



EBERLINE
SERVICES

0059985

May 30, 2003

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

Reference: P.O. #630
Eberline Services R3-04-095-7489, SDG H2163

Dear Mr. Trent:

Enclosed is the data report for one solid sample designated under SAF No. F03-006 received at Eberline Services on April 16, 2003. The sample was 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

MCM

Enclosure: Data Package



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Analytical Services
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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2163 was composed of one solid (soil) sample designated under SAF No. F03-006 with a Project Designations of: 200-PW-2/200-PW-4 OU – Borehole Soil Sampling. The sample in SDG H2163 was batched with the samples in SDG H2152 (Group R304071-7484).

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The matrix spike recovery was 91%. The matrix spike is associated with a sample in SDG H2152 (Group R304071-7484). 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

The matrix spike recovery was 97%. The matrix spike is associated with a sample in SDG H2152 (Group R304071-7484). 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.

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2163

SDG 7489
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_H2163

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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 05/30/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2163

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H2163

SDG 7489
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2163

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.

REPORT GUIDES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
 Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2163

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R304071-08	Lab Control Sample		SOLID		F03-006		
R304071-09	Method Blank		SOLID		F03-006		
R304071-12	Lab Control Sample		SOLID		F03-006		
R304071-13	Method Blank		SOLID		F03-006		
R304095-01	B16RX2	216-A-19 (C3245)	SOLID		F03-006	F03-006-008	04/09/03 09:50
R304095-02	Duplicate (R304095-01)	216-A-19 (C3245)	SOLID		F03-006		04/09/03 09:50

LAB SUMMARY

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SUMMARY DATA SECTION

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EBERLINE SERVICES/RICHMOND
 SAMPLE DELIVERY GROUP H2163

SDG 7489
 Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2163

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7484		Method Blank	SOLID						R304071-09	7484-009
		Method Blank	SOLID						R304071-13	7484-013
		Lab Control Sample	SOLID						R304071-08	7484-008
		Lab Control Sample	SOLID						R304071-12	7484-012
7489	F03-006-008	B16RX2	SOLID	98.2	181.7 g		04/16/03	7	R304095-01	7489-001
		Duplicate (R304095-01)	SOLID	98.2	181.7 g		04/16/03	7	R304095-02	7489-002

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 Protocol Hanford
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 Form DVD-QS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2163

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS
			BATCH	2σ %	CLIENT	MORE	RE BLANK	LCS DUP/ORIG MS/ORIG	
Alpha Spectroscopy									
NP	SOLID	Neptunium in Soil	7060-071	5.0	1		1	1	1/1
TH	SOLID	Thorium, Isotopic in Soil	7060-071	5.0	1		1	1	1/1
Beta Counting									
SR	SOLID	Total Strontium in Soil	7060-071	10.0	1		1	1	1/1
TC	SOLID	Technetium 99 in Soil	7060-071	10.0	1		1	1	1/1
Gamma Spectroscopy									
I	SOLID	Iodine 129 in Soil	7060-071	10.0	1		1	1	1/1
Liquid Scintillation Counting									
C	SOLID	Carbon 14 in Soil	7060-071	10.0	1		1	1	1/1
H	SOLID	Tritium in Soil	7060-071	10.0	1		1	1	1/1
NI_L	SOLID	Nickel 63 in Soil	7060-071	10.0	1		1	1	1/1

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

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EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2163

