H0329-T/W

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Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD C99-009
RFW# : 9901L779
SDG/SAF# : H0329/C99-009

W.O.# : 10985-001-001-9999-00
Date Received: 01-04-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 water samples.

2. 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. The preparation/method blanks for 2 analytes were outside method criteria (less than the PQL or samples greater than 20X MB value). Refer to the Inorganics Method Blank Data Summary.

   a.) The MB results for Copper and Zinc were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

8. All ICP Interference Check Standards were within the 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) and matrix spike duplicate (MSD) recoveries for 1 analyte were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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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 meaningful concentration levels, due to high concentrations of the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B0T134	Iron	20,000	94.7

12. All MSs and MSDs were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Matrix Spike Duplicate Report.

13. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

14. 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

1-29-99
Date

jjw/m01-779

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9901L779

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: X3005A __3010A __3015 __3020A __3050A __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	X 6010B		__200.7				__99
Antimony	X 6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	X 6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	X 6010B		__200.7				__99
Beryllium	X 6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	X 6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	X 6010B		__200.7				__99
Chromium	X 6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	X 6010B		__200.7				__99
Copper	X 6010B	__7211 [5]	__200.7	__220.2			__99
Iron	X 6010B		__200.7				__99
Lead	X 6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	X 6010B		__200.7				__99
Manganese	X 6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	X 6010B		__200.7				__99
Potassium	X 6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	X 6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	X 6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	X 6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	X 6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	X 6010B		__200.7				__99
Zinc	X 6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__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.

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INORGANICS DATA SUMMARY REPORT 01/27/99

CLIENT: TNU-HANFORD C99-009 RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0T133	Silver, Total	0.90 u	UG/L	0.90	1.0
		Aluminum, Total	17.8 u	UG/L	17.8	1.0
		Arsenic, Total	5.8	UG/L	3.3	1.0
		Barium, Total	85.7	UG/L	0.10	1.0
		Beryllium, Total	0.36	UG/L	0.10	1.0
		Calcium, Total	52200	UG/L	6.8	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Cobalt, Total	0.60 u	UG/L	0.60	1.0
		Chromium, Total	37.7	UG/L	0.60	1.0
		Copper, Total	4.8	UG/L	0.90	1.0
		Iron, Total	48.6	UG/L	17.9	1.0
		Potassium, Total	5480	UG/L	11.8	1.0
		Magnesium, Total	11700	UG/L	6.2	1.0
		Manganese, Total	3.0	UG/L	0.20	1.0
		Sodium, Total	12400	UG/L	3.3	1.0
		Nickel, Total	2.1	UG/L	1.1	1.0
		Lead, Total	1.8 u	UG/L	1.8	1.0
		Antimony, Total	2.3 u	UG/L	2.3	1.0
		Selenium, Total	3.6 u	UG/L	3.6	1.0
		Thallium, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	10.3	UG/L	0.60	1.0
		Zinc, Total	15.6	UG/L	0.80	1.0

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INORGANICS DATA SUMMARY REPORT 01/27/99

CLIENT: TNU-HANFORD C99-009

RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B0T134	Silver, Total	0.90 u	UG/L	0.90	1.0
		Aluminum, Total	17.8 u	UG/L	17.8	1.0
		Arsenic, Total	6.4	UG/L	3.3	1.0
		Barium, Total	91.4	UG/L	0.10	1.0
		Beryllium, Total	0.37	UG/L	0.10	1.0
		Calcium, Total	50500	UG/L	6.8	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Cobalt, Total	0.60 u	UG/L	0.60	1.0
		Chromium, Total	47.8	UG/L	0.60	1.0
		Copper, Total	5.4	UG/L	0.90	1.0
		Iron, Total	2620	UG/L	17.9	1.0
		Potassium, Total	5260	UG/L	11.8	1.0
		Magnesium, Total	11300	UG/L	6.2	1.0
		Manganese, Total	93.5	UG/L	0.20	1.0
		Sodium, Total	12100	UG/L	3.3	1.0
		Nickel, Total	4.5	UG/L	1.1	1.0
		Lead, Total	1.8 u	UG/L	1.8	1.0
		Antimony, Total	2.3 u	UG/L	2.3	1.0
		Selenium, Total	3.8	UG/L	3.6	1.0
		Thallium, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	12.2	UG/L	0.60	1.0
		Zinc, Total	9.1	UG/L	0.80	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/27/99

CLIENT: TNU-HANFORD C99-009

RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0020-MB1	Silver, Total	0.90	u	UG/L	0.90	1.0
		Aluminum, Total	17.8	u	UG/L	17.8	1.0
		Arsenic, Total	3.3	u	UG/L	3.3	1.0
		Barium, Total	0.75		UG/L	0.10	1.0
		Beryllium, Total	0.28		UG/L	0.10	1.0
		Calcium, Total	104		UG/L	6.8	1.0
		Cadmium, Total	0.40	u	UG/L	0.40	1.0
		Cobalt, Total	0.60	u	UG/L	0.60	1.0
		Chromium, Total	0.60	u	UG/L	0.60	1.0
		Copper, Total	3.8		UG/L	0.90	1.0
		Iron, Total	17.9	u	UG/L	17.9	1.0
		Potassium, Total	86.3		UG/L	11.8	1.0
		Magnesium, Total	33.7		UG/L	6.2	1.0
		Manganese, Total	0.48		UG/L	0.20	1.0
		Sodium, Total	188		UG/L	3.3	1.0
		Nickel, Total	1.1	u	UG/L	1.1	1.0
		Lead, Total	1.8	u	UG/L	1.8	1.0
		Antimony, Total	2.3	u	UG/L	2.3	1.0
		Selenium, Total	3.6	u	UG/L	3.6	1.0
		Thallium, Total	3.7	u	UG/L	3.7	1.0
		Vanadium, Total	0.60	u	UG/L	0.60	1.0
		Zinc, Total	4.8		UG/L	0.80	1.0

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INORGANICS ACCURACY REPORT 01/27/99

CLIENT: TNU-HANFORD C99-009 RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	B0T134	Silver, Total	51.1	0.90u	50.0	102.2	1.0
		Silver, Total MSD	48.8	0.90u	50.0	97.6	1.0
		Aluminum, Total	2120	17.8 u	2000	106.0	1.0
		Aluminum, Total MSD	2020	17.8 u	2000	101.2	1.0
		Arsenic, Total	2110	6.4	2000	105.0	1.0
		Arsenic, Total MSD	2070	6.4	2000	103.3	1.0
		Barium, Total	2140	91.4	2000	102.2	1.0
		Barium, Total MSD	2040	91.4	2000	97.5	1.0
		Beryllium, Total	53.2	0.37	50.0	105.7	1.0
		Beryllium, Total MSD	50.9	0.37	50.0	101.1	1.0
		Calcium, Total	77200	50500	25000	106.8	1.0
		Calcium, Total MSD	76400	50500	25000	103.4	1.0
		Cadmium, Total	49.8	0.40u	50.0	99.6	1.0
		Cadmium, Total MSD	49.2	0.40u	50.0	98.4	1.0
		Cobalt, Total	514	0.60u	500	102.8	1.0
		Cobalt, Total MSD	491	0.60u	500	98.2	1.0
		Chromium, Total	258	47.8	200	105.0	1.0
		Chromium, Total MSD	248	47.8	200	100.4	1.0
		Copper, Total	266	5.4	250	104.2	1.0
		Copper, Total MSD	255	5.4	250	99.7	1.0
		Iron, Total	4030	2620	1000	141.1	1.0
		Iron, Total MSD	3940	2620	1000	131.8	1.0
		Potassium, Total	31200	5260	25000	103.8	1.0
		Potassium, Total MSD	31000	5260	25000	102.8	1.0
		Magnesium, Total	37100	11300	25000	103.3	1.0
		Magnesium, Total MSD	36700	11300	25000	101.6	1.0
		Manganese, Total	645	93.5	500	110.3	1.0
		Manganese, Total MSD	617	93.5	500	104.7	1.0
		Sodium, Total	36000	12100	25000	95.8	1.0
		Sodium, Total MSD	35700	12100	25000	94.4	1.0
		Nickel, Total	506	4.5	500	100.4	1.0
		Nickel, Total MSD	487	4.5	500	96.5	1.0
		Lead, Total	510	1.8 u	500	102.0	1.0
		Lead, Total MSD	505	1.8 u	500	100.9	1.0
		Antimony, Total	518	2.3 u	500	103.7	1.0
		Antimony, Total MSD	516	2.3 u	500	103.3	1.0
		Selenium, Total	2100	3.8	2000	104.7	1.0
		Selenium, Total MSD	2090	3.8	2000	104.5	1.0
		Thallium, Total	2080	3.7 u	2000	104.1	1.0
		Thallium, Total MSD	2060	3.7 u	2000	103.2	1.0

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INORGANICS ACCURACY REPORT 01/27/99

CLIENT: TNU-HANFORD C99-009

RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	B0T134	Vanadium, Total	549	12.2	500	107.4	1.0
		Vanadium, Total MSD	525	12.2	500	102.5	1.0
		Zinc, Total	516	9.1	500	101.3	1.0
		Zinc, Total MSD	495	9.1	500	97.2	1.0

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INORGANICS DUPLICATE SPIKE REPORT 01/27/99

CLIENT: TNU-HANFORD C99-009

RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-002	B0T134	Silver, Total	102.2	97.6	4.6
		Aluminum, Total	106.0	101.2	4.7
		Arsenic, Total	105.0	103.3	1.6
		Barium, Total	102.2	97.5	4.7
		Beryllium, Total	105.7	101.1	4.5
		Calcium, Total	106.8	103.4	3.3
		Cadmium, Total	99.6	98.4	1.2
		Cobalt, Total	102.8	98.2	4.6
		Chromium, Total	105.0	100.4	4.5
		Copper, Total	104.2	99.7	4.4
		Iron, Total	141.1	131.8	6.8
		Potassium, Total	103.8	102.8	1.0
		Magnesium, Total	103.3	101.6	1.7
		Manganese, Total	110.3	104.7	5.2
		Sodium, Total	95.8	94.4	1.4
		Nickel, Total	100.4	96.5	4.0
		Lead, Total	102.0	100.9	1.1
		Antimony, Total	103.7	103.3	0.37
		Selenium, Total	104.7	104.5	0.21
		Thallium, Total	104.1	103.2	0.90
		Vanadium, Total	107.4	102.5	4.7
		Zinc, Total	101.3	97.2	4.2

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INORGANICS PRECISION REPORT 01/27/99

CLIENT: TNU-HANFORD C99-009 RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	B0T134	Silver, Total	0.90u	0.90u	NC	1.0
		Aluminum, Total	17.8 u	17.8 u	NC	1.0
		Arsenic, Total	6.4	5.8	9.8	1.0
		Barium, Total	91.4	92.3	0.98	1.0
		Beryllium, Total	0.37	0.27	31.2	1.0
		Calcium, Total	50500	51300	1.5	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Cobalt, Total	0.60u	0.60u	NC	1.0
		Chromium, Total	47.8	47.9	0.21	1.0
		Copper, Total	5.4	7.6	33.8	1.0
		Iron, Total	2620	2830	7.8	1.0
		Potassium, Total	5260	5440	3.3	1.0
		Magnesium, Total	11300	11400	1.2	1.0
		Manganese, Total	93.5	94.1	0.64	1.0
		Sodium, Total	12100	12400	2.4	1.0
		Nickel, Total	4.5	3.2	33.8	1.0
		Lead, Total	1.8 u	1.8 u	NC	1.0
		Antimony, Total	2.3 u	2.3 u	NC	1.0
		Selenium, Total	3.8	4.0	5.1	1.0
		Thallium, Total	3.7 u	3.7 u	NC	1.0
		Vanadium, Total	12.2	12.3	0.82	1.0
		Zinc, Total	9.1	9.1	0.00	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/27/99

CLIENT: TNU-HANFORD C99-009 RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0020-LC1	Silver, LCS	494	500	UG/L	98.7
		Aluminum, LCS	4990	5000	UG/L	99.9
		Arsenic, LCS	9970	10000	UG/L	99.7
		Barium, LCS	4870	5000	UG/L	97.4
		Beryllium, LCS	247	250	UG/L	98.9
		Calcium, LCS	24700	25000	UG/L	98.9
		Cadmium, LCS	242	250	UG/L	97.0
		Cobalt, LCS	2450	2500	UG/L	97.9
		Chromium, LCS	494	500	UG/L	98.7
		Copper, LCS	1240	1250	UG/L	99.6
		Iron, LCS	4890	5000	UG/L	97.7
		Potassium, LCS	25300	25000	UG/L	101.1
		Magnesium, LCS	24900	25000	UG/L	99.5
		Manganese, LCS	780	750	UG/L	104.0
		Sodium, LCS	24200	25000	UG/L	96.7
		Nickel, LCS	1910	2000	UG/L	95.5
		Lead, LCS	2490	2500	UG/L	99.5
		Antimony, LCS	3020	3000	UG/L	100.6
		Selenium, LCS	10100	10000	UG/L	101.3
		Thallium, LCS	10100	10000	UG/L	100.7
		Vanadium, LCS	2540	2500	UG/L	101.6
		Zinc, LCS	978	1000	UG/L	97.8

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-009

DATE RECEIVED: 01/04/99 RFW LOT # :9901L779

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0T133						
SILVER, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
ALUMINUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
ARSENIC, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
BARIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
BERYLLIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
CALCIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
CADMIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
COBALT, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
CHROMIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
COPPER, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
IRON, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
POTASSIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
MAGNESIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
MANGANESE, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
SODIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
NICKEL, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
LEAD, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
ANTIMONY, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
SELENIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
THALLIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
VANADIUM, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
ZINC, TOTAL	001	W	99L0020	12/30/98	01/15/99	01/18/99
B0T134						
SILVER, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
SILVER, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
SILVER, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
SILVER, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
ALUMINUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
ALUMINUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
ALUMINUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
ALUMINUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
ARSENIC, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
ARSENIC, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-009

DATE RECEIVED: 01/04/99 RFW LOT # :9901L779

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
ARSENIC, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
BARIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
BARIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
BARIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
BARIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
BERYLLIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
BERYLLIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
BERYLLIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
BERYLLIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
CALCIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
CALCIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
CALCIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
CALCIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
CADMIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
CADMIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
CADMIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
CADMIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
COBALT, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
COBALT, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
COBALT, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
COBALT, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
CHROMIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
CHROMIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
CHROMIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
CHROMIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
COPPER, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
COPPER, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
COPPER, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
COPPER, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
IRON, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
IRON, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
IRON, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
IRON, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
POTASSIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
POTASSIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
POTASSIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
POTASSIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-009

DATE RECEIVED: 01/04/99 RFW LOT # :9901L779

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
MAGNESIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
MAGNESIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
MAGNESIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
MANGANESE, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
MANGANESE, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
MANGANESE, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
MANGANESE, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
SODIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
SODIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
SODIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
SODIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
NICKEL, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
NICKEL, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
NICKEL, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
NICKEL, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
LEAD, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
LEAD, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
LEAD, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
LEAD, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
ANTIMONY, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
ANTIMONY, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
ANTIMONY, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
ANTIMONY, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
SELENIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
SELENIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
SELENIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
SELENIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
THALLIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
THALLIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
THALLIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
THALLIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
VANADIUM, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
VANADIUM, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99
VANADIUM, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
VANADIUM, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99
ZINC, TOTAL	002	W	99L0020	12/30/98	01/15/99	01/18/99
ZINC, TOTAL	002 REP	W	99L0020	12/30/98	01/15/99	01/18/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-009

