



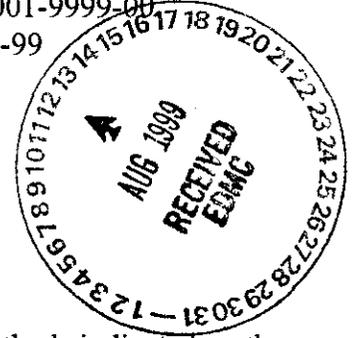
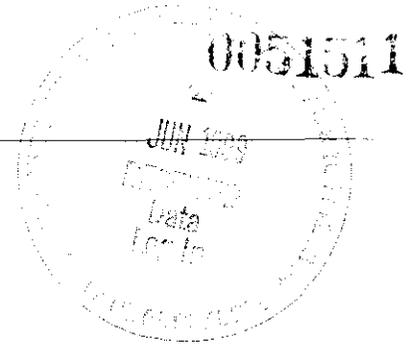
a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-004
RFW# : 9904L698
SDG# : H0384
SAF# : B99-004

W.O. # : 10985-001-001-9999-00
Date Received: 04-15-99



INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blank for Chromium VI was within method criteria.
6. The Laboratory Control Sample (LCS) for Insoluble Chromium VI was within the laboratory control limits, however the LCS for Soluble Chromium VI was above the laboratory control limits.
7. The matrix spike (MS) recovery for Insoluble Chromium VI was within the 75-125% control limits, however MS recovery for Soluble Chromium VI was below the Control limits which may be attributed to matrix interference and/or sample inhomogeneity.
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.

J. Michael Taylor

J. Michael Taylor
 Vice President
 Philadelphia Analytical Laboratory

5-21-99
 Date

njpli04-698

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 10 pages.

WET CHEMISTRY

METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
%Ash	_ D2216-80		
%Moisture	_ D2216-80		_ \sqrt ILMO4.0 (e)
%Solids			_ \sqrt 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: Chromium VI

Method: SW3010A/7196A

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., (1989).
 - b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)
 - 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.

RFW 21-21L-034/D-06/96

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INORGANICS DATA SUMMARY REPORT 04/23/99

CLIENT: TNU-HANFORD B99-004
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9904L698

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0V6R8	% Solids Chromium VI	97.4 0.41 u	% MG/KG	0.01 0.41	1.0 1.0
-002	B0V6R9	% Solids Chromium VI	97.6 0.41 u	% MG/KG	0.01 0.41	1.0 1.0
-003	B0V6T0	% Solids Chromium VI	98.1 0.41 u	% MG/KG	0.01 0.41	1.0 1.0
-004	B0V6T1	% Solids Chromium VI	97.9 1.3	% MG/KG	0.01 0.41	1.0 1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/23/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9904L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI035-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

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INORGANICS ACCURACY REPORT 04/23/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9904L698

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-004	B0V6T1	Soluble Chromium VI	3.6	1.3	4.1	54.1	1.0
		Insoluble Chromium VI	1360	1.3	1160	116.5	100
BLANK10	99LVI035-MB1	Soluble Chromium VI	1.1	0.40u	0.80	135.0	1.0
		Insoluble Chromium VI	1280	0.40u	1160	110.1	100

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INORGANICS PRECISION REPORT 04/23/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9904L698

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
-001REP	BOV6R8	‡ Solids	97.4	97.2	0.14	1.0
-004REP	BOV6T1	Chromium VI	1.3	1.4	2.7	1.0

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-004

DATE RECEIVED: 04/15/99

RFW LOT # :9904L698

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0V6R8						
% SOLIDS	001	S	99L&S054	04/12/99	04/19/99	04/20/99
% SOLIDS	001 REP	S	99L&S054	04/12/99	04/19/99	04/20/99
CHROMIUM VI	001	S	99LVI035	04/12/99	04/22/99	04/22/99
B0V6R9						
% SOLIDS	002	S	99L&S054	04/12/99	04/19/99	04/20/99
CHROMIUM VI	002	S	99LVI035	04/12/99	04/22/99	04/22/99
B0V6T0						
% SOLIDS	003	S	99L&S054	04/12/99	04/19/99	04/20/99
CHROMIUM VI	003	S	99LVI035	04/12/99	04/22/99	04/22/99
B0V6T1						
% SOLIDS	004	S	99L&S054	04/12/99	04/19/99	04/20/99
CHROMIUM VI	004	S	99LVI035	04/12/99	04/22/99	04/22/99
CHROMIUM VI	004 REP	S	99LVI035	04/12/99	04/22/99	04/22/99
CHROMIUM VI	004 MS	S	99LVI035	04/12/99	04/22/99	04/22/99
CHROMIUM VI	004 MSD	S	99LVI035	04/12/99	04/22/99	04/22/99

LAB QC:

CHROMIUM VI	MB1	S	99LVI035	N/A	04/22/99	04/22/99
CHROMIUM VI	MB1 BS	S	99LVI035	N/A	04/22/99	04/22/99
CHROMIUM VI	MB1 BSD	S	99LVI035	N/A	04/22/99	04/22/99

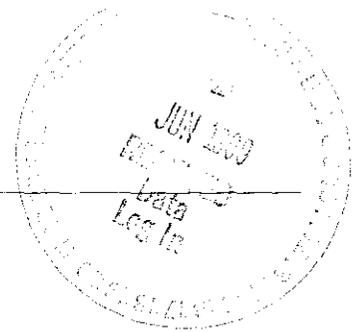
Collector Jacques/Stankovich	Company Contact Duane Jacques	Telephone No. (509) 531-0634	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 7 days
Project Designation 100 D Areas - Quick Turn	Sampling Location Pipeline Overburden	SAF No. B99-004			
Ice Chest No.	Field Logbook No. EI-1339-5	Method of Shipment Fed Ex			
Shipped To TMA/RECRA 8-10-99	Offsite Property No. NA	Bill of Lading/Air Bill No. NA			
COA					

POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive & PCB	Preservation	None	Cool 4C	Cool 4C	None						
	Type of Container	P	aG	aG	aG	aG	aG	aG	aG	aG	P
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage	Volume	20ml.	60ml.	60ml.	60ml.	60ml.	60ml.	60ml.	60ml.	60ml.	500ml.

SAMPLE ANALYSIS				Activity Scan	Chromium Hex - 7196	PCBs - 8080	See item (1) in Special Instructions	Isotopic Plutonium	Isotopic Uranium (Uranium-238)	Nickel-63	Strontium-89,90 -- Total Sr	See item (2) in Special Instructions
Sample No.	Matrix *	Sample Date	Sample Time									
BOV6R8	Soil	4-12-99	1009		X	X	X					BOV6R4
BOV6R9	Soil	4-12-99	1012		X	X	X					BOV6R5
BOV6T0	Soil	4-12-99	1015		X	X	X					BOV6R6
BOV6T1	Soil	4-12-99	1024		X	X	X					BOV6R7

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS COA R100DC 2100	Matrix *
Relinquished By <i>[Signature]</i> Date/Time 4-12-99 1525	Received By R.F.S. B @ 3°C Date/Time 4-14-99/1525	(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Silver) (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)	Soil Water Vapor Other Solid Other Liquid
Relinquished By Defg 10 Date/Time 4-14-99/0930	Received By E. amp... Date/Time 4-14-99/0930		
Relinquished By E. amp... Date/Time 4-14-99/1200	Received By Fed Ex Date/Time		
Relinquished By J. ell... Date/Time	Received By Date/Time		

LABORATORY SECTION	Received By <i>[Signature]</i>	Title Unit Leader	Date/Time 4/15/99 0930
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-004
RFW# : 9904L698
SDG/SAF# : H0384/B99-004

W.O.# : 10985-001-001-9999-00
Date Received: 04-15-99

METALS CASE NARRATIVE

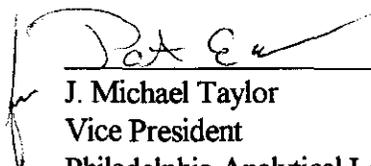
1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at the following concentration:

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
BOV6R8	Chromium	500	101.8

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of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory
mld/m04-698

4-29-99
Date



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Recra Lot#: 9904L698

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	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Antimony	<u> </u> 6010B <u> </u> 7041 ⁵	<u> </u> 200.7 <u> </u> 204.2			<u> </u> 99
Arsenic	<input checked="" type="checkbox"/> 6010B <u> </u> 7060A ⁵	<u> </u> 200.7 <u> </u> 206.2	<u> </u> 3113B		<u> </u> 99
Barium	<input checked="" type="checkbox"/> 6010B	<u> </u> 200.7			<u> </u> 99
Beryllium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Bismuth	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Boron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Cadmium	<input checked="" type="checkbox"/> 6010B <u> </u> 7131A ⁵	<u> </u> 200.7 <u> </u> 213.2			<u> </u> 99
Calcium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Chromium	<input checked="" type="checkbox"/> 6010B <u> </u> 7191 ⁵	<u> </u> 200.7 <u> </u> 218.2			<u> </u> SS17
Cobalt	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Copper	<u> </u> 6010B <u> </u> 7211 ⁵	<u> </u> 200.7 <u> </u> 220.2			<u> </u> 99
Iron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Lead	<input checked="" type="checkbox"/> 6010B <u> </u> 7421 ⁵	<u> </u> 200.7 <u> </u> 239.2	<u> </u> 3113B		<u> </u> 99
Lithium	<u> </u> 6010B <u> </u> 7430 ⁴	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Magnesium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Manganese	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Mercury	<u> </u> 7470A ³ <u> </u> 7471A ³	<u> </u> 245.1 ² <u> </u> 245.5 ²			<u> </u> 99
Molybdenum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Nickel	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Potassium	<u> </u> 6010B <u> </u> 7610 ⁴	<u> </u> 200.7 <u> </u> 258.1 ⁴			<u> </u> 99
Rare Earths	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Selenium	<u> </u> 6010B <u> </u> 7740 ⁵	<u> </u> 200.7 <u> </u> 270.2	<u> </u> 3113B		<u> </u> 99
Silicon	<u> </u> 6010B ¹	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silica	<u> </u> 6010B	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silver	<input checked="" type="checkbox"/> 6010B <u> </u> 7761 ⁵	<u> </u> 200.7 <u> </u> 272.2			<u> </u> 99
Sodium	<u> </u> 6010B <u> </u> 7770 ⁴	<u> </u> 200.7 <u> </u> 273.1 ⁴			<u> </u> 99
Strontium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Thallium	<u> </u> 6010B <u> </u> 7841 ⁵	<u> </u> 200.7 <u> </u> 279.2 <u> </u> 200.9			<u> </u> 99
Tin	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Titanium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Uranium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Vanadium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zinc	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zirconium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99

Other:

Method:

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

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 04/27/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9904L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B0V6R8	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	2.3	MG/KG	0.33	1.0
		Barium, Total	64.1	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	18.2	MG/KG	0.06	1.0
		Lead, Total	3.5	MG/KG	0.18	1.0
-002	B0V6R9	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	2.0	MG/KG	0.32	1.0
		Barium, Total	51.9	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	9.8	MG/KG	0.06	1.0
		Lead, Total	3.2	MG/KG	0.18	1.0
-003	B0V6T0	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.5	MG/KG	0.30	1.0
		Barium, Total	57.9	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	6.7	MG/KG	0.05	1.0
		Lead, Total	3.5	MG/KG	0.16	1.0
-004	B0V6T1	Silver, Total	0.32	MG/KG	0.09	1.0
		Arsenic, Total	2.0	MG/KG	0.32	1.0
		Barium, Total	66.1	MG/KG	0.01	1.0
		Cadmium, Total	1.1	MG/KG	0.04	1.0
		Chromium, Total	110	MG/KG	0.06	1.0
		Lead, Total	5.6	MG/KG	0.17	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/27/99

CLIENT: TNU-HANFORD B99-004

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SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0230-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	0.02	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.21	MG/KG	0.06	1.0
		Lead, Total	0.18 u	MG/KG	0.18	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 04/27/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9904L698

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

SAMPLE	SITE ID	ANALYTE	SPIKED	INITIAL	SPIKED	%RECOV	DILUTION
			SAMPLE	RESULT	AMOUNT		FACTOR (SPK)
-001	B0V6R8	Silver, Total	4.5	0.09u	5.0	90.0	1.0
		Arsenic, Total	188	2.3	199	93.3	1.0
		Barium, Total	245	64.1	199	90.7	1.0
		Cadmium, Total	4.6	0.04u	5.0	92.0	1.0
		Chromium, Total	32.8	18.2	19.9	73.4	1.0
		Lead, Total	49.0	3.5	49.8	91.4	1.0

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RECRA LOT #: 9904L698

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE	RPD	FACTOR (REP)
-001REP	BOV6R8	Silver, Total	0.09u	0.09u	NC	1.0
		Arsenic, Total	2.3	2.4	4.3	1.0
		Barium, Total	64.1	59.3	7.8	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	18.2	16.3	11.0	1.0
		Lead, Total	3.5	3.7	5.6	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/27/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9904L698

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	99L0230-LC1	Silver, LCS	49.1	50.0	MG/KG	98.2
		Arsenic, LCS	961	1000	MG/KG	96.1
		Barium, LCS	490	500	MG/KG	98.0
		Cadmium, LCS	24.1	25.0	MG/KG	96.4
		Chromium, LCS	49.4	50.0	MG/KG	98.8
		Lead, LCS	241	250	MG/KG	96.4

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-004

DATE RECEIVED: 04/15/99

RFW LOT # :9904L698

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
---------------------	-------	-----	--------	------------	-----------	----------

B0V6R8

SILVER, TOTAL	001	S	99L0230	04/12/99	04/22/99	04/24/99
SILVER, TOTAL	001 REP	S	99L0230	04/12/99	04/22/99	04/24/99
SILVER, TOTAL	001 MS	S	99L0230	04/12/99	04/22/99	04/24/99
ARSENIC, TOTAL	001	S	99L0230	04/12/99	04/22/99	04/24/99
ARSENIC, TOTAL	001 REP	S	99L0230	04/12/99	04/22/99	04/24/99
ARSENIC, TOTAL	001 MS	S	99L0230	04/12/99	04/22/99	04/24/99
BARIUM, TOTAL	001	S	99L0230	04/12/99	04/22/99	04/24/99
BARIUM, TOTAL	001 REP	S	99L0230	04/12/99	04/22/99	04/24/99
BARIUM, TOTAL	001 MS	S	99L0230	04/12/99	04/22/99	04/24/99
CADMIUM, TOTAL	001	S	99L0230	04/12/99	04/22/99	04/24/99
CADMIUM, TOTAL	001 REP	S	99L0230	04/12/99	04/22/99	04/24/99
CADMIUM, TOTAL	001 MS	S	99L0230	04/12/99	04/22/99	04/24/99
CHROMIUM, TOTAL	001	S	99L0230	04/12/99	04/22/99	04/24/99
CHROMIUM, TOTAL	001 REP	S	99L0230	04/12/99	04/22/99	04/24/99
CHROMIUM, TOTAL	001 MS	S	99L0230	04/12/99	04/22/99	04/24/99
LEAD, TOTAL	001	S	99L0230	04/12/99	04/22/99	04/24/99
LEAD, TOTAL	001 REP	S	99L0230	04/12/99	04/22/99	04/24/99
LEAD, TOTAL	001 MS	S	99L0230	04/12/99	04/22/99	04/24/99

B0V6R9

SILVER, TOTAL	002	S	99L0230	04/12/99	04/22/99	04/24/99
ARSENIC, TOTAL	002	S	99L0230	04/12/99	04/22/99	04/24/99
BARIUM, TOTAL	002	S	99L0230	04/12/99	04/22/99	04/24/99
CADMIUM, TOTAL	002	S	99L0230	04/12/99	04/22/99	04/24/99
CHROMIUM, TOTAL	002	S	99L0230	04/12/99	04/22/99	04/24/99
LEAD, TOTAL	002	S	99L0230	04/12/99	04/22/99	04/24/99