SDG 7489
Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2163

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R304071-08	Lab Control Sample	F03-006	SOLID	7484-008	C		05/22/03	05/29/03	MCM	Carbon 14 in Soil
				7484-008	H		05/19/03	05/29/03	MCM	Tritium in Soil
				7484-008	I		05/18/03	05/29/03	MCM	Iodine 129 in Soil
				7484-008	NP		05/08/03	05/29/03	MCM	Neptunium in Soil
				7484-008	SR		05/02/03	05/29/03	MCM	Total Strontium in Soil
				7484-008	TC		05/16/03	05/29/03	MCM	Technetium 99 in Soil
				7484-008	TH		05/05/03	05/29/03	MCM	Thorium, Isotopic in Soil
R304071-09	Method Blank	F03-006	SOLID	7484-009	C		05/21/03	05/29/03	MCM	Carbon 14 in Soil
				7484-009	H		05/19/03	05/29/03	MCM	Tritium in Soil
				7484-009	I		05/19/03	05/29/03	MCM	Iodine 129 in Soil
				7484-009	NP		05/08/03	05/29/03	MCM	Neptunium in Soil
				7484-009	SR		05/02/03	05/29/03	MCM	Total Strontium in Soil
				7484-009	TC		05/16/03	05/29/03	MCM	Technetium 99 in Soil
				7484-009	TH		05/05/03	05/29/03	MCM	Thorium, Isotopic in Soil
R304071-12	Lab Control Sample		SOLID	7484-012	NI_L		05/11/03	05/29/03	MCM	Nickel 63 in Soil
		F03-006								
R304071-13	Method Blank		SOLID	7484-013	NI_L		05/11/03	05/29/03	MCM	Nickel 63 in Soil
		F03-006								
R304095-01	B16RX2 04/09/03 216-A-19 (C3245) 04/16/03 F03-006-008	F03-006	SOLID	7489-001	C		05/22/03	05/30/03	MCM	Carbon 14 in Soil
				7489-001	H		05/19/03	05/30/03	MCM	Tritium in Soil
				7489-001	I		05/12/03	05/30/03	MCM	Iodine 129 in Soil
				7489-001	NI_L		05/11/03	05/30/03	MCM	Nickel 63 in Soil
				7489-001	NP		05/08/03	05/30/03	MCM	Neptunium in Soil
				7489-001	SR		05/02/03	05/30/03	MCM	Total Strontium in Soil
				7489-001	TC		05/18/03	05/30/03	MCM	Technetium 99 in Soil
7489-001	TH		05/05/03	05/30/03	MCM	Thorium, Isotopic in Soil				

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EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2163

WORK SUMMARY, cont.

SDG 7489
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2163

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R304095-02	Duplicate (R304095-01)			7489-002	C		05/22/03	05/30/03	MCM	Carbon 14 in Soil
04/09/03	216-A-19 (C3245)		SOLID	7489-002	H		05/19/03	05/30/03	MCM	Tritium in Soil
04/16/03		F03-006		7489-002	I		05/13/03	05/30/03	MCM	Iodine 129 in Soil
				7489-002	NI_L		05/11/03	05/30/03	MCM	Nickel 63 in Soil
				7489-002	NP		05/09/03	05/30/03	MCM	Neptunium in Soil
				7489-002	SR		05/02/03	05/30/03	MCM	Total Strontium in Soil
				7489-002	TC		05/17/03	05/30/03	MCM	Technetium 99 in Soil
				7489-002	TH		05/05/03	05/30/03	MCM	Thorium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
C	F03-006	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1		4
H	F03-006	Tritium in Soil	906.0_H3_LSC	1			1	1	1		4
I	F03-006	Iodine 129 in Soil	I129_SEP_LEPS_GS	1			1	1	1		4
NI_L	F03-006	Nickel 63 in Soil	NI63_LSC	1			1	1	1		4
NP	F03-006	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1		4
SR	F03-006	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1		4
TC	F03-006	Technetium 99 in Soil	TC99_TR_SEP_LSC	1			1	1	1		4
TH	F03-006	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1		4
TOTALS				8			8	8	8		32

WORK SUMMARY

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2163

7484-009

Method Blank

METHOD BLANK

SDG <u>7489</u>	Client/Case no <u>Hanford</u>	SDG <u>H2163</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304071-09</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7484-009</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-006</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.019	0.15	0.26	400	U	H
Carbon 14	14762-75-5	-1.09	2.1	3.6	50	U	C
Total Strontium	SR-RAD	0.081	0.13	0.25	1.0	U	SR
Technetium 99	14133-76-7	0.194	0.19	0.54	15	U	TC
Thorium 228	14274-82-9	0.042	0.17	0.32		U	TH
Thorium 230	14269-63-7	0.169	0.17	0.32	1.0	U	TH
Thorium 232	TH-232	0	0.085	0.32	1.0	U	TH
Neptunium 237	13994-20-2	0	0.063	0.095	1.0	U	NP
Iodine 129	15046-84-1	0.029	0.36	0.81	2.0	U	I

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

QC-BLANK #44438

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2163

7484-013

Method Blank

METHOD BLANK

SDG <u>7489</u>	Client/Case no <u>Hanford</u>	<u>SDG H2163</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304071-13</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7484-013</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-006</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Nickel 63	13981-37-8	0	1.3	2.1	30	U	NI_L

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

QC-BLANK #44519

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/30/03</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2163

7484-012

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7489</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R304071-12</u> Dept sample id <u>7484-012</u>	Client/Case no <u>Hanford</u> <u>SDG H2163</u> Contract No. <u>630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>F03-006</u>
-------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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
Nickel 63	267	5.6	2.7	30	NI_L	274	11	97	84-116	80-120

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

QC-LCS #44518

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
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EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2163

7489-002

B16RX2

DUPLICATE

SDG <u>7489</u>		Client/Case no <u>Hanford</u>	<u>SDG H2163</u>
Contact <u>Melissa C. Mannion</u>		Contract No. <u>630</u>	
DUPLICATE		ORIGINAL	
Lab sample id <u>R304095-02</u>	Lab sample id <u>R304095-01</u>	Client sample id <u>B16RX2</u>	
Dept sample id <u>7489-002</u>	Dept sample id <u>7489-001</u>	Location/Matrix <u>216-A-19 (C3245)</u>	<u>SOLID</u>
	Received <u>04/16/03</u>	Collected/Weight <u>04/09/03 09:50</u>	<u>181.7 g</u>
% solids <u>98.2</u>	% solids <u>98.2</u>	Custody/SAF No <u>F03-006-008</u>	<u>F03-006</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	TEST	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	PROT
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	LIMIT
Tritium	0.160	0.11	0.17	400	U	H	0.074	0.097	0.16	U	-		
Carbon 14	-1.14	1.7	2.9	50	U	C	-2.03	1.7	2.9	U	-		
Nickel 63	0.577	1.2	2.1	30	U	NI_L	1.34	1.3	2.1	U	-		
Total Strontium	-0.017	0.10	0.22	1.0	U	SR	-0.011	0.10	0.22	U	-		
Technetium 99	0.041	0.23	0.53	15	U	TC	0.236	0.28	0.54	U	-		
Thorium 228	0.704	0.34	0.32			TH	0.685	0.43	0.40		3	119	
Thorium 230	0.165	0.17	0.32	1.0	U	TH	0.105	0.21	0.50	U	-		
Thorium 232	0.620	0.33	0.32	1.0		TH	0.735	0.43	0.40		17	120	
Neptunium 237	0.036	<u>0.048</u>	0.036	1.0		NP	0.077	0.077	0.12	U	73	241	
Iodine 129	-0.681	0.75	1.7	2.0	U	I	-0.372	0.48	1.1	U	-		

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

QC-DUP#1 44447

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
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Form <u>DVD-DUP</u>
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Report date <u>05/30/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2163

7489-001

B16RX2

DATA SHEET

SDG <u>7489</u>	Client/Case no <u>Hanford</u>	<u>SDG H2163</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304095-01</u>	Client sample id <u>B16RX2</u>	
Dept sample id <u>7489-001</u>	Location/Matrix <u>216-A-19 (C3245)</u>	<u>SOLID</u>
Received <u>04/16/03</u>	Collected/Weight <u>04/09/03 09:50</u>	<u>181.7 g</u>
% solids <u>98.2</u>	Custody/SAF No <u>F03-006-008</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.074	0.097	0.16	400	U	H
Carbon 14	14762-75-5	<u>-2.03</u>	1.7	2.9	50	U	C
Nickel 63	13981-37-8	1.34	1.3	2.1	30	U	NI_L
Total Strontium	SR-RAD	-0.011	0.10	0.22	1.0	U	SR
Technetium 99	14133-76-7	0.236	0.28	0.54	15	U	TC
Thorium 228	14274-82-9	0.685	0.43	0.40			TH
Thorium 230	14269-63-7	0.105	0.21	0.50	1.0	U	TH
Thorium 232	TH-232	0.735	0.43	0.40	1.0		TH
Neptunium 237	13994-20-2	0.077	0.077	0.12	1.0	U	NP
Iodine 129	15046-84-1	-0.372	0.48	1.1	2.0	U	I

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

Lab id <u>EBRINE</u>
Protocol <u>Hanford</u>
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EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2163

Test NP Matrix SOLID
SDG 7489
Contact Melissa C. Mannion

LAB METHOD SUMMARY
NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2163

RESULTS

LAB	RAW	SUF-		Neptunium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	237

Preparation batch 7060-071

R304071-08	7484-008	LCS (QC ID=44437)	ok
R304071-09	7484-009	BLK (QC ID=44438)	U
R304095-01	7489-001	B16RX2	U
R304095-02	7489-002	Duplicate (R304095-01)	ok

Nominal values and limits from method RDLs (pCi/g) 1.0
200-PW-2/200-PW-4 OU - Borehole

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR

Preparation batch 7060-071 2σ prep error 5.0 % Reference Lab Notebook 7060 pg. 071

R304071-08	LCS (QC ID=44437)	0.094	0.500	79	109							05/07/03	05/08	SS-047
R304071-09	BLK (QC ID=44438)	0.095	0.500	80	109							05/07/03	05/08	SS-048
R304095-01	B16RX2	0.12	0.500	75	110						29	05/07/03	05/08	SS-050
R304095-02	Duplicate (R304095-01) (QC ID=44447)	0.036	0.500	76	345						30	05/07/03	05/09	SS-049

