Page 1 of 1

Collector Pope/Pfister/Hughes/Johansen	**Company Contact** LC Hulstrom **Telephone No.** 373-3928	**Project Coordinator** TRENT, SJ	**Price Code** 8N **Data Turnaround** 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	**Sampling Location** 216-A-36B (~~C9348~~) - 53.5-56' (C4160)	**SAF No.** F03-006	**Air Quality** ☐
Ice Chest No. SAWS 002	**Field Logbook No.** HNF-N-3361 **COA** 117504ES10	**Method of Shipment** Federal Express	
Shipped To ~~EDERLINE SERVICES (Formerly TMA)~~ TMS 7-1-03 Becra	**Offsite Property No.** A030337	**Bill of Lading/Air Bill No.** SEE ASPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE TIE TO: B173V3, B173V4, B17495

TMS 8-7-03

Special Handling and/or Storage

Preservation	Cool 4C	None	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (1) in Special Instructions	See item (2) in Special Instructions.	Tritium - H3							

Sample No.	Matrix *	Sample Date	Sample Time									
B173W0	SOIL	7.31.03	0730	X								
B173W1	SOIL	7.31.03	0730	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Pfister	7/31/3 1030	SITE FRIG.	7/31/3 1030
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Site Fridge	8-4-03 / 1320	S.S. Mc Ag	8-4-03 / 1320
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
S.S. Mc Ag	8-4-03 / 1510	Site Fridge #2	8-4-03 / 1510
Relinquished By/Removed From	Date/Time 0800	Received By/Stored In	Date/Time 0800
Site Fridge #2 8/7/03 ~~0830~~ 0800		TMS Johansen/Hughes 8/7/03	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TMS Johansen/Hughes 8/7/03	0900	Field Ø	8/7/03 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Field Ø	8/8/03 0930		8/8/03 0930

SPECIAL INSTRUCTIONS

~~The lab is to achieve a detection limit of 30.0 pCi/g for C-14.~~ FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155);~~ Gamma Spec - Add-on (Cesium-134, Radium-226, Radium-228, Tin-126); Total Uranium; Americium-241; Isotopic Plutonium; Isotopic Uranium

(2) ~~Technetium-99; Strontium-89,90 - Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237~~

GR 7.31.03

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)

Temp 5-7

11

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-202	Page 1 of 1
Collector: Pope/Pfister/Hughes/Johansen	Company Contact: LC Hulstrom	Telephone No.: 373-3928	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 216-A-36B (~~C3248~~) - 89.5-92' (C4160)		SAF No.: F03-006	Air Quality ☐
Ice Chest No.: SAWS 002	Field Logbook No.: HNF-N-3361	COA: 117504ES10	Method of Shipment: Federal Express	
Shipped To: TMJ 7-1-03 ~~EBERLINE SERVICES (Formerly TMA)~~ Recra	Offsite Property No.: A030337		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

TieTO: B17496

Special Handling and/or Storage

Preservation	Cool 4C	None	None	None								
Type of Container	aG	aG	aG	aG								
No. of Container(s)	1	1	1	1								
Volume	60mL	60mL	60mL	60mL								
SAMPLE ANALYSIS	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (1) in Special Instructions.	See item (2) in Special Instructions. 8.4.03	Tritium - H3								

Sample No.	Matrix *	Sample Date	Sample Time										
B173W2	SOIL	8.4.03	1125	X	✓								

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: JSPope	Date/Time: 8-4-03 1510	Received By/Stored In: Fridge #2 MO-026	Date/Time: 8-4-03 1510
Relinquished By/Removed From: Fridge #2 MO-026	Date/Time: 8-7-03 0800	Received By/Stored In: TMJohansen	Date/Time: 8-7-03 0800
Relinquished By/Removed From: TMJohansen	Date/Time: 8-7-03 0900	Received By/Stored In: Fed Ex	Date/Time: 8-7-03 0900
Relinquished By/Removed From: Fed Ex	Date/Time: 8/8/03 0930	Received By/Stored In: [signature]	Date/Time: 8/8/03 0930
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 8.4.03

~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14.~~ FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Cesium-134, Radium-226, Radium-228, Tin-126); Total Uranium; Americium-241, Isotopic Plutonium, Isotopic Uranium~~

~~(2) Technetium-99, Strontium-89,90 — Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129, Nickel-63, Neptunium-237~~

8.4.03

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)

12

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNC HANFORD

Purchase Order/Project:

DATE: 8-8-05

SAF# / SOW# / Release #:

Laboratory SDG #: 0308L133

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 will be 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 (°C) and Comments:

SAWS-002 5.7°

Laboratory Sample Custodian: [signature]

Laboratory Project Manager: