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AUG 1999 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-048
RFW# : 9906L284
SDG# : H0449
SAF# l B99-048

W.O. # : 10985-001-001-9999-00
Date Received: 06-23-99

NOV 1999 RECEIVED EDMC

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 11 solid 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 cooler temperature was recorded on the chain-of-custody.
5. The method blank were within method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits.
7. The matrix spike recoveries were within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

7-27-99
Date

njp\i06-284

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 22 pages.

WET CHEMISTRY
METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	ASTM	SW846	OTHER
%Ash	__ D2216-80		
%Moisture	__ D2216-80		__ ILMO4.0 (e)
%Solids			✓ ILMO4.0 (e)
%Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Corrosivity __by coupon __by pH		__ 1110 (mod)__ 9045	
Cyanide, Total		__ 9010	__ ILMO4.0 (e)
Cyanide, Reactive		__ Sec 7.3	
Density			__ b
Halides, Extractable Organic			__ EPA 600/4/84-008 (mod)
Halides, Total			__ EPA 600/4/84-008 (mod)
EP-Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Carbon, Total Organic (by LOI)			__ c
Oil and Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87 (mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1 (mod)
pH, Soil		__ 9045B	
Sulfide, Reactive		__ Sec 7.3	
Specific Gravity	__ D1429-76C		
Sulfur, Total		__ 9056	
TCLP		__ 1311	
TCLV		__ 1311	
Synthetic Precipitation Leach		__ 1312	
Chlorine, Total		__ 9056	
Paint Filter		__ 9095	

Other: Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate Method: EPA 300.0

002

RWW 21-21-034/B-08/95

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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.

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INORGANICS DATA SUMMARY REPORT 07/14/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VLT0	% Solids	95.6		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	47.7		MG/KG	1.3	1.0
		Fluoride by IC	13.1	u	MG/KG	13.1	5.0
		Nitrite by IC	3.3		MG/KG	1.3	1.0
		Nitrate by IC	43		MG/KG	1.3	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	17.1		MG/KG	1.3	1.0
-002	B0VLT1	% Solids	96.4		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	51.3		MG/KG	1.3	1.0
		Fluoride by IC	13.0	u	MG/KG	13.0	5.0
		Nitrite by IC	3.1		MG/KG	1.3	1.0
		Nitrate by IC	42		MG/KG	1.3	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	17.2		MG/KG	1.3	1.0
-003	B0VLT2	% Solids	97.4		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	36.0		MG/KG	1.3	1.0
		Fluoride by IC	12.8	u	MG/KG	12.8	5.0
		Nitrite by IC	4.1		MG/KG	1.3	1.0
		Nitrate by IC	27		MG/KG	1.3	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	162		MG/KG	6.4	5.0
-004	B0VLV0	% Solids	100		%	0.01	1.0
		Bromide by IC	1.2	u	MG/KG	1.2	1.0
		Chloride by IC	3.4		MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.2	u	MG/KG	1.2	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	2.8		MG/KG	1.2	1.0

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INORGANICS DATA SUMMARY REPORT 07/14/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	B0VLV4	% Solids	97.2		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	15.3		MG/KG	1.3	1.0
		Fluoride by IC	12.9	u	MG/KG	12.9	5.0
		Nitrite by IC	1.8		MG/KG	1.3	1.0
		Nitrate by IC	25		MG/KG	1.3	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	50.4		MG/KG	1.3	1.0
-006	B0VLT3	% Solids	99.7		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	45.6		MG/KG	1.3	1.0
		Fluoride by IC	12.5	u	MG/KG	12.5	5.0
		Nitrite by IC	11		MG/KG	1.3	1.0
		Nitrate by IC	20		MG/KG	1.3	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	40.5		MG/KG	1.3	1.0
-007	B0VLT4	% Solids	97.7		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	8.4		MG/KG	1.3	1.0
		Fluoride by IC	12.8	u	MG/KG	12.8	5.0
		Nitrite by IC	2.6		MG/KG	1.3	1.0
		Nitrate by IC	40		MG/KG	1.3	1.0
		Phosphate by IC	2.0		MG/KG	1.3	1.0
		Sulfate by IC	93.5		MG/KG	6.4	5.0
-008	B0VLT5	% Solids	98.9		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	12.2		MG/KG	1.3	1.0
		Fluoride by IC	12.6	u	MG/KG	12.6	5.0
		Nitrite by IC	1.7		MG/KG	1.3	1.0
		Nitrate by IC	54		MG/KG	6.3	5.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	95.9		MG/KG	6.3	5.0

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INORGANICS DATA SUMMARY REPORT 07/14/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	B0VLT6	% Solids	99.9		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	25.5		MG/KG	1.3	1.0
		Fluoride by IC	12.5	u	MG/KG	12.5	5.0
		Nitrite by IC	12		MG/KG	1.3	1.0
		Nitrate by IC	180		MG/KG	6.3	5.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	249		MG/KG	6.3	5.0
-010	B0VLT7	% Solids	100		%	0.01	1.0
		Bromide by IC	1.2	u	MG/KG	1.2	1.0
		Chloride by IC	11.2		MG/KG	1.2	1.0
		Fluoride by IC	12.5	u	MG/KG	12.5	5.0
		Nitrite by IC	2.6		MG/KG	1.2	1.0
		Nitrate by IC	65		MG/KG	6.3	5.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	58.0		MG/KG	6.3	5.0
-011	B0VLT8	% Solids	98.7		%	0.01	1.0
		Bromide by IC	1.3	u	MG/KG	1.3	1.0
		Chloride by IC	86.6		MG/KG	6.3	5.0
		Fluoride by IC	12.7	u	MG/KG	12.7	5.0
		Nitrite by IC	5.3		MG/KG	1.3	1.0
		Nitrate by IC	100		MG/KG	6.3	5.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Sulfate by IC	55.7		MG/KG	6.3	5.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/14/99

CLIENT: TNU-HANFORD B99-048

RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC062-MB1	Bromide by IC	1.2	u	MG/KG	1.2	1.0
		Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.2	u	MG/KG	1.2	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LIC063-MB1	Bromide by IC	1.2	u	MG/KG	1.2	1.0
		Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.2	u	MG/KG	1.2	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0

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INORGANICS ACCURACY REPORT 07/14/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0VLT0	Bromide by IC	124	0.0	131	94.9	5.0
		Chloride by IC	199	47.7	131	115.9	5.0
		Fluoride by IC	295	0.0	261	112.7	5.0
		Nitrite by IC	140	3.3	130	101.7	5.0
		Nitrate by IC	170	43	130	98.0	5.0
		Phosphate by IC	121	1.3 u	131	92.9	5.0
		Sulfate by IC	143	17.1	131	96.5	5.0
BLANK10	99LIC062-MB1	Bromide by IC	23.9	1.2 u	25.0	95.7	1.0
		Chloride by IC	24.6	1.2 u	25.0	98.3	1.0
		Fluoride by IC	52.4	2.5 u	50.0	104.9	1.0
		Nitrite by IC	24	1.2 u	25	97.5	1.0
		Nitrate by IC	24	1.2 u	25	96.3	1.0
		Phosphate by IC	25.0	1.2 u	25.0	100.1	1.0
		Sulfate by IC	23.5	1.2 u	25.0	94.0	1.0
BLANK10	99LIC063-MB1	Bromide by IC	23.9	1.2 u	25.0	95.7	1.0
		Chloride by IC	24.3	1.2 u	25.0	97.2	1.0
		Fluoride by IC	50.9	2.5 u	50.0	101.8	1.0
		Nitrite by IC	25	1.2 u	25	100.6	1.0
		Nitrate by IC	24	1.2 u	25	97.3	1.0
		Phosphate by IC	25.0	1.2 u	25.0	100.1	1.0
		Sulfate by IC	24.0	1.2 u	25.0	96.0	1.0

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INORGANICS PRECISION REPORT 07/14/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0VLT0	Bromide by IC	1.3 u	1.3 u	NC	1.0
		Chloride by IC	47.7	49.2	3.1	1.0
		Fluoride by IC	13.1 u	13.1 u	NC	5.0
		Nitrite by IC	3.3	3.1	5.7	1.0
		Nitrate by IC	43	49	12.9	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Sulfate by IC	17.1	15.8	7.6	1.0
-005REP	B0VLV4	% Solids	97.2	97.6	0.38	1.0

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VLT0						
% SOLIDS	001	SO	99L%S091	06/09/99	06/28/99	06/29/99
BROMIDE BY IC	001	SO	99LIC062	06/09/99	07/07/99	07/07/99
BROMIDE BY IC	001 REP	SO	99LIC062	06/09/99	07/07/99	07/07/99
BROMIDE BY IC	001 MS	SO	99LIC063	06/09/99	07/07/99	07/08/99
CHLORIDE BY IC	001	SO	99LIC062	06/09/99	07/07/99	07/07/99
CHLORIDE BY IC	001 REP	SO	99LIC062	06/09/99	07/07/99	07/07/99
CHLORIDE BY IC	001 MS	SO	99LIC063	06/09/99	07/07/99	07/08/99
FLUORIDE BY IC	001	SO	99LIC063	06/09/99	07/07/99	07/08/99
FLUORIDE BY IC	001 REP	SO	99LIC063	06/09/99	07/07/99	07/08/99
FLUORIDE BY IC	001 MS	SO	99LIC063	06/09/99	07/07/99	07/08/99
NITRITE BY IC	001	SO	99LIC062	06/09/99	07/07/99	07/07/99
NITRITE BY IC	001 REP	SO	99LIC062	06/09/99	07/07/99	07/07/99
NITRITE BY IC	001 MS	SO	99LIC063	06/09/99	07/07/99	07/08/99
NITRATE BY IC	001	SO	99LIC062	06/09/99	07/07/99	07/07/99
NITRATE BY IC	001 REP	SO	99LIC062	06/09/99	07/07/99	07/07/99
NITRATE BY IC	001 MS	SO	99LIC063	06/09/99	07/07/99	07/08/99
PHOSPHATE BY IC	001	SO	99LIC062	06/09/99	07/07/99	07/07/99
PHOSPHATE BY IC	001 REP	SO	99LIC062	06/09/99	07/07/99	07/07/99
PHOSPHATE BY IC	001 MS	SO	99LIC063	06/09/99	07/07/99	07/08/99
SULFATE BY IC	001	SO	99LIC062	06/09/99	07/07/99	07/07/99
SULFATE BY IC	001 REP	SO	99LIC062	06/09/99	07/07/99	07/07/99
SULFATE BY IC	001 MS	SO	99LIC063	06/09/99	07/07/99	07/08/99
TCLP	001	SO	99LTO083	06/09/99	06/29/99	06/30/99
B0VLT1						
% SOLIDS	002	SO	99L%S091	06/09/99	06/28/99	06/29/99
BROMIDE BY IC	002	SO	99LIC062	06/09/99	07/07/99	07/07/99
CHLORIDE BY IC	002	SO	99LIC062	06/09/99	07/07/99	07/07/99
FLUORIDE BY IC	002	SO	99LIC063	06/09/99	07/07/99	07/08/99
NITRITE BY IC	002	SO	99LIC062	06/09/99	07/07/99	07/07/99
NITRATE BY IC	002	SO	99LIC062	06/09/99	07/07/99	07/07/99
PHOSPHATE BY IC	002	SO	99LIC062	06/09/99	07/07/99	07/07/99
SULFATE BY IC	002	SO	99LIC062	06/09/99	07/07/99	07/07/99
TCLP	002	SO	99LTO083	06/09/99	06/29/99	06/30/99

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VLT2						
% SOLIDS	003	SO	99L%S091	06/10/99	06/28/99	06/29/99
BROMIDE BY IC	003	SO	99LIC062	06/10/99	07/07/99	07/07/99
CHLORIDE BY IC	003	SO	99LIC062	06/10/99	07/07/99	07/07/99
FLUORIDE BY IC	003	SO	99LIC063	06/10/99	07/07/99	07/08/99
NITRITE BY IC	003	SO	99LIC062	06/10/99	07/07/99	07/07/99
NITRATE BY IC	003	SO	99LIC062	06/10/99	07/07/99	07/07/99
PHOSPHATE BY IC	003	SO	99LIC062	06/10/99	07/07/99	07/07/99
SULFATE BY IC	003	SO	99LIC063	06/10/99	07/07/99	07/08/99
TCLP	003	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLV0						
% SOLIDS	004	SO	99L%S091	06/10/99	06/28/99	06/29/99
BROMIDE BY IC	004	SO	99LIC062	06/10/99	07/07/99	07/07/99
CHLORIDE BY IC	004	SO	99LIC062	06/10/99	07/07/99	07/07/99
FLUORIDE BY IC	004	SO	99LIC062	06/10/99	07/07/99	07/07/99
NITRITE BY IC	004	SO	99LIC062	06/10/99	07/07/99	07/07/99
NITRATE BY IC	004	SO	99LIC062	06/10/99	07/07/99	07/07/99
PHOSPHATE BY IC	004	SO	99LIC062	06/10/99	07/07/99	07/07/99
SULFATE BY IC	004	SO	99LIC062	06/10/99	07/07/99	07/07/99
TCLP	004	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLV4						
% SOLIDS	005	SO	99L%S091	06/10/99	06/28/99	06/29/99
% SOLIDS	005 REP	SO	99L%S091	06/10/99	06/28/99	06/29/99
BROMIDE BY IC	005	SO	99LIC062	06/10/99	07/07/99	07/07/99
CHLORIDE BY IC	005	SO	99LIC062	06/10/99	07/07/99	07/07/99
FLUORIDE BY IC	005	SO	99LIC063	06/10/99	07/07/99	07/08/99
NITRITE BY IC	005	SO	99LIC062	06/10/99	07/07/99	07/07/99
NITRATE BY IC	005	SO	99LIC062	06/10/99	07/07/99	07/07/99
PHOSPHATE BY IC	005	SO	99LIC062	06/10/99	07/07/99	07/07/99
SULFATE BY IC	005	SO	99LIC062	06/10/99	07/07/99	07/07/99
TCLP	005	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT3						
% SOLIDS	006	SO	99L%S091	06/10/99	06/28/99	06/29/99

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BROMIDE BY IC	006	SO	99LIC062	06/10/99	07/07/99	07/07/99
CHLORIDE BY IC	006	SO	99LIC062	06/10/99	07/07/99	07/07/99
FLUORIDE BY IC	006	SO	99LIC063	06/10/99	07/07/99	07/08/99
NITRITE BY IC	006	SO	99LIC062	06/10/99	07/07/99	07/07/99
NITRATE BY IC	006	SO	99LIC062	06/10/99	07/07/99	07/07/99
PHOSPHATE BY IC	006	SO	99LIC062	06/10/99	07/07/99	07/07/99
SULFATE BY IC	006	SO	99LIC062	06/10/99	07/07/99	07/07/99
TCLP	006	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT4						
% SOLIDS	007	SO	99L%S091	06/10/99	06/28/99	06/29/99
BROMIDE BY IC	007	SO	99LIC062	06/10/99	07/07/99	07/07/99
CHLORIDE BY IC	007	SO	99LIC062	06/10/99	07/07/99	07/07/99
FLUORIDE BY IC	007	SO	99LIC063	06/10/99	07/07/99	07/08/99
NITRITE BY IC	007	SO	99LIC062	06/10/99	07/07/99	07/07/99
NITRATE BY IC	007	SO	99LIC062	06/10/99	07/07/99	07/07/99
PHOSPHATE BY IC	007	SO	99LIC062	06/10/99	07/07/99	07/07/99
SULFATE BY IC	007	SO	99LIC063	06/10/99	07/07/99	07/08/99
TCLP	007	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT5						
% SOLIDS	008	SO	99L%S091	06/10/99	06/28/99	06/29/99
BROMIDE BY IC	008	SO	99LIC062	06/10/99	07/07/99	07/07/99
CHLORIDE BY IC	008	SO	99LIC062	06/10/99	07/07/99	07/07/99
FLUORIDE BY IC	008	SO	99LIC063	06/10/99	07/07/99	07/08/99
NITRITE BY IC	008	SO	99LIC062	06/10/99	07/07/99	07/07/99
NITRATE BY IC	008	SO	99LIC063	06/10/99	07/07/99	07/08/99
PHOSPHATE BY IC	008	SO	99LIC062	06/10/99	07/07/99	07/07/99
SULFATE BY IC	008	SO	99LIC063	06/10/99	07/07/99	07/08/99
TCLP	008	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT6						
% SOLIDS	009	SO	99L%S091	06/14/99	06/28/99	06/29/99
BROMIDE BY IC	009	SO	99LIC062	06/14/99	07/07/99	07/07/99
CHLORIDE BY IC	009	SO	99LIC062	06/14/99	07/07/99	07/07/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
FLUORIDE BY IC	009	SO	99LIC063	06/14/99	07/07/99	07/08/99
NITRITE BY IC	009	SO	99LIC062	06/14/99	07/07/99	07/07/99
NITRATE BY IC	009	SO	99LIC063	06/14/99	07/07/99	07/08/99
PHOSPHATE BY IC	009	SO	99LIC062	06/14/99	07/07/99	07/07/99
SULFATE BY IC	009	SO	99LIC063	06/14/99	07/07/99	07/08/99
TCLP	009	SO	99LTO083	06/14/99	06/29/99	06/30/99
B0VLT7						
% SOLIDS	010	SO	99L%S091	06/14/99	06/28/99	06/29/99
BROMIDE BY IC	010	SO	99LIC062	06/14/99	07/07/99	07/07/99
CHLORIDE BY IC	010	SO	99LIC062	06/14/99	07/07/99	07/07/99
FLUORIDE BY IC	010	SO	99LIC063	06/14/99	07/07/99	07/08/99
NITRITE BY IC	010	SO	99LIC062	06/14/99	07/07/99	07/07/99
NITRATE BY IC	010	SO	99LIC063	06/14/99	07/07/99	07/08/99
PHOSPHATE BY IC	010	SO	99LIC062	06/14/99	07/07/99	07/07/99
SULFATE BY IC	010	SO	99LIC063	06/14/99	07/07/99	07/08/99
TCLP	010	SO	99LTO083	06/14/99	06/29/99	06/30/99
B0VLT8						
% SOLIDS	011	SO	99L%S091	06/14/99	06/28/99	06/29/99
BROMIDE BY IC	011	SO	99LIC062	06/14/99	07/07/99	07/07/99
CHLORIDE BY IC	011	SO	99LIC063	06/14/99	07/07/99	07/08/99
FLUORIDE BY IC	011	SO	99LIC063	06/14/99	07/07/99	07/08/99
NITRITE BY IC	011	SO	99LIC062	06/14/99	07/07/99	07/07/99
NITRATE BY IC	011	SO	99LIC063	06/14/99	07/07/99	07/08/99
PHOSPHATE BY IC	011	SO	99LIC062	06/14/99	07/07/99	07/07/99
SULFATE BY IC	011	SO	99LIC063	06/14/99	07/07/99	07/08/99
TCLP	011	SO	99LTO083	06/14/99	06/29/99	06/30/99

LAB QC:

BROMIDE BY IC	MB1	S	99LIC062	N/A	07/07/99	07/07/99
BROMIDE BY IC	MB1 BS	S	99LIC062	N/A	07/07/99	07/07/99
BROMIDE BY IC	MB1	S	99LIC063	N/A	07/07/99	07/08/99
BROMIDE BY IC	MB1 BS	S	99LIC063	N/A	07/07/99	07/08/99
CHLORIDE BY IC	MB1	S	99LIC062	N/A	07/07/99	07/07/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	MB1 BS	S	99LIC062	N/A	07/07/99	07/07/99
CHLORIDE BY IC	MB1	S	99LIC063	N/A	07/07/99	07/08/99
CHLORIDE BY IC	MB1 BS	S	99LIC063	N/A	07/07/99	07/08/99
FLUORIDE BY IC	MB1	S	99LIC063	N/A	07/07/99	07/08/99
FLUORIDE BY IC	MB1 BS	S	99LIC063	N/A	07/07/99	07/08/99
NITRITE BY IC	MB1	S	99LIC062	N/A	07/07/99	07/07/99
NITRITE BY IC	MB1 BS	S	99LIC062	N/A	07/07/99	07/07/99
NITRATE BY IC	MB1	S	99LIC062	N/A	07/07/99	07/07/99
NITRATE BY IC	MB1 BS	S	99LIC062	N/A	07/07/99	07/07/99
NITRITE BY IC	MB1	S	99LIC063	N/A	07/07/99	07/08/99
NITRITE BY IC	MB1 BS	S	99LIC063	N/A	07/07/99	07/08/99
NITRATE BY IC	MB1	S	99LIC063	N/A	07/07/99	07/08/99
NITRATE BY IC	MB1 BS	S	99LIC063	N/A	07/07/99	07/08/99
PHOSPHATE BY IC	MB1	S	99LIC062	N/A	07/07/99	07/07/99
PHOSPHATE BY IC	MB1 BS	S	99LIC062	N/A	07/07/99	07/07/99
PHOSPHATE BY IC	MB1	S	99LIC063	N/A	07/07/99	07/08/99
PHOSPHATE BY IC	MB1 BS	S	99LIC063	N/A	07/07/99	07/08/99
SULFATE BY IC	MB1	S	99LIC062	N/A	07/07/99	07/07/99
SULFATE BY IC	MB1 BS	S	99LIC062	N/A	07/07/99	07/07/99
SULFATE BY IC	MB1	S	99LIC063	N/A	07/07/99	07/08/99
SULFATE BY IC	MB1 BS	S	99LIC063	N/A	07/07/99	07/08/99
FLUORIDE BY IC	MB1	S	99LIC062	N/A	07/07/99	07/07/99
FLUORIDE BY IC	MB1 BS	S	99LIC062	N/A	07/07/99	07/07/99

RECRA LabNet Use Only: 9906L284

Custody Transfer Record/Lab Work Request

Page 1 of ~~2~~ 3

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TRU Hanford B99-048
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 6-23-99 Date Due: 7/23/99
Account #:

Refrigerator #											5					
#/Type Container	Liquid															
	Solid										1oz					
Volume	Liquid															
	Solid										16D					
Preservatives																
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb		W/TCLP		INORG: Metal	CN						
RECRA LabNet Use Only							AngD				TCLP					

MATRIX CODES: S Soil, SE Sediment, SO Solid, SL Sludge, W Water, O Oil, A Air, D Drum, DS Solids Drum, DL Liquids Drum, TC EP/TCLP, LC Leachate, WI Wipe, OT Other, FS Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
001	BOVLT0			SO	6-9-99	0930
002	BOVLT1					1000
003	BOVLT2				6-10-99	0900
004	BOVLV0					0929
005	BOVLV4					0931
006	BOVLT3					1302
007	BOVLT4					1326
008	BOVLT5					1335
009	BOVLT6				6-14-99	0914
010	BOVLT7					0936

Special Instructions:
saf # B99-048

COMPOSITE WASTE

DATE/REVISIONS:
1. Run matrix QC
2. AngD = ICBR, ICCL, ICFL, ICNO2, ICNO3,
3. ICPO4, ICSO4
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4019444285
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 7.8 °C

Relinquished by	Received by	Date	Time
Fed Ex	TMurray	6/23/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL'		
	REWRITTEN		

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

RECRA LabNet Use Only

9906L284

Custody Transfer Record/Lab Work Request

Page 2 of 3

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TMU Hanford B99-048

Est. Final Proj. Sampling Date:

Project #:

Project Contact/Phone #:

RECRA Project Manager:

COC: Del: TAT:

Date Rec'd 6-23-99 Date Due:

Account #:

Refrigerator #											5					
#/Type Container	Liquid															
	Solid										1g					
Volume	Liquid															
	Solid										60					
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		RECRA LabNet Use Only														

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected												
011	BOVLT8			SO	6-14-99	0955												
12	LTO TCLP of 001			L	*	-												
13	LT1 2																	
14	LT2 3																	
15	LVO 4																	
16	LV4 5																	
17	LT3 6																	
18	LT4 7																	
19	LT6 8																	
20	LT6 9																	

Special Instructions:

DATE/REVISIONS:

1. * see labchron
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___
Airbill # 4019044285
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 7.8 °C

Relinquished by	Received by	Date	Time
FedEx	TMurray	6/23/99	0930

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

RECRA LabNet Use Only

9906L284

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TMC-Hanford
Est. Final Proj. Sampling Date:
Project #:
Project Contact/Phone #:
RECRA Project Manager:
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #																	
#/Type Container	Liquid																
	Solid																
Volume	Liquid																
	Solid																
Preservatives																	
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN							

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	RECRA LabNet Use Only												
	tclp 1/6																		
121	BØVLT7 + 010			L	*	–							✓						
122	BØVLT8 + 011			L	*	–							✓						

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

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

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	TMurray	6/23/99	0930				

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 100

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg — Telephone No.: 373-6585	Project Coordinator: TRENT, SJ	Price Code: — Data Turnaround: 45 Days
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west	SAF No.: B99-048	
Ice Chest No.: ERC 99 002	Field Logbook No.: EFL 1133-7	Method of Shipment: Fed EX	
Shipped To: ~~TMA~~/RECRA ATB 6-9-99	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: B200CS 6/00	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and or Storage: NONE

Preservation	None	None										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	~~40g~~ 60ml	~~60g~~ 60ml										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.										
Sample No. / Matrix * / Sample Date / Sample Time												
BOVLT0 / Other Solid / 6-9-99 / 0930		X										
BOVLT1 / other solid / 6-9-99 / 1020		X										

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	6-9-99 1300
Received By:	Ref 1B	6-9-99 1300
Relinquished By: Ref 1B		6/22/99 noon
Received By:	B. Porter	6/22/99 noon
Relinquished By: B. Porter		6/22/99 noon
Received By:	Fed Express	6/22/99
Relinquished By: Fed Ex		6/23/99 0930
Received By:	T Murray	6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

Collector unavailable to sign COC

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 19

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west		SAF No.: B99-048
Ice Chest No.: ERC 99002	Field Logbook No.: EFL 1133-7		Method of Shipment: Fed EX
Shipped To: ~~TMR~~/RECRA RB 6-10-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B200CS6/00

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: NONE

Preservation	None	None	none	none							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	120ml ~~60ml~~	120ml	250ml							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item #1 below	See item #2 below							

Sample No.	Matrix *	Sample Date	Sample Time										
BOVLT2	other Solid	6-10-99	0900		X					area	C-2		
BOVLV0	other Solid	6-10-99	0929		X					area	C-3		
BOVLV4	other Solid	6-10-99	0931				X			area	C-3		
BOVLT3	other Solid	6-10-99	1302		X					area	C-4		
BOVLT4	other Solid	6-10-99	1326		X					area	C-5		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers / Doug Bowers	Date/Time: 6-10-99/1755	Received By: Ref 1B	Date/Time: 6-10-99/1755
Relinquished By: Ref 1B	Date/Time: 6/22/99 noon	Received By: B. Porter	Date/Time: 6/22/99 noon
Relinquished By: B. Porter	Date/Time: 6/22/99 noon	Received By: Fed Express	Date/Time: 6/22/99
Relinquished By: Fed Ex	Date/Time: 6/23/99 0930	Received By: TMurray	Date/Time: 6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign COC

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector Doug Bowers/Jeff Gilley	Company Contact Jim Rugg	Telephone No. 373-6585	Project Coordinator TRENT, SJ
Project Designation 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location 221 U canyon 200 west		SAF No. B99-048
Ice Chest No. ERC 99 002	Field Logbook No. EFL 1133-7		Method of Shipment Fed EX
Shipped To ~~IMM~~/RECRA 6-10-99	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A
			COA B 200C5 6100

Price Code

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None	NaOH								
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	60mL	~~60mL~~ 120 mL DJB 6-10-99									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
BOVLT5	other solid	6-10-99	1355		X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers 6-10-99/1555	Date/Time	Received By Ref 1B 6-10-99/1555	Date/Time
Relinquished By Ref 1B 6/22/99 noon	Date/Time	Received By B. Porter 6/22/99 noon	Date/Time
Relinquished By B. Porter 6/22/99 noon	Date/Time	Received By Fed. Express 6/22/99	Date/Time
Relinquished By Fed Ex 6/23/99 0930	Date/Time	Received By TMurray 6/23/99 0930	Date/Time

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code: 20.50C	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west	SAF No.: B99-048	
Ice Chest No.: ERC 97-079	Field Logbook No.: EFL 1133-7	Method of Shipment: Fed EX	
Shipped To: ~~TMX~~/RECRA ~~[illegible] 6-14-99~~	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: B200CS 6100	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: NONE

Preservation	None	None									
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	60mL	120ml ~~60ml~~ [illegible] 6-14-99									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time								
BOVLT6	other solid	6-14-99	0914	X	X					area C-7	BOVLP6
~~BOVLT7~~	~~other solid~~	~~6-14-99~~	~~0936~~	~~X~~	~~X~~ [illegible] 6/23/99					area C-8	BOVLP7
~~BOVLT8~~	~~other solid~~	~~6-14-99~~	~~0955~~	~~X~~	~~X~~ [illegible] 6/23/99					area C-9	BOVLP8

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers [signature]	Date/Time: 6-14-99 1630	Received By: [signature]	Date/Time: 6-14-99 1630
Relinquished By: Ref. 1B	Date/Time: 6/22/99 12:25	Received By: B. Porter	Date/Time: 6/22/99 12:25
Relinquished By: B. Porter	Date/Time: 6/22/99 12:25	Received By: Fed. Express	Date/Time: 6/22/99
Relinquished By: Fed. Ex	Date/Time: 6/23/99 0930	Received By: [signature]	Date/Time: 6/23/99 0930
LABORATORY SECTION	Received By: [signature] for T Murray	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign coc

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 2

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west		SAF No.: B99-048
Ice Chest No.: ERC 99 002	Field Logbook No.: EFL 1133-7		Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA ~~BTB~~ 6-14-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B200CS 6100

BTB 6-14-99

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: NONE

Preservation	None	None									
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	60mL	120ml ~~60ml~~ BTB 6-14-99									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time								
~~BOVLT6~~ ~~BTB 6-14-99~~	~~other solid~~	~~6-14-99~~	~~0914~~	~~X~~	~~X~~				area 6-7	BOVLP6	
BOVLT7	other solid	6-14-99	0936	X	X				area 6-8	BOVLP7	
BOVLT8	other solid	6-14-99	0955	X	X				area 6-9	BOVLP8	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers / Doug Bowers	Date/Time: 6-14-99/1620	Received By: Ref IB	Date/Time: 6-14-99/1620
Relinquished By: Ref IB	Date/Time: 6/22/99 noon	Received By: B. Porter	Date/Time: 6/22/99 noon
Relinquished By: B. Porter	Date/Time: 6/22/99 noon	Received By: Fed Express	Date/Time: 6/22/99 ~~1100~~
Relinquished By: Fed Ex	Date/Time: 6/23/99 0930	Received By: TMyrray	Date/Time: 6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 – Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign COC

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

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

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

AUG 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-048
RFW# : 9906L284
SDG/SAF# : H0449/B99-048

W.O.# : 10985-001-001-9999-00
Date Received: 06-23-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 11 TCLP leachate samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control sample (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The TCLP extract from samples B0VLT0 for Mercury and B0VLT1 for the ICP metals were selected for the matrix spikes (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria with the exception of Silver at 18.8%. The recovery in the TCLP Leachate was below 80-120% of the action level so standard addition was not required per Federal Register, Vol.57, No.227, Nov. 24, 1992, page 55117. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 25 pages.

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12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

per Maureen L. Dougherty

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

7/21/99
Date

mld/m06-284

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9906L284

Leaching Procedure: __1310 ✓1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A ✓3010A __3015 __3020A __3050A __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	__6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	__6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	✓7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	__6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-03/98

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 07/19/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-012	B0VLT0	Silver, TCLP Leachate	4.3		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	47.7		UG/L	28.1	1.0
		Barium, TCLP Leachate	306		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	6.0		UG/L	4.0	1.0
		Chromium, TCLP Leachate	143		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-013	B0VLT1	Silver, TCLP Leachate	6.2		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	57.1		UG/L	28.1	1.0
		Barium, TCLP Leachate	343		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	126		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-014	B0VLT2	Silver, TCLP Leachate	3.8	u	UG/L	3.8	1.0
		Arsenic, TCLP Leachate	43.5		UG/L	28.1	1.0
		Barium, TCLP Leachate	490		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	92.3		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-015	B0VLV0	Silver, TCLP Leachate	3.8	u	UG/L	3.8	1.0
		Arsenic, TCLP Leachate	28.1	u	UG/L	28.1	1.0
		Barium, TCLP Leachate	173		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	3.5	u	UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0

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INORGANICS DATA SUMMARY REPORT 07/19/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-016	B0VLV4	Silver, TCLP Leachate	4.5		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	33.3		UG/L	28.1	1.0
		Barium, TCLP Leachate	542		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	5.6		UG/L	4.0	1.0
		Chromium, TCLP Leachate	63.4		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-017	B0VLT3	Silver, TCLP Leachate	5.3		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	36.2		UG/L	28.1	1.0
		Barium, TCLP Leachate	614		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	8.3		UG/L	4.0	1.0
		Chromium, TCLP Leachate	53.3		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-018	B0VLT4	Silver, TCLP Leachate	3.8	u	UG/L	3.8	1.0
		Arsenic, TCLP Leachate	58.1		UG/L	28.1	1.0
		Barium, TCLP Leachate	528		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.8		UG/L	4.0	1.0
		Chromium, TCLP Leachate	38.7		UG/L	3.5	1.0
		Mercury, TCLP Leachate	6.1		UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-019	B0VLT5	Silver, TCLP Leachate	6.1		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	36.8		UG/L	28.1	1.0
		Barium, TCLP Leachate	356		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	38.2		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 07/19/99

CLIENT: TNU-HANFORD B99-048

RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-020	B0VLT6	Silver, TCLP Leachate	3.8	u	UG/L	3.8	1.0
		Arsenic, TCLP Leachate	28.1	u	UG/L	28.1	1.0
		Barium, TCLP Leachate	354		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	75.1		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-021	B0VLT7	Silver, TCLP Leachate	5.6		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	28.9		UG/L	28.1	1.0
		Barium, TCLP Leachate	421		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	37.8		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
-022	B0VLT8	Silver, TCLP Leachate	7.4		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	81.8		UG/L	28.1	1.0
		Barium, TCLP Leachate	436		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.9		UG/L	4.0	1.0
		Chromium, TCLP Leachate	124		UG/L	3.5	1.0
		Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/19/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0449-MB1	Silver, TCLP Leachate	3.8	u	UG/L	3.8	1.0
		Arsenic, TCLP Leachate	28.1	u	UG/L	28.1	1.0
		Barium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	3.5	u	UG/L	3.5	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
BLANK2	99L0449-MB2	Silver, TCLP Leachate	3.8	u	UG/L	3.8	1.0
		Arsenic, TCLP Leachate	28.1	u	UG/L	28.1	1.0
		Barium, TCLP Leachate	30.5		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	3.7		UG/L	3.5	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
BLANK3	99L0449-MB3	Silver, TCLP Leachate	5.5		UG/L	3.8	1.0
		Arsenic, TCLP Leachate	33.1		UG/L	28.1	1.0
		Barium, TCLP Leachate	85.9		UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.2		UG/L	4.0	1.0
		Chromium, TCLP Leachate	8.5		UG/L	3.5	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0
BLANK1	99C0193-MB1	Mercury, Total	0.10	u	UG/L	0.10	1.0
BLANK2	99C0193-MB2	Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
BLANK1	99L0452-MB1	Silver, TCLP Leachate	3.8	u	UG/L	3.8	1.0
		Arsenic, TCLP Leachate	28.1	u	UG/L	28.1	1.0
		Barium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Cadmium, TCLP Leachate	4.0	u	UG/L	4.0	1.0
		Chromium, TCLP Leachate	3.5	u	UG/L	3.5	1.0
		Lead, TCLP Leachate	40.7	u	UG/L	40.7	1.0
		Selenium, TCLP Leachate	61.6	u	UG/L	61.6	1.0

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INORGANICS ACCURACY REPORT 07/19/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-012	B0VLT0	Mercury, TCLP Leachate	181	0.10u	200	90.5	50.0
-013	B0VLT1	Silver, TCLP Leachate	949	6.2	5000	18.8	1.0
		Arsenic, TCLP Leachate	4470	57.1	5000	88.2	1.0
		Barium, TCLP Leachate	93900	343	100000	93.6	5.0
		Cadmium, TCLP Leachate	829	4.0 u	1000	82.9	1.0
		Chromium, TCLP Leachat	4120	126	5000	79.9	1.0
		Lead, TCLP Leachate	4150	40.7 u	5000	83.0	1.0
		Selenium, TCLP Leachat	905	61.6 u	1000	90.5	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 07/19/99

CLIENT: TNU-HANFORD B99-048

RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-012REP	B0VLT0	Mercury, TCLP Leachate	0.10u	0.10u	NC	1.0
-013REP	B0VLT1	Silver, TCLP Leachate	6.2	3.8 u	~~NC~~ 200	1.0
		Arsenic, TCLP Leachate	57.1	37.2	42.2	1.0
		Barium, TCLP Leachate	343	393	13.6	1.0
		Cadmium, TCLP Leachate	4.0 u	4.0 u	NC	1.0
		Chromium, TCLP Leachate	126	127	0.79	1.0
		Lead, TCLP Leachate	40.7 u	40.7 u	NC	1.0
		Selenium, TCLP Leachate	61.6 u	61.6 u	NC	1.0

Correction MB 7/19/99

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/19/99

CLIENT: TNU-HANFORD B99-048 RECRA LOT #: 9906L284

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0449-LC1	Silver, LCS	493	500	UG/L	98.6
		Arsenic, LCS	10100	10000	UG/L	100.8
		Barium, LCS	4680	5000	UG/L	93.6
		Cadmium, LCS	206	250	UG/L	82.5
		Chromium, LCS	478	500	UG/L	95.5
		Lead, LCS	2450	2500	UG/L	98.1
		Selenium, LCS	9900	10000	UG/L	99.0
LCS1	99C0193-LC1	Mercury, LCS	4.7	5.0	UG/L	94.8
LCS1	99L0452-LC1	Silver, LCS	468	500	UG/L	93.5
		Arsenic, LCS	9560	10000	UG/L	95.6
		Barium, LCS	4890	5000	UG/L	97.8
		Cadmium, LCS	213	250	UG/L	85.3
		Chromium, LCS	448	500	UG/L	89.7
		Lead, LCS	2320	2500	UG/L	93.0
		Selenium, LCS	9370	10000	UG/L	93.7

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VLT0						
TCLP	001	SO	99LTO083	06/09/99	06/29/99	06/30/99
B0VLT1						
TCLP	002	SO	99LTO083	06/09/99	06/29/99	06/30/99
B0VLT2						
TCLP	003	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLV0						
TCLP	004	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLV4						
TCLP	005	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT3						
TCLP	006	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT4						
TCLP	007	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT5						
TCLP	008	SO	99LTO083	06/10/99	06/29/99	06/30/99
B0VLT6						
TCLP	009	SO	99LTO083	06/14/99	06/29/99	06/30/99
B0VLT7						
TCLP	010	SO	99LTO083	06/14/99	06/29/99	06/30/99

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VLT8						
TCLP	011	SO	99LTO083	06/14/99	06/29/99	06/30/99
B0VLT0						
SILVER, TCLP LEACHAT	012	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	012	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	012	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	012	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	012	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	012	W	99C0193	06/30/99	07/01/99	07/02/99
MERCURY, TCLP LEACHA	012 REP	W	99C0193	06/30/99	07/01/99	07/02/99
MERCURY, TCLP LEACHA	012 MS	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	012	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	012	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLT1						
SILVER, TCLP LEACHAT	013	W	99L0449	06/30/99	07/01/99	07/06/99
SILVER, TCLP LEACHAT	013 REP	W	99L0452	06/30/99	07/02/99	07/06/99
SILVER, TCLP LEACHAT	013 MS	W	99L0452	06/30/99	07/02/99	07/06/99
ARSENIC, TCLP LEACHA	013	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	013 REP	W	99L0452	06/30/99	07/02/99	07/06/99
ARSENIC, TCLP LEACHA	013 MS	W	99L0452	06/30/99	07/02/99	07/06/99
BARIUM, TCLP LEACHAT	013	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	013 REP	W	99L0452	06/30/99	07/02/99	07/07/99
BARIUM, TCLP LEACHAT	013 MS	W	99L0452	06/30/99	07/02/99	07/07/99
CADMIUM, TCLP LEACHA	013	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	013 REP	W	99L0452	06/30/99	07/02/99	07/06/99
CADMIUM, TCLP LEACHA	013 MS	W	99L0452	06/30/99	07/02/99	07/06/99
CHROMIUM, TCLP LEACH	013	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	013 REP	W	99L0452	06/30/99	07/02/99	07/06/99
CHROMIUM, TCLP LEACH	013 MS	W	99L0452	06/30/99	07/02/99	07/06/99
MERCURY, TCLP LEACHA	013	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	013	W	99L0449	06/30/99	07/01/99	07/06/99
LEAD, TCLP LEACHATE	013 REP	W	99L0452	06/30/99	07/02/99	07/06/99

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TCLP LEACHATE	013 MS	W	99L0452	06/30/99	07/02/99	07/06/99
SELENIUM, TCLP LEACH	013	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	013 REP	W	99L0452	06/30/99	07/02/99	07/06/99
SELENIUM, TCLP LEACH	013 MS	W	99L0452	06/30/99	07/02/99	07/06/99
B0VLT2						
SILVER, TCLP LEACHAT	014	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	014	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	014	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	014	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	014	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	014	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	014	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	014	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLV0						
SILVER, TCLP LEACHAT	015	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	015	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	015	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	015	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	015	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	015	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	015	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	015	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLV4						
SILVER, TCLP LEACHAT	016	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	016	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	016	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	016	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	016	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	016	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	016	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	016	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLT3						
SILVER, TCLP LEACHAT	017	W	99L0449	06/30/99	07/01/99	07/06/99

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CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TCLP LEACHA	017	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	017	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	017	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	017	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	017	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	017	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	017	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLT4						
SILVER, TCLP LEACHAT	018	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	018	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	018	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	018	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	018	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	018	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	018	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	018	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLT5						
SILVER, TCLP LEACHAT	019	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	019	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	019	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	019	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	019	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	019	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	019	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	019	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLT6						
SILVER, TCLP LEACHAT	020	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	020	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	020	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	020	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	020	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	020	W	99C0193	06/30/99	07/01/99	07/02/99

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TNU-HANFORD B99-048

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CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TCLP LEACHATE	020	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	020	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLT7						
SILVER, TCLP LEACHAT	021	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	021	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	021	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	021	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	021	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	021	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	021	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	021	W	99L0449	06/30/99	07/01/99	07/06/99
B0VLT8						
SILVER, TCLP LEACHAT	022	W	99L0449	06/30/99	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	022	W	99L0449	06/30/99	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	022	W	99L0449	06/30/99	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	022	W	99L0449	06/30/99	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	022	W	99L0449	06/30/99	07/01/99	07/06/99
MERCURY, TCLP LEACHA	022	W	99C0193	06/30/99	07/01/99	07/02/99
LEAD, TCLP LEACHATE	022	W	99L0449	06/30/99	07/01/99	07/06/99
SELENIUM, TCLP LEACH	022	W	99L0449	06/30/99	07/01/99	07/06/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0449	N/A	07/01/99	07/06/99
SILVER, TCLP LEACHAT	MB1	W	99L0449	N/A	07/01/99	07/06/99
SILVER, TCLP LEACHAT	MB2	W	99L0449	N/A	07/01/99	07/06/99
SILVER, TCLP LEACHAT	MB3	W	99L0449	N/A	07/01/99	07/06/99
ARSENIC LABORATORY	LC1 BS	W	99L0449	N/A	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	MB1	W	99L0449	N/A	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	MB2	W	99L0449	N/A	07/01/99	07/06/99
ARSENIC, TCLP LEACHA	MB3	W	99L0449	N/A	07/01/99	07/06/99
BARIUM LABORATORY	LC1 BS	W	99L0449	N/A	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	MB1	W	99L0449	N/A	07/01/99	07/06/99
BARIUM, TCLP LEACHAT	MB2	W	99L0449	N/A	07/01/99	07/06/99

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TNU-HANFORD B99-048

DATE RECEIVED: 06/23/99 RFW LOT # :9906L284

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BARIUM, TCLP LEACHAT	MB3	W	99L0449	N/A	07/01/99	07/06/99
CADMIUM LABORATORY	LC1 BS	W	99L0449	N/A	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	MB1	W	99L0449	N/A	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	MB2	W	99L0449	N/A	07/01/99	07/06/99
CADMIUM, TCLP LEACHA	MB3	W	99L0449	N/A	07/01/99	07/06/99
CHROMIUM LABORATORY	LC1 BS	W	99L0449	N/A	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	MB1	W	99L0449	N/A	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	MB2	W	99L0449	N/A	07/01/99	07/06/99
CHROMIUM, TCLP LEACH	MB3	W	99L0449	N/A	07/01/99	07/06/99
MERCURY LABORATORY	LC1 BS	W	99C0193	N/A	07/01/99	07/02/99
MERCURY, TOTAL	MB1	W	99C0193	N/A	07/01/99	07/02/99
MERCURY, TCLP LEACHA	MB2	W	99C0193	N/A	07/01/99	07/02/99
LEAD LABORATORY	LC1 BS	W	99L0449	N/A	07/01/99	07/06/99
LEAD, TCLP LEACHATE	MB1	W	99L0449	N/A	07/01/99	07/06/99
LEAD, TCLP LEACHATE	MB2	W	99L0449	N/A	07/01/99	07/06/99
LEAD, TCLP LEACHATE	MB3	W	99L0449	N/A	07/01/99	07/06/99
SELENIUM LABORATORY	LC1 BS	W	99L0449	N/A	07/01/99	07/06/99
SELENIUM, TCLP LEACH	MB1	W	99L0449	N/A	07/01/99	07/06/99
SELENIUM, TCLP LEACH	MB2	W	99L0449	N/A	07/01/99	07/06/99
SELENIUM, TCLP LEACH	MB3	W	99L0449	N/A	07/01/99	07/06/99
SILVER LABORATORY	LC1 BS	W	99L0452	N/A	07/02/99	07/06/99
SILVER, TCLP LEACHAT	MB1	W	99L0452	N/A	07/02/99	07/06/99
ARSENIC LABORATORY	LC1 BS	W	99L0452	N/A	07/02/99	07/06/99
ARSENIC, TCLP LEACHA	MB1	W	99L0452	N/A	07/02/99	07/06/99
BARIUM LABORATORY	LC1 BS	W	99L0452	N/A	07/02/99	07/07/99
BARIUM, TCLP LEACHAT	MB1	W	99L0452	N/A	07/02/99	07/07/99
CADMIUM LABORATORY	LC1 BS	W	99L0452	N/A	07/02/99	07/06/99
CADMIUM, TCLP LEACHA	MB1	W	99L0452	N/A	07/02/99	07/06/99
CHROMIUM LABORATORY	LC1 BS	W	99L0452	N/A	07/02/99	07/06/99
CHROMIUM, TCLP LEACH	MB1	W	99L0452	N/A	07/02/99	07/06/99
LEAD LABORATORY	LC1 BS	W	99L0452	N/A	07/02/99	07/06/99
LEAD, TCLP LEACHATE	MB1	W	99L0452	N/A	07/02/99	07/06/99
SELENIUM LABORATORY	LC1 BS	W	99L0452	N/A	07/02/99	07/06/99
SELENIUM, TCLP LEACH	MB1	W	99L0452	N/A	07/02/99	07/06/99

RECRA LabNet Use Only

9906L284

Custody Transfer Record/Lab Work Request

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RECRA LabNet

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TMU Hanford B99-048
Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OT
QC: spec Del: std TAT: 30 day
Date Rec'd: 6-23-99 Date Due: 7/23/99
Account #:

Refrigerator #											5					
#/Type Container	Liquid															
	Solid										1qt					
Volume	Liquid															
	Solid										16oz					
Preservatives																
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb		W/TCLP		INORG: Metal	CN						
RECRA LabNet Use Only							Arg ① ✓				TCLP ✓					

MATRIX CODES: Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP Leachate, Wipe, Other, Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
001	BOULT0			SO	6-9-99	0930
002	BOULT1				↓	1000
003	BOULT2				6-10-99	0900
004	BOULV0					0929
005	BOULV4					0931
006	BOULT3					1302
007	BOULT4					1326
008	BOULT5				↓	1335
009	BOULT6				6-11-99	0914
010	BOULT7				↓	0936

Special Instructions:
saf # B99-048

COMPOSITE WASTE

DATE/REVISIONS:
1. Run matrix QC
2. ~~Arg①~~ = ICBR, ICCL, ICFL, ICNO2, ICNO3,
3. ICPO4, ICSO4
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4019444285
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 7.8 °C

Relinquished by	Received by	Date	Time
Fed Ex	TMurray	6/23/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

RECRA LabNet Use Only

9906L284

Custody Transfer Record/Lab Work Request

Page 2 of ~~2~~ 3

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TMU Hanford B99-048

Est. Final Proj. Sampling Date:

Project #:

Project Contact/Phone #:

RECRA Project Manager:

TAT: Del: TAT:

Date Rec'd 6-23-99 Date Due:

Account #:

Refrigerator #												5					
#/Type Container	Liquid																
	Solid											18					
Volume	Liquid																
	Solid											160					
Preservatives																	
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN							
RECRA LabNet Use Only																	
												Arsenic	TCLP				

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
011	BOVLT8			SO	6-14-99	0955															
12	LT0 TCLP of 001			L	*	-															
13	LT1 2																				
14	LT2 3																				
15	LV0 4																				
16	LV4 5																				
17	LT3 6																				
18	LT4 7																				
19	LT5 8																				
20	LT6 9																				

Special Instructions:

DATE/REVISIONS:

* 1. see labchron

2.

3.

4.

5.

6.

Relinquished by	Received by	Date	Time
FedEx	TMurray	6/23/99	0930

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 4019644285
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 7.8 °C

RECRA LabNet Use Only

99OUL284

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TMC Hanford
Est. Final Proj. Sampling Date:
Project #:
Project Contact/Phone #:
RECRA Project Manager:
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #																
#/Type Container	Liquid															
	Solid															
Volume	Liquid															
	Solid															
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						

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	RECRA LabNet Use Only												
	tap up																		
021	BØVLT7 + 010			L	*	-							✓						
022	BØVLT8 + 011			L	*	-							✓						

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

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

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec'd Y or N

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	Murray	6/23/99	0930				

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west		SAF No.: B99-048
Ice Chest No.: ERC 99 002	Field Logbook No.: EFL 1133-7		Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA 6-9-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B200CS 6/00

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: NONE

Preservation	None	None										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	~~40g~~ 60ml	~~60g~~ 60ml										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.										

Sample No.	Matrix *	Sample Date	Sample Time										
BOULTO	Other Solid	6-9-99	0930		X								
BOULT1	Other Solid	6-9-99	1020		X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	6-9-99 1300	Ref 1B	6-9-99 1300
Ref 1B	6/22/99 noon	B. Porter	6/22/99 noon
B. Porter	6/22/99 noon	Fed Express	6/22/99
Fed Ex	6/23/99 0930	T Murray	6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470; IC Anions - 300.0

Collector unavailable to sign COC

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west		SAF No.: B99-048
Ice Chest No.: ERC 99002	Field Logbook No.: EFL 1133-7		Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA 6-10-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B200C56/00

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	None	None	none	none							
	Type of Container	aG	aG	aG	aG							
	No. of Container(s)	1	1	1	1							
Special Handling and/or Storage: NONE	Volume	60mL	120ml ~~60mL~~	120ml	250ml							
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item #1 below	See item #2 below							
Sample No.	Matrix *	Sample Date	Sample Time									
BOVLT2	other Solid	6-10-99	0900		X					area	C-2	
BOVLV0	other Solid	6-10-99	0929		X					area	C-3	
BOVLV4	other Solid	6-10-99	0931				X			area	C-3	
BOVLT3	other Solid	6-10-99	1302		X					area	C-4	
BOVLT4	other Solid	6-10-99	1326		X					area	C-5	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 6-10-99/1555	Received By: Ref 1B	Date/Time: 6-10-99/1555
Relinquished By: Ref 1B	Date/Time: 6/22/99 noon	Received By: B. Porter	Date/Time: 6/22/99 noon
Relinquished By: B. Porter	Date/Time: 6/22/99 noon	Received By: Fed Express	Date/Time: 6/22/99
Relinquished By: Fed Ex	Date/Time: 6/23/99 0930	Received By: T Murray	Date/Time: 6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign coc

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector Doug Bowers/Jeff Gilley	Company Contact Jim Rugg	Telephone No. 373-6585	Project Coordinator TRENT, SJ
Project Designation 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location 221 U canyon 200 west		SAF No. B99-048
Ice Chest No. ERC 99 002	Field Logbook No. EFL 1133-7		Method of Shipment Fed EX
Shipped To ~~TMA~~/RECRA 6-10-99	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A
			COA B 200C5 6100

Price Code

Data Turnaround
45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None	NGy 0								
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	60mL	~~60mL~~ 120 ml DTD 6-10-99									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									
Sample No. / Matrix * / Sample Date / Sample Time											
BOVLT5 / other solid / 6-10-99 / 1355		X									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	6-10-99/1555	Bob IB	6-10-99/1555
Bob IB	6/22/99 noon	B. Porter	6/22/99 noon
B. Porter	6/22/99 noon	Fed. Express	6/22/99
Fed Ex	6/23/99 0930	TMurray	6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code: 20.50C	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west		SAF No.: B99-048
Ice Chest No.: ERC 97-079	Field Logbook No.: EFL 1133-7		Method of Shipment: Fed EX
Shipped To: ~~TMT~~/RECRA ~~DJB~~ 6-14-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B200CS 6100

DJB 6-14-99

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None									
Type of Container	sG	sG									
No. of Container(s)	1	1									
Volume	60mL	120ml ~~60ml~~ DJB 6-14-99									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									
Sample No. / Matrix * / Sample Date / Sample Time											
BOVLT6 / other solid / 6-14-99 / 0914	X	X						area C-7	BOVLP6		
~~BOVLT7 / other solid / 6-14-99 / 0936~~	~~X~~	~~X~~ DJB 6/22/99						area C-8	BOVLP7		
~~BOVLT8 / other solid / 6-14-99 / 0955~~	~~X~~	~~X~~ DJB 6/22/99						area C-9	BOVLP8		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers / Doug Bowers	Date/Time: 6-14-99 1630	Received By: DJB	Date/Time: 6-14-99 1630
Relinquished By: Ref. 1B	Date/Time: 6/22/99 12:25	Received By: B. Porter	Date/Time: 6/22/99 12:25
Relinquished By: B. Porter	Date/Time: 6/22/99 12:25	Received By: Fed. Express	Date/Time: 6/22/99
Relinquished By: Fed. Ex	Date/Time: 6/23/99 0930	Received By: R P Unger	Date/Time: 6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign coc

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By: for T Murray	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector Doug Bowers/Jeff Gilley	Company Contact Jim Rugg	Telephone No. 373-6585	Project Coordinator TRENT, SJ
Price Code	Data Turnaround 45 Days		
Project Designation 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location 221 U canyon 200 west		SAF No. B99-048
Ice Chest No. ERC 99 002	Field Logbook No. EFL 1133-7		Method of Shipment Fed EX
Shipped To ~~TMA~~/RECRA DAB 6-14-99	Offsite Property No. N/A DAB 6-14-99		Bill of Lading/Air Bill No. N/A
			COA B200CS 6100

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None								
	Type of Container	aG	aG								
	No. of Container(s)	1	1								
Special Handling and/or Storage NONE	Volume	60mL	120ml ~~60ml~~ DAB 6-14-99								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.								

Sample No.	Matrix *	Sample Date	Sample Time								
~~BOVLT6~~ DAB 6-14-99	~~other solid~~	~~6-14-99~~	~~0944~~	~~X~~	~~X~~				area C-7	BOVLP6	
BOVLT7	other solid	6-14-99	0936	X	X				area C-8	BOVLP7	
BOVLT8	other solid	6-14-99	0955	X	X				area C-9	BOVLP8	

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By Doug Bowers	Date/Time 6-14-99/1630	Received By Ref 1B 6-14-99/1630
Relinquished By Ref 1B	Date/Time 6/22/99 noon	Received By B. Porter 6/22/99 noon
Relinquished By B. Porter	Date/Time 6/22/99 noon	Received By Fed Express 6/22/99 ~~1100~~
Relinquished By Fed Ex	Date/Time 6/23/99 0930	Received By T Murray 6/23/99 0930

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

H0449-TMA/RECR

SEP 1999
RECEIVED
Data
Log In

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0449 is composed of eleven solid (concrete) samples designated under SAF No. B99-048 with a Project Designation of: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel).

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

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses though recounts were taken for samples BOVLT0, BOVLV0 and BOVLT7. Most sample MDA's were greater than the RDL's due to the small aliquots available for counting.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses. Positive strontium activity was detected in all the samples except B0VLV0.

2.3 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses though recounts were taken on samples BOVLT6 and BOVLT7. In order to report the Plutonium levels with more accuracy, the Radiometrics supervisor decided to rechop the integration bounds of the spectra for most of the samples then recalculate the data. The recalculation of the data for samples BOVLT6 and BOVLT7 is reflected in the analysis date printed in the report and is not the count date.

2.5 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses though a recount was taken on sample BOVLT6.

2.4 Americium-241 Analyses

The results for the initial analysis were all based on low yields. The entire batch was reanalyzed in order to obtain more satisfactory tracer yields. The reanalyses were all satisfactory.

2.5 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses although there were significant levels of plutonium-239 detected on the thorium planchets. The data integration regions were rechop and the results recalculate. The recalculation

of the data is reflected in the analysis dates.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

SDG 7151
Contact L.A. Johnson

SAMPLE SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0VLT0	221 U canyon 200 west	SOLID		N906134-01	B99-048	B99-048-02	06/09/99 09:30
B0VLT1	221 U canyon 200 west	SOLID		N906134-02	B99-048	B99-048-02	06/09/99 10:20
B0VLT2	221 U canyon 200 west	SOLID		N906134-03	B99-048	B99-048-02	06/10/99 09:00
B0VLT3	221 U canyon 200 west	SOLID		N906134-06	B99-048	B99-048-02	06/10/99 13:02
B0VLT4	221 U canyon 200 west	SOLID		N906134-07	B99-048	B99-048-02	06/10/99 13:26
B0VLT5	221 U canyon 200 west	SOLID		N906134-08	B99-048	B99-048-02	06/10/99 13:55
B0VLT6	221 U canyon 200 west	SOLID		N906134-09	B99-048	B99-048-02	06/14/99 09:14
B0VLT7	221 U canyon 200 west	SOLID		N906134-10	B99-048	B99-048-02	06/14/99 09:36
B0VLT8	221 U canyon 200 west	SOLID		N906134-11	B99-048	B99-048-02	06/14/99 09:55
B0VLV0	221 U canyon 200 west	SOLID		N906134-04	B99-048	B99-048-02	06/10/99 09:29
B0VLV4	221 U canyon 200 west	SOLID		N906134-05	B99-048	B99-048-02	06/10/99 09:31
Method Blank		SOLID		N906134-13	B99-048		
Method Blank		SOLID		N906134-16	B99-048		
Lab Control Sample		SOLID		N906134-12	B99-048		
Lab Control Sample		SOLID		N906134-15	B99-048		
Duplicate (N906134-01)	221 U canyon 200 west	SOLID		N906134-14	B99-048		06/09/99 09:30
Duplicate (N906134-01)	221 U canyon 200 west	SOLID		N906134-17	B99-048		06/09/99 09:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

SDG 7151
Contact L.A. Johnson

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

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
7151	B99-048-02	B0VLT0	SOLID				06/23/99	14	N906134-01	7151-001
		B0VLT1	SOLID				06/23/99	14	N906134-02	7151-002
		B0VLT2	SOLID				06/23/99	13	N906134-03	7151-003
		B0VLT3	SOLID				06/23/99	13	N906134-06	7151-006
		B0VLT4	SOLID				06/23/99	13	N906134-07	7151-007
		B0VLT5	SOLID				06/23/99	13	N906134-08	7151-008
		B0VLT6	SOLID				06/23/99	9	N906134-09	7151-009
		B0VLT7	SOLID				06/23/99	9	N906134-10	7151-010
		B0VLT8	SOLID				06/23/99	9	N906134-11	7151-011
		B0VLV0	SOLID				06/23/99	13	N906134-04	7151-004
		B0VLV4	SOLID				06/23/99	13	N906134-05	7151-005
		Method Blank	SOLID						N906134-13	7151-013
		Method Blank	SOLID						N906134-16	7151-016
		Lab Control Sample	SOLID						N906134-12	7151-012
		Lab Control Sample	SOLID						N906134-15	7151-015
		Duplicate (N906134-01)	SOLID				06/23/99	14	N906134-14	7151-014
		Duplicate (N906134-01)	SOLID				06/23/99	14	N906134-17	7151-017

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

SDG 7151
Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

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	6880-172	5.0	11			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6880-172	5.0	11			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6880-172	5.0	11			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6880-172	5.0	11			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6880-172	10.0	11			1	1	1/1		
Gas Proportional Counting												
80A	SOLID	Gross Alpha in Soil	6880-172	20.0	11			1	1	1/1		
80B	SOLID	Gross Beta in Soil	6880-172	15.0	11			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6880-172	15.0	11			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

SDG 7151
Contact L.A. Johnson

WORK SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0VLT0			N906134-01	7151-001	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/09/99	7151-001	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-001	AM	A1	08/05/99	08/09/99	NJV	Americium 241 in Soil
				7151-001	GAM		07/01/99	08/09/99	NJV	Gamma Scan
				7151-001	PU		07/14/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-001	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-001	TH		07/13/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-001	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLT1			N906134-02	7151-002	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/09/99	7151-002	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-002	AM	A1	08/05/99	08/09/99	NJV	Americium 241 in Soil
				7151-002	GAM		06/30/99	08/09/99	NJV	Gamma Scan
				7151-002	PU		07/14/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-002	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-002	TH		07/13/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-002	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLT2			N906134-03	7151-003	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/10/99	7151-003	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-003	AM	A1	08/05/99	08/09/99	NJV	Americium 241 in Soil
				7151-003	GAM		07/01/99	08/09/99	NJV	Gamma Scan
				7151-003	PU		07/10/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-003	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-003	TH		07/13/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-003	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLT3			N906134-06	7151-006	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/10/99	7151-006	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-006	AM	A1	08/05/99	08/09/99	NJV	Americium 241 in Soil
				7151-006	GAM		07/02/99	08/09/99	NJV	Gamma Scan
				7151-006	PU		07/10/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-006	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-006	TH		07/13/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-006	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/09/99

SDG 7151
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0VLT4			N906134-07	7151-007	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/10/99	7151-007	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-007	AM	A1	08/06/99	08/09/99	NJV	Americium 241 in Soil
				7151-007	GAM		07/02/99	08/09/99	NJV	Gamma Scan
				7151-007	PU		07/14/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-007	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-007	TH		07/20/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-007	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLT5			N906134-08	7151-008	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/10/99	7151-008	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-008	AM	A1	08/06/99	08/09/99	NJV	Americium 241 in Soil
				7151-008	GAM		07/02/99	08/09/99	NJV	Gamma Scan
				7151-008	PU		07/13/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-008	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-008	TH		07/20/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-008	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLT6			N906134-09	7151-009	80A/80		07/21/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/14/99	7151-009	80B/80		07/21/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-009	AM	A1	08/06/99	08/09/99	NJV	Americium 241 in Soil
				7151-009	GAM		07/02/99	08/09/99	NJV	Gamma Scan
				7151-009	PU		07/16/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-009	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-009	TH		07/20/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-009	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLT7			N906134-10	7151-010	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/14/99	7151-010	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-010	AM	A1	08/06/99	08/09/99	NJV	Americium 241 in Soil
				7151-010	GAM		07/03/99	08/09/99	NJV	Gamma Scan
				7151-010	PU		07/16/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-010	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-010	TH		07/21/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-010	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

SDG 7151
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0VLT8			N906134-11	7151-011	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/14/99	7151-011	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-011	AM	A1	08/06/99	08/09/99	NJV	Americium 241 in Soil
				7151-011	GAM		07/06/99	08/09/99	NJV	Gamma Scan
				7151-011	PU		07/10/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-011	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-011	TH		07/20/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-011	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLV0			N906134-04	7151-004	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/10/99	7151-004	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-004	AM	A1	08/05/99	08/09/99	NJV	Americium 241 in Soil
				7151-004	GAM		07/02/99	08/09/99	NJV	Gamma Scan
				7151-004	PU		07/13/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-004	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-004	TH		07/13/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-004	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
B0VLV4			N906134-05	7151-005	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/10/99	7151-005	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
B99-048-02	B99-048		06/23/99	7151-005	AM	A1	08/05/99	08/09/99	NJV	Americium 241 in Soil
				7151-005	GAM		07/01/99	08/09/99	NJV	Gamma Scan
				7151-005	PU		07/10/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-005	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-005	TH		07/16/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-005	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
Method Blank			N906134-13	7151-013	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
		SOLID		7151-013	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
	B99-048			7151-013	GAM		07/01/99	08/09/99	NJV	Gamma Scan
				7151-013	PU		07/13/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-013	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-013	TH		07/15/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-013	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
Method Blank			N906134-16	7151-016	AM		08/06/99	08/09/99	NJV	Americium 241 in Soil
		SOLID								
	B99-048									

Lab id TMANC
Protocol Hanford
Version Ver 1.0
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Report date 08/09/99

SDG 7151
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			N906134-12	7151-012	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
		SOLID		7151-012	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
	B99-048			7151-012	GAM		07/01/99	08/09/99	NJV	Gamma Scan
				7151-012	PU		07/10/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-012	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-012	TH		07/20/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-012	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
Lab Control Sample			N906134-15	7151-015	AM		08/06/99	08/09/99	NJV	Americium 241 in Soil
		SOLID								
	B99-048									
Duplicate (N906134-01)			N906134-14	7151-014	80A/80		07/19/99	08/09/99	NJV	Gross Alpha in Soil
221 U canyon 200 west		SOLID	06/09/99	7151-014	80B/80		07/19/99	08/09/99	NJV	Gross Beta in Soil
	B99-048		06/23/99	7151-014	GAM		07/06/99	08/09/99	NJV	Gamma Scan
				7151-014	PU		07/14/99	08/09/99	NJV	Plutonium, Isotopic in Solids
				7151-014	SR		07/07/99	08/09/99	NJV	Total Strontium in Soil
				7151-014	TH		07/20/99	08/09/99	NJV	Thorium, Isotopic in Soil
				7151-014	U		07/08/99	08/09/99	NJV	Uranium, Isotopic in Soil
Duplicate (N906134-01)			N906134-17	7151-017	AM		08/06/99	08/09/99	NJV	Americium 241 in Soil
221 U canyon 200 west		SOLID	06/09/99							
	B99-048		06/23/99							

Lab id TMANC
Protocol Hanford
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Version 3.06
Report date 08/09/99

SDG 7151
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
80A/80	B99-048	Gross Alpha in Soil	EPA900.0	11			1	1	1	14
80B/80	B99-048	Gross Beta in Soil	EPA900.0	11			1	1	1	14
AM	B99-048	Americium 241 in Soil	AM/CMPLATE	11			1	1	1	14
GAM	B99-048	Gamma Scan	GAMMAHI	11			1	1	1	14
PU	B99-048	Plutonium, Isotopic in Solids	PUPLATE	11			1	1	1	14
SR	B99-048	Total Strontium in Soil		11			1	1	1	14
TH	B99-048	Thorium, Isotopic in Soil	THPLATE	11			1	1	1	14
U	B99-048	Uranium, Isotopic in Soil	UPLATE	11			1	1	1	14
TOTALS				88			8	8	8	112

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

N906134-13

METHOD BLANK

Method Blank

SDG	7151	Client/Case no	Hanford	SDG-H0449	
Contact	L.A. Johnson	Case no	TRB-SBB-207925		
Lab sample id	N906134-13	Client sample id	Method Blank		
Dept sample id	7151-013	Material/Matrix		SOLID	
		SAF No	B99-048		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.944	2.1	3.8	10	U	80A
Gross Beta	12587-47-2	4.18	3.6	5.7	15	U	80B
Uranium 233/234	U-233/234	0.025	0.025	0.097	1.0	U	U
Uranium 235	15117-96-1	0	0.031	0.12	1.0	U	U
Uranium 238	U-238	0	0.025	0.097	1.0	U	U
Plutonium 238	13981-16-3	-0.006	0.013	0.049	1.0	U	PU
Plutonium 239/240	PU-239/240	0.013	0.026	0.049	1.0	U	PU
Total Strontium	SR-RAD	-0.096	0.15	0.21	1.0	U	SR
Thorium 228	14274-82-9	0.011	0.045	0.085	1.0	U	TH
Thorium 230	14269-63-7	U		0.11	1.0	U	TH
Thorium 232	TH-232	0	0.022	0.042	1.0	U	TH
Potassium 40	13966-00-2	U		1.6		U	GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.098	0.10	U	GAM
Europium 152	14683-23-9	U		0.25	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.22	0.10	U	GAM
Radium 226	13982-63-3	U		0.17	0.10	U	GAM
Radium 228	15262-20-1	U		0.44	0.20	U	GAM
Thorium 228	14274-82-9	U		0.22		U	GAM
Thorium 232	TH-232	U		0.44		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM
Uranium 238	U-238	U		11		U	GAM
Uranium 235	15117-96-1	U		0.32		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

QC-BLANK 31155

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-16

METHOD BLANK

Method Blank

SDG	7151	Client/Case no	Hanford	SDG-H0449	
Contact	L.A. Johnson	Case no	TRB-SBB-207925		
Lab sample id	N906134-16	Client sample id	Method Blank		
Dept sample id	7151-016	Material/Matrix		SOLID	
		SAF No	B99-048		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	-0.009	0.052	0.11	1.0	U	AM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

QC-BLANK 31446

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

N906134-12

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7151
Contact L.A. Johnson

Client/Case no Hanford SDG-H0449
Case no TRB-SBB-207925

Lab sample id N906134-12
Dept sample id 7151-012

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-048

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
Gross Alpha	256	17	3.0	10		80A	240	9.6	107	66-134	80-120
Gross Beta	234	11	6.5	15		80B	228	9.1	103	75-125	80-120
Uranium 233/234	5.79	0.70	0.35	1.0		U	6.44	0.26	90	81-119	80-120
Uranium 235	4.83	0.63	0.095	1.0		U	5.23	0.21	92	80-120	80-120
Uranium 238	6.66	0.77	0.33	1.0		U	6.99	0.28	95	81-119	80-120
Plutonium 238	12.5	1.1	0.049	1.0		PU	13.1	0.52	95	84-116	80-120
Plutonium 239/240	13.4	1.2	0.049	1.0		PU	13.8	0.55	97	84-116	80-120
Total Strontium	5.49	0.48	0.36	1.0		SR	5.70	0.23	96	80-120	
Thorium 230	11.1	0.53	0.075	1.0		TH	10.2	0.41	109	87-113	
Cobalt 60	3.86	0.29	0.10	0.050		GAM	4.08	0.16	95	75-125	80-120
Cesium 137	4.12	0.25	0.17	0.10		GAM	4.54	0.18	91	77-123	80-120

221-U S/M&T Conc Smpg (Deck/RR Tunnl

QC-LCS 31154

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-15

LAB CONTROL SAMPLE

Lab Control Sample

SDG 7151
Contact L.A. Johnson

Client/Case no Hanford SDG-H0449
Case no TRB-SBB-207925

Lab sample id N906134-15
Dept sample id 7151-015

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-048

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
Americium 241	20.8	1.7	0.10	1.0		AM	19.2	0.77	108	83-117	80-120

221-U S/M&T Conc Smpg (Deck/RR Tunnl

QC-LCS 31445

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-14

B0VLT0

DUPLICATE

SDG 7151

Contact L.A. Johnson

Client/Case no Hanford SDG-H0449

Case no TRB-SBB-207925

DUPLICATE

Lab sample id N906134-14

Dept sample id 7151-014

ORIGINAL

Lab sample id N906134-01

Dept sample id 7151-001

Received 06/23/99

Client sample id B0VLT0

Location/Matrix 221 U canyon 200 west SOLID

Collected 06/09/99 09:30

Custody/SAF No B99-048-02 B99-048

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	64.0	11	3.0	10		80A	55.8	10	3.2		14	57	
Gross Beta	1950	30	7.3	15		80B	2060	31	7.6		5	32	
Uranium 233/234	0.619	0.14	0.057	1.0	J	U	0.767	0.17	0.068	J	21	49	
Uranium 235	0.072	0.055	0.069	1.0	J	U	0.065	0.044	0.083	U	10	155	
Uranium 238	0.761	0.16	0.057	1.0	J	U	0.954	0.20	0.068	J	23	46	
Plutonium 238	0.340	0.090	0.053	1.0	J	PU	0.323	0.085	0.050	J	5	57	
Plutonium 239/240	48.0	3.6	0.053	1.0		PU	49.9	3.6	0.035		4	19	
Total Strontium	748	30	4.0	1.0		SR	793	25	3.1		6	23	
Thorium 228	0.290	0.067	0.062	1.0	J	TH	0.289	0.092	0.070	J	0	60	
Thorium 230	0.568	0.098	0.082	1.0	J	TH	0.152	0.28	0.62	U	116	124	
Thorium 232	0.287	0.061	0.023	1.0	J	TH	0.378	0.093	0.043	J	27	51	
Potassium 40	10.4	1.8	0.97			GAM	8.74	1.7	1.3		17	50	
Cobalt 60	2.68	0.23	0.14	0.050		GAM	2.87	0.23	0.15		7	36	
Cesium 137	831	2.7	0.76	0.10		GAM	841	2.5	0.74		1	32	
Europium 152	U		2.2	0.10	U	GAM	U		2.2	U	-		
Europium 154	U		0.40	0.10	U	GAM	U		0.42	U	-		
Europium 155	U		1.5	0.10	U	GAM	U		1.4	U	-		
Radium 226	0.787	0.74	1.1	0.10	U	GAM	U		1.0	U	-		
Radium 228	U		0.71	0.20	U	GAM	0.533	0.53	0.62	U	-		
Thorium 228	U		0.93		U	GAM	U		0.94	U	-		
Thorium 232	U		0.71		U	GAM	0.533	0.53	0.62	U	-		
Americium 241	3.78	1.4	2.1			GAM	3.57	1.3	2.0		6	84	
Uranium 238	U		19		U	GAM	U		18	U	-		
Uranium 235	U		2.1		U	GAM	U		2.1	U	-		

221-U S/M&T Conc Smpg (Deck/RR Tunnl

QC-DUP#1 31156

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-DUP

Version 3.06

Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-17

B0VLT0

DUPLICATE

SDG	7151			Client/Case no	Hanford SDG-H0449
Contact	L.A. Johnson			Case no	TRB-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	N906134-17	Lab sample id	N906134-01	Client sample id	B0VLT0
Dept sample id	7151-017	Dept sample id	7151-001	Location/Matrix	221 U canyon 200 west SOLID
		Received	06/23/99	Collected	06/09/99 09:30
				Custody/SAF No	B99-048-02 B99-048

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Americium 241	3.28	0.38	0.11	1.0		AM	3.62	0.41	0.13		10	27	

221-U S/M&T Conc Smpg (Deck/RR Tunnl

QC-DUP#1 31447

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-01

DATA SHEET

B0VLT0

SDG	7151	Client/Case no	Hanford SDG-H0449
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N906134-01	Client sample id	B0VLT0
Dept sample id	7151-001	Location/Matrix	221 U canyon 200 west SOLID
Received	06/23/99	Collected	06/09/99 09:30
		Custody/SAF No	B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	55.8	10	3.2	10		80A
Gross Beta	12587-47-2	2060	31	7.6	15		80B
Uranium 233/234	U-233/234	0.767	0.17	0.068	1.0	J	U
Uranium 235	15117-96-1	0.065	0.044	0.083	1.0	U	U
Uranium 238	U-238	0.954	0.20	0.068	1.0	J	U
Plutonium 238	13981-16-3	0.323	0.085	0.050	1.0	J	PU
Plutonium 239/240	PU-239/240	49.9	3.6	0.035	1.0		PU
Americium 241	14596-10-2	3.62	0.41	0.13	1.0		AM
Total Strontium	SR-RAD	793	25	3.1	1.0		SR
Thorium 228	14274-82-9	0.289	0.092	0.070	1.0	J	TH
Thorium 230	14269-63-7	0.152	0.28	0.62	1.0	U	TH
Thorium 232	TH-232	0.378	0.093	0.043	1.0	J	TH
Potassium 40	13966-00-2	8.74	1.7	1.3			GAM
Cobalt 60	10198-40-0	2.87	0.23	0.15	0.050		GAM
Cesium 137	10045-97-3	841	2.5	0.74	0.10		GAM
Europium 152	14683-23-9	U		2.2	0.10	U	GAM
Europium 154	15585-10-1	U		0.42	0.10	U	GAM
Europium 155	14391-16-3	U		1.4	0.10	U	GAM
Radium 226	13982-63-3	U		1.0	0.10	U	GAM
Radium 228	15262-20-1	0.533	0.53	0.62	0.20	U	GAM
Thorium 228	14274-82-9	U		0.94		U	GAM
Thorium 232	TH-232	0.533	0.53	0.62		U	GAM
Americium 241	14596-10-2	3.57	1.3	2.0			GAM
Uranium 238	U-238	U		18		U	GAM
Uranium 235	15117-96-1	U		2.1		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

N906134-02

DATA SHEET

B0VLT1

SDG	7151	Client/Case no	Hanford SDG-H0449
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N906134-02	Client sample id	B0VLT1
Dept sample id	7151-002	Location/Matrix	221 U canyon 200 west SOLID
Received	06/23/99	Collected	06/09/99 10:20
		Custody/SAF No	B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	23.5	9.6	3.3	10		80A
Gross Beta	12587-47-2	2570	34	6.4	15		80B
Uranium 233/234	U-233/234	0.908	0.27	0.13	1.0	J	U
Uranium 235	15117-96-1	0.120	0.080	0.15	1.0	U	U
Uranium 238	U-238	0.908	0.27	0.13	1.0	J	U
Plutonium 238	13981-16-3	0.262	0.090	0.079	1.0	J	PU
Plutonium 239/240	PU-239/240	46.4	3.7	0.042	1.0		PU
Americium 241	14596-10-2	4.51	0.54	0.12	1.0		AM
Total Strontium	SR-RAD	808	26	2.0	1.0		SR
Thorium 228	14274-82-9	0.393	0.11	0.083	1.0	J	TH
Thorium 230	14269-63-7	0.558	0.13	0.071	1.0	J	TH
Thorium 232	TH-232	0.334	0.093	0.044	1.0	J	TH
Potassium 40	13966-00-2	8.35	1.6	1.2			GAM
Cobalt 60	10198-40-0	2.91	0.22	0.14	0.050		GAM
Cesium 137	10045-97-3	806	2.4	0.70	0.10		GAM
Europium 152	14683-23-9	U		2.1	0.10	U	GAM
Europium 154	15585-10-1	U		0.34	0.10	U	GAM
Europium 155	14391-16-3	U		1.3	0.10	U	GAM
Radium 226	13982-63-3	U		0.98	0.10	U	GAM
Radium 228	15262-20-1	U		0.66	0.20	U	GAM
Thorium 228	14274-82-9	0.878	0.69	0.96		U	GAM
Thorium 232	TH-232	U		0.66		U	GAM
Americium 241	14596-10-2	4.53	1.2	1.8			GAM
Uranium 238	U-238	U		16		U	GAM
Uranium 235	15117-96-1	U		2.0		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-03

B0VLT2

DATA SHEET

SDG 7151 Client/Case no Hanford SDG-H0449
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N906134-03 Client sample id B0VLT2
Dept sample id 7151-003 Location/Matrix 221 U canyon 200 west SOLID
Received 06/23/99 Collected 06/10/99 09:00
Custody/SAF No B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	95.1	14	3.0	10		80A
Gross Beta	12587-47-2	3180	38	7.2	15		80B
Uranium 233/234	U-233/234	0.724	0.24	0.13	1.0	J	U
Uranium 235	15117-96-1	0.159	0.12	0.15	1.0	J	U
Uranium 238	U-238	0.806	0.24	0.13	1.0	J	U
Plutonium 238	13981-16-3	1.78	0.39	0.21	1.0		PU
Plutonium 239/240	PU-239/240	114	7.5	0.21	1.0		PU
Americium 241	14596-10-2	14.1	1.3	0.082	1.0		AM
Total Strontium	SR-RAD	1040	8.8	0.72	1.0		SR
Thorium 228	14274-82-9	0.404	0.11	0.11	1.0	J	TH
Thorium 230	14269-63-7	0.390	0.11	0.088	1.0	J	TH
Thorium 232	TH-232	0.348	0.099	0.047	1.0	J	TH
Potassium 40	13966-00-2	11.1	1.8	1.1			GAM
Cobalt 60	10198-40-0	3.62	0.31	0.19	0.050		GAM
Cesium 137	10045-97-3	1200	3.0	0.71	0.10		GAM
Europium 152	14683-23-9	U		2.8	0.10	U	GAM
Europium 154	15585-10-1	U		0.59	0.10	U	GAM
Europium 155	14391-16-3	U		1.3	0.10	U	GAM
Radium 226	13982-63-3	0.974	0.77	1.0	0.10	U	GAM
Radium 228	15262-20-1	0.780	0.66	0.83	0.20	U	GAM
Thorium 228	14274-82-9	U		1.1		U	GAM
Thorium 232	TH-232	0.780	0.66	0.83		U	GAM
Americium 241	14596-10-2	17.8	0.69	0.91			GAM
Uranium 238	U-238	U		27		U	GAM
Uranium 235	15117-96-1	U		2.4		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

N906134-06

DATA SHEET

B0VLT3

SDG	7151	Client/Case no	Hanford SDG-H0449
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N906134-06	Client sample id	B0VLT3
Dept sample id	7151-006	Location/Matrix	221 U canyon 200 west SOLID
Received	06/23/99	Collected	06/10/99 13:02
		Custody/SAF No	B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	15.9	8.0	4.3	10		80A
Gross Beta	12587-47-2	1880	29	5.8	15		80B
Uranium 233/234	U-233/234	2.19	0.45	0.16	1.0		U
Uranium 235	15117-96-1	0.226	0.12	0.16	1.0	J	U
Uranium 238	U-238	2.83	0.50	0.13	1.0		U
Plutonium 238	13981-16-3	0.194	0.052	0.035	1.0	J	PU
Plutonium 239/240	PU-239/240	18.2	1.2	0.030	1.0		PU
Americium 241	14596-10-2	3.84	0.66	0.22	1.0		AM
Total Strontium	SR-RAD	290	15	3.8	1.0		SR
Thorium 228	14274-82-9	0.362	0.11	0.089	1.0	J	TH
Thorium 230	14269-63-7	0.622	0.13	0.094	1.0	J	TH
Thorium 232	TH-232	0.389	0.095	0.044	1.0	J	TH
Potassium 40	13966-00-2	11.0	2.5	1.7			GAM
Cobalt 60	10198-40-0	U		0.22	0.050	U	GAM
Cesium 137	10045-97-3	2110	5.0	1.1	0.10		GAM
Europium 152	14683-23-9	U		4.7	0.10	U	GAM
Europium 154	15585-10-1	U		0.59	0.10	U	GAM
Europium 155	14391-16-3	U		2.0	0.10	U	GAM
Radium 226	13982-63-3	U		1.7	0.10	U	GAM
Radium 228	15262-20-1	U		0.78	0.20	U	GAM
Thorium 228	14274-82-9	U		1.9		U	GAM
Thorium 232	TH-232	U		0.78		U	GAM
Americium 241	14596-10-2	U		1.0		U	GAM
Uranium 238	U-238	U		22		U	GAM
Uranium 235	15117-96-1	U		3.9		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

N906134-07

DATA SHEET

B0VLT4

SDG	7151	Client/Case no	Hanford SDG-H0449
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N906134-07	Client sample id	B0VLT4
Dept sample id	7151-007	Location/Matrix	221 U canyon 200 west SOLID
Received	06/23/99	Collected	06/10/99 13:26
		Custody/SAF No	B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	75.8	11	3.1	10		80A
Gross Beta	12587-47-2	1780	29	7.3	15		80B
Uranium 233/234	U-233/234	1.70	0.44	0.21	1.0		U
Uranium 235	15117-96-1	0.162	0.11	0.21	1.0	U	U
Uranium 238	U-238	1.74	0.44	0.17	1.0		U
Plutonium 238	13981-16-3	0.620	0.12	0.076	1.0	J	PU
Plutonium 239/240	PU-239/240	50.6	3.8	0.052	1.0		PU
Americium 241	14596-10-2	7.26	0.67	0.11	1.0		AM
Total Strontium	SR-RAD	334	18	5.5	1.0		SR
Thorium 228	14274-82-9	0.336	0.077	0.062	1.0	J	TH
Thorium 230	14269-63-7	0.685	0.12	0.087	1.0	J	TH
Thorium 232	TH-232	0.354	0.077	0.036	1.0	J	TH
Sodium 22	13966-32-0	0.441	0.24	0.22			GAM
Potassium 40	13966-00-2	8.26	2.0	1.5			GAM
Cobalt 60	10198-40-0	2.78	0.29	0.18	0.050		GAM
Cesium 137	10045-97-3	1480	4.0	0.81	0.10		GAM
Europium 152	14683-23-9	U		3.2	0.10	U	GAM
Europium 154	15585-10-1	1.30	0.72	0.65	0.10		GAM
Europium 155	14391-16-3	U		1.6	0.10	U	GAM
Radium 226	13982-63-3	U		1.2	0.10	U	GAM
Radium 228	15262-20-1	U		0.87	0.20	U	GAM
Thorium 228	14274-82-9	U		1.3		U	GAM
Thorium 232	TH-232	U		0.87		U	GAM
Americium 241	14596-10-2	3.50	0.71	1.0			GAM
Uranium 238	U-238	U		28		U	GAM
Uranium 235	15117-96-1	U		2.8		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-08

DATA SHEET

B0VLT5

SDG	7151	Client/Case no	Hanford	SDG-H0449	
Contact	L.A. Johnson	Case no	TRB-SBB-207925		
Lab sample id	N906134-08	Client sample id	B0VLT5		
Dept sample id	7151-008	Location/Matrix	221 U canyon 200 west	SOLID	
Received	06/23/99	Collected	06/10/99 13:55		
		Custody/SAF No	B99-048-02	B99-048	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.70	3.6	3.2	10	J	80A
Gross Beta	12587-47-2	280	12	7.6	15		80B
Uranium 233/234	U-233/234	0.665	0.16	0.063	1.0	J	U
Uranium 235	15117-96-1	0.030	0.040	0.076	1.0	U	U
Uranium 238	U-238	0.591	0.14	0.063	1.0	J	U
Plutonium 238	13981-16-3	0.022	0.033	0.052	1.0	U	PU
Plutonium 239/240	PU-239/240	1.67	0.24	0.042	1.0		PU
Americium 241	14596-10-2	0.256	0.13	0.15	1.0	J	AM
Total Strontium	SR-RAD	119	7.0	2.1	1.0		SR
Thorium 228	14274-82-9	0.377	0.086	0.068	1.0	J	TH
Thorium 230	14269-63-7	0.563	0.11	0.075	1.0	J	TH
Thorium 232	TH-232	0.318	0.077	0.032	1.0	J	TH
Potassium 40	13966-00-2	8.90	1.7	1.1			GAM
Cobalt 60	10198-40-0	0.132	0.11	0.12	0.050		GAM
Cesium 137	10045-97-3	86.9	0.87	0.26	0.10		GAM
Europium 152	14683-23-9	U		0.83	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.55	0.10	U	GAM
Radium 226	13982-63-3	0.378	0.34	0.45	0.10	U	GAM
Radium 228	15262-20-1	0.436	0.32	0.33	0.20		GAM
Thorium 228	14274-82-9	0.411	0.29	0.38			GAM
Thorium 232	TH-232	0.436	0.32	0.33			GAM
Americium 241	14596-10-2	U		0.78		U	GAM
Uranium 238	U-238	U		13		U	GAM
Uranium 235	15117-96-1	U		0.83		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

N906134-09

DATA SHEET

B0VLT6

SDG	7151	Client/Case no	Hanford	SDG-H0449	
Contact	L.A. Johnson	Case no	TRB-SBB-207925		
Lab sample id	N906134-09	Client sample id	B0VLT6		
Dept sample id	7151-009	Location/Matrix	221 U canyon 200 west	SOLID	
Received	06/23/99	Collected	06/14/99 09:14		
		Custody/SAF No	B99-048-02	B99-048	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	407	49	3.3	10		80A
Gross Beta	12587-47-2	95700	210	5.8	15		80B
Uranium 233/234	U-233/234	6.06	1.0	0.20	1.0		U
Uranium 235	15117-96-1	0.384	0.20	0.25	1.0	J	U
Uranium 238	U-238	6.83	1.1	0.20	1.0		U
Plutonium 238	13981-16-3	1.54	0.51	0.33	1.0		PU
Plutonium 239/240	PU-239/240	234	42	0.36	1.0		PU
Americium 241	14596-10-2	20.6	1.5	0.13	1.0		AM
Total Strontium	SR-RAD	37000	540	19	1.0		SR
Thorium 228	14274-82-9	0.427	0.12	0.098	1.0	J	TH
Thorium 230	14269-63-7	0.737	0.14	0.083	1.0	J	TH
Thorium 232	TH-232	0.357	0.094	0.044	1.0	J	TH
Potassium 40	13966-00-2	10.8	4.4	4.2			GAM
Cobalt 60	10198-40-0	2.91	0.62	0.47	0.050		GAM
Cesium 137	10045-97-3	27500	30	13	0.10		GAM
Europium 152	14683-23-9	U		30	0.10	U	GAM
Europium 154	15585-10-1	4.23	3.8	4.6	0.10	U	GAM
Europium 155	14391-16-3	U		17	0.10	U	GAM
Radium 226	13982-63-3	U		14	0.10	U	GAM
Radium 228	15262-20-1	U		8.9	0.20	U	GAM
Thorium 228	14274-82-9	U		12		U	GAM
Thorium 232	TH-232	U		8.9		U	GAM
Americium 241	14596-10-2	16.1	14	21		U	GAM
Uranium 238	U-238	U		220		U	GAM
Uranium 235	15117-96-1	U		27		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

N906134-10

DATA SHEET

B0VLT7

SDG	7151	Client/Case no	Hanford	SDG-H0449
Contact	L.A. Johnson	Case no	TRB-SBB-207925	
Lab sample id	N906134-10	Client sample id	B0VLT7	
Dept sample id	7151-010	Location/Matrix	221 U canyon 200 west	SOLID
Received	06/23/99	Collected	06/14/99 09:36	
		Custody/SAF No	B99-048-02	B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	57.0	11	3.0	10		80A
Gross Beta	12587-47-2	1980	30	7.2	15		80B
Uranium 233/234	U-233/234	0.985	0.27	0.12	1.0	J	U
Uranium 235	15117-96-1	0.195	0.12	0.15	1.0	J	U
Uranium 238	U-238	1.08	0.27	0.12	1.0		U
Plutonium 238	13981-16-3	0.510	0.091	0.034	1.0	J	PU
Plutonium 239/240	PU-239/240	71.0	4.5	0.039	1.0		PU
Americium 241	14596-10-2	3.39	0.37	0.057	1.0		AM
Total Strontium	SR-RAD	761	36	5.5	1.0		SR
Thorium 228	14274-82-9	0.339	0.076	0.061	1.0	J	TH
Thorium 230	14269-63-7	0.548	0.11	0.089	1.0	J	TH
Thorium 232	TH-232	0.379	0.076	0.029	1.0	J	TH
Potassium 40	13966-00-2	10.8	1.2	0.68			GAM
Cobalt 60	10198-40-0	1.06	0.12	0.080	0.050		GAM
Cesium 137	10045-97-3	626	1.7	0.37	0.10		GAM
Europium 152	14683-23-9	5.90	1.1	1.4	0.10		GAM
Europium 154	15585-10-1	0.817	0.35	0.34	0.10		GAM
Europium 155	14391-16-3	U		0.92	0.10	U	GAM
Radium 226	13982-63-3	0.513	0.40	0.56	0.10	U	GAM
Radium 228	15262-20-1	0.424	0.39	0.48	0.20	U	GAM
Thorium 228	14274-82-9	0.373	0.36	0.55		U	GAM
Thorium 232	TH-232	0.424	0.39	0.48		U	GAM
Americium 241	14596-10-2	2.47	0.71	1.1			GAM
Uranium 238	U-238	U		14		U	GAM
Uranium 235	15117-96-1	U		1.4		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-11

B0VLT8

DATA SHEET

SDG 7151 Client/Case no Hanford SDG-H0449
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N906134-11 Client sample id B0VLT8
Dept sample id 7151-011 Location/Matrix 221 U canyon 200 west SOLID
Received 06/23/99 Collected 06/14/99 09:55
Custody/SAF No B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	65.9	12	3.8	10		80A
Gross Beta	12587-47-2	2460	34	5.8	15		80B
Uranium 233/234	U-233/234	15.3	1.7	0.29	1.0		U
Uranium 235	15117-96-1	1.44	0.36	0.16	1.0		U
Uranium 238	U-238	13.0	1.5	0.26	1.0		U
Plutonium 238	13981-16-3	0.273	0.072	0.048	1.0	J	PU
Plutonium 239/240	PU-239/240	23.5	1.7	0.030	1.0		PU
Americium 241	14596-10-2	3.73	0.59	0.15	1.0		AM
Total Strontium	SR-RAD	752	27	2.3	1.0		SR
Thorium 228	14274-82-9	0.443	0.076	0.049	1.0	J	TH
Thorium 230	14269-63-7	0.431	0.082	0.078	1.0	J	TH
Thorium 232	TH-232	0.368	0.064	0.022	1.0	J	TH
Potassium 40	13966-00-2	9.01	1.7	1.6			GAM
Cobalt 60	10198-40-0	7.65	0.37	0.18	0.050		GAM
Cesium 137	10045-97-3	1220	3.0	0.68	0.10		GAM
Europium 152	14683-23-9	U		2.7	0.10	U	GAM
Europium 154	15585-10-1	U		0.48	0.10	U	GAM
Europium 155	14391-16-3	U		1.3	0.10	U	GAM
Radium 226	13982-63-3	U		1.0	0.10	U	GAM
Radium 228	15262-20-1	U		1.1	0.20	U	GAM
Thorium 228	14274-82-9	U		1.2		U	GAM
Thorium 232	TH-232	U		1.1		U	GAM
Americium 241	14596-10-2	1.80	0.56	0.83			GAM
Uranium 238	U-238	U		33		U	GAM
Uranium 235	15117-96-1	U		2.3		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-04

DATA SHEET

B0VLV0

SDG	7151	Client/Case no	Hanford SDG-H0449
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N906134-04	Client sample id	B0VLV0
Dept sample id	7151-004	Location/Matrix	221 U canyon 200 west SOLID
Received	06/23/99	Collected	06/10/99 09:29
		Custody/SAF No	B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.82	1.9	2.7	10	U	80A
Gross Beta	12587-47-2	20.4	4.5	5.6	15		80B
Uranium 233/234	U-233/234	0.226	0.089	0.066	1.0	J	U
Uranium 235	15117-96-1	0.011	0.021	0.080	1.0	U	U
Uranium 238	U-238	0.200	0.088	0.066	1.0	J	U
Plutonium 238	13981-16-3	0.022	0.033	0.053	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.011	0.011	0.052	1.0	U	PU
Americium 241	14596-10-2	0.018	0.035	0.067	1.0	U	AM
Total Strontium	SR-RAD	0.087	0.15	0.24	1.0	U	SR
Thorium 228	14274-82-9	0.342	0.10	0.085	1.0	J	TH
Thorium 230	14269-63-7	0.265	0.10	0.085	1.0	J	TH
Thorium 232	TH-232	0.246	0.077	0.048	1.0	J	TH
Potassium 40	13966-00-2	17.8	1.8	0.84			GAM
Cobalt 60	10198-40-0	U		0.099	0.050	U	GAM
Cesium 137	10045-97-3	U		0.089	0.10	U	GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.31	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.303	0.17	0.18	0.10		GAM
Radium 228	15262-20-1	U		0.55	0.20	U	GAM
Thorium 228	14274-82-9	0.393	0.11	0.11			GAM
Thorium 232	TH-232	U		0.55		U	GAM
Americium 241	14596-10-2	U		0.066		U	GAM
Uranium 238	U-238	U		12		U	GAM
Uranium 235	15117-96-1	U		0.21		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

N906134-05

DATA SHEET

B0VLV4

SDG	7151	Client/Case no	Hanford SDG-H0449
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N906134-05	Client sample id	B0VLV4
Dept sample id	7151-005	Location/Matrix	221 U canyon 200 west SOLID
Received	06/23/99	Collected	06/10/99 09:31
		Custody/SAF No	B99-048-02 B99-048

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	61.2	11	3.4	10		80A
Gross Beta	12587-47-2	1790	29	6.6	15		80B
Uranium 233/234	U-233/234	1.30	0.31	0.14	1.0		U
Uranium 235	15117-96-1	0.044	0.044	0.17	1.0	U	U
Uranium 238	U-238	1.43	0.35	0.14	1.0		U
Plutonium 238	13981-16-3	0.471	0.20	0.19	1.0	J	PU
Plutonium 239/240	PU-239/240	52.1	4.0	0.24	1.0		PU
Americium 241	14596-10-2	7.35	1.2	0.27	1.0		AM
Total Strontium	SR-RAD	623	32	4.9	1.0		SR
Thorium 228	14274-82-9	0.322	0.070	0.056	1.0	J	TH
Thorium 230	14269-63-7	0.461	0.091	0.076	1.0	J	TH
Thorium 232	TH-232	0.262	0.063	0.026	1.0	J	TH
Potassium 40	13966-00-2	8.02	3.1	2.9			GAM
Cobalt 60	10198-40-0	6.80	0.68	0.33	0.050		GAM
Cesium 137	10045-97-3	1130	6.0	1.8	0.10		GAM
Europium 152	14683-23-9	U		5.4	0.10	U	GAM
Europium 154	15585-10-1	8.77	1.6	1.5	0.10		GAM
Europium 155	14391-16-3	11.9	3.1	4.3	0.10		GAM
Radium 226	13982-63-3	U		2.5	0.10	U	GAM
Radium 228	15262-20-1	U		2.1	0.20	U	GAM
Thorium 228	14274-82-9	U		2.3		U	GAM
Thorium 232	TH-232	U		2.1		U	GAM
Americium 241	14596-10-2	53.2	4.8	6.2			GAM
Uranium 238	U-238	U		57		U	GAM
Uranium 235	15117-96-1	U		5.3		U	GAM

221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/09/99

Test AM Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6880-172					
B0VLT0	N906134-01		A1	7151-001	3.62
B0VLT1	N906134-02		A1	7151-002	4.51
B0VLT2	N906134-03		A1	7151-003	14.1
B0VLT3	N906134-06		A1	7151-006	3.84
B0VLT4	N906134-07		A1	7151-007	7.26
B0VLT5	N906134-08		A1	7151-008	0.256 J
B0VLT6	N906134-09		A1	7151-009	20.6
B0VLT7	N906134-10		A1	7151-010	3.39
B0VLT8	N906134-11		A1	7151-011	3.73
B0VLV0	N906134-04		A1	7151-004	U
B0VLV4	N906134-05		A1	7151-005	7.35
BLK (QC ID=31446)	N906134-16			7151-016	U
LCS (QC ID=31445)	N906134-15			7151-015	ok
Duplicate (N906134-01)	N906134-17			7151-017	ok

Nominal values and limits from method 221-U S/M&T Conc Smpg (Deck/RR Tunnl RDLs (pCi/g) 1.0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

Test AM Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 5.0 %			Reference Lab Notebook 6880 pg.172												
B0VLT0	N906134-01		A1	0.13	0.250			92		647			57	08/05/99	08/05	SS-038
B0VLT1	N906134-02		A1	0.12	0.250			75		624			57	08/05/99	08/05	SS-002
B0VLT2	N906134-03		A1	0.082	0.250			81		582			56	08/05/99	08/05	SS-001
B0VLT3	N906134-06		A1	0.22	0.250			39		624			56	08/05/99	08/05	SS-008
B0VLT4	N906134-07		A1	0.11	0.250			90		621			57	08/05/99	08/06	SS-035
B0VLT5	N906134-08		A1	0.15	0.250			72		621			57	08/05/99	08/06	SS-036
B0VLT6	N906134-09		A1	0.13	0.250			93		621			53	08/05/99	08/06	SS-038
B0VLT7	N906134-10		A1	0.057	0.250			87		726			53	08/05/99	08/06	SS-005
B0VLT8	N906134-11		A1	0.15	0.250			41		726			53	08/05/99	08/06	SS-006
B0VLV0	N906134-04		A1	0.067	0.250			87		624			56	08/05/99	08/05	SS-005
B0VLV4	N906134-05		A1	0.27	0.250			27		624			56	08/05/99	08/05	SS-006
BLK (QC ID=31446)	N906134-16			0.11	0.250			76		727				08/05/99	08/06	SS-008
LCS (QC ID=31445)	N906134-15			0.10	0.250			82		520				08/05/99	08/06	SS-056
Duplicate (N906134-01) (QC ID=31447)	N906134-17			0.11	0.250			83		725			58	08/05/99	08/06	SS-009
Nominal values and limits from method				1.0	0.250			20-105		700	100		180			

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

AVERAGES ± 2 SD				
FOR 14 SAMPLES	MDA	0.13	±	0.11
	YIELD	73	±	43

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

Test PU Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 6880-172						
B0VLT0	N906134-01			7151-001	0.323 J	49.9
B0VLT1	N906134-02			7151-002	0.262 J	46.4
B0VLT2	N906134-03			7151-003	1.78	114
B0VLT3	N906134-06			7151-006	0.194 J	18.2
B0VLT4	N906134-07			7151-007	0.620 J	50.6
B0VLT5	N906134-08			7151-008	U	1.67
B0VLT6	N906134-09			7151-009	1.54	234
B0VLT7	N906134-10			7151-010	0.510 J	71.0
B0VLT8	N906134-11			7151-011	0.273 J	23.5
B0VLV0	N906134-04			7151-004	U	U
B0VLV4	N906134-05			7151-005	0.471 J	52.1
BLK (QC ID=31155)	N906134-13			7151-013	U	U
LCS (QC ID=31154)	N906134-12			7151-012	ok	ok
Duplicate (N906134-01)	N906134-14			7151-014	ok J	ok
Nominal values and limits from method 221-U S/M&T Conc Smpg (Deck/RR Tunnl				RDLs (pCi/g)	1.0	1.0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

Test PU Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 5.0 %			Reference Lab Notebook 6880 pg.172												
B0VLT0	N906134-01			0.050	0.500			99		510			35	07/09/99	07/14	SS-031
B0VLT1	N906134-02			0.079	0.500			82		510			35	07/09/99	07/14	SS-032
B0VLT2	N906134-03			0.21	0.100			95		720			30	07/09/99	07/10	SS-057
B0VLT3	N906134-06			0.035	0.500			98		721			30	07/09/99	07/10	SS-060
B0VLT4	N906134-07			0.076	0.500			98		510			34	07/09/99	07/14	SS-033
B0VLT5	N906134-08			0.052	0.500			90		491			33	07/09/99	07/13	SS-012
B0VLT6	N906134-09			0.36	0.500			87		1042			32	07/09/99	07/16	SS-051
B0VLT7	N906134-10			0.039	0.500			91		1042			32	07/09/99	07/16	SS-052
B0VLT8	N906134-11			0.048	0.500			81		721			26	07/09/99	07/10	SS-061
B0VLV0	N906134-04			0.053	0.500			85		491			33	07/09/99	07/13	SS-010
B0VLV4	N906134-05			0.24	0.100			83		721			30	07/09/99	07/10	SS-059
BLK (QC ID=31155)	N906134-13			0.049	0.430			89		489				07/09/99	07/13	SS-013
LCS (QC ID=31154)	N906134-12			0.049	0.430			75		548				07/09/99	07/10	SS-056
Duplicate (N906134-01) (QC ID=31156)	N906134-14			0.053	0.500			95		507			35	07/09/99	07/14	SS-045
Nominal values and limits from method				1.0	0.430			20-105		10	100		180			

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

AVERAGES ± 2 SD	MDA	0.10	±	0.20
FOR 14 SAMPLES	YIELD	89	±	15

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

Test TH Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6880-172							
B0VLT0	N906134-01			7151-001	0.289 J	U	0.378 J
B0VLT1	N906134-02			7151-002	0.393 J	0.558 J	0.334 J
B0VLT2	N906134-03			7151-003	0.404 J	0.390 J	0.348 J
B0VLT3	N906134-06			7151-006	0.362 J	0.622 J	0.389 J
B0VLT4	N906134-07			7151-007	0.336 J	0.685 J	0.354 J
B0VLT5	N906134-08			7151-008	0.377 J	0.563 J	0.318 J
B0VLT6	N906134-09			7151-009	0.427 J	0.737 J	0.357 J
B0VLT7	N906134-10			7151-010	0.339 J	0.548 J	0.379 J
B0VLT8	N906134-11			7151-011	0.443 J	0.431 J	0.368 J
B0VLV0	N906134-04			7151-004	0.342 J	0.265 J	0.246 J
B0VLV4	N906134-05			7151-005	0.322 J	0.461 J	0.262 J
BLK (QC ID=31155)	N906134-13			7151-013	U	U	U
LCS (QC ID=31154)	N906134-12			7151-012		ok	
Duplicate (N906134-01)	N906134-14			7151-014	ok J	ok J	ok J
Nominal values and limits from method 221-U S/M&T Conc Smpg (Deck/RR Tunnl				RDLs (pCi/g)	1.0	1.0	1.0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

Test TH Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 5.0 %			Reference Lab Notebook 6880 pg.172												
B0VLT0	N906134-01			0.62	0.500			87		468			34	07/12/99	07/13	SS-031
B0VLT1	N906134-02			0.083	0.500			85		468			34	07/12/99	07/13	SS-032
B0VLT2	N906134-03			0.11	0.500			82		468			33	07/12/99	07/13	SS-033
B0VLT3	N906134-06			0.094	0.500			88		468			33	07/12/99	07/13	SS-036
B0VLT4	N906134-07			0.087	0.500			102		598			40	07/20/99	07/20	SS-031
B0VLT5	N906134-08			0.075	0.500			91		598			40	07/20/99	07/20	SS-032
B0VLT6	N906134-09			0.098	0.500			67		598			36	07/20/99	07/20	SS-034
B0VLT7	N906134-10			0.089	0.500			92		688			37	07/20/99	07/21	SS-036
B0VLT8	N906134-11			0.078	0.500			99		848			36	07/20/99	07/20	SS-035
B0VLV0	N906134-04			0.085	0.500			79		468			33	07/12/99	07/13	SS-034
B0VLV4	N906134-05			0.076	0.500			94		722			36	07/12/99	07/16	SS-034
BLK (QC ID=31155)	N906134-13			0.11	0.500			92		470				07/12/99	07/15	SS-036
LCS (QC ID=31154)	N906134-12			0.075	0.500			91		848				07/20/99	07/20	SS-036
Duplicate (N906134-01) (QC ID=31156)	N906134-14			0.082	0.500			96		848			41	07/20/99	07/20	SS-038
Nominal values and limits from method				1.0	0.500			20-105		200			180			

PROCEDURES	REFERENCE	THPLATE
	EP-000	Data Entry and Document Preparation, rev 0
	EP-001	Q.C. Preparation, rev 0
	EP-003	Tracing, rev 0
	EP-008	Heavy Elements Electroplating, rev 0
	EP-070	Soil Dissolution, rev 0
	RP-901	Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD				
FOR 14 SAMPLES	MDA	0.13	±	0.29
	YIELD	89	±	18

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

Test U Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1+3	2σ	2+3	2σ
Preparation batch 6880-172											
B0VLT0	N906134-01			7151-001	0.767 J	U	0.954 J	80	25	7	5
B0VLT1	N906134-02			7151-002	0.908 J	U	0.908 J	100	42	13	10
B0VLT2	N906134-03			7151-003	0.724 J	0.159 J	0.806 J	90	40	20	16
B0VLT3	N906134-06			7151-006	2.19	0.226 J	2.83	77	21	8	4
B0VLT4	N906134-07			7151-007	1.70	U	1.74	98	35	9	7
B0VLT5	N906134-08			7151-008	0.665 J	U	0.591 J	113	38	5	7
B0VLT6	N906134-09			7151-009	6.06	0.384 J	6.83	89	20	6	3
B0VLT7	N906134-10			7151-010	0.985 J	0.195 J	1.08	91	34	18	12
B0VLT8	N906134-11			7151-011	15.3	1.44	13.0	118	19	11	3
B0VLV0	N906134-04			7151-004	0.226 J	U	0.200 J	113	67	6	11
B0VLV4	N906134-05			7151-005	1.30	U	1.43	91	31	3	3
BLK (QC ID=31155)	N906134-13			7151-013	U	U	U				
LCS (QC ID=31154)	N906134-12			7151-012	ok	ok	ok				
Duplicate (N906134-01)	N906134-14			7151-014	ok J	ok J	ok J	81	25	9	7
Nominal values and limits from method			RDLs (pCi/g)		1.0	1.0	1.0	100		4	
221-U S/M&T Conc Smpg (Deck/RR Tunnl							Averages	95		10	

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

Test U Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 5.0 %			Reference Lab Notebook 6880 pg.172												
B0VLT0	N906134-01			0.083	1.00			87		152			29	07/07/99	07/08	SS-031
B0VLT1	N906134-02			0.15	0.500			95		152			29	07/07/99	07/08	SS-032
B0VLT2	N906134-03			0.15	0.500			96		152			28	07/07/99	07/08	SS-033
B0VLT3	N906134-06			0.16	0.500			95		152			28	07/07/99	07/08	SS-036
B0VLT4	N906134-07			0.21	0.500			75		152			28	07/07/99	07/08	SS-038
B0VLT5	N906134-08			0.076	1.00			97		150			28	07/07/99	07/08	SS-039
B0VLT6	N906134-09			0.25	0.500			59		150			24	07/07/99	07/08	SS-040
B0VLT7	N906134-10			0.15	0.500			98		150			24	07/07/99	07/08	SS-044
B0VLT8	N906134-11			0.29	0.500			91		150			24	07/07/99	07/08	SS-045
B0VLV0	N906134-04			0.080	1.00			90		152			28	07/07/99	07/08	SS-034
B0VLV4	N906134-05			0.17	0.500			90		152			28	07/07/99	07/08	SS-035
BLK (QC ID=31155)	N906134-13			0.12	0.750			83		150				07/07/99	07/08	SS-049
LCS (QC ID=31154)	N906134-12			0.35	0.750			104		150				07/07/99	07/08	SS-048
Duplicate (N906134-01) (QC ID=31156)	N906134-14			0.069	1.00			107		150			29	07/07/99	07/08	SS-050
Nominal values and limits from method				1.0	0.750			30-105		150	100		180			

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

AVERAGES ± 2 SD	MDA	0.16	±	0.17
FOR 14 SAMPLES	YIELD	90	±	24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

Test SR Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6880-172					
B0VLT0	N906134-01			7151-001	793
B0VLT1	N906134-02			7151-002	808
B0VLT2	N906134-03			7151-003	1040
B0VLT3	N906134-06			7151-006	290
B0VLT4	N906134-07			7151-007	334
B0VLT5	N906134-08			7151-008	119
B0VLT6	N906134-09			7151-009	37000
B0VLT7	N906134-10			7151-010	761
B0VLT8	N906134-11			7151-011	752
B0VLV0	N906134-04			7151-004	U
B0VLV4	N906134-05			7151-005	623
BLK (QC ID=31155)	N906134-13			7151-013	U
LCS (QC ID=31154)	N906134-12			7151-012	ok
Duplicate (N906134-01)	N906134-14			7151-014	ok

Nominal values and limits from method 221-U S/M&T Conc Smpg (Deck/RR Tunnl RDLs (pCi/g) 1.0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

Test SR Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 10.0 %			Reference Lab Notebook 6880 pg.172												
B0VLT0	N906134-01			3.1	1.00			96		134			28	07/07/99	07/07	GRB-205
B0VLT1	N906134-02			2.0	0.500			100		134			28	07/07/99	07/07	GRB-207
B0VLT2	N906134-03			0.72	0.500			94		134			27	07/07/99	07/07	GRB-208
B0VLT3	N906134-06			3.8	0.500			90		135			27	07/07/99	07/07	GRB-209
B0VLT4	N906134-07			5.6	0.500			95		135			27	07/07/99	07/07	GRB-210
B0VLT5	N906134-08			2.1	1.00			97		135			27	07/07/99	07/07	GRB-211
B0VLT6	N906134-09			19	0.500			93		134			23	07/07/99	07/07	GRB-212
B0VLT7	N906134-10			5.5	0.500			90		400			23	07/07/99	07/07	GRB-207
B0VLT8	N906134-11			2.3	0.500			94		400			23	07/07/99	07/07	GRB-208
B0VLV0	N906134-04			0.24	1.00			86		200			27	07/07/99	07/07	GRB-201
B0VLV4	N906134-05			4.9	0.500			95		135			27	07/07/99	07/07	GRB-216
BLK (QC ID=31155)	N906134-13			0.21	1.00			86		400				07/07/99	07/07	GRB-204
LCS (QC ID=31154)	N906134-12			0.36	1.00			87		200				07/07/99	07/07	GRB-218
Duplicate (N906134-01) (QC ID=31156)	N906134-14			4.0	1.00			101		400			28	07/07/99	07/07	GRB-205
Nominal values and limits from method				1.0	1.00					100			180			

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

AVERAGES ± 2 SD FOR 14 SAMPLES
MDA 3.8 ± 9.5
YIELD 93 ± 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

Test 80A Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

GROSS ALPHA IN SOIL

GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 6880-172					
B0VLT0	N906134-01	80		7151-001	55.8
B0VLT1	N906134-02	80		7151-002	23.5
B0VLT2	N906134-03	80		7151-003	95.1
B0VLT3	N906134-06	80		7151-006	15.9
B0VLT4	N906134-07	80		7151-007	75.8
B0VLT5	N906134-08	80		7151-008	4.70 J
B0VLT6	N906134-09	80		7151-009	407
B0VLT7	N906134-10	80		7151-010	57.0
B0VLT8	N906134-11	80		7151-011	65.9
B0VLV0	N906134-04	80		7151-004	U
B0VLV4	N906134-05	80		7151-005	61.2
BLK (QC ID=31155)	N906134-13	80		7151-013	U
LCS (QC ID=31154)	N906134-12	80		7151-012	ok
Duplicate (N906134-01)	N906134-14	80		7151-014	ok

Nominal values and limits from method 221-U S/M&T Conc Smpg (Deck/RR Tunnl

RDLs (pCi/g) 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

Test 80A Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 20.0 %	Reference Lab Notebook 6880 pg.172														
B0VLT0	N906134-01	80		3.2	0.100			44		100			40	07/14/99	07/19	GRB-110
B0VLT1	N906134-02	80		3.3	0.100			56		100			40	07/14/99	07/19	GRB-111
B0VLT2	N906134-03	80		3.0	0.100			51		100			39	07/14/99	07/19	GRB-112
B0VLT3	N906134-06	80		4.3	0.100			51		100			39	07/14/99	07/19	GRB-115
B0VLT4	N906134-07	80		3.1	0.100			46		100			39	07/14/99	07/19	GRB-116
B0VLT5	N906134-08	80		3.2	0.100			43		100			39	07/14/99	07/19	GRB-110
B0VLT6	N906134-09	80		3.3	0.100			47		100			37	07/14/99	07/21	GRB-113
B0VLT7	N906134-10	80		3.0	0.100			48		100			35	07/14/99	07/19	GRB-112
B0VLT8	N906134-11	80		3.8	0.100			52		100			35	07/14/99	07/19	GRB-113
B0VLV0	N906134-04	80		2.7	0.100			12		100			39	07/14/99	07/19	GRB-113
B0VLV4	N906134-05	80		3.4	0.100			51		100			39	07/14/99	07/19	GRB-114
BLK (QC ID=31155)	N906134-13	80		3.8	0.100			36		100				07/14/99	07/19	GRB-115
LCS (QC ID=31154)	N906134-12	80		3.0	0.100			36		100				07/14/99	07/19	GRB-114
Duplicate (N906134-01) (QC ID=31156)	N906134-14	80		3.0	0.100			44		100			40	07/14/99	07/19	GRB-116
Nominal values and limits from method				10	0.100			5-150		100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-170	Preparation of Solids for Gross Alpha and Gross Beta Counting, rev 1

AVERAGES ± 2 SD	MDA	3.3	±	0.84
FOR 14 SAMPLES	RESIDUE	44	±	22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

~~SAMPLE DELIVERY GROUP H0449~~

Test 80B Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

GROSS BETA IN SOIL

GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 6880-172					
B0VLT0	N906134-01	80		7151-001	2060
B0VLT1	N906134-02	80		7151-002	2570
B0VLT2	N906134-03	80		7151-003	3180
B0VLT3	N906134-06	80		7151-006	1880
B0VLT4	N906134-07	80		7151-007	1780
B0VLT5	N906134-08	80		7151-008	280
B0VLT6	N906134-09	80		7151-009	95700
B0VLT7	N906134-10	80		7151-010	1980
B0VLT8	N906134-11	80		7151-011	2460
B0VLV0	N906134-04	80		7151-004	20.4
B0VLV4	N906134-05	80		7151-005	1790
BLK (QC ID=31155)	N906134-13	80		7151-013	U
LCS (QC ID=31154)	N906134-12	80		7151-012	ok
Duplicate (N906134-01)	N906134-14	80		7151-014	ok

Nominal values and limits from method RDLs (pCi/g) 15
221-U S/M&T Conc Smpg (Deck/RR Tunnl

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

Test 80B Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

GROSS BETA IN SOIL

GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 15.0 %	Reference Lab Notebook 6880 pg.172														
B0VLT0	N906134-01	80		7.6	0.100			44		100			40	07/14/99	07/19	GRB-110
B0VLT1	N906134-02	80		6.4	0.100			56		100			40	07/14/99	07/19	GRB-111
B0VLT2	N906134-03	80		7.2	0.100			51		100			39	07/14/99	07/19	GRB-112
B0VLT3	N906134-06	80		5.8	0.100			51		100			39	07/14/99	07/19	GRB-115
B0VLT4	N906134-07	80		7.3	0.100			46		100			39	07/14/99	07/19	GRB-116
B0VLT5	N906134-08	80		7.6	0.100			43		100			39	07/14/99	07/19	GRB-110
B0VLT6	N906134-09	80		5.8	0.100			47		100			37	07/14/99	07/21	GRB-113
B0VLT7	N906134-10	80		7.2	0.100			48		100			35	07/14/99	07/19	GRB-112
B0VLT8	N906134-11	80		5.8	0.100			52		100			35	07/14/99	07/19	GRB-113
B0VLV0	N906134-04	80		5.6	0.100			12		100			39	07/14/99	07/19	GRB-113
B0VLV4	N906134-05	80		6.6	0.100			51		100			39	07/14/99	07/19	GRB-114
BLK (QC ID=31155)	N906134-13	80		5.7	0.100			36		100				07/14/99	07/19	GRB-115
LCS (QC ID=31154)	N906134-12	80		6.5	0.100			36		100				07/14/99	07/19	GRB-114
Duplicate (N906134-01) (QC ID=31156)	N906134-14	80		7.3	0.100			44		100			40	07/14/99	07/19	GRB-116
Nominal values and limits from method				15	0.100			5-150		100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-170	Preparation of Solids for Gross Alpha and Gross Beta Counting, rev 1

AVERAGES ± 2 SD FOR 14 SAMPLES
MDA 6.6 ± 1.5
RESIDUE 44 ± 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/09/99

Test GAM Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6880-172						
B0VLT0	N906134-01			7151-001	2.87	841
B0VLT1	N906134-02			7151-002	2.91	806
B0VLT2	N906134-03			7151-003	3.62	1200
B0VLT3	N906134-06			7151-006	U	2110
B0VLT4	N906134-07			7151-007	2.78	1480
B0VLT5	N906134-08			7151-008	0.132	86.9
B0VLT6	N906134-09			7151-009	2.91	27500
B0VLT7	N906134-10			7151-010	1.06	626
B0VLT8	N906134-11			7151-011	7.65	1220
B0VLV0	N906134-04			7151-004	U	U
B0VLV4	N906134-05			7151-005	6.80	1130
BLK (QC ID=31155)	N906134-13			7151-013	U	U
LCS (QC ID=31154)	N906134-12			7151-012	ok	ok
Duplicate (N906134-01)	N906134-14			7151-014	ok	ok
Nominal values and limits from method 221-U S/M&T Conc Smpg (Deck/RR Tunnl				RDLs (pCi/g)	0.050	0.10

Lab id TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0449

Test GAM Matrix SOLID
SDG 7151
Contact L.A. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-172	2σ prep error 15.0 % Reference Lab Notebook 6880 pg.172															
B0VLT0	N906134-01			0.32	39.2					607			22	06/25/99	07/01	PD,03,00
B0VLT1	N906134-02			0.30	39.2					629			21	06/25/99	06/30	PD,03,00
B0VLT2	N906134-03			0.47	47.1					477			21	06/25/99	07/01	PD,01,00
B0VLT3	N906134-06			0.44	38.1					346			22	06/25/99	07/02	PD,01,00
B0VLT4	N906134-07			0.42	43.3					471			22	06/25/99	07/02	PD,01,00
B0VLT5	N906134-08			0.27	42.4					472			22	06/25/99	07/02	PD,03,00
B0VLT6	N906134-09			3.4	42.3					103			18	06/25/99	07/02	PD,03,00
B0VLT7	N906134-10			0.35	46.8					403			19	06/25/99	07/03	PD,04,00
B0VLT8	N906134-11			0.54	47.7					515			22	06/25/99	07/06	PD,01,00
B0VLV0	N906134-04			0.23	67.4					405			22	06/25/99	07/02	PD,01,00
B0VLV4	N906134-05			0.86	48.7					117			21	06/25/99	07/01	PD,03,00
BLK (QC ID=31155)	N906134-13			0.18	45.6					402				06/25/99	07/01	PD,03,00
LCS (QC ID=31154)	N906134-12			0.10	45.6					402				06/25/99	07/01	PD,01,00
Duplicate (N906134-01) (QC ID=31156)	N906134-14			0.36	39.2					515			27	06/25/99	07/06	PD,03,00
Nominal values and limits from method				0.050	45.6					100			180			

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

AVERAGES ± 2 SD FOR 14 SAMPLES
MDA 0.58 ± 1.7
YIELD ____ ± ____

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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

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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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0449

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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REPORT GUIDE

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Contract TRB-SBB-207925
Case no SDG-H0449

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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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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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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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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GUIDE, cont.

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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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Contract TRB-SBB-207925
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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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REPORT GUIDE

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Contract TRB-SBB-207925
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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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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-048-02

Collector Doug Bowers/Jeff Gilley	**Company Contact** Jim Rugg	**Telephone No.** 373-6585	**Project Coordinator** TRENT, SJ
Project Designation 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	**Sampling Location** 221 U canyon 200 west		**SAF No.** B99-048
Ice Chest No. ERC 96-087	**Field Logbook No.** EFL 1133-7		**Method of Shipment** Fed EX
Shipped To TMA/~~RECRA~~ 6-9-99	**Offsite Property No.** N/A		**Bill of Lading/Air Bill No.** N/A
			COA B200CS 6/00

Price Code

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None
Type of Container	G	G
No. of Container(s)	1	1
Volume	~~40g~~ 60ml	~~60g~~ 60ml

SAMPLE ANALYSIS

				See item (1) in Special Instructions.	See item (2) in Special Instructions.							
Sample No.	Matrix *	Sample Date	Sample Time								MR/h	Flashing
BOVLT0	Other Solid	6-9-99	0930	X							0.016	500 CPM
BOVLT1	Other Solid	6-9-99	1020	X							0.010	500 CPM

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	6-9-99/1300	Rof JB	6-9-99/1700
Rof JB	6/22/99 Noon	B. Porter	6/22/99 Noon
B. Porter	6/22/99 Noon	Fed Express	6/22/99 Noon
Fed Ex	9:40 6-23-99	TNU M. Goldenberg	9:40 6-23-99

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470; IC Anions - 300.0

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector Doug Bowers/Jeff Gilley	Company Contact Jim Rugg	Telephone No. 373-6585	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 45 Days
Project Designation 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location 221 U canyon 200 west		SAF No. B99-048		
Ice Chest No. ERC 96 087	Field Logbook No. EFL 1133-7		Method of Shipment Fed EX		
Shipped To TMA/~~RECRA~~ DB 6-10-99	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A		
			COA B200CS6/00		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None	none	none							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	120ml ~~60mL~~	120ml	250ml							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item #1 below	See item #2 below							MA/n

Sample No.	Matrix *	Sample Date	Sample Time										
BOVLT2	other Solid	6-10-99	0900	X						area	C-2	0.008	1000 CPM
BOVLV0	other Solid	6-10-99	0929	X						area	C-3	<0.003	430 CPM
BOVLV4	other Solid	6-10-99	0931			X				area	C-3	0.007	1000 CPM
BOVLT3	other Solid	6-10-99	1302	X						area	C-4	DNOD	380 CPM
BOVLT4	other Solid	6-10-99	1326	X						area	C-5	0.009	1000 CPM

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers 6/10-99/1555	Date/Time	Received By Ref 1B 6/10-99/1555	Date/Time
Relinquished By Ref. 1B 6/22/99 noon	Date/Time	Received By B. Porter 6/22/99 noon	Date/Time
Relinquished By B. Porter 6/22/99 noon	Date/Time	Received By Federal Express 6/22/99	Date/Time
Relinquished By FedEx 9:40	Date/Time 6-23-99	Received By TNV M. Coleberg 9:40 6-23-99	Date/Time

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

Collector unavailable to sign COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-048-02	Page 1 of 1

Collector Doug Bowers/Jeff Gilley	Company Contact Jim Rugg	Telephone No. 373-6585	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 45 Days
Project Designation 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location 221 U canyon 200 west		SAF No. B99-048		
Ice Chest No. ERC 96-087	Field Logbook No. EFL 1133-7		Method of Shipment Fed EX		
Shipped To TMA/~~RECRA~~ DJB 6-10-99	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A		
			COA B200C5 6100		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None	NONE								
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	60mL	~~60mL~~ 120 ml DJB 6-10-99									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.								MRB/07	Reading

Sample No.	Matrix *	Sample Date	Sample Time										
✓ B0VLT5	other solid	6-10-99	1355	X								CO,D01	<40 CPM

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers	Date/Time 6-10-99/1555	Received By B of D	Date/Time 6-10-99/1555
Relinquished By Bof. IB	Date/Time 6/22/99 noon	Received By B. Porter	Date/Time 6/22/99 noon
Relinquished By B. Porter	Date/Time 6/22/99 noon	Received By Fed Express	Date/Time 6/22/99
Relinquished By FedEx 9:40	Date/Time 6-23-99	Received By TNU M. Goldenberg 9:40	Date/Time 6-23-99

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-048-02

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west		SAF No.: B99-048
Ice Chest No.: #99-159	Field Logbook No.: EFL 1133-7		Method of Shipment: Fed EX
Shipped To: TMA/~~RECRA~~ BJB 6-14-99	Offsite Property No.: N/A	BJB 6-14-99	Bill of Lading/Air Bill No.: N/A
			COA: B200CS 6100

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None
Type of Container	aG	aG
No. of Container(s)	1	1
Volume	60mL	120ml ~~60ml~~ BJB 6-14-99
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time						MR/h				
BOVLT6	other solid	6-14-99	0914	X	X				0.08	area C-7		BOVLP6 12KE	
~~BOVLT7~~	~~other solid~~	~~6-14-99~~	~~0936~~	~~X~~	~~X~~	~~BJB 6-21-99~~				area C-8		BOVLP7	
~~BOVLT8~~	~~other solid~~	~~6-14-99~~	~~0955~~	~~X~~	~~X~~	~~BJB 6-21-99~~				area C-9		BOVLP8	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [illegible]	Date/Time: 6-14-99 1630	Received By: RCF JB	Date/Time: 6-14-99 1230
Relinquished By: Ref JB	Date/Time: 6/22/99 12:20	Received By: B. Porter	Date/Time: 6/22/99 12:20
Relinquished By: B. Porter	Date/Time: 6/22/99 12:20	Received By: Fed. Express	Date/Time: 6/22/99 12:20
Relinquished By: FedEx	Date/Time: 9:40 6/23/99	Received By: TNW M. Goldenberg	Date/Time: 9:40 6/23/99

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 -- Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

collector unavailable to sign COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-048-02

Collector: Doug Bowers/Jeff Gilley	Company Contact: Jim Rugg	Telephone No.: 373-6585	Project Coordinator: TRENT, SJ
Price Code	Data Turnaround: 45 Days		
Project Designation: 221-U S/M&T Concrete Sampling (Deck & RR Tunnel)	Sampling Location: 221 U canyon 200 west		SAF No.: B99-048
Ice Chest No.: ERC 96 087	Field Logbook No.: EFL 1133-7		Method of Shipment: Fed EX
Shipped To: TMA/~~RECRA~~ 6-14-99	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
			COA: B200CS 6100

DTB 1-14-99

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
NONE

Preservation	None	None									
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	60mL	120ml ~~60ml~~ DTB 6-14-99									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time								
~~BOVLT6~~	~~6099~~ other solid	~~6-14-99~~	~~0944~~	~~X~~	X				MR/h	area C-7	BOVLP6
✓✓ BOVLT7	other solid	6-14-99	0936	X	X				<0.001	area C-8	BOVLP7 (520
✓✓ BOVLT8	other solid	6-14-99	0955	X	X				0.006	area C-9	BOVLP8 (520

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 6-14-99 1630	Received By: Ref 1B	Date/Time: 6-14-99 1630
Relinquished By: Ref. 1B	Date/Time: 6/24/99 12:00	Received By: B. Porter	Date/Time: 6/24/99 Noon
Relinquished By: B. Porter	Date/Time: 6/24/99 Noon	Received By: Fed Express	Date/Time: 6/24/99
Relinquished By: FedEx 9:40	Date/Time: 6-23-99	Received By: TNV M. Goldenberg 9:40	Date/Time: 6-23-99
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Strontium-89,90 – Total Sr; Activity Scan
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470; IC Anions - 300.0

COLLECTOR UNAVAILABLE TO SIGN COC.

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Date/Time received 6-23-99 9:40

CoC No. B99-048-02

Container I.D. No. 99-159 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]

Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]

Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]

Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]

Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]

Number of samples in shipping container: 11

7. Number of containers per sample: 1 (Or see CoC _____)

8. Paperwork agrees with samples? Yes [✓] No [ ]

9. Samples have: Tape [✓] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]

10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]

11. Describe any anomalies: 12K CPM2
0.11 mR/hr Sample # BDYLT6

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

14. Received by M. Goldenberg Date: 6-23-99 Time: 9:40

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

RADIOACTIVE SHIPMENT RECORD

107965

Page 1 of 2

1. SHIP FROM U.S. DEPT. OF ENERGY C/O

Company: Bechtel Hanford Inc
Address: 3728 Bldg, 300-Area
City, State, Zip: Richland, WA 99352
Contact: David St. John
Phone: 509-372-9588

Ship: [X] Prepaid [ ] Collect

Via: [ ] Motor [X] Air Psgr [ ] UPS [ ] Rail [ ] Air Cargo [ ] Site Carrier

SHIPMENT AUTHORIZATION NUMBER

2. SHIP TO

Company: Thermo Retech
Address: 2030 Wright Avenue
City, State, Zip: Richmond, CA 94804-0040
Attention: ~~[illegible]~~ LARRY Johnson
Phone: 510-235-2633

Markings Applied 6.
- [ ] Radioactive - LSA
- [ ] Radioactive - SCO
- [ ] Type A
- [ ] Type B with trefoil

N/A

LSA Description 8.
- [ ] LSA-I
- [ ] LSA-II
- [ ] LSA-III
- [ ] SCO-I
- [ ] SCO-II

N/A

Labels Applied 10.
- [X] Empty
- [ ] Radioactive White - I
- [ ] Radioactive Yellow - II
- [ ] Radioactive Yellow - III
- [ ] Subsidiary Hazard

N/A

For Normal Form only
Identify
Physical Form: [ ] Liquid [ ] Gas [X] Solid
Chemical Form: [X] Eleme [ ] Metal [ ] Nitrate [ ] Oxide [ ] Mixture [ ] Other

EMERGENCY RESPONSE
Telephone: 1-888-766-0771
Emergency Response Guide(s): 161

Highway Route Controlled Quantity
Exclusive Use Shipment with instructions
Placards Applied
If Rail Specify:
Fissile Excepted, Grams
Excepted Package Statement

5. HM Proper Shipping Name: _____ Radioactive Material,

	Proper Shipping Name	Class	UN
	excepted package - empty packaging	7	UN2910
	excepted package - instruments or articles	7	UN2910
X	excepted package - limited quantity of material	7	UN2910
	excepted package - articles manufactured from natural or depleted uranium or natural thorium	7	UN2910
	Special Form, n.o.s.	7	UN2974
	Low Specific Activity, n.o.s.	7	UN2912
	n.o.s.	7	UN2982
	Fissile, n.o.s.	7	UN2918
	Surface Contaminated Object	7	UN2913

Warning -- Fissile Material Controlled Shipment. Do Not Load More Than N/A Packages Per Vehicle. In Loading and Storage Areas, Keep at Least 20 Feet From Other Packages Bearing Radioactive Labels.

11.

No. Pkg	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	T.I.	Bq/Package (TBq)	Gr. Wt. K
1	poly cooler	strong tight	99-159	tape	Sr-90, Cs-137, Th-233, Co-60	N/A	1.2×10^{7}	2 Kg
1	poly cooler	strong tight	ERC96087	tape	Sr-90, Cs-137	N/A	8.2×10^{8}	5 Kg
glass sample jars wrapped in bubble wrap and packed with cushioning in poly cooler, 1225 gms total this shipment. Samples						SAF	B99-048	
(Shipper may describe package in detail on one of the unused lines above)					TOTALS	N/A	2.0×10^{7}	7 Kg

12. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Certifier's Signature: David St John — On behalf of DOE-RL — Date: 6/21/99 — Organization: ERC · AFS — Complete Cost Code (Inc. End Function): R200CS 6100

13. Surface Dose Rate of Package: [X] <0.005 or ____ mSv/hr; <0.5 or ____ mrem/hr (N+ß γ)

Dose Rate @ 1 Meter from Surface of Package: [X] <0.005 or ____ mSv/hr; <0.5 or ____ mrem/hr (N+ß γ)

Smears of Outer Container: [X] <0.41 Bq (22 dpm) ß γ /cm²; [X] <0.04 Bq (2.2 dpm) α /cm²; [ ] <Tbl. 2-2 HSRCM Onsite Limits

TRUCK LOAD OR EXCLUSIVE USE: Surface [X] <2 mSv/hr (200 mrem/h; @ 2 meters [X] <0.1 mSv/hr (10 mrem/; @ Cab or sleeper [X] <0.02 mSv/hr (2 mrem/ (Using N+ß γ)

Additional Data and Instructions (inc. Readings on Internal Packaging): INTERIOR SURFACES NOT SURVEYED

Signature - Radiation Monitoring: Len Morse — Bldg. FF-1 — Survey No. FF1/2-99-0930 — Date: 6/22/99

14. TRANSPORTER: Vehicle Number 66319584 — DRIVER SIGNATURE: [signature]

RECEIVER: RECEIVER SIGNATURE — Date

15. OFFSITE AUTHORIZATION

Shipment has been inspected and verified to be in compliance with DOT regulations

Authorized Signature: Ronald L. Clawson — Printed Name: RONALD L. CLAWSON — Date: 6-22-9

16. AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION: [ ] N/A

CARGO AIRCRAFT: [ ] Cargo Aircraft Only Labels Applied

PASSENGER AIRCRAFT: [ ] Ltd Qty [ ] <3 T.I. [ ] Research/Medical Diagnosis [ ] Human Medical Research

Pkg. Dimensions (cm)

17. OFFSITE AUTHORIZATION

Tracking No.: RMBH-3578 — Date Shipped: 6/22/99 — Routing: FED-X — ETA: 6/23/9

Surveyed By: DWB — Date: 6-22-99 — Approved for Shipment Offsite: [signature] — Date: 6/22/99