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

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	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	MDA	<u>0.086</u> ± <u>0.071</u>
FOR 4 SAMPLES	YIELD	<u>78</u> ± <u>5</u>

Lab id	<u>EBRLNE</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-LMS</u>
Version	<u>3.06</u>
Report date	<u>05/30/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2163

Test TH Matrix SOLID
 SDG 7489
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
 ALPHA SPECTROSCOPY

Client Hanford
 Contract No. 630
 Contract SDG H2163

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Thorium 230

Preparation batch 7060-071

R304071-08	7484-008	LCS (QC ID=44437)	ok
R304071-09	7484-009	BLK (QC ID=44438)	U
R304095-01	7489-001	B16RX2	U
R304095-02	7489-002	Duplicate (R304095-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
 200-PW-2/200-PW-4 OU - Borehole

METHOD PERFORMANCE

LAB RAW SUF- MAX MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
 SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7060-071

2σ prep error 5.0 % Reference Lab Notebook 7060 pg. 071

R304071-08	LCS (QC ID=44437)	0.34	0.250	81	152							05/05/03	05/05	SS-047
R304071-09	BLK (QC ID=44438)	0.32	0.250	86	152							05/05/03	05/05	SS-048
R304095-01	B16RX2	0.50	0.250	79	153						26	05/05/03	05/05	SS-050
R304095-02	Duplicate (R304095-01) (QC ID=44447)	0.32	0.250	83	162						26	05/05/03	05/05	SS-048

Nominal values and limits from method 1.0 0.250 20-105 150 180

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	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	MDA	<u>0.37</u> ± <u>0.17</u>
FOR 4 SAMPLES	YIELD	<u>82</u> ± <u>6</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2163

Test SR Matrix SOLID
SDG 7489
Contact Melissa C. Mannion

LAB METHOD SUMMARY
TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2163

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium
Preparation batch 7060-071				
R304071-08		7484-008	LCS (QC ID=44437)	ok
R304071-09		7484-009	BLK (QC ID=44438)	U
R304095-01		7489-001	B16RX2	U
R304095-02		7489-002	Duplicate (R304095-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
200-PW-2/200-PW-4 OU - Borehole

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7060-071			2σ prep error 10.0 %		Reference Lab Notebook 7060		pg. 071								
R304071-08		LCS (QC ID=44437)	0.30	1.00			78	100					05/02/03	05/02	GRB-230
R304071-09		BLK (QC ID=44438)	0.25	1.00			79	100					05/02/03	05/02	GRB-217
R304095-01		B16RX2	0.22	1.00			93	100				23	05/02/03	05/02	GRB-219
R304095-02		Duplicate (R304095-01)	0.22	1.00			90	100				23	05/02/03	05/02	GRB-220
			(QC ID=44447)												

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	MDA	<u>0.25</u>	±	<u>0.075</u>
FOR 4 SAMPLES	YIELD	<u>85</u>	±	<u>15</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2163

Test TC Matrix SOLID
 SDG 7489
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL
 BETA COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H2163

RESULTS

LAB	RAW	SUF-		Technetium
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT SAMPLE ID
				99
Preparation batch 7060-071				
R304071-08			7484-008	LCS (QC ID=44437) ok
R304071-09			7484-009	BLK (QC ID=44438) U
R304095-01			7489-001	B16RX2 U
R304095-02			7489-002	Duplicate (R304095-01) - U

Nominal values and limits from method RDLs (pCi/g) 15
 200-PW-2/200-PW-4 OU - Borehole

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-				
SAMPLE ID	TEST	FIX	CLIENT	SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7060-071 2σ prep error 10.0 % Reference Lab Notebook 7060 pg. 071																	
R304071-08			LCS (QC ID=44437)		0.56	1.00			96		50			05/13/03	05/16		GRB-232
R304071-09			BLK (QC ID=44438)		0.54	1.00			93		50			05/13/03	05/16		GRB-217
R304095-01			B16RX2		0.54	1.04			90		50		39	05/13/03	05/18		GRB-218
R304095-02			Duplicate (R304095-01)		0.53	1.04			90		50		38	05/13/03	05/17		GRB-203
			(QC ID=44447)														

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

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 <u>0.54</u> ± <u>0.025</u>
FOR 4 SAMPLES	YIELD <u>92</u> ± <u>6</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2163

LAB METHOD SUMMARY
IODINE 129 IN SOIL
GAMMA SPECTROSCOPY

Test 1 Matrix SOLID
SDG 7489
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2163