DATE RECEIVED: 01/04/99 RFW LOT # :9901L779

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	002 MS	W	99L0020	12/30/98	01/15/99	01/18/99
ZINC, TOTAL	002 MSD	W	99L0020	12/30/98	01/15/99	01/18/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
SILVER, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
ALUMINUM LABORTORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
ALUMINUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
ARSENIC LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
ARSENIC, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
BARIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
BARIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
BERYLLIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
BERYLLIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
CALCIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
CALCIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
CADMIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
CADMIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
COBALT LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
COBALT, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
CHROMIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
CHROMIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
COPPER LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
COPPER, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
IRON LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
IRON, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
POTASSIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
POTASSIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
MAGNESIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
MAGNESIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
MANGANESE LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
MANGANESE, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
SODIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
SODIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
NICKEL LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
NICKEL, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
LEAD LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-009

DATE RECEIVED: 01/04/99 RFW LOT # :9901L779

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
ANTIMONY LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
ANTIMONY, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
SELENIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
SELENIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
THALLIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
THALLIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
VANADIUM LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
VANADIUM, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99
ZINC LABORATORY	LC1 BS	W	99L0020	N/A	01/15/99	01/18/99
ZINC, TOTAL	MB1	W	99L0020	N/A	01/15/99	01/18/99

RECRA LabNet Use Only
9910179

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD P... (8) metals dig

Client TNU - Hanford C99-004
Est. Final Proj. Sampling Date
Project # 10985-001-001-9999-00
Project Contact/Phone #
RECRA Project Manager AJ
QC spec Del std TAT 30 day
Date Rec'd 1/4/99 Date Due 2/3/99
Account #

Refrigerator #												6		6					
#/Type Container	Liquid											1p		1p					
	Solid																		
Volume	Liquid											500		500					
	Solid																		
Preservatives												HNO3							
ANALYSES REQUESTED		ORGANIC										INORG							
		VOA	BNA	Pest/PCB	Herb							Metal	CN						
		RECRA LabNet Use Only																	
												Met①		Ing①					

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
S - Soil	001	BØT133			W	12/30/98	0910						✓		✓	1/4/99				
SE - Sediment	002	BØT134	✓	✓	W	↓	↓						✓		✓					
SO - Solid																				
SL - Sludge																				
W - Water																				
O - Oil																				
A - Air																				
DS - Drum Solids																				
DL - Drum Liquids																				
L - EP/TCLP Leachate																				
WI - Wipe																				
X - Other																				
F - Fish																				

Special Instructions:
saf # C99-009
Alg # H0329

COMPOSITE WASTE

DATE/REVISIONS:
Met① = HSL-Hg Cy ICP
Ing①2 = ICCL, ICFL, ICNO3, ICNO2, ICSO4
1/6/99 3 002 - most of sample spilled
4 about 50-100 ml remaining
5
* 6 808247156517

Relinquished by	Received by	Date	Time
Jedlicka	Tucker	1/4/99	1000

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

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

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.8 °C

1/6 1/03 mt

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# C99-009-109 (12329)

Page 1 of 1

Collector: D.R. BREWINGTON (RFS)	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100-HR3-IAM (2) GW SAMPLING NOVEMBER 1998	Logbook No.: WA-EMF-118	Ice Chest No. Temp. 4 °C
Shipped To (Lab): TMA/RPCRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
FAX COPIES OF TMA & QES LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0T133 (F)		W	12-30-98	0910	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B0T134		W			1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B0T134		W			1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	Cool 4C
B0T134		W			1x20-mL P	Activity Scan	None
B0T134		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B0T134		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B0T134		W			1x250-mL P	Tritium - H3	None

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D.R. Brewington / D.R. BREWINGTON (RFS) DEC 30 1998	1140	RZ Steffler / RZ Steffler	12-30-98 1140
RZ Steffler / RZ Steffler		Fed Ex	12-30-98
Fed Ex	12-31-98 1100	JR Cosso / JR Cosso	12-31-98 1100
JR Cosso / JR Cosso	12-31-98 1700	Fed Ex	12-31-98 1700

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

SAMPLE DISPOSAL: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

FEB 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD C99-009
RFW# : 9901L779
SDG# : H0329
SAF# : C99-009

W.O. # : 10985-001-001-9999-00
Date Received: 01-04-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the method checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate and Nitrite which were received past hold.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blanks were within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% RPD control limit.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-26-99
Date

mp:a01-779

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.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610)-280-3000 • Fax (610) 280-3041

WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF WATER SAMPLES

	EPA 600	SW846	OTHER
Acidity	__305.1		
__Alkalinity __Bicarbonate __Carbonate	__310.1		
BOD	__405.1		__5210B (b)
Ion Chromatography:			
__Bromide ✓Chloride ✓Fluoride	✓300.0	__9056	
✓Nitrite ✓Nitrate __Phosphate	✓300.0	__9056	
✓Sulfate __Formate __Acetate __Oxalate	✓300.0	__9056	
Chloride	__325.2	__9251	
Chlorine Residual	__330.5 (mod)		
Cyanide Amenable to Chlorination	__335.2	__9010A	
Cyanide (Total)	__335.2	__9010A __9012	__ILM04.0 (e)
Cyanide, Weak Acid Dissociable			__412 (a) __4500CN-I (b)
COD	__410.4 (mod)		__5220 C (b)
Color	__110.2		
Corrosivity (by Coupon)		__1110 (mod)	
Chromium VI		__7196A	__3500Cr-D (b)
Fluoride	__340.2		
Hardness, Calcium	__215.2		
Hardness, Total	__130.2		
Iodide			__ASTM D19P202 (1)
Surfactant	__425.1		
__Nitrate-Nitrite __Nitrate __Nitrite	__353.2		
Ammonia	__350.3		
Total__Kjeldahl Nitrogen __Organic Nitrogen	__351.4		
Total __Organic __Inorganic Carbon	__415.1	__9060	
Oil and Grease	__413.1	__9070	
__pH __pH, Paper	__150.1	__9040A __9041A	
Petroleum Hydrocarbons, Total Recoverable	__418.1		
Phenol	__420.1 __420.2	__9065 __9066	
__Ortho Phosphate __Total Phosphate	__365.2		__4500-P B __C
Salinity			__210A (a) __2520B (b)
Settleable Solids	__160.5		
Sulfide	__376.2 __376.1	__9030A	
Reactive __Cyanide __Sulfide		__Sec 7.3	
Silica	__370.1		
Sulfite	__377.1		
Sulfate	__375.4	__9038	
Specific Conductance	__120.1	__9050	
Specific Gravity			__213E (a)
__TCLP __TCLV		__1311	
Synthetic Precipitation Leach		__1312	
Total __Dissolved __Suspended __Solids	160__.1__.2__.3		
Total Organic Halides	__450.1	__9020B	
Turbidity	__180.1		
Volatile Solids __Total __Dissolved __Suspended	__160.4		

Other:_____ Method:_____

RFW 21-21-034/A-08/95

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/21/99

CLIENT: TNU-HANFORD C99-009 RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B0T134	Chloride by IC	18.5	MG/L	1.0	4.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	23	MG/L	1.0	4.0
		Sulfate by IC	74.3	MG/L	2.5	10.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/21/99

CLIENT: TNU-HANFORD C99-009 RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LAC003-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/21/99

CLIENT: TNU-HANFORD C99-009 RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	B0T134	Chloride by IC	40.8	18.5	20.0	111.2	4.0
		Fluoride by IC	44.7	0.16	40.0	111.4	4.0
		Nitrite by IC	21	0.25u	20	107.2	4.0
		Nitrate by IC	46	23	20	116.2	4.0
		Sulfate by IC	186	74.3	100	111.9	20.0
BLANK10	99LAC003-MB1	Chloride by IC	5.0	0.25u	5.0	99.8	1.0
		Fluoride by IC	11.1	0.50u	10.0	110.8	1.0
		Nitrite by IC	5.0	0.25u	5.0	100.1	1.0
		Nitrate by IC	5.2	0.25u	5.0	104.4	1.0
		Sulfate by IC	5.0	0.25u	5.0	99.9	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 01/21/99

CLIENT: TNU-HANFORD C99-009

RECRA LOT #: 9901L779

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	B0T134	Chloride by IC	18.5	18.2	1.7	4.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	23	22	2.1	4.0
		Sulfate by IC	74.3	74.6	0.40	10.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-009

DATE RECEIVED: 01/04/99 RFW LOT # :9901L779

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0T134						
CHLORIDE BY IC	002	W	99LAC003	12/30/98	01/08/99	01/08/99
CHLORIDE BY IC	002 REP	W	99LAC003	12/30/98	01/08/99	01/08/99
CHLORIDE BY IC	002 MS	W	99LAC003	12/30/98	01/08/99	01/08/99
FLUORIDE BY IC	002	W	99LAC003	12/30/98	01/08/99	01/08/99
FLUORIDE BY IC	002 REP	W	99LAC003	12/30/98	01/08/99	01/08/99
FLUORIDE BY IC	002 MS	W	99LAC003	12/30/98	01/08/99	01/08/99
NITRITE BY IC	002	W	99LAC003	12/30/98	01/08/99	01/08/99
NITRITE BY IC	002 REP	W	99LAC003	12/30/98	01/08/99	01/08/99
NITRITE BY IC	002 MS	W	99LAC003	12/30/98	01/08/99	01/08/99
NITRATE BY IC	002	W	99LAC003	12/30/98	01/08/99	01/08/99
NITRATE BY IC	002 REP	W	99LAC003	12/30/98	01/08/99	01/08/99
NITRATE BY IC	002 MS	W	99LAC003	12/30/98	01/08/99	01/08/99
SULFATE BY IC	002	W	99LAC003	12/30/98	01/08/99	01/08/99
SULFATE BY IC	002 REP	W	99LAC003	12/30/98	01/08/99	01/08/99
SULFATE BY IC	002 MS	W	99LAC003	12/30/98	01/08/99	01/08/99

LAB QC:

CHLORIDE BY IC	MB1	W	99LAC003	N/A	01/08/99	01/08/99
CHLORIDE BY IC	MB1 BS	W	99LAC003	N/A	01/08/99	01/08/99
FLUORIDE BY IC	MB1	W	99LAC003	N/A	01/08/99	01/08/99
FLUORIDE BY IC	MB1 BS	W	99LAC003	N/A	01/08/99	01/08/99
NITRITE BY IC	MB1	W	99LAC003	N/A	01/08/99	01/08/99
NITRITE BY IC	MB1 BS	W	99LAC003	N/A	01/08/99	01/08/99
NITRATE BY IC	MB1	W	99LAC003	N/A	01/08/99	01/08/99
NITRATE BY IC	MB1 BS	W	99LAC003	N/A	01/08/99	01/08/99
SULFATE BY IC	MB1	W	99LAC003	N/A	01/08/99	01/08/99
SULFATE BY IC	MB1 BS	W	99LAC003	N/A	01/08/99	01/08/99

9910L779

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford C99-004
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: CJ
QC: spec Del: std TAT: 30 days
Date Rec'd: 1/4/99 Date Due: 2/3/99
Account #:

Refrigerator #										6		6				
#/Type Container	Liquid									1p		1p				
	Solid															
Volume	Liquid									500		500				
	Solid															
Preservatives										HNO3						
ANALYSES REQUESTED		ORGANIC								INORG						
		VOA	BNA	Pest/PCB	Herb					Metal	CN					
RECRA LabNet Use Only										Met①		Ing②				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
S - Soil	001	BOT133			W	12/30/98	0910							✓		✓	1/4/99			
SE - Sediment	002	BOT134	✓	✓	W	↓	↓							✓		✓				
SO - Solid																				
SL - Sludge																				
W - Water																				
O - Oil																				
A - Air																				
DS - Drum Solids																				
DL - Drum Liquids																				
L - EP/TCLP Leachate																				
WI - Wipe																				
X - Other																				
F - Fish																				

Special Instructions:
saf # C99-009
sdg # H0329

COMPOSITE WASTE

DATE/REVISIONS:
Met① = HSL-Hg-Cy ICP
Ing②₂ = ICCL, ICFL, ICNO3, ICNO2, ICSO4
3
4
5
* 6 8082471560517

Relinquished by	Received by	Date	Time
Declan	Stoker	1/4/99	1000

Relinquished by	Date	Time
ORIGINAL REWRITTEN		

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

RECRA LabNet Use Only

Samples were:
1) Shipped (Y) or Hand Delivered
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times Y or (N)
NO2, NO3 out

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Tape Present Upon Sample Receipt (Y) or N
Cooler Temp 1.8 C

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C99-009-10[illegible] (12324)

Page 1 of 1

Collector: D.R. BREWINGTON (RFS)	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100-HR3-IAM (2) GW SAMPLING NOVEMBER 1998	Logbook No.: WMS-EMF-118	Ice Chest No. Temp. 4 °C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
FAX COPIES OF TMA & QES LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0T133 (F)		W	12-30-98	0910	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B0T134		W			1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B0T134		W			1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	Cool 4C
B0T134		W			1x20-mL P	Activity Scan	None
B0T134		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B0T134		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B0T134		W			1x250-mL P	Tritium - H3	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D.R. BREWINGTON (RFS)	D.R. Brewington		DEC 30 1998 1140	RZ Steffler		RZ Steffler	12-30-98 1140
RZ Steffler		RZ Steffler		Fed Ex			12-30-98
Fed Ex			12-31-98 11:00	JR Corso		JR Corso	12-31-98 11:00
JR Corso		JR Corso	12-31-98 17:00	Fed Ex			12-31-98 17:00

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wipe	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0329 is comprised of a single liquid (water) sample designated under SAF No. C99-009 with a Project Designation of: 100-HR-3-IAM (2) GW Sampling. November 1998.

The sample was received as stated on the Chain-of-Custody document.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analyses

The relative percent difference in the results of the duplicate and the original analysis was 87%, greater than the 3σ limit of 48%. Positive gross beta activity was detected in the sample and the duplicate. The QC blank sample also indicated some contamination from the samples' activity.

2.2 Tritium Analyses

No problems were encountered in the processing of the samples.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

SAMPLE SUMMARY

SDG 7079
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0T134	HANFORD SITE	WATER		N812125-01	C99-009	C99-009-109	12/30/98 09:10
Method Blank		WATER		N812125-03	C99-009		
Lab Control Sample		WATER		N812125-02	C99-009		
Duplicate (N812125-01)	HANFORD SITE	WATER		N812125-04	C99-009		12/30/98 09:10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 02/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

QC SUMMARY

SDG 7079
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7079	C99-009-109	B0T134	WATER				12/31/98	1	N812125-01	7079-001
		Method Blank	WATER						N812125-03	7079-003
		Lab Control Sample	WATER						N812125-02	7079-002
		Duplicate (N812125-01)	WATER				12/31/98	1	N812125-04	7079-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

SDG 7079
Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
80A	WATER	Gross Alpha in Water	2857-131	20.0	1			1	1	1/1		
80B	WATER	Gross Beta in Water	2857-131	15.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	WATER	Tritium in Water	2857-131	10.0	1			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 02/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

