



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client : TNU-HANFORD B99-029
RFW# : 9903L585
SDG/SAF# : H0371/B99-029

W.O.# : 10985-001-001-9999-06
Date Received: 03-30-99

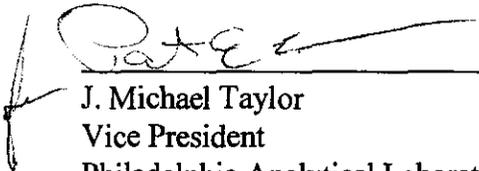


METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 TCLP leachate samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. A ten-fold dilution was performed on all samples due to the sample matrix.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. The laboratory control sample (LCS) was within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The TCLP extract from sample B0V3K2 was selected for the matrix spike (MS) for this analytical batch. The MS recovery was greater than 50% as per method criteria. Refer to the Inorganics Accuracy Report.
11. The duplicate analysis was within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. For the purposes of this report, the data has been reported to the Instrument Detection Limit

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 13 pages.

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


J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory
mld/m03-585

4-19-95
Date



METALS METHOD GLOSSARY

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

Recra Lot#: 9903L585

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	<u> </u> 6010B <u> </u> 7060A ⁵	<u> </u> 200.7 <u> </u> 206.2	<u> </u> 3113B		<u> </u> 99
Barium	<u> </u> 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	<u> </u> 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"/> <u> </u> 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	<u> </u> 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	<u> </u> 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 04/19/99

CLIENT: TNU-HANFORD B99-029
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9903L585

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	B0V3K2	Chromium, TCLP Leachate	4890	UG/L	6.0	10.0
-006	B0V3K4	Chromium, TCLP Leachate	3340	UG/L	6.0	10.0
-007	B0V3K6	Chromium, TCLP Leachate	5050	UG/L	6.0	10.0
-008	B0V3K8	Chromium, TCLP Leachate	3470	UG/L	6.0	10.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/19/99

CLIENT: TNU-HANFORD B99-029

RECRA LOT #: 9903L585

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0204-MB1	Chromium, TCLP Leachate	7.3	UG/L	6.0	10.0
BLANK2	99L0204-MB2	Chromium, TCLP Leachate	12.8	UG/L	6.0	10.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 04/19/99

CLIENT: TNU-HANFORD B99-029

RECRA LOT #: 9903L585

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-005	B0V3K2	Chromium, TCLP Leachat	9980	4890	5000	101.8	10.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 04/19/99

CLIENT: TNU-HANFORD B99-029

RECRA LOT #: 9903L585

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----	-----
-005REP	B0V3K2	Chromium, TCLP Leachate	4890	4990	2.0	10.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/19/99

CLIENT: TNW-HANFORD B99-029

RECRA LOT #: 9903L585

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
-----	-----	-----	-----	-----	-----	-----
LCS1	99L0204-LC1	Chromium, LCS	508	500	UG/L	101.5

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-029

DATE RECEIVED: 03/30/99

RFW LOT # :9903L585

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0V3K2						
TCLP	001	SO	99LTO035	03/24/99	03/31/99	04/01/99
B0V3K4						
TCLP	002	SO	99LTO035	03/24/99	03/31/99	04/01/99
B0V3K6						
TCLP	003	SO	99LTO035	03/24/99	03/31/99	04/01/99
B0V3K8						
TCLP	004	SO	99LTO035	03/24/99	03/31/99	04/01/99
B0V3K2						
CHROMIUM, TCLP LEACH	005	W	99L0204	04/01/99	04/03/99	04/06/99
CHROMIUM, TCLP LEACH	005 REP	W	99L0204	04/01/99	04/03/99	04/06/99
CHROMIUM, TCLP LEACH	005 MS	W	99L0204	04/01/99	04/03/99	04/06/99
B0V3K4						
CHROMIUM, TCLP LEACH	006	W	99L0204	04/01/99	04/03/99	04/06/99
B0V3K6						
CHROMIUM, TCLP LEACH	007	W	99L0204	04/01/99	04/03/99	04/06/99
B0V3K8						
CHROMIUM, TCLP LEACH	008	W	99L0204	04/01/99	04/03/99	04/06/99
LAB QC:						
CHROMIUM LABORATORY	LC1 BS	W	99L0204	N/A	04/03/99	04/06/99

Recre LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-029

DATE RECEIVED: 03/30/99

RFW LOT # :9903L585

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TCLP LEACH	MB1	W	99L0204	N/A	04/03/99	04/06/99
CHROMIUM, TCLP LEACH	MB2	W	99L0204	N/A	04/03/99	04/06/99

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-029-12

Page 1 of 1

Collector
DOUG BOWERS

Company Contact
Thomas E. Pickett

Telephone No.
509-373-4630

Project Coordinator
Trent, SJ

Price Code IV/FA

Data Turnaround

Project Designation
100-KR-4 Pump & Treat - Resin Sampling FY 99

Sampling Location
100-KR-4 Pump and Treat

SAF No.
B99-029

45 Days

Ice Chest No.
Shipping Unit 96-004

Field Logbook No.
EL-1381-1

Method of Shipment
Federal Express

Shipped To
TMA/RI/CRA
6-20-99

Offsite Property No.
AG96093

Bill of Lading/Air Bill No.
123579524088

COA

POSSIBLE SAMPLE HAZARDS/REMARKS

Preservation

None

None

None

None

None

None

None

Type of Container

aG

aG

aG

aG

aG

aG

aG

No. of Container(s)

1

1

1

1

1

1

1

Special Handling and/or Storage

Volume

60ml.

60ml.

60ml.

60ml.

125ml.

250ml.

500ml.

SAMPLE ANALYSIS

Activity Scan

Isotopic
Chemistry

Strontium-
87/90 Total
Sr

Technetium-99

Tritium - III

IC Anions -
100.0 (Nitrate)

Metals by ICP
(ICP)
111 (As) (Cd)
(Chromium)

Sample No.

Matrix *

Sample Date

Sample Time

B0V3K2

Other Solid

3-24-99

0911

X

X

B0V3K3

B0V3K4

Other Solid

3-24-99

0939

X

X

B0V3K5

B0V3K6

Other Solid

3-24-99

0943

X

X

B0V3K7

B0V3K8

Other Solid

3-24-99

0959

X

X

B0V3K9

CHAIN OF POSSESSION

Sign/Print Names

SPECIAL INSTRUCTIONS

Matrix *

Soil
Water
Vapor
Other Solid
Other Liquid

Relinquished By Doug Bowers Date/Time 3-24-99/1300

Received By Rofg LA@3738 Date/Time 3-24-99/1300

in 1 A e 4°C

Relinquished By Rofg LA@3738 Date/Time 3-24-99/1300

Received By Rofg LA@3738 Date/Time 3-24-99/1300

Relinquished By Rofg LA@3738 Date/Time 3-24-99/1300

Received By Ted Ely Date/Time 3-24-99/1300

Relinquished By Ted Ely Date/Time 3-24-99/1300

Received By Ted Ely Date/Time 3-24-99/1300

DBOWERS NOT available to Relinquish samples.

LABORATORY SECTION

Received By

Title

Date/Time

FINAL SAMPLE DISPOSITION

Disposal Method

Disposed By

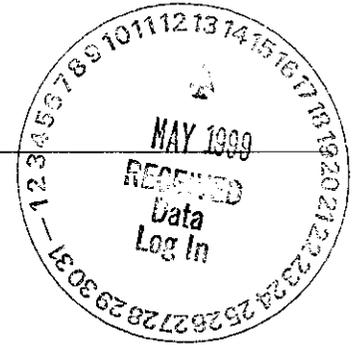
Date/Time

285

3



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Virtual Laboratories Everywhere



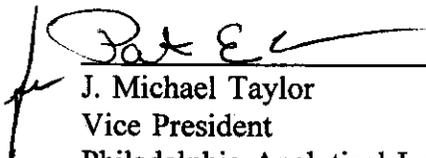
**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-029
RFW# : 9903L585
SDG# : H0371
SAF# : B99-029

W.O. # : 10985-001-001-9999-00
Date Received: 03-30-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 solid samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blank for Nitrate was within method criteria.
6. The Laboratory Control Sample (LCS) for Nitrate was within the laboratory control limits.
7. The matrix spike recovery for Nitrate was within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

5-4-99
Date

njp\03-585

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

Other: Nitrate

Method: EPA 300.0

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/03/99

CLIENT: TNU-MANFORD B99-029

RECRA LOT #: 9903L585

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B0V3K2	‡ Solids	42.7	‡	0.01	1.0
		Nitrate by IC	9.3	MG/KG	2.9	1.0
-002	B0V3K4	‡ Solids	43.0	‡	0.01	1.0
		Nitrate by IC	49	MG/KG	2.9	1.0
-003	B0V3K6	‡ Solids	43.0	‡	0.01	1.0
		Nitrate by IC	11	MG/KG	2.9	1.0
-004	B0V3K8	‡ Solids	42.8	‡	0.01	1.0
		Nitrate by IC	55	MG/KG	2.9	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/03/99

CLIENT: TNU-HANFORD B99-029
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9903L585

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LXC049-MB1	Nitrate by IC	1.2	u MG/KG	1.2	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/03/99

CLIENT: TNU-HANFORD B99-029

RECRA LOT #: 9903L585

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

SAMPLE	SITE ID	ANALYTE	SPIKED	INITIAL	SPIKED	%RECOV	DILUTION
			SAMPLE	RESULT	AMOUNT		FACTOR (SPK)
-001	B0V3K2	Nitrate by IC	82	9.3	59	122.7	1.0
BLANK10	99LXC049-MB1	Nitrate by IC	24	1.2 u	25	96.2	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/03/99

CLIENT: TNU-HANFORD B99-029

RECRA LOT #: 9903L585

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (RBP)
			RESULT	REPLICATE	RPD	
-001REP	B0V3K2	Nitrate by IC	9.3	10	12.2	1.0
-002REP	B0V3K4	‡ Solids	43.0	42.3	1.7	1.0

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-029

DATE RECEIVED: 03/30/99

RFW LOT # :9903L585

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

B0V3K2

% SOLIDS	001		SO 99L*S047	03/24/99	03/31/99	04/01/99
NITRATE BY IC	001		SO 99LXC049	03/24/99	04/30/99	04/30/99
NITRATE BY IC	001 REP		SO 99LXC049	03/24/99	04/30/99	04/30/99
NITRATE BY IC	001 MS		SO 99LXC049	03/24/99	04/30/99	04/30/99
TCLP	001		SO 99LTO035	03/24/99	03/31/99	04/01/99

B0V3K4

% SOLIDS	002		SO 99L*S047	03/24/99	03/31/99	04/01/99
% SOLIDS	002 REP		SO 99L*S047	03/24/99	03/31/99	04/01/99
NITRATE BY IC	002		SO 99LXC049	03/24/99	04/30/99	04/30/99
TCLP	002		SO 99LTO035	03/24/99	03/31/99	04/01/99

B0V3K6

% SOLIDS	003		SO 99L*S047	03/24/99	03/31/99	04/01/99
NITRATE BY IC	003		SO 99LXC049	03/24/99	04/30/99	04/30/99
TCLP	003		SO 99LTO035	03/24/99	03/31/99	04/01/99

B0V3K8

% SOLIDS	004		SO 99L*S047	03/24/99	03/31/99	04/01/99
NITRATE BY IC	004		SO 99LXC049	03/24/99	04/30/99	04/30/99
TCLP	004		SO 99LTO035	03/24/99	03/31/99	04/01/99

LAB QC:

NITRATE BY IC	MB1	S	99LXC049	N/A	04/30/99	04/30/99
NITRATE BY IC	MB1 BS	S	99LXC049	N/A	04/30/99	04/30/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-029-12		Page 1 of 1	
Collector DOUG BOWERS		Company Contact Thomas E. Pickett		Telephone No. 509-373-4630		Project Coordinator TRENT, SJ		Price Code IV/FA Data Turnaround 45 Days	
Project Designation 100-KR-4 Pump & Treat - Resin Sampling FY 99		Sampling Location 100-KR-4 Pump and Treat				SAF No. B99-029		010	
Ice Chest No. Shipping Van 916-004		Field Logbook No. EL-1381-1				Method of Shipment Federal Express			
Shipped To HAWAII RECRA Box 7-24-99		Offsite Property No. A9910093				Bill of Lading/Air Bill No. 123579524088			
COA									

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	None	None	None	None		
	Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
	No. of Container(s)	1	1	1	1	1	1	1	1		
Special Handling and/or Storage	Volume	60ml.	60ml.	60ml.	60ml.	125ml.	250ml.	500ml.			

SAMPLE ANALYSIS				Activity Scan	Isotopic Uranium	Strontium-87/90 Total %	Technetium-99	Tritium - H3	IC Anions - 1000 (Nitrate)	Metals by ICP (ICP) - 111/6010A (Chromium)		
Sample No.	Matrix *	Sample Date	Sample Time									
B0V3K2	Other Solid	3-24-99	0911						X	X		B0V3K3
B0V3K4	Other Solid	3-24-99	0929						X	X		B0V3K5
B0V3K6	Other Solid	3-24-99	0943						X	X		B0V3K7
B0V3K8	Other Solid	3-24-99	0959						X	X		B0V3K9

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By	Date/Time	Received By	Date/Time			in 1 @ 4°C				Soil	
Relinquished By	Date/Time	Received By	Date/Time							Water	
Relinquished By	Date/Time	Received By	Date/Time							Vapor	
Relinquished By	Date/Time	Received By	Date/Time							Other Solid	
Relinquished By	Date/Time	Received By	Date/Time			Other Liquid		DBWP is not available to Relinquish samples.			
LABORATORY SECTION	Received By		Title			Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By			Date/Time					

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0371 is comprised of four solid samples designated under SAF No. B99-029 with a Project Designation of: 100-KR-4 Pump & Treat - Resin Sampling FY 99.

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

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the processing of the samples.

2.2 Strontium-90 Analyses

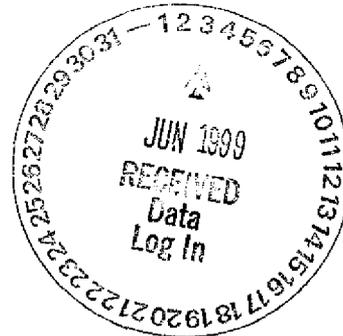
No problems were encountered during the processing of the samples.

2.3 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.4 Technetium-99 Analyses

No problems were encountered during the processing of the samples.



TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0371

SAMPLE SUMMARY

SDG 7107
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0371

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0V3K2		SOLID		N903165-01	B99-029	B99-029-12	03/24/99 09:15
B0V3K4		SOLID		N903165-02	B99-029	B99-029-12	03/24/99 09:29
B0V3K6		SOLID		N903165-03	B99-029	B99-029-12	03/24/99 09:43
B0V3K8		SOLID		N903165-04	B99-029	B99-029-12	03/24/99 09:59
Method Blank		SOLID		N903165-06	B99-029		
Lab Control Sample		SOLID		N903165-05	B99-029		
Duplicate (N903165-01)		SOLID		N903165-07	B99-029		03/24/99 09:15

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CS
 Version 3.06
 Report date 05/27/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0371

QC SUMMARY

SDG 7107
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0371

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	SAMPLE BASIS	SAMPLE AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7107	B99-029-12	B0V3K2	SOLID			03/30/99	6	N903165-01	7107-001
		B0V3K4	SOLID			03/30/99	6	N903165-02	7107-002
		B0V3K6	SOLID			03/30/99	6	N903165-03	7107-003
		B0V3K8	SOLID			03/30/99	6	N903165-04	7107-004
		Method Blank	SOLID					N903165-06	7107-006
		Lab Control Sample	SOLID					N903165-05	7107-005
		Duplicate (N903165-01)	SOLID			03/30/99	6	N903165-07	7107-007

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id TMANC
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 Version 3.06
 Report date 05/27/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0371

SDG 7107
 Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0371

TEST	MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALI-
			BATCH	2σ %	CLIENT MORE	RE	BLANK	LCS	
Alpha Spectroscopy									
U	SOLID	Uranium, Isotopic in Soil	6880-026	5.0	4	1	1	1/1	
Beta Counting									
SR	SOLID	Total Strontium in Soil	6880-026	10.0	4	1	1	1/1	
TC	SOLID	Technetium 99 in Soil	6880-026	10.0	4	1	1	1/1	
Liquid Scintillation Counting									
H	SOLID	Tritium in Soil	6880-026	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 05/27/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0371

SDG 7107
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

WORK SUMMARY

CLIENT SAMPLE ID		LAB SAMPLE ID								
LOCATION	MATRIX	COLLECTED	SUF-							
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
B0V3K2		N903165-01	7107-001	H		05/03/99	05/19/99	TAH	Tritium in Soil	
	SOLID	03/24/99	7107-001	SR		05/04/99	05/19/99	TAH	Total Strontium in Soil	
B99-029-12	B99-029	03/30/99	7107-001	TC		05/05/99	05/19/99	TAH	Technetium 99 in Soil	
			7107-001	U		05/04/99	05/19/99	TAH	Uranium, Isotopic in Soil	
B0V3K4		N903165-02	7107-002	H		05/03/99	05/19/99	TAH	Tritium in Soil	
	SOLID	03/24/99	7107-002	SR		05/04/99	05/19/99	TAH	Total Strontium in Soil	
B99-029-12	B99-029	03/30/99	7107-002	TC		05/05/99	05/19/99	TAH	Technetium 99 in Soil	
			7107-002	U		05/04/99	05/19/99	TAH	Uranium, Isotopic in Soil	
B0V3K6		N903165-03	7107-003	H		05/03/99	05/19/99	TAH	Tritium in Soil	
	SOLID	03/24/99	7107-003	SR		05/04/99	05/19/99	TAH	Total Strontium in Soil	
B99-029-12	B99-029	03/30/99	7107-003	TC		05/07/99	05/19/99	TAH	Technetium 99 in Soil	
			7107-003	U		05/05/99	05/19/99	TAH	Uranium, Isotopic in Soil	
B0V3K8		N903165-04	7107-004	H		05/03/99	05/19/99	TAH	Tritium in Soil	
	SOLID	03/24/99	7107-004	SR		05/04/99	05/19/99	TAH	Total Strontium in Soil	
B99-029-12	B99-029	03/30/99	7107-004	TC		05/04/99	05/19/99	TAH	Technetium 99 in Soil	
			7107-004	U		05/04/99	05/19/99	TAH	Uranium, Isotopic in Soil	
Method Blank		N903165-06	7107-006	H		05/04/99	05/19/99	TAH	Tritium in Soil	
	SOLID		7107-006	SR		05/04/99	05/19/99	TAH	Total Strontium in Soil	
	B99-029		7107-006	TC		05/07/99	05/19/99	TAH	Technetium 99 in Soil	
			7107-006	U		05/04/99	05/19/99	TAH	Uranium, Isotopic in Soil	
Lab Control Sample		N903165-05	7107-005	H		05/04/99	05/19/99	TAH	Tritium in Soil	
	SOLID		7107-005	SR		05/04/99	05/19/99	TAH	Total Strontium in Soil	
	B99-029		7107-005	TC		05/03/99	05/19/99	TAH	Technetium 99 in Soil	
			7107-005	U		05/04/99	05/19/99	TAH	Uranium, Isotopic in Soil	
Duplicate (N903165-01)		N903165-07	7107-007	H		05/04/99	05/19/99	TAH	Tritium in Soil	
	SOLID	03/24/99	7107-007	SR		05/04/99	05/19/99	TAH	Total Strontium in Soil	
	B99-029	03/30/99	7107-007	TC		05/07/99	05/19/99	TAH	Technetium 99 in Soil	
			7107-007	U		05/04/99	05/19/99	TAH	Uranium, Isotopic in Soil	

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 05/27/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0371

SDG 7107
 Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0371

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
H	B99-029	Tritium in Soil	EPA906.0	4			1	1	1		7
SR	B99-029	Total Strontium in Soil		4			1	1	1		7
TC	B99-029	Technetium 99 in Soil	TC99TRLSC	4			1	1	1		7
U	B99-029	Uranium, Isotopic in Soil	UPDATE	4			1	1	1		7
TOTALS				16			4	4	4		28

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 05/27/99

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 7 1

N903165-06

Method Blank

M E T H O D B L A N K

SDG <u>7107</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0371</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903165-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7107-006</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-029</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.016	0.051	0.087	0.50	U	H
Technetium 99	14133-76-7	0	0	<u>1.2</u>	0.50	U	TC
Uranium 233/234	U-233/234	0.023	0.023	0.087	0.30	U	U
Uranium 235	15117-96-1	0	0.027	0.10	0.30	U	U
Uranium 238	U-238	0.011	0.023	0.087	0.30	U	U
Total Strontium	SR-RAD	-0.041	0.14	0.19	1.0	U	SR

100-KR-4 Pump/Treat Resin Smply FY99

QC-BLANK 30443

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>05/27/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0371

N903165-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7107</u>	Client/Case no <u>Hanford</u> <u>SDG-H0371</u>	
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903165-05</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7107-005</u>	Material/Matrix _____ <u>SOLID</u>	
	SAF No <u>B99-029</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	3.94	0.14	0.088	0.50	H		4.26	0.17	92	84-116	80-120
Technetium 99	35.3	1.5	0.33	0.50	TC		34.9	1.4	101	82-118	80-120
Uranium 233/234	4.40	0.55	0.26	0.30	U		4.95	0.20	89	81-119	80-120
Uranium 235	3.42	0.46	0.077	0.30	U		4.04	0.16	85	81-119	80-120
Uranium 238	4.92	0.59	0.25	0.30	U		5.10	0.20	96	80-120	80-120
Total Strontium	13.8	0.39	0.15	1.0	SR		12.6	0.50	110	82-118	

100-KR-4 Pump/Treat Resin Smpg FY99

QC-LCS 30442

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/27/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0371

N903165-07

B0V3K2

DUPLICATE

SDG <u>7107</u>		Client/Case no <u>Hanford</u> <u>SDG-H0371</u>
Contact <u>L.A. Johnson</u>		Case no <u>TRB-SBB-207925</u>
DUPLICATE	ORIGINAL	
Lab sample id <u>N903165-07</u>	Lab sample id <u>N903165-01</u>	Client sample id <u>B0V3K2</u>
Dept sample id <u>7107-007</u>	Dept sample id <u>7107-001</u>	Location/Matrix <u>SOLID</u>
	Received <u>03/30/99</u>	Collected <u>03/24/99 09:15</u>
		Custody/SAF No <u>B99-029-12</u> <u>B99-029</u>

ANALYTE	DUPLICATE		MDA		RDL		QUALI-PIERS	TEST	ORIGINAL		MDA		QUALI-PIERS	RPD %	3σ	PROT TOT LIMIT
	pCi/g	2σ ERR (COUNT)	pCi/g		pCi/g				pCi/g	2σ ERR (COUNT)	pCi/g					
Tritium	6.72	0.18	0.095		0.50		H		6.74	0.18	0.095		U	0	22	
Technetium 99	0	0	<u>3.0</u>		0.50		U	TC	0	0	<u>3.9</u>		U	-	-	
Uranium 233/234	0.074	0.064	0.081		0.30		U	U	0.109	0.066	0.083		J	38	151	
Uranium 235	0	0.026	0.098		0.30		U	U	0	0.026	0.10		U	-	-	
Uranium 238	0.042	0.043	0.081		0.30		U	U	0.022	0.022	0.083		U	-	-	
Total Strontium	0.047	0.13	0.17		1.0		U	SR	0.020	0.12	0.17		U	-	-	

100-KR-4 Pump/Treat Resin Smpg FY99

QC-DUP#1 30444

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 05/27/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0371

N903165-01

B0V3K2

DATA SHEET

SDG <u>7107</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0371</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903165-01</u>	Client sample id <u>B0V3K2</u>	
Dept sample id <u>7107-001</u>	Location/Matrix <u>SOLID</u>	
Received <u>03/30/99</u>	Collected <u>03/24/99 09:15</u>	
	Custody/SAF No <u>B99-029-12</u>	<u>B99-029</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	6.74	0.18	0.095	0.50		H
Technetium 99	14133-76-7	0	0	<u>3.9</u>	0.50	U	TC
Uranium 233/234	U-233/234	0.109	0.066	0.083	0.30	J	U
Uranium 235	15117-96-1	0	0.026	0.10	0.30	U	U
Uranium 238	U-238	0.022	0.022	0.083	0.30	U	U
Total Strontium	SR-RAD	0.020	0.12	0.17	1.0	U	SR

100-KR-4 Pump/Treat Resin Smplg FY99

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>05/27/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 7 1

N903165-02

BOV3K4

D A T A S H E E T

SDG <u>7107</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0371</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903165-02</u>	Client sample id <u>BOV3K4</u>	
Dept sample id <u>7107-002</u>	Location/Matrix <u>SOLID</u>	
Received <u>03/30/99</u>	Collected <u>03/24/99 09:29</u>	
	Custody/SAF No <u>B99-029-12</u> <u>B99-029</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	6.77	0.18	0.090	0.50		H
Technetium 99	14133-76-7	3.08	0.47	<u>1.0</u>	0.50		TC
Uranium 233/234	U-233/234	0.087	0.066	0.083	0.30	J	U
Uranium 235	15117-96-1	0	0.026	0.10	0.30	U	U
Uranium 238	U-238	0.033	0.044	0.083	0.30	U	U
Total Strontium	SR-RAD	0.105	0.15	0.19	1.0	U	SR

100-KR-4 Pump/Treat Resin Smply FY99

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>05/27/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 7 1

N903165-03

B0V3K6

D A T A S H E E T

SDG <u>7107</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0371</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903165-03</u>	Client sample id <u>B0V3K6</u>	
Dept sample id <u>7107-003</u>	Location/Matrix <u>SOLID</u>	
Received <u>03/30/99</u>	Collected <u>03/24/99 09:43</u>	
	Custody/SAF No <u>B99-029-12</u> <u>B99-029</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	6.86	0.19	0.097	0.50		H
Technetium 99	14133-76-7	0	0	<u>4.6</u>	0.50	U	TC
Uranium 233/234	U-233/234	0.052	0.042	0.080	0.30	U	U
Uranium 235	15117-96-1	0	0.025	0.096	0.30	U	U
Uranium 238	U-238	0.042	0.042	0.080	0.30	U	U
Total Strontium	SR-RAD	0.013	0.13	0.18	1.0	U	SR

100-KR-4 Pump/Treat Resin Smply FY99

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>05/27/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0371

N903165-04

BOV3K8

DATA SHEET

SDG <u>7107</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0371</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903165-04</u>	Client sample id <u>BOV3K8</u>	
Dept sample id <u>7107-004</u>	Location/Matrix <u>SOLID</u>	
Received <u>03/30/99</u>	Collected <u>03/24/99 09:59</u>	
	Custody/SAF No <u>B99-029-12</u>	<u>B99-029</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	6.78	0.18	0.095	0.50		H
Technetium 99	14133-76-7	0	0	<u>6.3</u>	0.50	U	TC
Uranium 233/234	U-233/234	0.077	0.066	0.084	0.30	U	U
Uranium 235	15117-96-1	0	0.027	0.10	0.30	U	U
Uranium 238	U-238	0.055	0.044	0.084	0.30	U	U
Total Strontium	SR-RAD	0.029	0.16	0.20	1.0	U	SR

100-KR-4 Pump/Treat Resin Smply FY99

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>05/27/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0371

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7107
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Uranium		2: Uranium		3: Uranium		RESULT RATIOS (%)					
					233/234		235		238		1+3	2σ	2+3	2σ		
Preparation batch 6880-026																
BOV3K2	N903165-01			7107-001	0.109 J		U		U							
BOV3K4	N903165-02			7107-002	0.087 J		U		U							
BOV3K6	N903165-03			7107-003	U		U		U							
BOV3K8	N903165-04			7107-004	U		U		U							
BLK (QC ID=30443)	N903165-06			7107-006	U		U		U							
LCS (QC ID=30442)	N903165-05			7107-005	ok		ok		ok							
Duplicate (N903165-01)	N903165-07			7107-007	ok	U	-	U	-	U						
Nominal values and limits from method					RDLS (pCi/g)	0.30	0.30	0.30			100					4
100-KR-4 Pump/Treat Resin Smply FY99											Averages					

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-		
														PREPARED	YZED	DETECTOR
Preparation batch 6880-026													2σ prep error 5.0 %	Reference Lab Notebook 6880 pg.26		
BOV3K2	N903165-01			0.10	1.08			67		151			41	05/04/99	05/04	SS-012
BOV3K4	N903165-02			0.10	1.09			66		151			41	05/04/99	05/04	SS-013
BOV3K6	N903165-03			0.096	1.14			66		152			42	05/04/99	05/05	SS-010
BOV3K8	N903165-04			0.10	1.12			65		151			41	05/04/99	05/04	SS-015
BLK (QC ID=30443)	N903165-06			0.10	1.00			69		151				05/04/99	05/04	SS-035
LCS (QC ID=30442)	N903165-05			0.26	1.00			95		151				05/04/99	05/04	SS-016
Duplicate (N903165-01)	N903165-07			0.098	1.08			69		151			41	05/04/99	05/04	SS-036
(QC ID=30444)																
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	0.12 ± 0.12
FOR 7 SAMPLES	YIELD	71 ± 21

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/27/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0371

METHOD SUMMARY
TOTAL STRONTIUM IN SOIL
BETA COUNTING

Test SR Matrix SOLID
SDG 7107
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 6880-026					
BOV3K2	N903165-01			7107-001	U
BOV3K4	N903165-02			7107-002	U
BOV3K6	N903165-03			7107-003	U
BOV3K8	N903165-04			7107-004	U
BLK (QC ID=30443)	N903165-06			7107-006	U
LCS (QC ID=30442)	N903165-05			7107-005	ok
Duplicate (N903165-01)	N903165-07			7107-007	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
100-KR-4 Pump/Treat Resin Smply FY99

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 6880-026 2σ prep error 10.0 % Reference Lab Notebook 6880 pg.26															
BOV3K2	N903165-01			0.17	1.02			85		400			41	05/04/99	05/04 GRB-205
BOV3K4	N903165-02			0.19	1.07			79		400			41	05/04/99	05/04 GRB-206
BOV3K6	N903165-03			0.18	1.07			78		400			41	05/04/99	05/04 GRB-207
BOV3K8	N903165-04			0.20	1.05			79		400			41	05/04/99	05/04 GRB-208
BLK (QC ID=30443)	N903165-06			0.19	1.00			74		400				05/04/99	05/04 GRB-218
LCS (QC ID=30442)	N903165-05			0.15	1.00			98		400				05/04/99	05/04 GRB-217
Duplicate (N903165-01) (QC ID=30444)	N903165-07			0.17	1.02			83		400			41	05/04/99	05/04 GRB-219
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 0.18 ± 0.034
FOR 7 SAMPLES YIELD 82 ± 16

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0371

METHOD SUMMARY
TECHNETIUM 99 IN SOIL
BETA COUNTING

Test TC Matrix SOLID
SDG 7107
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Technetium 99
Preparation batch 6880-026					
B0V3K2	N903165-01			7107-001	U
B0V3K4	N903165-02			7107-002	3.08
B0V3K6	N903165-03			7107-003	U
B0V3K8	N903165-04			7107-004	U
BLK (QC ID=30443)	N903165-06			7107-006	U
LCS (QC ID=30442)	N903165-05			7107-005	ok
Duplicate (N903165-01)	N903165-07			7107-007	- U
Nominal values and limits from method					
100-KR-4 Pump/Treat Resin Smply FY99				RDs (pCi/g)	0.50

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-026 2σ prep error 10.0 % Reference Lab Notebook 6880 pg.26																
B0V3K2	N903165-01			<u>3.9</u>	<u>1.00</u>			46		101			42	04/29/99	05/05	GRB-220
B0V3K4	N903165-02			<u>1.0</u>	<u>1.00</u>			33		101			42	04/29/99	05/05	GRB-217
B0V3K6	N903165-03			<u>4.6</u>	<u>1.00</u>			50		101			44	04/29/99	05/07	GRB-218
B0V3K8	N903165-04			<u>6.3</u>	<u>1.00</u>			64		101			41	04/29/99	05/04	GRB-217
BLK (QC ID=30443)	N903165-06			<u>1.2</u>	2.00			41		101				04/29/99	05/07	GRB-220
LCS (QC ID=30442)	N903165-05			0.33	2.00			54		101				04/29/99	05/03	GRB-229
Duplicate (N903165-01)	N903165-07			<u>3.0</u>	<u>1.00</u>			32		400			44	04/29/99	05/07	GRB-230
(QC ID=30444)																
Nominal values and limits from method				0.50	2.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99TRLSC
EP-060		Soil Preparation, rev 0
EP-020		Sample Leach For Technetium-99, rev 0
EP-540		Technetium-99 Purification, rev 0

AVERAGES ± 2 SD	MDA	<u>2.9</u>	±	<u>4.4</u>
FOR 7 SAMPLES	YIELD	<u>46</u>	±	<u>23</u>

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/27/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0371

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Test H Matrix SOLID
 SDG 7107
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0371

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Tritium
Preparation batch 6880-026					
BOV3K2	N903165-01			7107-001	6.74
BOV3K4	N903165-02			7107-002	6.77
BOV3K6	N903165-03			7107-003	6.86
BOV3K8	N903165-04			7107-004	6.78
BLK (QC ID=30443)	N903165-06			7107-006	U
LCS (QC ID=30442)	N903165-05			7107-005	ok
Duplicate (N903165-01)	N903165-07			7107-007	ok
Nominal values and limits from method					
100-KR-4 Pump/Treat Resin Smply FY99				RDLs (pCi/g)	0.50

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-026 2σ prep error 10.0 % Reference Lab Notebook 6880 pg.26																
BOV3K2	N903165-01			0.095	<u>18.5</u>			100		120			40	05/01/99	05/03	LSC-005
BOV3K4	N903165-02			0.090	<u>19.3</u>			100		120			40	05/01/99	05/03	LSC-005
BOV3K6	N903165-03			0.097	<u>18.6</u>			100		120			40	05/01/99	05/03	LSC-005
BOV3K8	N903165-04			0.095	<u>19.4</u>			100		120			40	05/01/99	05/03	LSC-005
BLK (QC ID=30443)	N903165-06			0.087	20.0			100		120				05/01/99	05/04	LSC-005
LCS (QC ID=30442)	N903165-05			0.088	20.0			100		120				05/01/99	05/04	LSC-005
Duplicate (N903165-01)	N903165-07			0.095	<u>18.5</u>			100		120			41	05/01/99	05/04	LSC-005
(QC ID=30444)																
Nominal values and limits from method				0.50	20.0					25			180			

PROCEDURES REFERENCE EPA906.0
 EP-060 Soil Preparation, rev 0
 EP-211 Tritium in Solid Samples by Azeotropic Distillation, rev 0

AVERAGES ± 2 SD MDA 0.092 ± 0.008
 FOR 7 SAMPLES YIELD 100 ± 0

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 05/27/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0371

SDG 7107
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

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Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

P R E P A R A T I O N B A T C H S U M M A R Y

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.

SDG 7107
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
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Case no SDG-H0371

WORK SUMMARY

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

The following notes apply to this report:

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

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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 7 1

SDG 7107
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
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D A T A S H E E T

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

R E P O R T G U I D E S

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

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D A T A S H E E T

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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R E P O R T G U I D E

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L A B C O N T R O L S A M P L E

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.

SDG 7107
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

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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TMA / RICHMOND
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SDG 7107
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
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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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Contract TRB-SBB-207925
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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

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 05/27/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0371

SDG 7107
Contact L.A. Johnson

GUIDE , c o n t .

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

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.

SDG 7107
Contact L.A. Johnson

Client Hanford
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REPORT GUIDE

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'

REPORT GUIDES

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METHOD SUMMARY

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

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

MDAs are underlined if greater than the printed RDL.