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129	
Preparation batch 7060-071					
R304071-08		7484-008	LCS (QC ID=44437)	ok	
R304071-09		7484-009	BLK (QC ID=44438)	U	
R304095-01		7489-001	B16RX2	U	
R304095-02		7489-002	Duplicate (R304095-01)	-	U
Nominal values and limits from method			RDLs (pCi/g)	2.0	
200-PW-2/200-PW-4 OU - Borehole					

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7060-071			2σ prep error 10.0 %		Reference Lab Notebook 7060 pg. 071										
R304071-08		LCS (QC ID=44437)	1.2	1.00			92		1249				05/12/03	05/18	XSPEC-004
R304071-09		BLK (QC ID=44438)	0.81	1.00			92		604				05/12/03	05/19	XSPEC-004
R304095-01		B16RX2	1.1	1.04			53		1365			33	05/12/03	05/12	XSPEC-004
R304095-02		Duplicate (R304095-01) (QC ID=44447)	1.7	1.04			54		610			34	05/12/03	05/13	XSPEC-004
Nominal values and limits from method			2.0	1.00			20-105		300				180		

PROCEDURES REFERENCE 1129_SEP_LEPS_GS
CP-024 Iodine-129, Sample Dissolution, rev 3
CP-530 Iodine-129 Purification, rev 0

AVERAGES ± 2 SD MDA 1.2 ± 0.74
FOR 4 SAMPLES YIELD 73 ± 44

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2163

LAB METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Test C Matrix SOLID
SDG 7489
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2163

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Carbon 14

Preparation batch 7060-071

R304071-08	7484-008	LCS (QC ID=44437)	ok
R304071-09	7484-009	BLK (QC ID=44438)	U
R304095-01	7489-001	B16RX2	U
R304095-02	7489-002	Duplicate (R304095-01)	- U

Nominal values and limits from method RDLs (pCi/g) 50
200-PW-2/200-PW-4 OU - Borehole

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-				
SAMPLE ID	TEST	FIX	CLIENT	SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR

Preparation batch 7060-071 2σ prep error 10.0 % Reference Lab Notebook 7060 pg. 071

R304071-08	LCS (QC ID=44437)	11	0.243	100	11	05/20/03	05/22	LSC-005	
R304071-09	BLK (QC ID=44438)	3.6	0.243	100	100	05/20/03	05/21	LSC-005	
R304095-01	B16RX2	2.9	0.297	100	100	43	05/20/03	05/22	LSC-005
R304095-02	Duplicate (R304095-01) (QC ID=44447)	2.9	0.290	100	100	43	05/20/03	05/22	LSC-005

Nominal values and limits from method 50 0.243 50 180

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

AVERAGES ± 2 SD MDA 5.1 ± 7.9
FOR 4 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2163

Test H Matrix SOLID
 SDG 7489
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H2163

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Tritium

Preparation batch 7060-071

R304071-08	7484-008	LCS (QC ID=44437)	ok
R304071-09	7484-009	BLK (QC ID=44438)	U
R304095-01	7489-001	B16RX2	U
R304095-02	7489-002	Duplicate (R304095-01)	- U

Nominal values and limits from method RDLs (pCi/g) 400
 200-PW-2/200-PW-4 OU - Borehole

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 7060-071 2σ prep error 10.0 % Reference Lab Notebook 7060 pg. 071

R304071-08	LCS (QC ID=44437)	0.26	20.0	33	120	05/16/03	05/19	LSC-007
R304071-09	BLK (QC ID=44438)	0.26	20.0	33	120	05/16/03	05/19	LSC-007
R304095-01	B16RX2	0.16	21.0	52	120	40	05/16/03	05/19 LSC-007
R304095-02	Duplicate (R304095-01) (QC ID=44447)	0.17	20.3	50	120	40	05/16/03	05/19 LSC-007

Nominal values and limits from method 400 20.0 25 180

PROCEDURES REFERENCE 906.0_H3_LSC
 CP-216 Tritium in Solid Samples by Azeotropic
 Distillation, rev 6

AVERAGES ± 2 SD MDA 0.21 ± 0.11
 FOR 4 SAMPLES YIELD 42 ± 21

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2163

Test NI L Matrix SOLID
 SDG 7489
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H2163

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 7060-071

R304071-12	7484-012	LCS (QC ID=44518)	ok
R304071-13	7484-013	BLK (QC ID=44519)	U
R304095-01	7489-001	B16RX2	U
R304095-02	7489-002	Duplicate (R304095-01)	- U