SDG 7079
Contact L.A. Johnson

WORK SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0T134			N812125-01	7079-001	80A/80		01/18/99	01/21/99	DER	Gross Alpha in Water
HANFORD SITE		WATER	12/30/98	7079-001	80B/80		01/18/99	01/21/99	DER	Gross Beta in Water
C99-009-109	C99-009		12/31/98	7079-001	H		01/16/99	01/21/99	DER	Tritium in Water
Method Blank			N812125-03	7079-003	80A/80		01/18/99	01/21/99	DER	Gross Alpha in Water
		WATER		7079-003	80B/80		01/18/99	01/21/99	DER	Gross Beta in Water
	C99-009			7079-003	H		01/16/99	01/21/99	DER	Tritium in Water
Lab Control Sample			N812125-02	7079-002	80A/80		01/18/99	01/21/99	DER	Gross Alpha in Water
		WATER		7079-002	80B/80		01/18/99	01/21/99	DER	Gross Beta in Water
	C99-009			7079-002	H		01/16/99	01/21/99	DER	Tritium in Water
Duplicate (N812125-01)			N812125-04	7079-004	80A/80		01/18/99	01/21/99	DER	Gross Alpha in Water
HANFORD SITE		WATER	12/30/98	7079-004	80B/80		01/18/99	01/21/99	DER	Gross Beta in Water
	C99-009		12/31/98	7079-004	H		01/16/99	01/21/99	DER	Tritium in Water

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
80A/80	C99-009	Gross Alpha in Water	EPA900.0	1			1	1	1	4
80B/80	C99-009	Gross Beta in Water	EPA900.0	1			1	1	1	4
H	C99-009	Tritium in Water	EPA906.0	1			1	1	1	4
TOTALS				3			3	3	3	12

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

N812125-03

METHOD BLANK

Method Blank

SDG	7079	Client/Case no	Hanford	SDG-H0329	
Contact	L.A. Johnson	Case no	TRB-SBB-207925		
Lab sample id	N812125-03	Client sample id	Method Blank		
Dept sample id	7079-003	Material/Matrix		WATER	
		SAF No	C99-009		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.230	0.77	1.4	3.0	U	80A
Gross Beta	12587-47-2	2.50	1.4	2.1	4.0	J	80B
Tritium	10028-17-8	81.0	140	230	400	U	H

100-HR3-IAM(2)GW SAMPLING NOV. 1998

QC-BLANK 29966

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/99

N812125-02

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

LAB CONTROL SAMPLE

Lab Control Sample

SDG 7079
Contact L.A. Johnson

Client/Case no Hanford SDG-H0329
Case no TRB-SBB-207925

Lab sample id N812125-02
Dept sample id 7079-002

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No C99-009

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	56.0	4.8	1.1	3.0		80A	67.0	2.7	84	72-128	80-120
Gross Beta	77.0	3.7	2.3	4.0	B	80B	76.7	3.1	100	76-124	80-120
Tritium	12000	340	230	400		H	11100	440	108	82-118	80-120

100-HR3-IAM(2)GW SAMPLING NOV. 1998

QC-LCS 29965

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/02/99

N812125-04

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

DUPLICATE

B0T134

SDG 7079
Contact L.A. Johnson

DUPLICATE
Lab sample id N812125-04
Dept sample id 7079-004

ORIGINAL
Lab sample id N812125-01
Dept sample id 7079-001
Received 12/31/98

Client/Case no Hanford SDG-H0329
Case no TRB-SBB-207925

Client sample id B0T134
Location/Matrix HANFORD SITE WATER
Collected 12/30/98 09:10
Custody/SAF No C99-009-109 C99-009

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	0.760	0.88	1.2	3.0	U	80A	0.560	0.82	1.3	U	-		
Gross Beta	18.0	2.2	2.5	4.0	B	80B	7.10	1.7	2.3	B	87	48	
Tritium	4100	230	230	400		H	4300	230	230		5	24	

100-HR3-IAM(2)GW SAMPLING NOV. 1998

QC-DUP#1 29967

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 02/02/99

N812125-01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

DATA SHEET

B0T134

SDG	7079	Client/Case no	Hanford SDG-H0329
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N812125-01	Client sample id	B0T134
D.pt sample id	7079-001	Location/Matrix	HANFORD SITE WATER
Received	12/31/98	Collected	12/30/98 09:10
		Custody/SAF No	C99-009-109 C99-009

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.560	0.82	1.3	3.0	U	80A
Gross Beta	12587-47-2	7.10	1.7	2.3	4.0	B	80B
Tritium	10028-17-8	4300	230	230	400		H

100-HR3-IAM(2)GW SAMPLING NOV. 1998

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

Test 80A Matrix WATER
SDG 7079
Contact L.A. Johnson

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 2857-131						
B0T134	N812125-01	80		7079-001	U	
BLK (QC ID=29966)	N812125-03	80		7079-003	U	
LCS (QC ID=29965)	N812125-02	80		7079-002	ok	
Duplicate (N812125-01)	N812125-04	80		7079-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	3.0	
100-HR3-IAM(2)GW SAMPLING NOV. 1998						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2857-131	2σ prep error 20.0 %			Reference Lab			Notebook #2857 pg. 131									
B0T134	N812125-01	80		1.3	0.300			63		100			19	01/14/99	01/18	GRB-113
BLK (QC ID=29966)	N812125-03	80		1.4	0.300			42		100				01/14/99	01/18	GRB-115
LCS (QC ID=29965)	N812125-02	80		1.1	0.300			42		100				01/14/99	01/18	GRB-114
Duplicate (N812125-01) (QC ID=29967)	N812125-04	80		1.2	0.300			62		100			19	01/14/99	01/18	GRB-116
Nominal values and limits from method				3.0	0.300			5-150		100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-120	Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.2 ± 0.26
RESIDUE 52 ± 24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

Test 80B Matrix WATER
SDG 7079
Contact L.A. Johnson

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 2857-131					
B0T134	N812125-01	80		7079-001	7.10
BLK (QC ID=29966)	N812125-03	80		7079-003	2.50 J
LCS (QC ID=29965)	N812125-02	80		7079-002	ok
Duplicate (N812125-01)	N812125-04	80		7079-004	OUT
Nominal values and limits from method				RDLs (pCi/L)	4.0
100-HR3-IAM(2)GW SAMPLING NOV. 1998					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2857-131	2σ prep error 15.0 % Reference Lab Notebook #2857 pg. 131															
B0T134	N812125-01	80		2.3	0.300			63		100			19	01/14/99	01/18	GRB-113
BLK (QC ID=29966)	N812125-03	80		2.1	0.300			42		100				01/14/99	01/18	GRB-115
LCS (QC ID=29965)	N812125-02	80		2.3	0.300			42		100				01/14/99	01/18	GRB-114
Duplicate (N812125-01) (QC ID=29967)	N812125-04	80		2.5	0.300			62		100			19	01/14/99	01/18	GRB-116
Nominal values and limits from method				4.0	0.300			5-150		100			180			

PROCEDURES REFERENCE EPA900.0
EP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2.3 ± 0.33
RESIDUE 52 ± 24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0329

Test H Matrix WATER
SDG 7079
Contact L.A. Johnson

METHOD SUMMARY

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium
Preparation batch 2857-131					
B0T134	N812125-01			7079-001	4300
BLK (QC ID=29966)	N812125-03			7079-003	U
LCS (QC ID=29965)	N812125-02			7079-002	ok
Duplicate (N812125-01)	N812125-04			7079-004	ok

Nominal values and limits from method RDLs (pCi/L) 400
100-HR3-IAM(2)GW SAMPLING NOV. 1998

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2857-131	2σ prep error 10.0 %			Reference Lab	Notebook #2857 pg. 131											
B0T134	N812125-01			230	0.0100					100			17	01/15/99	01/16	LSC-004
BLK (QC ID=29966)	N812125-03			230	0.0100					100				01/15/99	01/16	LSC-004
LCS (QC ID=29965)	N812125-02			230	0.0100					100				01/15/99	01/16	LSC-004
Duplicate (N812125-01) (QC ID=29967)	N812125-04			230	0.0100					100			17	01/15/99	01/16	LSC-004
Nominal values and limits from method				400	0.0100					25			180			

PROCEDURES REFERENCE EPA906.0
EP-210 Tritium in Water by Distillation, rev 0

AVERAGES ± 2 SD MDA 230 ± 0
FOR 4 SAMPLES YIELD ±

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/02/99

SDG 7079
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

SDG 7079
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

SDG 7079
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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SDG 7079
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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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Protocol Hanford
Version Ver 1.0
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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.

SDG 7079
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

SDG 7079
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

SDG 7079
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

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.

SDG 7079
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

SDG 7079
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

MATRIX SPIKE

for the recovery.

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

SDG 7079
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0329

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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Protocol Hanford
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Contact L.A. Johnson

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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.

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

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

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

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/02/99

METHOD SUMMARY

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

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

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

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

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C99-009-109

Collector: D.R. BREWINGTON (RFS)	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100-HR3-JAM (2) GW SAMPLING, NOVEMBER 1998	Logbook No.: WA-SMF-118	Ice Chest No. Temp. 4 °C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
FAX COPIES OF TMA & QES LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0T133 (F)		W	12-30-98	0910	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B0T134		W			1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B0T134		W			1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	Cool 4C
B0T134		W			1x20-mL P	Activity Scan	None
B0T134		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B0T134		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B0T134		W			1x250-mL P	Tritium - H3	None

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D.R. BREWINGTON (RFS) DEC 30 1998	1140	RZ Steffler	12-30-98 1140
RZ Steffler		Fed Ex	12-30-98
Fed Ex	12-31-98 11:00	J R Lopez	12-31-98 11:00

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

Overnight Air

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
Waste Management F.S.		W99 00083

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Hanford Tech. Services	Enviromental Ops.	Sampling + Mobile Labs

The following items are to be shipped from ☒ Contractor / ☐ Vendor

Routing Fed Ex 423574521104 ☒ Prepaid ☐ Collect

Shipped to TMA / Weston
Company
Address 2030 Wright Ave.
City Richmond State CA. Zip Code 94804
Country

Off-site Custodian Delores Sanchez

On-site Custodian Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1	Cooler	Groundwater samples that are double bagged + on wet ice. Cooler # SML-587 Weight 49 CoC# C99-009-109 Sample# BOT133, BOT134	

☐ 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) Samples require analysis other than those available on this site.

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

RM Clearance for Public Release	RM Survey No.	Date
NA	NA	NA

Location of and Contact for Property (Name/Phone No./Bldg./Area)
Rory Steffler / 372-2321 / 345 Hills / 600

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
12-30-98	03E00 / DB8074	NA

~~Originated By~~ Relinquished	Date	Authorized By	Date
12-30-98 1330 RZ Steffler R.P. Steffler	12-30-98		12-29-98

Property Representative Signature	Date	Property Management Approval	Date
			12/30/98

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
CR. Nelson	12-30-98

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

BC-6001-579 (01/95)