B0V6T0

SILVER, TOTAL	003	S	99L0230	04/12/99	04/22/99	04/24/99
ARSENIC, TOTAL	003	S	99L0230	04/12/99	04/22/99	04/24/99
BARIUM, TOTAL	003	S	99L0230	04/12/99	04/22/99	04/24/99
CADMIUM, TOTAL	003	S	99L0230	04/12/99	04/22/99	04/24/99
CHROMIUM, TOTAL	003	S	99L0230	04/12/99	04/22/99	04/24/99

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-004

DATE RECEIVED: 04/15/99

RFW LOT # :9904L698

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	003	S	99L0230	04/12/99	04/22/99	04/24/99
B0V6T1						
SILVER, TOTAL	004	S	99L0230	04/12/99	04/22/99	04/24/99
ARSENIC, TOTAL	004	S	99L0230	04/12/99	04/22/99	04/24/99
BARIUM, TOTAL	004	S	99L0230	04/12/99	04/22/99	04/24/99
CADMIUM, TOTAL	004	S	99L0230	04/12/99	04/22/99	04/24/99
CHROMIUM, TOTAL	004	S	99L0230	04/12/99	04/22/99	04/24/99
LEAD, TOTAL	004	S	99L0230	04/12/99	04/22/99	04/24/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0230	N/A	04/22/99	04/24/99
SILVER, TOTAL	MB1	S	99L0230	N/A	04/22/99	04/24/99
ARSENIC LABORATORY	LC1 BS	S	99L0230	N/A	04/22/99	04/24/99
ARSENIC, TOTAL	MB1	S	99L0230	N/A	04/22/99	04/24/99
BARIUM LABORATORY	LC1 BS	S	99L0230	N/A	04/22/99	04/24/99
BARIUM, TOTAL	MB1	S	99L0230	N/A	04/22/99	04/24/99
CADMIUM LABORATORY	LC1 BS	S	99L0230	N/A	04/22/99	04/24/99
CADMIUM, TOTAL	MB1	S	99L0230	N/A	04/22/99	04/24/99
CHROMIUM LABORATORY	LC1 BS	S	99L0230	N/A	04/22/99	04/24/99
CHROMIUM, TOTAL	MB1	S	99L0230	N/A	04/22/99	04/24/99
LEAD LABORATORY	LC1 BS	S	99L0230	N/A	04/22/99	04/24/99
LEAD, TOTAL	MB1	S	99L0230	N/A	04/22/99	04/24/99

Collector Jacques/Stankovich	Company Contact Duane Jacques	Telephone No. (509) 531-0634	Project Coordinator TRENT, SJ	Price Code	Data Turnaround
Project Designation 100 D Areas - Quick Turn	Sampling Location Pipeline Overburden	SAF No. B99-004	7 days		
Ice Chest No.	Field Logbook No. EL-1339-5	Method of Shipment Fed Ex			
Shipped To TMA/RECRA 8/16/99	Offsite Property No. NA	Bill of Lading/Air Bill No. NA			
COA					

POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive & PCB	Preservation	None	Cool 4C	Cool 4C	None	None	None	None	None	None	None
	Type of Container	P	aG	aG	aG	aG	aG	aG	aG	P	
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	1	1	
	Volume	20mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL	500mL	

SAMPLE ANALYSIS				Activity Scan	Chromium Hex - 7196	PCBs - 8080	See item (1) in Special Instructions	Isotopic Plutonium	Isotopic Uranium [Uranium-238]	Nickel-63	Strontium-89,90 -- Total Sr	See item (2) in Special Instructions
Sample No.	Matrix *	Sample Date	Sample Time									
B0V6R8	Soil	4-12-99	1009		X	X	X					
B0V6R9	Soil	4-12-99	1012		X	X	X					
B0V6T0	Soil	4-12-99	1015		X	X	X					
B0V6T1	Soil	4-12-99	1024		X	X	X					

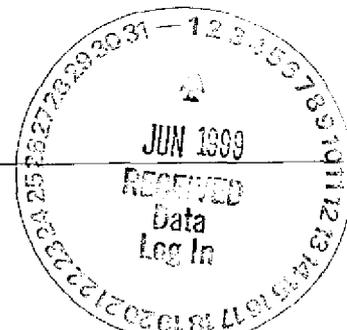
CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS COA R100DC 2F00				Matrix * Soil Water Vapor Other Solid Other Liquid
	Relinquished By <i>Stankovich</i>	Date/Time 4-12-99 1525	Received By <i>R.F.G.</i>	Date/Time 4-12-99 1525	(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Silver)		
	Relinquished By <i>Defg 10</i>	Date/Time 4-14-99 10920	Received By <i>Boysen</i>	Date/Time 4-14-99 0830	(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)		
	Relinquished By <i>Boysen</i>	Date/Time 4-14-99 11200	Received By <i>Fed Ex</i>	Date/Time	3°C		

LABORATORY SECTION	Received By <i>J. Miller</i>	Title <i>Unit Reader</i>	Date/Time 4/15/99 0830
DISPOSED SECTION	Disposal Method	Disposed By	Date/Time



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-004
RFW#: 9904L698
SDG/SAF#: H0384/B99-004

W.O.#: 10985--001-001-9999-00
Date Received: 04-15-99

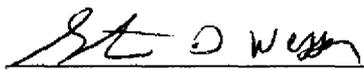
PCB

The set of samples consisted of four (4) soil samples collected on 04-12-99.

The samples and their associated QC samples were extracted on 04-16-99 and analyzed based on SW846, 3rd Edition on 04-20,21-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8081.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.


 J. Michael Taylor
 Vice President
 Philadelphia Analytical Laboratory
 pef\r\group\data\pest\04L-698.pes

04-28-99
 Date

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 6 pages.

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

- U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I** = Interference.

ABBREVIATIONS

- BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** = Indicates blank spike duplicate.
- MS** = Indicates matrix spike.
- MSD** = Indicates matrix spike duplicate.
- DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA** = Not Applicable.
- DF** = Dilution Factor.
- NR** = Not Required.
- SP** = Indicates Spiked Compound.



GLOSSARY OF PESTICIDE/PCB DATA

- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C** = This flag applies to a compound that has been confirmed by GC/MS.



Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 04/21/99 11:38

RFW Batch Number: 9904L698

Client: TNU-HANFORD B99-004

Work Order: 10985001001 Page: 1

Cust ID:		B0V6R8	B0V6R8	B0V6R8	B0V6R9	B0V6T0	B0V6T1	04
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004	
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	
Surrogate:	Tetrachloro-m-xylene	75 %	72 %	102 %	72 %	88 %	78 %	
	Decachlorobiphenyl	79 %	77 %	119 %	70 %	95 %	75 %	
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====								
Aroclor-1016		34 U	34 U	43 U	34 U	34 U	34 U	
Aroclor-1221		68 U	68 U	86 U	68 U	68 U	68 U	
Aroclor-1232		34 U	34 U	43 U	34 U	34 U	34 U	
Aroclor-1242		34 U	34 U	43 U	34 U	34 U	34 U	
Aroclor-1248		34 U	34 U	43 U	34 U	34 U	34 U	
Aroclor-1254		34 U	75 %	106 %	34 U	34 U	34 U	
Aroclor-1260		34 U	34 U	43 U	34 U	34 U	34 U	

Cust ID:		PBLKIB	PBLKIB BS
Sample Information	RFW#:	99LE0457-MB1	99LE0457-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	48 %	82 %
	Decachlorobiphenyl	53 %	84 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====			
Aroclor-1016		33 U	33 U
Aroclor-1221		67 U	67 U
Aroclor-1232		33 U	33 U
Aroclor-1242		33 U	33 U
Aroclor-1248		33 U	33 U
Aroclor-1254		33 U	70 %
Aroclor-1260		33 U	33 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. % = Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Handwritten signature/initials

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-004

DATE RECEIVED: 04/15/99

RFW LOT # :9904L698

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOV6R8	001	S	99LE0457	04/12/99	04/16/99	04/20/99
BOV6R8	001 MS	S	99LE0457	04/12/99	04/16/99	04/21/99
BOV6R8	001 MSD	S	99LE0457	04/12/99	04/16/99	04/21/99
BOV6R9	002	S	99LE0457	04/12/99	04/16/99	04/21/99
BOV6T0	003	S	99LE0457	04/12/99	04/16/99	04/21/99
BOV6T1	004	S	99LE0457	04/12/99	04/16/99	04/21/99

LAB QC:

PBLKIB	MB1	S	99LE0457	N/A	04/16/99	04/21/99
PBLKIB	MB1 BS	S	99LE0457	N/A	04/16/99	04/21/99

BSR 4/20/99

05
4/21/99

Thermo NUTech

2030 Wright Avenue

P.O. Box 4040

Richmond, CA 94804-0040

TEL (510) 235-2033 • FAX (510) 235-0438

April 27, 1999

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

Reference: P.O. #TRB-SBB-207925
Thermo Nutech N9-04-087-7715, SDG H0384



Dear Ms. Kessner:

Enclosed is the data report for a four solid samples designated under SAF No. B99-004 received at Thermo Nutech on April 15, 1999. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

A handwritten signature in cursive script that reads "Terrie A. Higgins".