Nominal values and limits from method RDLs (pCi/g) 30
 200-PW-2/200-PW-4 OU - Borehole

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 7060-071 2σ prep error 10.0 % Reference Lab Notebook 7060 pg. 071

R304071-12	LCS (QC ID=44518)	2.7	0.500	100	60	05/09/03	05/11	LSC-004	
R304071-13	BLK (QC ID=44519)	2.1	0.500	100	100	05/09/03	05/11	LSC-004	
R304095-01	B16RX2	2.1	0.500	100	100	32	05/09/03	05/11	LSC-004
R304095-02	Duplicate (R304095-01) (QC ID=44447)	2.1	0.500	100	100	32	05/09/03	05/11	LSC-004

Nominal values and limits from method 30 0.500 30-105 50 180

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-281	Nickel-63 Purification By Extraction Chromatography, rev 0

AVERAGES ± 2 SD	MDA	<u>2.2</u> ± <u>0.60</u>
FOR 4 SAMPLES	YIELD	<u>100</u> ± <u>0</u>

METHOD SUMMARIES

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2163

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2163

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2163

WORK SUMMARY

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

The following notes apply to this report:

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Protocol Hanford
Version Ver 1.0
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
 Contact Melissa C. Mannion

R E P O R T G U I D E

Client Hanford
 Contract No. 630
 Case no SDG H2163

D A T A S H E E T

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).

REPORT GUIDES

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SUMMARY DATA SECTION

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 Protocol Hanford
 Version Ver 1.0
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 Version 3.06
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 630
 Case no SDG H2163

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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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 05/30/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2163

SDG 7489

Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford

Contract No. 630

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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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Form DVD-RG

Version 3.06

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SAMPLE DELIVERY GROUP H2163

SDG 7489
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REPORT GUIDE

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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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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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DUPLICATE

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

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

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

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

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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

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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.

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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METHOD SUMMARY

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

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
 - * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
 - * Preparation factors are underlined if greater than the nominal value specified for the method.
 - * Dilution factors are underlined if greater than the nominal value specified for the method.
 - * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
 - * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
 - * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

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

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

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

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

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

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

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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 05/30/03

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-008		Page 1 of 1												
Collector Johansen/Pope/Pfister		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-19 (C3245) 97.5-100 ft		506 H2163 (7489)		SAF No. F03-006		Air Quality <input type="checkbox"/>												
Ice Chest No. ERC 99-013		Field Logbook No. HNF-N-3361		COA 117504ES10		Method of Shipment Federal Express														
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030 196		Bill of Lading/Air Bill No. 79222942847																
POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive Tie To BGRY3 Special Handling and/or Storage None			Preservation	Cool 4C	Cool 4C	None	None													
			Type of Container	aG	aG	aG	aG													
			No. of Container(s)	1	1	1	1													
			Volume	125mL 120mL	120mL	60mL	60mL													
SAMPLE ANALYSIS			Chromium Hex - 7196	Oil & Grease - 413.1	See item (1) in Special Instructions.	Tritium - H3														
Sample No.	Matrix *	Sample Date	Sample Time																	
B16RX2	SOIL	4-9-03	0950			X	X													
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS						Matrix *								
Relinquished By/Removed From Johansen/Pope/Pfister 4/10/03		Date/Time		Received By/Stored In ERC		Date/Time		** The laboratory is to achieve a detection limit of 50.0 pCi/g for Carbon-14. ** The laboratory is to report both kerosene and diesel range compounds from the WTPHD analysis. (1) 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 SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Times Wl=Wipe L=Liquid V=Vegetation X=Other												
Relinquished By/Removed From K. Felle R. Fahlberg 4.9.03		Date/Time		Received By/Stored In IB 3728		Date/Time														
Relinquished By/Removed From IB 3728		Date/Time		Received By/Stored In K. Felle R. Fahlberg		Date/Time														
Relinquished By/Removed From ERC		Date/Time		Received By/Stored In FedEx		Date/Time														
Relinquished By/Removed From FedEx		Date/Time		Received By/Stored In K. Felle		Date/Time														
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time														
LABORATORY SECTION	Received By	Title				Date/Time														
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time														



ANALYTICAL SERVICES GROUP

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

Client: FLR Date/Time received 1000 4-16-03

CoC No. F03006

Container I.D. No. ERC-99-013 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: 1
- 7. Number of containers per sample: 2 (Or see CoC _____)
- 8. Paperwork agrees with samples? Yes [] No []
- 9. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
- 10. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
- 11. Samples are: Preserved [] Not preserved [] Preservative _____
- 12. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [] No [] Date _____