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

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Client Hanford
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METHOD SUMMARY

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

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

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

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

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

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

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0371

SDG 7107
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0371

METHOD SUMMARY

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

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

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

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

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SUMMARY DATA SECTION

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Lab id TMANC
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Collector DOUG BOWERS	Company Contact Thomas E. Pickett	Telephone No. 509-373-4630	Project Coordinator TRENT, SJ	Price Code IV/FA	Data Turnaround 45 Days
Project Designation 100-KR-4 Pump & Treat - Resin Sampling FY 99	Sampling Location 100-KR-4 Pump and Treat	SAF No. B99-029			
Ice Chest No. ERC90-045	Field Logbook No. EL-1381-1	Method of Shipment Federal Express			
Shipped To TMA/KCRA 8703-24-99	Offsite Property No. AG90094	Bill of Lading/Air Bill No. 423579524099			
			COA		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	None	None	None				
	Type of Container	aG	aG	aG	aG	aG	aG	aG				
	No. of Container(s)	1	1	1	1	1	1	1				
Special Handling and/or Storage	Volume	60mL	60mL	60mL	60mL	125mL	250mL	500mL				

SAMPLE ANALYSIS				Activity Scan	Isotopic Uranium	Strontium-89,90 - Total Sr	Technetium-99	Tritium - H3	IC Anions - 300.0 (Nitrate)	Metals by ICP (TCLP) - 1311/6010A (Chromium)			
Sample No.	Matrix *	Sample Date	Sample Time										
BOV3K2	Other Solid	3-24-99	10915	X	Y	X	X	X					BOV3K7
BOV3K4	Other Solid	3-24-99	0929	X	Y	X	X	X					BOV3K5
BOV3K6	Other Solid	3-24-99	0943	X	Y	X	X	X					BOV3K7
BOV3K8	Other Solid	3-24-99	0959	Y	X	X	X	X					BOV3K9

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Received By Doug Bowers	Date/Time 3-24-99/1300	Received By R. Nielsen	Date/Time 3-24-99/1300					Soil	
Received By R. Nielsen	Date/Time 3-29-99 0955	Received By R. Nielsen	Date/Time 3-29-99					Water	
Received By R. Nielsen	Date/Time 3-29-99 0955	Received By Fed Ex	Date/Time 3-29-99					Vapor	
Received By Fed Ex	Date/Time 3-30-99 10:30	Received By ADP/Baran JK Corp	Date/Time 3-30-99					Other Solid	
LABORATORY SECTION	Received By	Title						Other Liquid	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time			

Contractor BHI - Hanford	OFF-SITE PROPERTY CONTROL	CONTROL NO. <i>(To be obtained from PROPERTY MANAGEMENT)</i> A990094
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PART I - TO BE COMPLETED BY ORIGINATOR

Department ERC Engineering Support	Section Field & Analytical Support	Unit Field Sampling
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The following items are to be shipped from Contractor Vendor

Routing Prepaid Collect

Shipped to Thermo Retec Company 2030 Wright Ave Address Richmond, CA 94804-0040 City (510) 235-2633 State _____ Zip Code _____ Country Attn: Larry Johnson	Off-site Custodian _____ On-site Custodian _____ Payroll No. _____
---	---

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1	32 lbs	Sample #: BOV3K2, BOV3K4, BOV3K6, BOV3K8, BOT9V3, BOT9V9 BOT9W5, BOT9W7, BOV113 Cooler #: ERC96-045 Polycooler with environmental samples packed with packing peanuts. BILL OF LADING # <u>423579524099</u>	N/A

Classified
 Unclassified
 Shipped Under DOE Contract
 Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

Required for Project Work. List Project No. _____
 Business Trip
 Off-site Assignment
 Shipment to Subcontractor. List Subcontract No. _____
 Other (Please specify) _____

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release N/A	RM Survey No. RUN 3/29/99	Date _____
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Location of and Contact for Property (Name/Phone No./Bldg./Area)
Renee Nielson/(509)372-9604/3728 bldg/300 Area

Date Ready for Shipment 3/29/99	Cost Code to be Charged R10KPL/C570	Approximate Date This Property will be Returned _____
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Originated By Renee Nielson	Date 3/29/99	Authorized By Renee Nielson	Date 3/29/99
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Property Representative Signature Larry Johnson	Date 3/29/99	Property Management Approval Larry Johnson	Date 3/29/99
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PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature Ch. Nelson	Date 3-29-99
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DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management
 Yellow - Shipping
 Green - Accounts Payable
 Pink - Originator
 Goldenrod - Property Management

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client: <u>Bechtel Hanford</u>	Date/Time received <u>3-30-99 10:30</u>		
CoC No. <u>B99-028-02, B99-029-12, B99-001-133</u>			
Container I.D. No. <u>ERC96-04E</u> Requested TAT (Days) <u>45</u> P.O. Received Yes [] No [<input checked="" type="checkbox"/>]			
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>9</u>		
7.	Number of containers per sample: _____ (Or see CoC <u>✓</u>)		
8.	Paperwork agrees with samples?	Yes [<input checked="" type="checkbox"/>]	No []
9.	Samples have: Tape [] 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 [] No [] Date _____		
14.	Received by <u>Accorato</u> Date: <u>3-30-99</u> Time: <u>10:30</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 _____	