Terrie A. Higgins
Program Manager

TAH/kcj

Enclosure: Data Package

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0384 is comprised of four solid (soil) samples designated under SAF No. B99-004 with a Project Designation of: 100 D Areas - Quick Turn.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. There was a quick turn-around time requirement for gamma spec, isotopic plutonium, and total strontium. The data for isotopic uranium and isotopic plutonium was reported by fax on April 21, 1999; gamma spec and total strontium on April 22, 1999; and nickel-63 on April 27, 1999.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses

No problems were encountered during the processing of the samples.

2.3 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.4 Isotopic Plutonium Analyses

No problems were encountered during the processing of the samples.

2.6 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

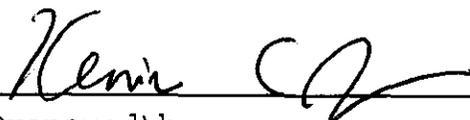
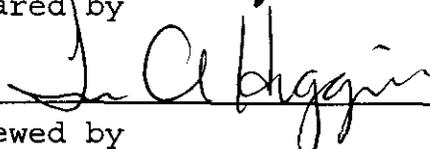
T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0384

SDG 7715
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

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

T A B L E O F C O N T E N T S	
About this section	1
Sample Summaries	3
Prep Batch Summary	5
Work Summary	6
Method Blanks	8
Lab Control Samples	9
Duplicates	10
Data Sheets	11
Method Summaries	15
Report Guides	20
End of Section	34


Prepared by _____

Reviewed by _____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 05/06/99

SDG 7715
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/06/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

SDG 7715
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0384

SAMPLE SUMMARY

SDG 7715
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF	
				SAMPLE ID	SAF NO	CUSTODY	COLLECTED
B0V6R8	Pipeline Overburden	SOLID		N904087-01	B99-004	B99-004-065	04/12/99 10:09
B0V6R9	Pipeline Overburden	SOLID		N904087-02	B99-004	B99-004-065	04/12/99 10:12
B0V6T0	Pipeline Overburden	SOLID		N904087-03	B99-004	B99-004-065	04/12/99 10:15
B0V6T1	Pipeline Overburden	SOLID		N904087-04	B99-004	B99-004-065	04/12/99 10:24
Method Blank		SOLID		N904087-06	B99-004		
Lab Control Sample		SOLID		N904087-05	B99-004		
Duplicate (N904087-01)	Pipeline Overburden	SOLID		N904087-07	B99-004		04/12/99 10:09

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 05/06/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0384

QC SUMMARY

SDG 7715
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0384

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7715	B99-004-065	B0V6R8	SOLID	97.6			04/15/99	3	N904087-01	7715-001
		B0V6R9	SOLID	97.3			04/15/99	3	N904087-02	7715-002
		B0V6T0	SOLID	98.1			04/15/99	3	N904087-03	7715-003
		B0V6T1	SOLID	97.2			04/15/99	3	N904087-04	7715-004
		Method Blank	SOLID						N904087-06	7715-006
		Lab Control Sample	SOLID						N904087-05	7715-005
		Duplicate (N904087-01)	SOLID	97.6			04/15/99	3	N904087-07	7715-007

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 05/06/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0384

SDG 7715
 Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0384

TEST MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALI- FIERS
		BATCH	2σ %	CLIENT MORE	RE BLANK	LCS	DUP/ORIG MS/ORIG	
Alpha Spectroscopy								
PU SOLID	Plutonium, Isotopic in Solids	2851-062	5.0	4	1	1	1/1	
U SOLID	Uranium, Isotopic in Soil	2851-062	5.0	4	1	1	1/1	
Beta Counting								
SR SOLID	Total Strontium in Soil	2851-062	10.0	4	1	1	1/1	
Gamma Spectroscopy								
GAM SOLID	Gamma Scan	2851-062	15.0	4	1	1	1/1	
Liquid Scintillation Counting								
NI_L SOLID	Nickel 63 in Soil	2851-062	10.0	4	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 05/06/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0384

WORK SUMMARY

SDG 7715
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

CLIENT SAMPLE ID		LAB SAMPLE ID			SUF-				
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
CUSTODY	SAF No	RECEIVED							
B0V6R8		N904087-01	7715-001	GAM		04/20/99	04/22/99	TAH	Gamma Scan
Pipeline Overburden	SOLID	04/12/99	7715-001	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil
B99-004-065	B99-004	04/15/99	7715-001	PU		04/20/99	04/21/99	TAH	Plutonium, Isotopic in Solids
			7715-001	SR		04/22/99	04/22/99	TAH	Total Strontium in Soil
			7715-001	U		04/20/99	04/21/99	TAH	Uranium, Isotopic in Soil
B0V6R9		N904087-02	7715-002	GAM		04/21/99	04/22/99	TAH	Gamma Scan
Pipeline Overburden	SOLID	04/12/99	7715-002	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil
B99-004-065	B99-004	04/15/99	7715-002	PU		04/20/99	04/21/99	TAH	Plutonium, Isotopic in Solids
			7715-002	SR		04/22/99	04/22/99	TAH	Total Strontium in Soil
			7715-002	U		04/20/99	04/21/99	TAH	Uranium, Isotopic in Soil
B0V6T0		N904087-03	7715-003	GAM		04/21/99	04/22/99	TAH	Gamma Scan
Pipeline Overburden	SOLID	04/12/99	7715-003	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil
B99-004-065	B99-004	04/15/99	7715-003	PU		04/20/99	04/21/99	TAH	Plutonium, Isotopic in Solids
			7715-003	SR		04/22/99	04/22/99	TAH	Total Strontium in Soil
			7715-003	U		04/20/99	04/21/99	TAH	Uranium, Isotopic in Soil
B0V6T1		N904087-04	7715-004	GAM		04/21/99	04/22/99	TAH	Gamma Scan
Pipeline Overburden	SOLID	04/12/99	7715-004	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil
B99-004-065	B99-004	04/15/99	7715-004	PU		04/20/99	04/21/99	TAH	Plutonium, Isotopic in Solids
			7715-004	SR		04/22/99	04/22/99	TAH	Total Strontium in Soil
			7715-004	U		04/20/99	04/21/99	TAH	Uranium, Isotopic in Soil
Method Blank		N904087-06	7715-006	GAM		04/21/99	04/22/99	TAH	Gamma Scan
	SOLID		7715-006	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil
	B99-004		7715-006	PU		04/20/99	04/21/99	TAH	Plutonium, Isotopic in Solids
			7715-006	SR		04/22/99	04/22/99	TAH	Total Strontium in Soil
			7715-006	U		04/20/99	04/21/99	TAH	Uranium, Isotopic in Soil
Lab Control Sample		N904087-05	7715-005	GAM		04/21/99	04/22/99	TAH	Gamma Scan
	SOLID		7715-005	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil
	B99-004		7715-005	PU		04/20/99	04/21/99	TAH	Plutonium, Isotopic in Solids
			7715-005	SR		04/22/99	04/22/99	TAH	Total Strontium in Soil
			7715-005	U		04/20/99	04/21/99	TAH	Uranium, Isotopic in Soil

WORK SUMMARY

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Lab id TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0384

SDG 7715
 Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0384

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED		TEST	SUF-					
CUSTODY	SAF No	RECEIVED	PLANCHET		FIX	ANALYZED	REVIEWED	BY	METHOD	
Duplicate (N904087-01)		N904087-07	7715-007	GAM		04/21/99	04/22/99	TAH	Gamma Scan	
Pipeline Overburden	SOLID	04/12/99	7715-007	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil	
	B99-004	04/15/99	7715-007	PU		04/20/99	04/21/99	TAH	Plutonium, Isotopic in Solids	
			7715-007	SR		04/22/99	04/22/99	TAH	Total Strontium in Soil	
			7715-007	U		04/20/99	04/21/99	TAH	Uranium, Isotopic in Soil	

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
GAM	B99-004	Gamma Scan	GAMMAHI	4			1	1	1		7
NI_L	B99-004	Nickel 63 in Soil	NI63LSC	4			1	1	1		7
PU	B99-004	Plutonium, Isotopic in Solids	PUPLATE	4			1	1	1		7
SR	B99-004	Total Strontium in Soil		4			1	1	1		7
U	B99-004	Uranium, Isotopic in Soil	UPLATE	4			1	1	1		7
TOTALS				20			5	5	5		35

WORK SUMMARY

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Lab id TMANC
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

N904087-06

Method Blank

METHOD BLANK

SDG <u>7715</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0384</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904087-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7715-006</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-004</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0	0.025	0.097	0.30	U	U
Uranium 235	15117-96-1	0	0.031	0.12	0.30	U	U
Uranium 238	U-238	0	0.025	0.097	0.30	U	U
Plutonium 238	13981-16-3	0.022	0.13	<u>0.27</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.044	0.045	<u>0.21</u>	0.050	U	PU
Nickel 63	13981-37-8	0.055	1.3	2.2	20	U	NI_L
Total Strontium	SR-RAD	-0.050	0.14	0.26	1.0	U	SR
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Cesium 134	13967-70-9	U		0.023		U	GAM
Cesium 137	10045-97-3	U		0.018	0.050	U	GAM
Europium 152	14683-23-9	U		0.048	0.10	U	GAM
Europium 154	15585-10-1	U		0.054	0.10	U	GAM
Europium 155	14391-16-3	U		0.043	0.10	U	GAM
Americium 241	14596-10-2	U		0.055		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Uranium 235	15117-96-1	U		0.068		U	GAM

100 D Areas-Quick Turn

QC-BLANK 30529

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 05/06/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0384

N904087-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7715</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0384</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904087-05</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7715-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-004</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMIS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	5.34	0.79	<u>0.36</u>	0.30		U	4.95	0.20	108	74-126	80-120
Uranium 235	4.09	0.66	0.12	0.30		U	4.04	0.16	101	74-126	80-120
Uranium 238	4.89	0.74	<u>0.35</u>	0.30		U	5.10	0.20	96	76-124	80-120
Plutonium 238	6.24	0.68	<u>0.084</u>	0.050		PU	5.66	0.23	110	79-121	80-120
Plutonium 239/240	5.82	0.65	<u>0.084</u>	0.050		PU	5.29	0.21	110	79-121	80-120
Nickel 63	137	3.5	2.3	20		NI_L	134	5.4	102	83-117	
Total Strontium	25.0	0.87	0.29	1.0		SR	22.9	0.92	109	82-118	
Cobalt 60	0.370	0.051	0.028	0.050		GAM	0.356	0.014	104	68-132	80-120
Cesium 134	U		0.038		U	GAM					
Cesium 137	0.430	0.049	0.031	0.050		GAM	0.347	0.014	<u>124</u>	64-136	80-120
Europium 152	U		0.070	0.10	U	GAM					
Europium 154	U		0.073	0.10	U	GAM					
Europium 155	U		0.037	0.10	U	GAM					
Americium 241	U		0.019		U	GAM					
Uranium 238	U		4.8		U	GAM					
Uranium 235	U		0.066		U	GAM					

100 D Areas-Quick Turn

QC-LCS 30528

LAB CONTROL SAMPLES

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>05/06/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0384

N904087-07

B0V6R8

DUPLICATE

SDG <u>7715</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0384</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N904087-07</u>	Lab sample id <u>N904087-01</u>	Client sample id <u>B0V6R8</u>
Dept sample id <u>7715-007</u>	Dept sample id <u>7715-001</u>	Location/Matrix <u>Pipeline Overburden</u> <u>SOLID</u>
	Received <u>04/15/99</u>	Collected <u>04/12/99 10:09</u>
% solids <u>97.6</u>	% solids <u>97.6</u>	Custody/SAP No <u>B99-004-065</u> <u>B99-004</u>

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
Uranium 233/234	0.667	0.28	0.20	0.30		U	0.607	0.25	0.19		9	89	
Uranium 235	0	0.065	0.25	0.30	U	U	0.059	0.059	0.22	U	-		
Uranium 238	0.667	0.28	0.20	0.30		U	0.461	0.20	0.19		37	92	
Plutonium 238	-0.083	0.33	<u>0.79</u>	0.050	U	PU	0.077	0.31	<u>0.59</u>	U	-		
Plutonium 239/240	0	0.33	<u>0.79</u>	0.050	U	PU	0	0.15	<u>0.59</u>	U	-		
Nickel 63	38.8	2.4	2.6	20		NI_L	41.3	2.5	2.7		6	25	
Total Strontium	-0.950	1.5	<u>2.9</u>	1.0	U	SR	-0.374	1.6	<u>3.0</u>	U	-		
Potassium 40	11.0	0.61	0.33			GAM	11.7	1.1	0.60		6	36	
Cobalt 60	1.10	0.065	0.042	0.050		GAM	1.14	0.13	<u>0.095</u>		4	37	
Cesium 134	U		0.069		U	GAM	U		0.12	U	-		
Cesium 137	15.0	0.17	<u>0.072</u>	0.050		GAM	15.0	0.27	<u>0.13</u>		0	32	
Europium 152	7.00	0.18	<u>0.16</u>	0.10		GAM	7.03	0.36	<u>0.36</u>		0	33	
Europium 154	0.910	0.17	<u>0.17</u>	0.10		GAM	0.836	0.28	<u>0.28</u>		8	65	
Europium 155	U		<u>0.19</u>	0.10	U	GAM	U		<u>0.23</u>	U	-		
Radium 226	0.530	0.10	<u>0.12</u>	0.10		GAM	0.443	0.18	<u>0.21</u>		18	71	
Radium 228	0.600	0.20	<u>0.24</u>	0.20		GAM	0.579	0.41	<u>0.48</u>		4	120	
Thorium 228	0.660	0.064	0.089			GAM	0.806	0.11	0.15		20	41	
Thorium 232	0.600	0.20	0.24			GAM	0.579	0.41	0.48		4	120	
Americium 241	U		0.18		U	GAM	U		0.11	U	-		
Uranium 238	U		7.8		U	GAM	U		15	U	-		
Uranium 235	U		0.25		U	GAM	U		0.34	U	-		

100 D Areas-Quick Turn

QC-DUP#1 30533

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 05/06/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

N904087-01

B0V6R8

DATA SHEET

SDG <u>7715</u>	Client/Case no <u>Hanford</u>	SDG-H0384
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904087-01</u>	Client sample id <u>B0V6R8</u>	
Dept sample id <u>7715-001</u>	Location/Matrix <u>Pipeline Overburden</u>	<u>SOLID</u>
Received <u>04/15/99</u>	Collected <u>04/12/99 10:09</u>	
% solids <u>97.6</u>	Custody/SAF No <u>B99-004-065</u>	<u>B99-004</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.607	0.25	0.19	0.30		U
Uranium 235	15117-96-1	0.059	0.059	0.22	0.30	U	U
Uranium 238	U-238	0.461	0.20	0.19	0.30		U
Plutonium 238	13981-16-3	0.077	0.31	<u>0.59</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.15	<u>0.59</u>	0.050	U	PU
Nickel 63	13981-37-8	41.3	2.5	2.7	20		NI_L
Total Strontium	SR-RAD	-0.374	1.6	<u>3.0</u>	1.0	U	SR
Potassium 40	13966-00-2	11.7	1.1	0.60			GAM
Cobalt 60	10198-40-0	1.14	0.13	<u>0.095</u>	0.050		GAM
Cesium 134	13967-70-9	U		0.12		U	GAM
Cesium 137	10045-97-3	15.0	0.27	<u>0.13</u>	0.050		GAM
Europium 152	14683-23-9	7.03	0.36	<u>0.36</u>	0.10		GAM
Europium 154	15585-10-1	0.836	0.28	<u>0.28</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.23</u>	0.10	U	GAM
Radium 226	13982-63-3	0.443	0.18	<u>0.21</u>	0.10		GAM
Radium 228	15262-20-1	0.579	0.41	<u>0.48</u>	0.20		GAM
Thorium 228	14274-82-9	0.806	0.11	0.15			GAM
Thorium 232	TH-232	0.579	0.41	0.48			GAM
Americium 241	14596-10-2	U		0.11		U	GAM
Uranium 238	U-238	U		15		U	GAM
Uranium 235	15117-96-1	U		0.34		U	GAM

100 D Areas-Quick Turn

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
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Report date <u>05/06/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

N904087-02

BOV6R9

DATA SHEET

SDG <u>7715</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0384</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904087-02</u>	Client sample id <u>BOV6R9</u>	
Dept sample id <u>7715-002</u>	Location/Matrix <u>Pipeline Overburden</u>	<u>SOLID</u>
Received <u>04/15/99</u>	Collected <u>04/12/99 10:12</u>	
% solids <u>97.3</u>	Custody/SAF No <u>B99-004-065</u>	<u>B99-004</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.556	0.26	0.19	0.30		U
Uranium 235	15117-96-1	0.031	0.061	0.23	0.30	U	U
Uranium 238	U-238	0.379	0.21	0.19	0.30		U
Plutonium 238	13981-16-3	-0.071	0.14	<u>0.54</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	0.142	0.14	<u>0.54</u>	0.050	U	PU
Nickel 63	13981-37-8	14.4	2.0	2.8	20	J	NI_L
Total Strontium	SR-RAD	-0.566	1.6	<u>3.1</u>	1.0	U	SR
Potassium 40	13966-00-2	10.8	0.48	0.27			GAM
Cobalt 60	10198-40-0	0.563	0.045	0.034	0.050		GAM
Cesium 134	13967-70-9	U		0.070		U	GAM
Cesium 137	10045-97-3	4.96	0.082	<u>0.056</u>	0.050		GAM
Europium 152	14683-23-9	5.47	0.11	0.10	0.10		GAM
Europium 154	15585-10-1	0.615	0.13	<u>0.13</u>	0.10		GAM
Europium 155	14391-16-3	U		0.087	0.10	U	GAM
Radium 226	13982-63-3	0.443	0.072	0.081	0.10		GAM
Radium 228	15262-20-1	0.580	0.14	0.16	0.20		GAM
Thorium 228	14274-82-9	0.619	0.040	0.050			GAM
Thorium 232	TH-232	0.580	0.14	0.16			GAM
Americium 241	14596-10-2	U		0.042		U	GAM
Uranium 238	U-238	U		5.9		U	GAM
Uranium 235	15117-96-1	U		0.12		U	GAM

100 D Areas-Quick Turn

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/06/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

N904087-03

BOV6T0

DATA SHEET

SDG <u>7715</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0384</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904087-03</u>	Client sample id <u>BOV6T0</u>	
Dept sample id <u>7715-003</u>	Location/Matrix <u>Pipeline Overburden</u>	<u>SOLID</u>
Received <u>04/15/99</u>	Collected <u>04/12/99 10:15</u>	
% solids <u>98.1</u>	Custody/SAF No <u>B99-004-065</u>	<u>B99-004</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.642	0.26	0.20	0.30		U
Uranium 235	15117-96-1	0.031	0.062	0.24	0.30	U	U
Uranium 238	U-238	0.436	0.21	0.20	0.30		U
Plutonium 238	13981-16-3	0	0.15	<u>0.57</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	0.074	0.15	<u>0.57</u>	0.050	U	PU
Nickel 63	13981-37-8	0.480	1.7	2.9	20	U	NI_L
Total Strontium	SR-RAD	-0.541	1.5	<u>2.9</u>	1.0	U	SR
Potassium 40	13966-00-2	12.1	0.50	0.24			GAM
Cobalt 60	10198-40-0	0.036	0.026	0.027	0.050	J	GAM
Cesium 134	13967-70-9	U		0.030		U	GAM
Cesium 137	10045-97-3	0.074	0.022	0.027	0.050		GAM
Europium 152	14683-23-9	0.124	0.032	0.048	0.10		GAM
Europium 154	15585-10-1	U		0.082	0.10	U	GAM
Europium 155	14391-16-3	U		0.061	0.10	U	GAM
Radium 226	13982-63-3	0.491	0.045	0.047	0.10		GAM
Radium 228	15262-20-1	0.736	0.093	0.097	0.20		GAM
Thorium 228	14274-82-9	0.794	0.042	0.042			GAM
Thorium 232	TH-232	0.736	0.093	0.097			GAM
Americium 241	14596-10-2	U		0.089		U	GAM
Uranium 238	U-238	U		3.0		U	GAM
Uranium 235	15117-96-1	U		0.098		U	GAM

100 D Areas-Quick Turn

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/06/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

N904087-04

BOV6T1

DATA SHEET

SDG <u>7715</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0384</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904087-04</u>	Client sample id <u>BOV6T1</u>	
Dept sample id <u>7715-004</u>	Location/Matrix <u>Pipeline Overburden</u>	<u>SOLID</u>
Received <u>04/15/99</u>	Collected <u>04/12/99 10:24</u>	
% solids <u>97.2</u>	Custody/SAF No <u>B99-004-065</u>	<u>B99-004</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.776	0.27	0.20	0.30		U
Uranium 235	15117-96-1	0.094	0.13	0.24	0.30	U	U
Uranium 238	U-238	0.518	0.21	0.20	0.30		U
Plutonium 238	13981-16-3	0.443	0.36	<u>0.68</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	4.52	1.3	<u>0.68</u>	0.050		PU
Nickel 63	13981-37-8	1140	23	6.4	20		NI_L
Total Strontium	SR-RAD	1.42	2.1	<u>3.3</u>	1.0	U	SR
Potassium 40	13966-00-2	25.6	1.1	1.5			GAM
Cobalt 60	10198-40-0	29.6	0.25	<u>0.15</u>	0.050		GAM
Cesium 134	13967-70-9	U		0.29		U	GAM
Cesium 137	10045-97-3	161	0.40	<u>0.21</u>	0.050		GAM
Europium 152	14683-23-9	283	1.0	<u>0.79</u>	0.10		GAM
Europium 154	15585-10-1	36.9	0.62	<u>0.53</u>	0.10		GAM
Europium 155	14391-16-3	1.34	0.53	<u>0.78</u>	0.10		GAM
Radium 226	13982-63-3	0.587	0.24	<u>0.35</u>	0.10		GAM
Thorium 228	14274-82-9	0.583	0.13	0.24			GAM
Americium 241	14596-10-2	U		0.59		U	GAM
Uranium 238	U-238	U		34		U	GAM
Uranium 235	15117-96-1	U		0.86		U	GAM

100 D Areas-Quick Turn

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/06/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0384

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Test PU Matrix SOLID

SDG 7715

Contact L.A. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0384

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 2851-062					
B0V6R8	N904087-01		7715-001	0.077 U	U
B0V6R9	N904087-02		7715-002	U	0.142 U
B0V6T0	N904087-03		7715-003	U	0.074 U
B0V6T1	N904087-04		7715-004	0.443 U	4.52
BLK (QC ID=30529)	N904087-06		7715-006	U	U
LCS (QC ID=30528)	N904087-05		7715-005	ok	ok
Duplicate (N904087-01)	N904087-07		7715-007	- U	- U

Nominal values and limits from method RDLs (pCi/g) 0.050 0.050
100 D Areas-Quick Turn

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2851-062 2σ prep error 5.0 % Reference Lab Notebook #2851 pg. 062															
B0V6R8	N904087-01		0.59	0.100			76		203			8	04/20/99	04/20	SS-005
B0V6R9	N904087-02		0.54	0.100			84		203			8	04/20/99	04/20	SS-007
B0V6T0	N904087-03		0.57	0.100			79		203			8	04/20/99	04/20	SS-008
B0V6T1	N904087-04		0.68	0.100			67		203			8	04/20/99	04/20	SS-011
BLK (QC ID=30529)	N904087-06		0.27	1.00			26		200				04/20/99	04/20	SS-039
LCS (QC ID=30528)	N904087-05		0.084	1.00			52		203				04/20/99	04/20	SS-013
Duplicate (N904087-01)	N904087-07		0.79	0.100			70		200			8	04/20/99	04/20	SS-041
(QC ID=30533)															

Nominal values and limits from method 0.050 1.00 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 0.50 ± 0.49
FOR 7 SAMPLES YIELD 65 ± 40

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/06/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0384

METHOD SUMMARY
URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7715
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX PLANCHET	1: Uranium			2: Uranium			3: Uranium			RESULT RATIOS (%)				
			233/234	235	238	1+3	2σ	2+3	2σ							
Preparation batch 2851-062																
B0V6R8	N904087-01	7715-001	0.607	U	0.461	132	79	13	14							
B0V6R9	N904087-02	7715-002	0.556	U	0.379	147	106	8	17							
B0V6T0	N904087-03	7715-003	0.642	U	0.436	147	93	7	15							
B0V6T1	N904087-04	7715-004	0.776	U	0.518	150	80	18	26							
BLK (QC ID=30529)	N904087-06	7715-006	U	U	U											
LCS (QC ID=30528)	N904087-05	7715-005	ok	ok	ok											
Duplicate (N904087-01)	N904087-07	7715-007	ok	- U	ok	100	59	0	10							
Nominal values and limits from method			RDLS (pCi/g)	0.30	0.30	0.30	100	4								
100 D Areas-Quick Turn						Averages 135	9									

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL-		
													PREPARED	YZED	DETECTOR
Preparation batch 2851-062													2σ prep error 5.0 %	Reference Lab	Notebook #2851 pg. 062
B0V6R8	N904087-01		0.22	0.500			87	108				8	04/20/99	04/20	SS-044
B0V6R9	N904087-02		0.23	0.500			82	108				8	04/20/99	04/20	SS-045
B0V6T0	N904087-03		0.24	0.500			85	104				8	04/20/99	04/20	SS-055
B0V6T1	N904087-04		0.24	0.500			84	104				8	04/20/99	04/20	SS-056
BLK (QC ID=30529)	N904087-06		0.12	1.00			90	102					04/20/99	04/20	SS-059
LCS (QC ID=30528)	N904087-05		0.36	1.00			84	104					04/20/99	04/20	SS-058
Duplicate (N904087-01)	N904087-07		0.25	0.500			82	102				8	04/20/99	04/20	SS-060
(QC ID=30533)															
Nominal values and limits from method			0.30	1.00			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	0.24 ± 0.14
FOR 7 SAMPLES	YIELD	85 ± 6

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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Lab id TMAC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/06/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0384

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0384

Test SR Matrix SOLID
 SDG 7715
 Contact L.A. Johnson

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
 BETA COUNTING

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 2851-062					
BOV6R8	N904087-01			7715-001	U
BOV6R9	N904087-02			7715-002	U
BOV6T0	N904087-03			7715-003	U
BOV6T1	N904087-04			7715-004	1.42 U
BLK (QC ID=30529)	N904087-06			7715-006	U
LCS (QC ID=30528)	N904087-05			7715-005	ok
Duplicate (N904087-01)	N904087-07			7715-007	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
 100 D Areas-Quick Turn

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	ANAL- YZED	DETECTOR
Preparation batch 2851-062 2σ prep error 10.0 % Reference Lab Notebook #2851 pg. 062															
BOV6R8	N904087-01			<u>3.0</u>	<u>0.100</u>			72		150			10	04/21/99	04/22 GRB-230
BOV6R9	N904087-02			<u>3.1</u>	<u>0.100</u>			73		150			10	04/21/99	04/22 GRB-231
BOV6T0	N904087-03			<u>2.9</u>	<u>0.100</u>			79		150			10	04/21/99	04/22 GRB-232
BOV6T1	N904087-04			<u>3.3</u>	<u>0.100</u>			68		200			10	04/21/99	04/22 GRB-201
BLK (QC ID=30529)	N904087-06			0.26	1.00			81		200				04/21/99	04/22 GRB-202
LCS (QC ID=30528)	N904087-05			0.29	1.00			81		150				04/21/99	04/22 GRB-229
Duplicate (N904087-01)	N904087-07			<u>2.9</u>	<u>0.100</u>			70		200			10	04/21/99	04/22 GRB-203
(QC ID=30530)															

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 MDA 2.2 ± 2.7
 FOR 7 SAMPLES YIELD 75 ± 11

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 05/06/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0384

METHOD SUMMARY
GAMMA SCAN
GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
SDG 7715
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2851-062					
B0V6R8	N904087-01		7715-001	1.14	15.0
B0V6R9	N904087-02		7715-002	0.563	4.96
B0V6T0	N904087-03		7715-003	0.036 J	0.074
B0V6T1	N904087-04		7715-004	29.6	161
BLK (QC ID=30529)	N904087-06		7715-006	U	U
LCS (QC ID=30528)	N904087-05		7715-005	ok	<u>HIGH</u>
Duplicate (N904087-01)	N904087-07		7715-007	ok	ok
Nominal values and limits from method					
100 D Areas-Quick Turn			RDLs (pCi/g)	0.050	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2851-062 2σ prep error 15.0 % Reference Lab Notebook #2851 pg. 062																
B0V6R8	N904087-01		<u>0.13</u>	762						100			8	04/16/99	04/20	02,01,00
B0V6R9	N904087-02		<u>0.056</u>	830						446			9	04/16/99	04/21	02,01,00
B0V6T0	N904087-03		<u>0.027</u>	<u>730</u>						446			9	04/16/99	04/21	02,03,00
B0V6T1	N904087-04		<u>0.21</u>	770						180			9	04/16/99	04/21	02,04,00
BLK (QC ID=30529)	N904087-06		0.018	750						128				04/16/99	04/21	01,03,00
LCS (QC ID=30528)	N904087-05		0.031	750						127				04/16/99	04/21	01,01,00
Duplicate (N904087-01)	N904087-07		<u>0.072</u>	762						108			9	04/16/99	04/21	02,04,00
(QC ID=30530)																
Nominal values and limits from method																
			0.050	750				100			180					

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

AVERAGES ± 2 SD	MDA	<u>0.078</u> ± <u>0.14</u>
FOR 7 SAMPLES	YIELD	_____ ± _____

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id	<u>TMANC</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-CMS</u>
Version	<u>3.06</u>
Report date	<u>05/06/99</u>

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0384

METHOD SUMMARY
 NICKEL 63 IN SOIL
 LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
 SDG 7715
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0384

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- PLANCHET	Nickel 63
Preparation batch 2851-062				
BOV6R8	N904087-01		7715-001	41.3
BOV6R9	N904087-02		7715-002	14.4 J
BOV6T0	N904087-03		7715-003	U
BOV6T1	N904087-04		7715-004	1140
BLK (QC ID=30529)	N904087-06		7715-006	U
LCS (QC ID=30528)	N904087-05		7715-005	ok
Duplicate (N904087-01)	N904087-07		7715-007	ok
Nominal values and limits from method				
100 D Areas-Quick Turn			RDLs (pCi/g)	20

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 2851-062 2σ prep error 10.0 % Reference Lab Notebook #2851 pg. 062																
BOV6R8	N904087-01		2.7	0.500						100			12	04/23/99	04/24	LSC-004
BOV6R9	N904087-02		2.8	0.500						100			12	04/23/99	04/24	LSC-004
BOV6T0	N904087-03		2.9	0.500						100			12	04/23/99	04/24	LSC-004
BOV6T1	N904087-04		6.4	0.500						19			12	04/23/99	04/24	LSC-004
BLK (QC ID=30529)	N904087-06		2.2	0.500						100				04/23/99	04/24	LSC-004
LCS (QC ID=30528)	N904087-05		2.3	0.500						100				04/23/99	04/24	LSC-004
Duplicate (N904087-01)	N904087-07		2.6	0.500						100			12	04/23/99	04/24	LSC-004
(QC ID=30533)																
Nominal values and limits from method			20	0.500						10			180			

PROCEDURES	REFERENCE	NI63LSC
	EP-060	Soil Preparation, rev 0
	EP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD	MDA	3.1	±	2.9
FOR 7 SAMPLES	YIELD		±	

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

SDG 7715
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

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.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

SDG 7715
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/06/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

SDG 7715
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

WORK SUMMARY

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

The following notes apply to this report:

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

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/06/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0384

SDG 7715
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0384

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.

Client Hanford
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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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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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DUPLICATE

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

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

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

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

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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

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

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

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

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

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

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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.

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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-004-065		Page 1 of 1			
Collector Jacques/Stankovich		Company Contact Duane Jacques		Telephone No. (509) 531-0634		Project Coordinator TRENT, SJ		Price Code		Data Turnaround	
Project Designation 100 D Areas - Quick Turn		Sampling Location Pipeline Overburden		SAF No. B99-004						7 days	
Ice Chest No.		Field Logbook No. EL-1339-5		Method of Shipment							
Shipped To TMA/REGRA 5-20-99		Offsite Property No. NA		Bill of Lading/Air Bill No. NA							
COA											

POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive & PCB	Preservation	None	Cool 4C	Cool 4C	None						
	Type of Container	P	aG	aG	aG	aG	aG	aG	aG	aG	P
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage	Volume	20mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL	500mL

SAMPLE ANALYSIS				Activity Scan	Chromium Hex - 7196	PCBs - 8080	See item (1) in Special Instructions	Isotopic Plutonium	Isotopic Uranium {Uranium-238}	Nickel-63	Strontium-89,90 -- Total Sr	See item (2) in Special Instructions
Sample No.	Matrix *	Sample Date	Sample Time									
✓ B0V6R8	Soil	4-12-99	1009	✓				✓	✓	✓	✓	✓
✓ B0V6R9	Soil	4-12-99	1012	✓				✓	✓	✓	✓	✓
✓ B0V6T0	Soil	4-12-99	1015	✓				✓	✓	✓	✓	✓
2 B0V6T1	Soil	4-12-99	1024	✓				✓	✓	✓	✓	✓

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS COA R100DC 2F00				Matrix *	
Relinquished By: <i>Stankovich</i> Date/Time: 1525 4-12-99		Received By: <i>Rafes</i> #1-BD3°C 4-12-99 Date/Time: 1525		(1) ICP Metals - 6010A (Supertrace) ; Arsenic, Barium, Cadmium, Chromium, Lead, Silver; (2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-238} 3°C				Soil Water Vapor Other Solid Other Liquid	
Relinquished By: <i>Rafes</i> Date/Time: 4-14-99/0930		Received By: <i>Doeg Bonors</i> Date/Time: 4-14-99/0930							
Relinquished By: <i>Doeg Bonors</i> Date/Time: 4-14-99/1100		Received By: <i>Frank Ex</i> Date/Time: 4-14-99							
Relinquished By: <i>Frank Ex</i> Date/Time: 4-15-99 11:02		Received By: <i>Doeg Bonors</i> Date/Time: 4-15-99 11:02							
LABORATORY SECTION	Received By	Title						Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time	

SHIPPING INST.: **SHIP TO:** Therma Retec
Company: 3030 Wright Avenue
Address: Richmond, Ca 94804-0040
City, State, Zip: Richmond, Ca 94804-0040
Attention: Larry Johnson (510) 235-2633

HAZARDOUS MATERIAL SHIPMENT RECORD (HMSR)

Originating Facility: Building 3728 Area 300
Originator Signature: [Signature] **Date:** 4-14-99
FROM: WHC KEH PNL OTHER BHE
OFFSITE ONLY: SHIP: PREPAID COLLECT
VIA: Parcel Post Air Parcel Post Freight (Rail/Truck)
 Air (Passenger) Air (Cargo) **Cost Code:** R100 DC 2 F00

CONTAINERS/PACKAGING						CONTENT DESCRIPTION
Number of Containers	Type	DOT Spec	Package Dimensions	Quantity Pkg	Gross Wt Each Pkg	See 49 CFR 172.101(c) Hazardous Material Table
1	Metal can inner, steel drum outer	IP3	11" dia. 14" HT	12 x 60ml total	14 lbs 6 kg	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID M.S. Hazard Class: 9 (suspect PCBs) UN/NA No.: UN3077 PG II List Secondary Hazards: none List Labels Req'd/Applied: CLASS 9
1	Metal can inner, steel drum outer	IP3	11" dia. 14" HT	3 x 500ml 4 x 60ml total	16 lbs 7 kg	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID M.S. Hazard Class: 9 (suspect PCBs) UN/NA No.: UN3077 PG III List Secondary Hazards: none List Labels Req'd/Applied: CLASS 9
1	Metal can inner, steel drum outer	IP3	11" dia. 14" HT	3 x 500ml 4 x 60ml total	15 lbs 7 kg	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID M.S. Hazard Class: 9 (suspect PCBs) UN/NA No.: UN3077 PG II List Secondary Hazards: none List Labels Req'd/Applied: CLASS 9

Total No. Containers: 3 **Gross Wt of Shipment:** 45 lbs / 20 kg
Identify Placards Required:
 1. N/A 3. -
 2. - 4. -
Identify Property Control or Return Order No.: (if applicable)

Material in manufacturers original container: Yes No
Container free of deterioration or damage: Yes
Container acceptability documented: Yes
Material is packaged, sealed, marked and labelled to meet DOT requirements: Yes

Describe Internal Packaging:
Class jars bubble wrapped, double bagged, cushioned with vermiculite in I.D.
IP3 inner container with vermiculite
NOTE: Packed in accordance with Dangerous Goods Regulations Limitations Ex-26

RADIATION RELEASE: Survey No. _____ Date _____ **RM Signature:** _____ **Print Name:** M.A. SANS 4-14-99
See attached total activity reports

EMERG PHONE: 1-888-766-0771 **CERTIFICATION**

CONTRACTORS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport according to the applicable regulations of the Department of Transportation:
Authorizing Signature: [Signature] **Print Name:** M.A. SANS **Date:** 4-14-99

This shipment is within the Limitations prescribed for:
 Passenger Aircraft Cargo Aircraft NA Aircraft

FOR OFFSITE SHIPMENTS - ADDITIONAL APPROVAL REQUIRED

WHC	TRAFFIC	B.L. No.:	Date Shipped:	ETA:	Routing:	Special Considerations:
			<u>4/14/99</u>	<u>11/15/99</u>	<u>FED. X</u>	
WHC Traffic:		<u>[Signature]</u>		WHC Shipping:		

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client:	<u>Beechtel Hanford</u>	Date/Time received	<u>4-15-99 11:01</u>
CoC No.	<u>B99-004-1265</u>		
Container I.D. No.	Requested TAT (Days)	P.O. Received Yes [] No []	
	<u>7</u>		
INSPECTION			
1.	Custody seals on shipping container intact?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
2.	Custody seals on shipping container dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
3.	Custody seals on sample containers intact?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
4.	Custody seals on sample containers dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
5.	Cooler Temperature: _____	Packing material is:	Wet [] Dry [<input checked="" type="checkbox"/>]
6.	Number of samples in shipping container:	<u>4</u>	
7.	Number of containers per sample:	<u>6</u> (Or see CoC _____)	
8.	Paperwork agrees with samples?	Yes [<input checked="" type="checkbox"/>]	No []
9.	Samples have: Tape [<input checked="" type="checkbox"/>] Hazard labels [] Rad labels [<input checked="" type="checkbox"/>] Appropriate sample labels [<input checked="" type="checkbox"/>]		
10.	Samples are: In good condition [<input checked="" type="checkbox"/>] Leaking [] Broken Container [] Missing []		
11.	Describe any anomalies: _____ _____ _____		
13.	Was P.M. notified of any anomalies?	Yes [<input checked="" type="checkbox"/>] No []	Date <u>4-15-99</u>
14.	Received by	<u>[Signature]</u>	Date: <u>4-15-99</u> Time: <u>11:01</u>
LOGIN			
TNU W.O. No.	Group No.	Client W.O. No.	
PROGRAM MANAGER			
Sample holding times exceeded?	Yes []	No []	
Client Notified: Name	Date/time		