14. Received by [Signature] Date: 4-16-03 Time: 1000

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
<u>1316RX2</u>	<u>LSO</u>	<u>.006</u>					

Ion Chamber Ser. No. 4011 Calibration date 3-20-03

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 99574 Calibration date 12-12-02



23 May 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 #	0304L189
SDG #	H2163
SAF #	F03-006
Date Received	4-16-03
# Samples	1
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

r:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD F03-006 H2163



DATE RECEIVED: 04/16/03

LVL LOT # :0304L189

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16RX2						
% SOLIDS	001	S	03L&S054	04/09/03	04/17/03	04/21/03
% SOLIDS	001 REP	S	03L&S054	04/09/03	04/17/03	04/21/03
CHROMIUM VI	001	S	03LVI039	04/09/03	04/30/03	04/30/03
CHROMIUM VI	001 REP	S	03LVI039	04/09/03	04/30/03	04/30/03
CHROMIUM VI	001 MS	S	03LVI039	04/09/03	04/30/03	04/30/03
CHROMIUM VI	001 MSD	S	03LVI039	04/09/03	04/30/03	04/30/03
NITRATE NITRITE	001	S	03LN3A24	04/09/03	05/05/03	05/05/03
NITRATE NITRITE	001 REP	S	03LN3A24	04/09/03	05/05/03	05/05/03
NITRATE NITRITE	001 MS	S	03LN3A24	04/09/03	05/05/03	05/05/03
OIL & GREASE BY GRAV	001	S	03LOG016	04/09/03	04/30/03	05/02/03
OIL AND GREASE BY GR	001 REP	S	03LOG016	04/09/03	04/30/03	05/02/03
OIL AND GREASE BY GR	001 MS	S	03LOG016	04/09/03	04/30/03	05/02/03

LAB QC:

CHROMIUM VI	MB1	S	03LVI039	N/A	04/30/03	04/30/03
CHROMIUM VI	MB1 BS	S	03LVI039	N/A	04/30/03	04/30/03
CHROMIUM VI	MB1 BSD	S	03LVI039	N/A	04/30/03	04/30/03
NITRATE NITRITE	MB1	S	03LN3A24	N/A	05/05/03	05/05/03
NITRATE NITRITE	MB1 BS	S	03LN3A24	N/A	05/05/03	05/05/03
OIL & GREASE BY GRAV	MB1	S	03LOG016	N/A	04/30/03	05/02/03
OIL AND GREASE BY GR	MB1 BS	S	03LOG016	N/A	04/30/03	05/02/03
OIL AND GREASE BY GR	MB1 BSD	S	03LOG016	N/A	04/30/03	05/02/03



Analytical Report

Client: TNU-HANFORD F03-006 H2163
LVL#: 0304L189

W.O.#: 11343-606-001-9999-00
Date Received: 04-16-03

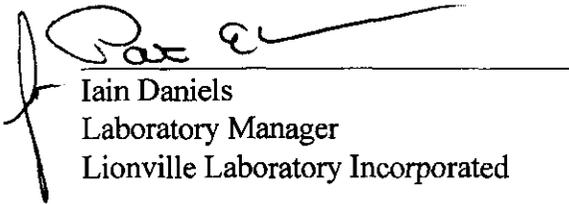
INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.
2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The 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 03LOG016-MB1 for Oil and Grease that was below the 80-120% acceptance limits, however the LCS duplicate yielded a recovery of 99.4%. The duplicate LCS for Oil and Grease was outside the 20% Relative Percent Difference (RPD) control limit.
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% RPD control limit.
9. Results for solid samples are reported on a dry weight basis.

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.

02

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

pef&njpl04-189

05-08-03
Date

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	___ D2216-80		
% Moisture	___ D2216-80		___ ILMO4.0 (e)
% Solids	✓ ___ 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/ERA 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: <i>Nitrate Nitrite</i>		Method: <i>EPA 353.2(mod.)</i>	
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 05/06/03

CLIENT: TNUHANFORD P03-006 H2163
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L189

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B16RX2	% Solids	98.1	%	0.01	1.0
		Chromium VI	0.41	u MG/KG	0.41	1.0
		Nitrate Nitrite	24.8	MG/KG	2.1	10.0
		Oil & Grease Gravimetri	679	u MG/KG	679	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/06/03

CLIENT: TNUHANFORD F03-006 H2163
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L189

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK10	03LVI039-MB1	Chromium VI	0.40	u MG/KG	0.40	1.0
BLANK10	03LN3A24-MB1	Nitrate Nitrite	0.20	u MG/KG	0.20	1.0
BLANK10	03LOG016-MB1	Oil & Grease Gravimetri	667	u MG/KG	667	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/06/03

CLIENT: TNUHANFORD P03-006 H2163
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L189

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B16RX2	Soluble Chromium VI	3.9	0.41u	4.1	95.8	1.0
		Insoluble Chromium VI	1130	0.41u	1060	106.7	100
		Nitrate Nitrite	78.0	24.8	51.6	103.2	10.0
		Oil & Grease Gravimetr	6230	679 u	6510	95.7	1.0
BLANK10	03LVI039-MB1	Soluble Chromium VI	4.1	0.40u	4.0	101.8	1.0
		Insoluble Chromium VI	1180	0.40u	1170	101.2	100
BLANK10	03LN3A24-MB1	Nitrate Nitrite	5.0	0.20u	5.0	100.6	1.0
BLANK10	03LOG016-MB1	Oil & Grease Gravimetr	4600	667 u	6390	72.0	1.0
		Oil & Grease - Grav M	6350	667 u	6390	99.4	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 05/06/03

CLIENT: TNUHANFORD F03-006 H2163
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L189

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	03LOG016-MB1	Oil & Grease - Grav	72.0	99.4	32.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/06/03

CLIENT: TNUHANFORD P03-006 H2163
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L189

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----	-----
-001REP	B16RX2	% Solids	98.1	98.1	0.041	1.0
		Chromium VI	0.41u	0.41u	NC	1.0
		Nitrate Nitrite	24.8	22.1	11.2	10.0
		Oil & Grease Gravimetri	679 u	679 u	NC	1.0

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-008		Page 1 of 1				
Collector Johansen/Pope/Pfister		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-19 (C3245) 97.5-100 ft		SAF No. F03-006		Air Quality <input type="checkbox"/>						
Ice Chest No. ERC 02-105		Field Logbook No. HNF-N-3361		COA 117504ES10		Method of Shipment Federal Express						
Shipped To EBERLINE SERVICES (Formerly TMA) RECRE		Offsite Property No. A030210		Bill of Lading/Air Bill No. 790261421173								
POSSIBLE SAMPLE HAZARDS/REMARKS Radiactive Tri-TO B16RY3 Special Handling and/or Storage cool 4C				Preservation	Cool 4C	Cool 4C	None	None				
				Type of Container	aG	aG	aG	aG				
				No. of Container(s)	1	1	1	1				
				Volume	125ml 120ml	120mL	60mL	60mL				
SAMPLE ANALYSIS				Chromium Hex - 7196	Oil & Grease - 413.1	See item (1) in Special Instructions.	Tritium - 17					
Sample No.	Matrix *	Sample Date	Sample Time									
B16RX2	SOIL	4-9-03	0950	X	X	/			B16RY3			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS		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		
Relinquished By/Removed From <i>[Signature]</i>		Date/Time 4-10-03 1210		Received By/Stored In <i>[Signature]</i>		Date/Time 4-9-03		** The laboratory is to achieve a detection limit of 50.0 pCi/g for Carbon-14. ** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis.				
Relinquished By/Removed From <i>[Signature]</i>		Date/Time 4-9-03 1210		Received By/Stored In <i>[Signature]</i>		Date/Time 4-9-03 1210		(1) Technetium-99, Strontium-89,90 - Total Sr, Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237 <i>REF 4-3-3</i>				
Relinquished By/Removed From <i>[Signature]</i>		Date/Time 4-15-03 1000		Received By/Stored In <i>[Signature]</i>		Date/Time 4-15-03						
Relinquished By/Removed From <i>[Signature]</i>		Date/Time 4-15-03 1000		Received By/Stored In <i>[Signature]</i>		Date/Time						
Relinquished By/Removed From <i>[Signature]</i>		Date/Time 4-16-03 0915		Received By/Stored In <i>[Signature]</i>		Date/Time 4-16-03 10915						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
LABORATORY SECTION	Received By	Title						Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By						Date/Time				

**LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST**

CLIENT: TNU Hartford

Purchase Order/Project:

DATE: 4.16.03

AF# / SOW# / Release #: F03-006

Laboratory SDG #:

0304L189

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

- | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------|-----------------------------------------|----------------------------------------|
| 1. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 2. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 3. Airbill # recorded? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> 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) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 5. Sample containers are intact? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 7. All samples on coc received? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 8. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 10. Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 11. Where applicable, bar code labels are affixed to coc? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 12. coc signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 13. coc will be faxed or emailed to client? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |

Cooler # / temp (°C) and Comments:

ELC-02.105 / 2.3°

Laboratory Sample Custodian:

[Signature]

Laboratory Project Manager: