RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

0054591

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD C01-007 H1123
RFW# : 0011L198

W.O. # : 10985-001-001-9999-00
Date Received: 11-09-00

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 water samples.

2. The samples were 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, Nitrite and Phosphate 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% Relative Percent Difference (RPD) control limit.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

RECEIVED
MAR 28 2001
EDMC

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

12-25-00
Date

njp\i11-198

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 15 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chormatography:			
✓ Bromide ✓ Chloride ✓ Fluoride	✓ 300.0	___ 9056	
✓ Nitrate ✓ Nitrite ✓ Phosphate	✓ 300.0	___ 9056	
✓ Sulfate ___Formate ___Acetate ___Oxalate	✓ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B ___ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
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 ___ Organic Nitrogen	___ 351.4		
Total___ Organic ___ Inorganic Carbon	___ 415.1	___ 9060	
Oil & Grease	___ 413.1	___ 9070	
___ pH ____ pH; paper	___ 150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 ___ 420.2	___ 9065 ___ 9066	
___Ortho ___Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1 ___ 376.2	___ 9030B/9034 (acid soluble)	
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (__9014__9030B)	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
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:**

L-WI-034/A-02/00

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/06/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B10J29	Bromide by IC	2.5 u	MG/L	2.5	10.0
		Chloride by IC	7.4	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	43	MG/L	2.5	10
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	61.2	MG/L	2.5	10.0
-004	B10J37	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	8.0	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	20	MG/L	1.2	5.0
		Phosphate by IC	0.30	MG/L	0.25	1.0
		Sulfate by IC	30.6	MG/L	1.2	5.0
-006	B10J01	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	9.9	MG/L	1.2	5.0
		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	24	MG/L	1.2	5.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	32.1	MG/L	1.2	5.0
-008	B10J03	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	4.9	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	11	MG/L	1.2	5.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	38.6	MG/L	1.2	5.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/06/00

CLIENT: TNUHANFORD C01-007 H1123

RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LIC072-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		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
		Phosphate 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 12/06/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	B10J37	Bromide by IC	4.6	0.00	5.0	93.0	1.0
		Chloride by IC	60.7	8.0	50.0	105.3	10.0
		Fluoride by IC	11.6	0.26	10.0	113.3	1.0
		Nitrite by IC	5.4	0.25u	5.0	108.5	1.0
		Nitrate by IC	74	20	50	108.0	10
		Phosphate by IC	5.0	0.30	5.0	93.5	1.0
		Sulfate by IC	86.7	30.6	50.0	112.1	10.0
BLANK10	00LIC072-MB1	Bromide by IC	4.8	0.25u	5.0	96.7	1.0
		Chloride by IC	4.8	0.25u	5.0	95.5	1.0
		Fluoride by IC	10.6	0.50u	10.0	106.1	1.0
		Nitrite by IC	5.0	0.25u	5.0	99.8	1.0
		Nitrate by IC	4.9	0.25u	5.0	97.7	1.0
		Phosphate by IC	4.9	0.25u	5.0	98.7	1.0
		Sulfate by IC	4.8	0.25u	5.0	95.7	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/06/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-004REP	B10J37	Bromide by IC	0.25u	0.25u	NC	1.0
		Chloride by IC	8.0	8.1	1.9	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	20	19	2.2	5.0
		Phosphate by IC	0.30	0.33	9.5	1.0
		Sulfate by IC	30.6	30.5	0.44	5.0

RECRA LabNet Use Only

0011L198

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: ALL-HANFORD C01-007

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 11-9-00 Date Due: 12-9-00

Account #:

		A	B
Refrigerator #		S	S
#/Type Container	Liquid	1PL	1PL
	Solid		
Volume	Liquid	500	500
	Solid		
Preservatives		HNO3	—
ANALYSES REQUESTED	ORGANIC: VOA		
	ORGANIC: BNA		
	ORGANIC: Pest/PCB		
	ORGANIC: Herb		
	INORG: Metal		IC Anions
	INORG: CN		
RECRA LabNet Use Only		(1) Metals	(1) IC

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Metals	IC
001	B10J28			W	11-3-00	1050	1	
002	29					↓	1	1
003	36					1211	1	
004	37					↓	1	1
005	00					1500	1	
006	01					↓	1	1
007	02					1033	1	
008	03					↓	1	1

Special Instructions: Saf C01-007

Run Matrix QC

DATE/REVISIONS:
003,004 1. Original COC has no time or
↓ 2. collection date written on it.
Mt (1) 3. Al, Ag, Ba, Be, Ca, Cd, Cr, Co, Cu, Fe, K, Mg,
↓ 4. Mn, Ni, Na, Sb, Sr, V, Zn
IC (1) 5. Cl, F, Br, NO2, NO3, PO4, SO4
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___
Airbill # See Below
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. 6.5 C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 8214 89830570

Relinquished by	Received by	Date	Time
Fed Ex	V. Hemmy	11/9/00	0200

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEMSDG 41123

C.O.C. # C01-007-27

Page 1 of 1

Collector D. P. CONNOLLY	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688	MSIN / FAX
SAF No. C01-007	Sampling Origin HANFORD SITE	Purchase Order/Charge Code	
Project Title 100 KR4 IAM (1 & 2)	Logbook No. WM-SAWS-1439	Ice Chest No. GWS 107	Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT VEHICLE	Bill of Lading/Air Bill No. 4235795 40280	
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No. W0100024	

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J28 (F)		W	11-3-00	1050	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J29		W			1x20-mL P	Activity Scan	None
B10J29		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J29		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J29		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J29		W			1x250-mL P	Tritium - H3	None

11-3-00

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D. P. CONNOLLY	NOV 03 2000	Fed Ex	11/03/00
FED-Express	11/04/00 10:30	B Pagano	11/04/00 9:30
JR Corso	11-8-00 16:00	Fed Ex	11-8-00
Fed Ex	11/9/00 1020	Kennedy	11/9/00 1020

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SOG 41123

C.O.C. # C01-007-47

Page 1 of 1

Collector D. P. CONNOLLY	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-007	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title 100 KR4 JAM (1 & 2)	Logbook No. WM-5AWS-1139	Ice Chest No. GWS 107 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235 7954 0280
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No. W01000024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J36 (F)		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J37		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J37		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J37		W			1x20-mL P	Activity Scan	None
B10J37		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J37		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J37		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J37		W			1x250-mL P	Tritium - H3	None

11-3-00 EC

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	D. P. CONNOLLY		11-3-00	Fed Ex			11/03/00
Fed Express			11/04 9:20	E. Argumo			11/04 9:20
JR Porso			11-8-00 16:02	Fed Ex			11-8-00
Fed Ex			11/9/00 1020				11/9/00 1020

Matrix *

S	Soil	DS	Drum Solid
SE	Sediment	DL	Drum Liqui
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG 41123

C.O.C. # C01-007-49

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H37	Ice Chest No.: SML-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J00 (F)		W	11/3/00		1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J01		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J01		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J01		W			1x20-mL P	Activity Scan	None
B10J01		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J01		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J01		W			1x1000-mL G/P	Carbon-14	None
B10J01		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J01		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		11-3-00 1330	FEDX			11/03/00
Fed. Express			11/04/00 9:20	E. Agnew			11/04/00 9:20
JR Corso			11-8-00 16:00				
Ed Es			11/9/00 1020	Vicki Hernandez			11/9/00 1020

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG H1123

C.O.C. # C01-007-51

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H37	Ice Chest No.: SAL-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J02 (F)		W	11/3/00	1033	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J03		W			1x20-mL P	Activity Scan	None
B10J03		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J03		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J03		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J03		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	11-3-00 1330	FEDX	11/03/00
FED Express	11/04/00 10:30	E. Pegues	11/04/00 1030
JR Corso JR Corso	11-8-00 16:00	Fed Ex	11-9-00
Fed Ex	11/9/00 1020	V. Hernandez	11/9/00 1020

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

PAGE 1 Thermo NUtech CHAIN OF CUSTODY ORD # R0-11-070

11/07/00 18:30:07 WORK ID: SAF C01-007 SDG H1123

RCVD: 11/04/00 DUE: 12/19/00 KEEP: 12/19/01 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS		
01A	B10J28(F)	RECRA	DISPOS	E011	
02A	B10J29	RECRA	DISPOS	E011	E260
02B	B10J29 MS	RECRA	E011	E260	
02C	B10J29 DUP	RECRA	E011	E260	
03A	B10J36(F)	RECRA	DISPOS	E011	
04A	B10J37	RECRA	DISPOS	E011	E260
05A	B10J00(F)	RECRA	DISPOS	E011	
06A	B10J01	RECRA	DISPOS	E011	E260
07A	B10J02(F)	RECRA	DISPOS	E011	
08A	B10J03	RECRA	DISPOS	E011	E260

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible]	11-8-00	Fed Ex	11-8-00		

H1123

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-007 H1123

DATE RECEIVED: 11/09/00 RFW LOT # :0011L198

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10J28						
SILVER, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
SILVER, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
SILVER, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-007 H1123

DATE RECEIVED: 11/09/00 RFW LOT # :0011L198

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	001	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	001 REP	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	001 MS	W	99L1809	11/03/00	12/13/00	12/16/00
B10J29						
SILVER, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-007 H1123

DATE RECEIVED: 11/09/00 RFW LOT # :0011L198

CLIENT ID. /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SODIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	002	W	99L1809	11/03/00	12/13/00	12/16/00
B10J36						
SILVER, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	003	W	99L1809	11/03/00	12/13/00	12/16/00
B10J37						
SILVER, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-007 H1123

DATE RECEIVED: 11/09/00 RFW LOT # :0011L198

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	004	W	99L1809	11/03/00	12/13/00	12/16/00
B10J00						
SILVER, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	005	W	99L1809	11/03/00	12/13/00	12/16/00
B10J01						
SILVER, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-007 H1123

DATE RECEIVED: 11/09/00 RFW LOT # :0011L198

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ALUMINUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	006	W	99L1809	11/03/00	12/13/00	12/16/00
B10J02						
SILVER, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-007 H1123

DATE RECEIVED: 11/09/00 RFW LOT # :0011L198

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	007	W	99L1809	11/03/00	12/13/00	12/16/00
B10J03						
SILVER, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
ALUMINUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
BARIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
BERYLLIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
CALCIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
CADMIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
COBALT, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
CHROMIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
COPPER, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
IRON, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
POTASSIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
MAGNESIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
MANGANESE, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
SODIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
NICKEL, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
ANTIMONY, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
STRONTIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
VANADIUM, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00
ZINC, TOTAL	008	W	99L1809	11/03/00	12/13/00	12/16/00

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
SILVER, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
ALUMINUM LABORTORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
ALUMINUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
BARIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
BARIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
BERYLLIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
BERYLLIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
CALCIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
CALCIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
CADMIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-007 H1123

DATE RECEIVED: 11/09/00 RFW LOT # :0011L198

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CADMIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
COBALT LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
COBALT, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
CHROMIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
CHROMIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
COPPER LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
COPPER, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
IRON LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
IRON, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
POTASSIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
POTASSIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
MAGNESIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
MAGNESIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
MANGANESE LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
MANGANESE, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
SODIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
SODIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
NICKEL LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
NICKEL, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
ANTIMONY LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
ANTIMONY, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
STRONTIUM LCS STANDA	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
STRONTIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
VANADIUM LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
VANADIUM, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00
ZINC LABORATORY	LC1 BS	W	99L1809	N/A	12/13/00	12/16/00
ZINC, TOTAL	MB1	W	99L1809	N/A	12/13/00	12/16/00

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD C01-007
RFW#: 0011L198
SDG/SAF#: H1123/C01-007

W.O.#: 10985-001-001-9999-00
Date Received: 11-09-00

METALS CASE NARRATIVE

1. This narrative covers the analyses of 8 water samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

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

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

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to form 7.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 28 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.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

12-22-05
Date

gmb/m11-198

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0011L198

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: ✓3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	✓6010B		__200.7				__99
Antimony	✓6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010B		__200.7				__99
Lead	__6010B	__7421 [6]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010B		__200.7				__99
Manganese	✓6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	✓6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	✓6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-11/99

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 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10J28	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	23.4		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	58800		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	98.0		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	24.0		UG/L	3.8	1.0
		Potassium, Total	2660		UG/L	303	1.0
		Magnesium, Total	8630		UG/L	27.4	1.0
		Manganese, Total	2.3		UG/L	2.3	1.0
		Sodium, Total	7780		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	256		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	220		UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B10J29	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	23.9		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	58900		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	94.7		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	22.1		UG/L	3.8	1.0
		Potassium, Total	2300		UG/L	303	1.0
		Magnesium, Total	8600		UG/L	27.4	1.0
		Manganese, Total	2.6		UG/L	2.3	1.0
		Sodium, Total	7630		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	280		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	243		UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B10J36	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	25.2		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	38800		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	15.0		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	14.6		UG/L	3.8	1.0
		Potassium, Total	4570		UG/L	303	1.0
		Magnesium, Total	8730		UG/L	27.4	1.0
		Manganese, Total	2.3	u	UG/L	2.3	1.0
		Sodium, Total	13400		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	176		UG/L	5.5	1.0
		Vanadium, Total	6.9		UG/L	4.8	1.0
		Zinc, Total	3.1		UG/L	2.7	1.0

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INORGANICS DATA SUMMARY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	B10J37	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	27.3		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	40800		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	14.6		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	1780		UG/L	3.8	1.0
		Potassium, Total	4510		UG/L	303	1.0
		Magnesium, Total	9110		UG/L	27.4	1.0
		Manganese, Total	3.9		UG/L	2.3	1.0
		Sodium, Total	14000		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	192		UG/L	5.5	1.0
		Vanadium, Total	7.5		UG/L	4.8	1.0
		Zinc, Total	5.3		UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	B10J00	Silver, Total	3.5		UG/L	2.5	1.0
		Aluminum, Total	37.5		UG/L	19.1	1.0
		Barium, Total	23.9		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	47700		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	22.6		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	16.9		UG/L	3.8	1.0
		Potassium, Total	1890		UG/L	303	1.0
		Magnesium, Total	5850		UG/L	27.4	1.0
		Manganese, Total	2.3	u	UG/L	2.3	1.0
		Sodium, Total	7160		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	218		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	21.8		UG/L	2.7	1.0

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INORGANICS DATA SUMMARY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	B10J01	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	33.8		UG/L	19.1	1.0
		Barium, Total	23.5		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	47600		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	22.4		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	84.3		UG/L	3.8	1.0
		Potassium, Total	1740		UG/L	303	1.0
		Magnesium, Total	5860		UG/L	27.4	1.0
		Manganese, Total	2.3	u	UG/L	2.3	1.0
		Sodium, Total	7020		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	226		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	7.6		UG/L	2.7	1.0

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INORGANICS DATA SUMMARY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	B10J02	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	69.4		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	27200		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	12.1		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	32.8		UG/L	3.8	1.0
		Potassium, Total	4070		UG/L	303	1.0
		Magnesium, Total	15300		UG/L	27.4	1.0
		Manganese, Total	2.3	u	UG/L	2.3	1.0
		Sodium, Total	28900		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	469		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	2.7	u	UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	B10J03	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	69.4		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	28100		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	66.4		UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	257		UG/L	3.8	1.0
		Potassium, Total	4560		UG/L	303	1.0
		Magnesium, Total	15700		UG/L	27.4	1.0
		Manganese, Total	4.9		UG/L	2.3	1.0
		Sodium, Total	28900		UG/L	22.9	1.0
		Nickel, Total	28.9		UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	410		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	2.7	u	UG/L	2.7	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1809-MB1	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	3.0	u	UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	26.6		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	4.9	u	UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	4.3		UG/L	3.8	1.0
		Potassium, Total	303	u	UG/L	303	1.0
		Magnesium, Total	27.4	u	UG/L	27.4	1.0
		Manganese, Total	2.3	u	UG/L	2.3	1.0
		Sodium, Total	55.4		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	5.5	u	UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	2.7	u	UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10J28	Silver, Total	47.1	2.5 u	50.0	94.2	1.0
		Aluminum, Total	1970	19.1 u	2000	98.5	1.0
		Barium, Total	1980	23.4	2000	98.1	1.0
		Beryllium, Total	48.6	0.60u	50.0	97.2	1.0
		Calcium, Total	84500	58800	25000	102.8	1.0
		Cadmium, Total	48.7	3.4 u	50.0	97.4	1.0
		Cobalt, Total	485	5.6 u	500	97.0	1.0
		Chromium, Total	289	98.0	200	95.5	1.0
		Copper, Total	239	2.6 u	250	95.5	1.0
		Iron, Total	979	24.0	1000	95.5	1.0
		Potassium, Total	26900	2660	25000	97.1	1.0
		Magnesium, Total	33300	8630	25000	98.7	1.0
		Manganese, Total	489	2.3	500	97.3	1.0
		Sodium, Total	32700	7780	25000	99.8	1.0
		Nickel, Total	486	12.5 u	500	97.3	1.0
		Antimony, Total	498	17.0 u	500	99.7	1.0
		Strontium, Total	1330	256	1000	107.6	1.0
		Vanadium, Total	478	4.8 u	500	95.7	1.0
		Zinc, Total	703	220	500	96.6	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10J28	Silver, Total	2.5 u	2.5 u	NC	1.0
		Aluminum, Total	19.1 u	19.1 u	NC	1.0
		Barium, Total	23.4	25.7	9.4	1.0
		Beryllium, Total	0.60u	0.60u	NC	1.0
		Calcium, Total	58800	59800	1.6	1.0
		Cadmium, Total	3.4 u	3.4 u	NC	1.0
		Cobalt, Total	5.6 u	5.6 u	NC	1.0
		Chromium, Total	98.0	98.4	0.41	1.0
		Copper, Total	2.6 u	2.6 u	NC	1.0
		Iron, Total	24.0	3.9	144.1	1.0
		Potassium, Total	2660	2650	0.26	1.0
		Magnesium, Total	8630	8730	1.1	1.0
		Manganese, Total	2.3	3.1	29.6	1.0
		Sodium, Total	7780	7880	1.3	1.0
		Nickel, Total	12.5 u	12.5 u	NC	1.0
		Antimony, Total	17.0 u	17.0 u	NC	1.0
		Strontium, Total	256	243	5.0	1.0
		Vanadium, Total	4.8 u	4.8 u	NC	1.0
		Zinc, Total	220	225	2.4	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/19/00

CLIENT: TNUHANFORD C01-007 H1123 RECRA LOT #: 0011L198

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1809-LC1	Silver, LCS	500	500	UG/L	99.9
		Aluminum, LCS	5140	5000	UG/L	102.9
		Barium, LCS	5070	5000	UG/L	101.5
		Beryllium, LCS	250	250	UG/L	100.1
		Calcium, LCS	25200	25000	UG/L	101.0
		Cadmium, LCS	248	250	UG/L	99.2
		Cobalt, LCS	2540	2500	UG/L	101.6
		Chromium, LCS	499	500	UG/L	99.8
		Copper, LCS	1250	1250	UG/L	100.1
		Iron, LCS	5080	5000	UG/L	101.6
		Potassium, LCS	24900	25000	UG/L	99.6
		Magnesium, LCS	25200	25000	UG/L	101.0
		Manganese, LCS	753	750	UG/L	100.4
		Sodium, LCS	25300	25000	UG/L	101.2
		Nickel, LCS	2050	2000	UG/L	102.4
		Antimony, LCS	3000	3000	UG/L	100
		Strontium, LCS	4500	5000	UG/L	89.9
		Vanadium, LCS	2510	2500	UG/L	100.3
		Zinc, LCS	995	1000	UG/L	99.5

RECRA LabNet Use Only

0011L198

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: ALL-HANFORD C01-007

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: QS

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 11-9-00 Date Due: 12-9-00

Account #:

		A	B
Refrigerator #		S	S
#/Type Container	Liquid	1PL	1PL
	Solid		
Volume	Liquid	500	500
	Solid		
Preservatives		HNO3	—
ANALYSES REQUESTED	ORGANIC: VOA		
	ORGANIC: BNA		
	ORGANIC: Pest/PCB		
	ORGANIC: Herb		
	INORG: Metal	Mt+(1)	
	INORG: CN		
	INORG: IC		IC (1)

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only: Mt+(1)	IC (1)
001	B10J28			W	11-3-00	1050	1	
002	29					1	1	1
003	36					1211	1	
004	37					1	1	1
005	00					1500	1	
006	01					1	1	1
007	02					1033	1	
008	03					1	1	1

Special Instructions: See C01-007

Run Matrix QC

DATE/REVISIONS:

003,004 1. Original COC has no time or
1 2. collection date written on it.
Mt+(1) 3. Al, Ag, Ba, Be, Ca, Cd, Cr, Co, Cu, Fe, K, Mg,
1 4. Mn, Ni, Na, Sb, Sr, V, Zn
IC(1) 5. Cl, Fl, Br, NO2, NO3, PO4, SO4
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
AirBill # See Below
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. 6.5 C

Discrepancies Between Samples Labels and COC Record? (Y) or N
NOTES: 8214 89830570

Relinquished by	Received by	Date	Time
Fed Ex	V. Hemmings	11/9/00	0920

Relinquished by	Received by	Date	Time

COMPOSITE

ORIGINAL

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEMSDG 41123

C.O.C. # C01-007-27

Page 1 of 1

Collector: D. P. CONNOLLY	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-1437	Ice Chest No.: GWS 107 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795 40280
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J28 (F)		W	11-3-00	1050	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J29		W			1x20-mL P	Activity Scan	None
B10J29		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J29		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J29		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J29		W			1x250-mL P	Tritium - H3	None

11-3-00

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D. P. CONNOLLY	NOV 03 2000	Fed Ex	11/03/00
FED-Express	11/04/00 10:30	B Aguirre	11/04/00 9:30
JR Corso	11-8-00 16:00	Fed Ex	11-8-00
Fed Ex	11/9/00 1020	Rick Hernandez	11/9/00 1020

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SOG 41123

C.O.C. # C01-007-47

Page 1 of 1

Collector: D. P. CONNOLLY	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-1139	Ice Chest No.: GWS 107 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0280
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J36 (F) ✓		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW ✓	HNO3 to pH <2
B10J37 ✓		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW ✓	HNO3 to pH <2
B10J37 ✓		W			1x500-mL P	IC Anions - 300.0 ✓	Cool 4C
B10J37 ✓		W			1x20-mL P	Activity Scan ✓	None
B10J37 ✓		W			2x1000-mL G/P	Gross Alpha ✓	HNO3 to pH <2 **
B10J37 ✓		W			2x1000-mL G/P	Gross Beta ✓	HNO3 to pH <2
B10J37 ✓		W			1x1000-mL G/P	Gamma Spectroscopy(Water) ✓	HNO3 to pH <2
B10J37 ✓		W			1x250-mL P	Tritium - H3 ✓	None
						11-3-00	

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D. P. CONNOLLY	11-3-00	Fed Ex	11/03/00
Fed Express	11/04/00 9:30	E. Aguirre	11/04/00 9:30
JR Porso	11-8-00 16:00	Fed Ex	11-8-00
Fed Ex	11/9/00 1020		11/9/00 1020

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG 41123

C.O.C. # C01-007-49

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H37	Ice Chest No.: SML-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS: ** **

SPECIAL INSTRUCTIONS Hold Time — Total Activity Exemption: Yes ☑ No ☐

Submit deliverables & invoices to JH Kessner

FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J00 (F) ✓		W	11/3/00		1x500-mL G/P	ICP Metals - 6010A RCRA GW ✓	HNO3 to pH <2
B10J01 ✓		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW ✓	HNO3 to pH <2
B10J01 ✓		W			1x500-mL P	IC Anions - 300.0 ✓	Cool 4C
B10J01 ✓		W			1x20-mL P	Activity Scan ✓	None
B10J01 ✓		W			2x1000-mL G/P	Gross Alpha ✓	HNO3 to pH <2
B10J01 ✓		W			2x1000-mL G/P	Gross Beta ✓	HNO3 to pH <2
B10J01 ✓		W			1x1000-mL G/P	Carbon-14 ✓	None
B10J01 ✓		W			1x1000-mL G/P	Gamma Spectroscopy(Water) ✓	HNO3 to pH <2
B10J01 ✓		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	11-3-00 1330	FEDX			11/03/00
FED. Express			11/04/00 9:30		E. Fagnano		11/04/00 9:30
JR Corso			11-8-00 16:00				
Ed Eo			11/9/00 1020		Vicki Hernandez		11/9/00 1020

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SOG H1123

C.O.C. # C01-007-51

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H37	Ice Chest No.: SAL-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J02 (F)		W	11/3/00	1033	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J03		W			1x20-mL P	Activity Scan	None
B10J03		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J03		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J03		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J03		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	11-3-00 1330	FEDX			11/03/00
FED Express			11/04/00 10:30	E. Pegues			11/04/00 1030
JR Corso		JR Corso	11-8-00 16:00	Fed Ex			11-8-00
Fed Ex			11/9/00 1020	V. Hernandez			11/9/00 1020

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1123 was composed of five water samples designated under SAF No. C01-007 with a Project Designation of: 100 KR4 IAM (1 & 2).

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

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Tritium Analyses

No problems were encountered during the course of the analyses.

2.3 Carbon-14 Analyses

The LCS percent recovery (83%) was slightly below the 3σ limits (86 to 114%), but within the laboratory protocol limits (80 to 120%). No other problems were encountered during the course of the analyses.

2.4 Strontium-90 Analyses (By Yttrium Analysis)

No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion

Melissa C. Mannion
Program Manager

12/30/00

Date

JAN 2001
RECEIVED

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

SAMPLE SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B10HX5	Hanford Site	WATER		R011056-01	C01-007	C01-007-11	11/03/00 09:13
B10J01	Hanford Site	WATER		R011056-04	C01-007	C01-007-49	11/03/00 11:50
B10J03	Hanford Site	WATER		R011056-05	C01-007	C01-007-51	11/03/00 10:33
B10J29	Hanford Site	WATER		R011056-02	C01-007	C01-007-27	11/03/00 10:50
B10J37	Hanford Site	WATER		R011056-03	C01-007	C01-007-47	11/03/00 12:11
Method Blank		WATER		R011056-07	C01-007		
Lab Control Sample		WATER		R011056-06	C01-007		
Duplicate (R011056-01)	Hanford Site	WATER		R011056-08	C01-007		11/03/00 09:13
Duplicate (R011056-04)	Hanford Site	WATER		R011056-09	C01-007		11/03/00 11:50
Spike (R011056-04)	Hanford Site	WATER		R011056-10	C01-007		11/03/00 11:50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

QC SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

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
7551	C01-007-11	B10HX5	WATER				11/04/00	1	R011056-01	7551-001
	C01-007-27	B10J29	WATER				11/04/00	1	R011056-02	7551-002
	C01-007-47	B10J37	WATER				11/04/00	1	R011056-03	7551-003
	C01-007-49	B10J01	WATER				11/04/00	1	R011056-04	7551-004
	C01-007-51	B10J03	WATER				11/04/00	1	R011056-05	7551-005
		Method Blank	WATER						R011056-07	7551-007
		Lab Control Sample	WATER						R011056-06	7551-006
		Duplicate (R011056-01)	WATER				11/04/00	1	R011056-08	7551-008
		Duplicate (R011056-04)	WATER				11/04/00	1	R011056-09	7551-009
		Spike (R011056-04)	WATER				11/04/00	1	R011056-10	7551-010

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

PREP BATCH SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Beta Counting												
Y	WATER	Strontium 90 in Water	6962-065	10.0	1			1	1	1/1		
Gas Proportional Counting												
82B	WATER	Gross Beta in Water	6962-065	15.0	4			1	1	1/1		
88A	WATER	Gross Alpha in Water	6962-065	20.0	4			1	1	1/1		
Gamma Scan												
GAM	WATER	Gamma Emitters	6962-065	15.0	4			1	1	1/1		
Liquid Scintillation Counting												
C	WATER	Carbon 14 in Water	6962-065	10.0	1			1	1	1/1	1/1	X
H	WATER	Tritium in Water	6962-065	10.0	5			1	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 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

WORK SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B10HX5			R011056-01	7551-001	H		12/05/00	12/30/00	MCM	Tritium in Water
Hanford Site		WATER	11/03/00	7551-001	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water
C01-007-11	C01-007		11/04/00							
B10J01			R011056-04	7551-004	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-004	88A/88		12/29/00	12/30/00	MCM	Gross Alpha in Water
C01-007-49	C01-007		11/04/00	7551-004	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-004	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-004	H		12/05/00	12/30/00	MCM	Tritium in Water
B10J03			R011056-05	7551-005	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-005	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
C01-007-51	C01-007		11/04/00	7551-005	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-005	H		12/05/00	12/30/00	MCM	Tritium in Water
B10J29			R011056-02	7551-002	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-002	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
C01-007-27	C01-007		11/04/00	7551-002	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-002	H		12/05/00	12/30/00	MCM	Tritium in Water
B10J37			R011056-03	7551-003	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-003	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
C01-007-47	C01-007		11/04/00	7551-003	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-003	H		12/05/00	12/30/00	MCM	Tritium in Water
Method Blank			R011056-07	7551-007	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
		WATER		7551-007	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
	C01-007			7551-007	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-007	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-007	H		12/05/00	12/30/00	MCM	Tritium in Water
				7551-007	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water
Lab Control Sample			R011056-06	7551-006	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
		WATER		7551-006	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
	C01-007			7551-006	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-006	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-006	H		12/05/00	12/30/00	MCM	Tritium in Water
				7551-006	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

SDG 7551
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R011056-01)			R011056-08	7551-008	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water
Hanford Site		WATER	11/03/00							
	C01-007		11/04/00							
Duplicate (R011056-04)			R011056-09	7551-009	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-009	88A/88		12/29/00	12/30/00	MCM	Gross Alpha in Water
	C01-007		11/04/00	7551-009	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-009	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-009	H		12/05/00	12/30/00	MCM	Tritium in Water
Spike (R011056-04)			R011056-10	7551-010	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
Hanford Site		WATER	11/03/00	7551-010	H		12/05/00	12/30/00	MCM	Tritium in Water
	C01-007		11/04/00							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
82B/82	C01-007	Gross Beta in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
88A/88	C01-007	Gross Alpha in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
C	C01-007	Carbon 14 in Water	C14_CHEM_LSC	1			1	1	1	1	5
GAM	C01-007	Gamma Emitters	GAMMA_GS	4			1	1	1		7
H	C01-007	Tritium in Water	906.0_H3_LSC	5			1	1	1	1	9
Y	C01-007	Strontium 90 in Water	SRISO_SEP_PRECIP_GPC	1			1	1	1		4
TOTALS				19			6	6	6	2	39

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/30/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-07 **Method Blank**

METHOD BLANK

SDG	7551	Client/Case no	Hanford	SDG H1123	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011056-07	Client sample id	Method Blank		
Dept sample id	7551-007	Material/Matrix		WATER	
		SAF No	C01-007		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.821	0.67	0.92	3.0	U	88A
Gross Beta	12587-47-2	0.389	1.2	2.0	4.0	U	82B
Tritium	10028-17-8	-165	1100	1800	400	U	H
Carbon 14	14762-75-5	8.24	22	36	200	U	C
Strontium 90	10098-97-2	-0.088	0.45	1.1	2.0	U	Y
Potassium 40	13966-00-2	U		63		U	GAM
Cobalt 60	10198-40-0	U		6.0	25	U	GAM
Cesium 137	10045-97-3	U		5.0	15	U	GAM
Radium 226	13982-63-3	U		13		U	GAM
Radium 228	15262-20-1	U		20		U	GAM
Europium 152	14683-23-9	U		13	50	U	GAM
Europium 154	15585-10-1	U		16	50	U	GAM
Europium 155	14391-16-3	U		13	50	U	GAM
Thorium 228	14274-82-9	U		6.9		U	GAM
Thorium 232	TH-232	U		20		U	GAM
Uranium 235	15117-96-1	U		18		U	GAM
Uranium 238	U-238	U		640		U	GAM
Americium 241	14596-10-2	U		18		U	GAM

100 KR4 IAM (1 & 2)

QC-BLANK 36717

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-06

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7551
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1123
Case no TRC-SBB-207925

Lab sample id R011056-06
Dept sample id 7551-006

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No C01-007

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	72.3	4.9	1.2	3.0		88A	71.7	2.9	101	67-133	70-130
Gross Beta	77.9	3.7	2.6	4.0		82B	80.7	3.2	97	76-124	70-130
Tritium	48800	2400	1900	400		H	49700	2000	98	83-117	80-120
Carbon 14	17600	180	50	200		C	21300	850	83	86-114	80-120
Strontium 90	25.9	1.4	1.0	2.0		Y	24.2	0.97	107	81-119	80-120
Cobalt 60	526	25	12	25		GAM	472	19	111	73-127	80-120
Cesium 137	608	22	15	15		GAM	554	22	110	74-126	80-120

100 KR4 IAM (1 & 2)

QC-LCS 36716

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-08

B10HX5

DUPLICATE

SDG	7551			Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R011056-08	Lab sample id	R011056-01	Client sample id	B10HX5
Dept sample id	7551-008	Dept sample id	7551-001	Location/Matrix	Hanford Site WATER
		Received	11/04/00	Collected	11/03/00 09:13
				Custody/SAF No	C01-007-11 C01-007

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
Strontium 90	19.2	1.5	1.0	2.0		Y	20.6	1.5	1.1		7	27	

100 KR4 IAM (1 & 2)

QC-DUP#1 36718

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-09 B10J01

DUPLICATE

SDG	7551			Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R011056-09	Lab sample id	R011056-04	Client sample id	B10J01
Dept sample id	7551-009	Dept sample id	7551-004	Location/Matrix	Hanford Site WATER
		Received	11/04/00	Collected	11/03/00 11:50
				Custody/SAF No	C01-007-49 C01-007

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 PROT TOT LIMIT
Gross Alpha	0.770	1.1	1.6	3.0	U	88A	0.013	0.91	1.7	U	-	
Gross Beta	19.1	2.2	2.4	4.0		82B	18.5	2.2	2.4		3	40
Tritium	234000	3400	920	400		H	232000	3400	920		1	21
Carbon 14	236	27	37	200		C	232	28	39		2	33
Potassium 40	U		180		U	GAM	U		360	U	-	
Cobalt 60	U		13	25	U	GAM	U		16	U	-	
Cesium 137	U		11	15	U	GAM	U		15	U	-	
Radium 226	U		23		U	GAM	U		39	U	-	
Radium 228	U		43		U	GAM	U		58	U	-	
Europium 152	U		29	50	U	GAM	U		36	U	-	
Europium 154	U		34	50	U	GAM	U		34	U	-	
Europium 155	U		27	50	U	GAM	U		46	U	-	
Thorium 228	U		15		U	GAM	U		20	U	-	
Thorium 232	U		43		U	GAM	U		58	U	-	
Uranium 235	U		42		U	GAM	U		51	U	-	
Uranium 238	U		1400		U	GAM	U		1600	U	-	
Americium 241	U		36		U	GAM	U		100	U	-	

100 KR4 IAM (1 & 2)

QC-DUP#4 36719

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-10

B10J01

MATRIX SPIKE

SDG	7551			Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R011056-10	Lab sample id	R011056-04	Client sample id	B10J01
Dept sample id	7551-010	Dept sample id	7551-004	Location/Matrix	Hanford Site WATER
		Received	11/04/00	Collected	11/03/00 11:50
				Custody/SAF No	C01-007-49 C01-007

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	334000	4200	1000	400		H	105000	4200	232000	3400	97	41-159	60-140
Carbon 14	57300	580	110	200	X	C	63800	2600	232	28	89	85-115	60-140

100 KR4 IAM (1 & 2)

QC-MS#4 36720

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	12/30/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-01 **B10HX5**

DATA SHEET

SDG	7551	Client/Case no	Hanford	SDG H1123	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011056-01	Client sample id	B10HX5		
Dept sample id	7551-001	Location/Matrix	Hanford Site	WATER	
Received	11/04/00	Collected	11/03/00 09:13		
		Custody/SAF No	C01-007-11	C01-007	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	558	570	930	400	U	H
Strontium 90	10098-97-2	20.6	1.5	1.1	2.0		Y

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-04 B10J01

DATA SHEET

SDG	7551	Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R011056-04	Client sample id	B10J01
Dept sample id	7551-004	Location/Matrix	Hanford Site WATER
Received	11/04/00	Collected	11/03/00 11:50
		Custody/SAF No	C01-007-49 C01-007

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.013	0.91	1.7	3.0	U	88A
Gross Beta	12587-47-2	18.5	2.2	2.4	4.0		82B
Tritium	10028-17-8	232000	3400	920	400		H
Carbon 14	14762-75-5	232	28	39	200		C
Potassium 40	13966-00-2	U		360		U	GAM
Cobalt 60	10198-40-0	U		16	25	U	GAM
Cesium 137	10045-97-3	U		15	15	U	GAM
Radium 226	13982-63-3	U		39		U	GAM
Radium 228	15262-20-1	U		58		U	GAM
Europium 152	14683-23-9	U		36	50	U	GAM
Europium 154	15585-10-1	U		34	50	U	GAM
Europium 155	14391-16-3	U		46	50	U	GAM
Thorium 228	14274-82-9	U		20		U	GAM
Thorium 232	TH-232	U		58		U	GAM
Uranium 235	15117-96-1	U		51		U	GAM
Uranium 238	U-238	U		1600		U	GAM
Americium 241	14596-10-2	U		100		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-05 B10J03

DATA SHEET

SDG	7551	Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R011056-05	Client sample id	B10J03
Dept sample id	7551-005	Location/Matrix	Hanford Site WATER
Received	11/04/00	Collected	11/03/00 10:33
		Custody/SAF No	C01-007-51 C01-007

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.13	1.6	1.6	3.0		88A
Gross Beta	12587-47-2	5.84	1.7	2.4	4.0		82B
Tritium	10028-17-8	243	570	950	400	U	H
Potassium 40	13966-00-2	U		440		U	GAM
Cobalt 60	10198-40-0	U		15	25	U	GAM
Cesium 137	10045-97-3	U		23	15	U	GAM
Radium 226	13982-63-3	U		32		U	GAM
Radium 228	15262-20-1	U		70		U	GAM
Europium 152	14683-23-9	U		37	50	U	GAM
Europium 154	15585-10-1	U		47	50	U	GAM
Europium 155	14391-16-3	U		27	50	U	GAM
Thorium 228	14274-82-9	U		19		U	GAM
Thorium 232	TH-232	U		70		U	GAM
Uranium 235	15117-96-1	U		45		U	GAM
Uranium 238	U-238	U		1900		U	GAM
Americium 241	14596-10-2	U		16		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-02 **B10J29**

DATA SHEET

SDG	7551	Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R011056-02	Client sample id	B10J29
Dept sample id	7551-002	Location/Matrix	Hanford Site WATER
Received	11/04/00	Collected	11/03/00 10:50
		Custody/SAF No	C01-007-27 C01-007

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.13	1.7	1.7	3.0		88A
Gross Beta	12587-47-2	28.0	3.3	3.3	4.0		82B
Tritium	10028-17-8	10800	920	950	400		H
Potassium 40	13966-00-2	U		340		U	GAM
Cobalt 60	10198-40-0	U		17	25	U	GAM
Cesium 137	10045-97-3	U		20	15	U	GAM
Radium 226	13982-63-3	45.0	29	30			GAM
Radium 228	15262-20-1	U		81		U	GAM
Europium 152	14683-23-9	U		44	50	U	GAM
Europium 154	15585-10-1	U		56	50	U	GAM
Europium 155	14391-16-3	U		43	50	U	GAM
Thorium 228	14274-82-9	U		24		U	GAM
Thorium 232	TH-232	U		81		U	GAM
Uranium 235	15117-96-1	U		67		U	GAM
Uranium 238	U-238	U		2300		U	GAM
Americium 241	14596-10-2	U		56		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA / RICHMOND
SAMPLE DELIVERY GROUP H1123

R011056-03 B10J37

DATA SHEET

SDG	7551	Client/Case no	Hanford	SDG H1123	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011056-03	Client sample id	B10J37		
Dept sample id	7551-003	Location/Matrix	Hanford Site	WATER	
Received	11/04/00	Collected	11/03/00 12:11		
		Custody/SAF No	C01-007-47	C01-007	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.42	1.1	1.6	3.0	U	88A
Gross Beta	12587-47-2	35.7	3.5	3.2	4.0		82B
Tritium	10028-17-8	6200	760	920	400		H
Potassium 40	13966-00-2	U		100		U	GAM
Cobalt 60	10198-40-0	U		8.8	25	U	GAM
Cesium 137	10045-97-3	U		7.7	15	U	GAM
Radium 226	13982-63-3	U		29		U	GAM
Radium 228	15262-20-1	U		33		U	GAM
Europium 152	14683-23-9	U		19	50	U	GAM
Europium 154	15585-10-1	U		20	50	U	GAM
Europium 155	14391-16-3	U		20	50	U	GAM
Thorium 228	14274-82-9	U		11		U	GAM
Thorium 232	TH-232	U		33		U	GAM
Uranium 235	15117-96-1	U		29		U	GAM
Uranium 238	U-238	U		1100		U	GAM
Americium 241	14596-10-2	U		29		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

Test Y	Matrix WATER
SDG 7551	
Contact Melissa C. Mannion	

METHOD SUMMARY

STRONTIUM 90 IN WATER

BETA COUNTING

Client Hanford	
Contract TRC-SBB-207925	
Contract SDG H1123	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Strontium 90
Preparation batch 6962-065					
B10HX5	R011056-01			7551-001	20.6
BLK (QC ID=36717)	R011056-07			7551-007	U
LCS (QC ID=36716)	R011056-06			7551-006	ok
Duplicate (R011056-01)	R011056-08			7551-008	ok
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	2.0

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 6962-065	2σ prep error 10.0 % Reference Lab Notebook 6962 pg. 065															
B10HX5	R011056-01			1.1	0.500			70		100			35	12/08/00	12/08	GRB-217
BLK (QC ID=36717)	R011056-07			1.1	0.500			72		100				12/08/00	12/08	GRB-219
LCS (QC ID=36716)	R011056-06			1.0	0.500			73		100				12/08/00	12/08	GRB-218
Duplicate (R011056-01) (QC ID=36718)	R011056-08			1.0	0.500			72		100			35	12/08/00	12/08	GRB-220
Nominal values and limits from method				2.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	SRISO_SEP_PRECIP_GPC
	CP-040	Environmental Water Dissolution, rev 3
	CP-520	Yttrium Purification, rev 2

AVERAGES ± 2 SD	MDA	1.0	± 0.12
FOR 4 SAMPLES	YIELD	72	± 3

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

Test 82B Matrix WATER
SDG 7551
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Gross Beta	2: Sum, Beta Emitters	RESULT RATIO (%) 2÷1	2σ
Preparation batch 6962-065								
B10J01	R011056-04	82		7551-004	18.5			
B10J03	R011056-05	82		7551-005	5.84			
B10J29	R011056-02	82		7551-002	28.0	45.0	161	111
B10J37	R011056-03	82		7551-003	35.7			
BLK (QC ID=36717)	R011056-07	82		7551-007	U			
LCS (QC ID=36716)	R011056-06	82		7551-006	ok			
Duplicate (R011056-04)	R011056-09	82		7551-009	ok			
Nominal values and limits from method				RDLs (pCi/L)	4.0			
100 KR4 IAM (1 & 2)							Average 161	

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 6962-065	2σ prep error 15.0 %				Reference Lab Notebook 6962 pg. 065											
B10J01	R011056-04	82		2.4	0.300			59		100			46	12/01/00	12/19	GRB-110
B10J03	R011056-05	82		2.4	0.300			64		100			46	12/01/00	12/19	GRB-112
B10J29	R011056-02	82		3.3	0.300			71		58			46	12/01/00	12/19	GRB-110
B10J37	R011056-03	82		3.2	0.300			61		58			46	12/01/00	12/19	GRB-112
BLK (QC ID=36717)	R011056-07	82		2.0	0.300			24		100				12/01/00	12/19	GRB-115
LCS (QC ID=36716)	R011056-06	82		2.6	0.300			22		100				12/01/00	12/19	GRB-114
Duplicate (R011056-04) (QC ID=36719)	R011056-09	82		2.4	0.300			48		100			46	12/01/00	12/19	GRB-110
Nominal values and limits from method				4.0	0.300			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 2.6 ± 0.94
RESIDUE 50 ± 39

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

Test 88A Matrix WATER
SDG 7551
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6962-065						
B10J01	R011056-04	88		7551-004	U	
B10J03	R011056-05	88		7551-005	4.13	
B10J29	R011056-02	88		7551-002	4.13	
B10J37	R011056-03	88		7551-003	U	
BLK (QC ID=36717)	R011056-07	88		7551-007	U	
LCS (QC ID=36716)	R011056-06	88		7551-006	ok	
Duplicate (R011056-04)	R011056-09	88		7551-009	-	U
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	3.0	

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 6962-065	2σ prep error 20.0 %				Reference Lab Notebook 6962 pg. 065											
B10J01	R011056-04	88		1.7	0.300			65		100			56	12/02/00	12/29	GRB-105
B10J03	R011056-05	88		1.6	0.300			70		100			45	12/02/00	12/18	GRB-114
B10J29	R011056-02	88		1.7	0.300			79		100			45	12/02/00	12/18	GRB-111
B10J37	R011056-03	88		1.6	0.300			72		100			45	12/02/00	12/18	GRB-112
BLK (QC ID=36717)	R011056-07	88		0.92	0.300			22		100				12/02/00	12/18	GRB-116
LCS (QC ID=36716)	R011056-06	88		1.2	0.300			21		100				12/02/00	12/18	GRB-115
Duplicate (R011056-04) (QC ID=36719)	R011056-09	88		1.6	0.300			74		100			56	12/02/00	12/29	GRB-107
Nominal values and limits from method				3.0	0.300			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 1.5 ± 0.60
RESIDUE 58 ± 50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

METHOD SUMMARY

GAMMA EMITTERS

GAMMA SCAN

Test GAM Matrix WATER
SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 6962-065								
B10J01	R011056-04			7551-004	U		U	
B10J03	R011056-05			7551-005	U		U	
B10J29	R011056-02			7551-002	U		U	
B10J37	R011056-03			7551-003	U		U	
BLK (QC ID=36717)	R011056-07			7551-007	U		U	
LCS (QC ID=36716)	R011056-06			7551-006	ok		ok	
Duplicate (R011056-04)	R011056-09			7551-009	-	U	-	U
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	25		15	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX 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 6962-065 2σ prep error 15.0 % Reference Lab Notebook 6962 pg. 065																
B10J01	R011056-04			15	0.500					310			28	12/01/00	12/01	MB,05,00
B10J03	R011056-05			23	0.500					310			28	12/01/00	12/01	MB,07,00
B10J29	R011056-02			20	0.500					309			28	12/01/00	12/01	01,03,00
B10J37	R011056-03			7.7	0.500					309			28	12/01/00	12/01	01,04,00
BLK (QC ID=36717)	R011056-07			5.0	0.500					752				12/01/00	12/01	01,04,00
LCS (QC ID=36716)	R011056-06			15	0.500					753				12/01/00	12/01	MB,05,00
Duplicate (R011056-04) (QC ID=36719)	R011056-09			11	0.500					752			28	12/01/00	12/01	01,03,00
Nominal values and limits from method				15	0.500					100			180			

PROCEDURES REFERENCE GAMMA_GS
CP-100 Ge(Li) Preparation for Commercial Samples, rev 2

AVERAGES ± 2 SD MDA 14 ± 13
FOR 7 SAMPLES YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

Test C Matrix WATER
SDG 7551
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

METHOD SUMMARY

CARBON 14 IN WATER
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6962-065						
B10J01	R011056-04			7551-004	232	
BLK (QC ID=36717)	R011056-07			7551-007	U	
LCS (QC ID=36716)	R011056-06			7551-006	LOW	
Duplicate (R011056-04)	R011056-09			7551-009	ok	
Spike (R011056-04)	R011056-10			7551-010	ok	X
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	200	

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 6962-065	2σ prep error 10.0 %				Reference Lab Notebook 6962 pg. 065											
B10J01	R011056-04			39	0.0300			100		100			38	12/08/00	12/11	LSC-005
BLK (QC ID=36717)	R011056-07			36	0.0300			100		100				12/08/00	12/11	LSC-005
LCS (QC ID=36716)	R011056-06			50	0.0300			100		54				12/08/00	12/11	LSC-005
Duplicate (R011056-04) (QC ID=36719)	R011056-09			37	0.0300			100		100			38	12/08/00	12/11	LSC-005
Spike (R011056-04) (QC ID=36720)	R011056-10			110	0.0200			100		27			38	12/08/00	12/11	LSC-005
Nominal values and limits from method				200	0.0300					50			180			

PROCEDURES REFERENCE C14_CHEM_LSC
CP-241 Carbon-14 in Aqueous Samples, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 54 ± 63
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

Test H Matrix WATER
SDG 7551
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

METHOD SUMMARY

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6962-065						
B10HX5	R011056-01			7551-001	558	U
B10J01	R011056-04			7551-004	232000	
B10J03	R011056-05			7551-005	U	
B10J29	R011056-02			7551-002	10800	
B10J37	R011056-03			7551-003	6200	
BLK (QC ID=36717)	R011056-07			7551-007	U	
LCS (QC ID=36716)	R011056-06			7551-006	ok	
Duplicate (R011056-04)	R011056-09			7551-009	ok	
Spike (R011056-04)	R011056-10			7551-010	ok	
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	400	

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 6962-065 2σ prep error 10.0 % Reference Lab Notebook 6962 pg. 065																
B10HX5	R011056-01			930	0.0100			20		100			32	12/05/00	12/05	LSC-005
B10J01	R011056-04			920	0.0100			20		100			32	12/05/00	12/05	LSC-005
B10J03	R011056-05			950	0.0100			20		100			32	12/05/00	12/05	LSC-005
B10J29	R011056-02			950	0.0100			20		100			32	12/05/00	12/05	LSC-005
B10J37	R011056-03			920	0.0100			20		100			32	12/05/00	12/05	LSC-005
BLK (QC ID=36717)	R011056-07			1800	0.0100			10		100				12/05/00	12/05	LSC-005
LCS (QC ID=36716)	R011056-06			1900	0.0100			10		100				12/05/00	12/05	LSC-005
Duplicate (R011056-04) (QC ID=36719)	R011056-09			920	0.0100			20		100			32	12/05/00	12/05	LSC-005
Spike (R011056-04) (QC ID=36720)	R011056-10			1000	0.0100			18		100			32	12/05/00	12/05	LSC-005
Nominal values and limits from method				400	0.0100					25			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

Test H Matrix WATER
SDG 7551
Contact Melissa C. Mannion

METHOD SUMMARY, cont.

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

PROCEDURES	REFERENCE	906.0_H3_LSC
	CP-210	Tritium in Water Samples by Distillation, rev 3

AVERAGES ± 2 SD	MDA	1100	±	800
FOR 9 SAMPLES	YIELD	18	±	9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-11

Page 1 of 1

Collector: D Parchen	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H39	Ice Chest No.: GWS107 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0280
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W010 0024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10HX5		W	11-3-00	0913	1:20-mL P	Activity Scan	None
B10HX5		W			2:1000-mL G/P	Strontium-89,90 – Sr-90	HNO3 to pH <2
B10HX5		W			1:250-mL P	Tritium - H3	None

11-3-00

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D Parchen	D. E. PARCHEN		NOV 0 3 2000 1330	Fed Ex			11/03/00
FED. EXPRESS			11/04/00 10:30	E. Laguna			11/04/00 10:30

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-27

Page 1 of 1

Collector: D. P. CONNOLLY	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-1437	Ice Chest No.: GWS 107 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795 40280
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J28 (F)		W	11-3-00	1050	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J29		W			1x20-mL P	Activity Scan	None
B10J29		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J29		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J29		W			1x1000-mL G/P	Gamma Specroscopy(Water)	HNO3 to pH <2
B10J29		W			1x250-mL P	Tritium - H3	None

11-3-00

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	D. P. CONNOLLY		NOV 03 2000		Fed Ex		11/03/00
Relinquished By			Date/Time	Received By			Date/Time
	FED-Express		11/04/00 10:30				11/04/00 9:30
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-47

Page 1 of 1

Collector D. P. CONNOLLY	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-007	Sampling Origin HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title 100 KR4 IAM (1 & 2)	Logbook No. WM-SAWS-1139	Ice Chest No. GWS 107 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235 7954 028
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No. W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

MM 11/8/00

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J36 (F)		W	11/3/00	1211	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J37		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J37		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J37		W			1x20-mL P	Activity Scan	None
B10J37		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J37		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J37		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J37		W			1x250-mL P	Tritium - H3	None

H-3:20 [illegible]

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	D. P. CONNOLLY	[illegible]	11-3-00 1330	Fed Ex			11/03/00
Relinquished By			Date/Time	Received By			Date/Time
Fed Express			11/04 9:20	E. Aguirre			11/04 9:30
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-49

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H37	Ice Chest No.: SML-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J00 (F)		W	11/3/00	1150	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J01		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J01		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J01		W			1x20-mL P	Activity Scan	None
B10J01		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J01		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J01		W			1x1000-mL G/P	Carbon-14	None
B10J01		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J01		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		11-3-00 1330	FEDX			11/03/00
Relinquished By			Date/Time	Received By			Date/Time
FED. Express			11/04/00 9:20	E. Aguirre			11/04/00 9:20
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-51

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SALWS-H37	Ice Chest No.: SML-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J02 (F)		W	11/3/00	1033	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J03		W			1x20-mL P	Activity Scan	None
B10J03		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J03		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J03		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J03		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	11-3-00 1330	FEDX	11/03/00
FED Express	11/04/00 10:30	E. Pegurr	11/04/00 10:30

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

ThermoRetec
Richmond Laboratory

Analytical Services

ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: (WMTS) BECHTEL HANFORD (PNNL) Date: 11-04-00 11:AM

Ice chest # or description	GWS-107					
Thermometer: time in	11:45					
Thermometer: time out	12:30					
Thermometer reading	4°C					
Thermometer number	6536					
Correction factor	NONE					
Actual temperature*	—					
Custody seals on ice chest intact?	NO					
Custody seals dated ?	—					
Custody seals signed?	—					
Custody seals on samples?	Yes					
Ice chest scanned for activity?	Yes					

* Temperature is in degrees centigrade.

Technician:_____

Comments:_____

ThermoRetec
Richmond Laboratory

Analytical Services

ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: (WMTS) BECHTEL HANFORD (PNNL) Date: 11/04/00 11:AM

Ice chest # or description	SML598					
Thermometer: time in	11:35					
Thermometer: time out	12:25					
Thermometer reading	4°C					
Thermometer number	2132					
Correction factor	NONE					
Actual temperature*	—					
Custody seals on ice chest intact?	NO					
Custody seals dated ?	—					
Custody seals signed?	—					
Custody seals on samples?	Yes					
Ice chest scanned for activity?	Yes					

* Temperature is in degrees centigrade.

Technician:_____

Comments:_____

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: (WMTS) BECHTEL HANFORD (PNNL) Date/Time received 11/04/12 10:30 AM

CoC No. C01-007-11, -27, 47, - 49 AND C01, 007-51.

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

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [ ]
6. Number of samples in shipping container: 9
7. Number of containers per sample: PLEASE REFER (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: C01-007-49 – No time listed for B10J00 on COC
    C01-007-47 – No time or date listed on COC for B10J37
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by E. Pagano Date: 11/04/12 Time: 10:30 AM

Customer Sample No.	cpm	mr/hr	Customer Sample No.	Cpm	mr/hr

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1123 was composed of five water samples designated under SAF No. C01-007 with a Project Designation of: 100 KR4 IAM (1 & 2).

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

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Tritium Analyses

No problems were encountered during the course of the analyses.

2.3 Carbon-14 Analyses

The LCS percent recovery (83%) was slightly below the 3σ limits (86 to 114%), but within the laboratory protocol limits (80 to 120%). No other problems were encountered during the course of the analyses.

2.4 Strontium-90 Analyses (By Yttrium Analysis)

No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion

Melissa C. Mannion
Program Manager

01/03/01

Date

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

SAMPLE SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B10HX5	Hanford Site	WATER		R011056-01	C01-007	C01-007-11	11/03/00 09:13
B10J01	Hanford Site	WATER		R011056-04	C01-007	C01-007-49	11/03/00 11:50
B10J03	Hanford Site	WATER		R011056-05	C01-007	C01-007-51	11/03/00 10:33
B10J29	Hanford Site	WATER		R011056-02	C01-007	C01-007-27	11/03/00 10:50
B10J37	Hanford Site	WATER		R011056-03	C01-007	C01-007-47	11/03/00 12:11
Method Blank		WATER		R011056-07	C01-007		
Lab Control Sample		WATER		R011056-06	C01-007		
Duplicate (R011056-01)	Hanford Site	WATER		R011056-08	C01-007		11/03/00 09:13
Duplicate (R011056-04)	Hanford Site	WATER		R011056-09	C01-007		11/03/00 11:50
Spike (R011056-04)	Hanford Site	WATER		R011056-10	C01-007		11/03/00 11:50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

QC SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

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
7551	C01-007-11	B10HX5	WATER				11/04/00	1	R011056-01	7551-001
	C01-007-27	B10J29	WATER				11/04/00	1	R011056-02	7551-002
	C01-007-47	B10J37	WATER				11/04/00	1	R011056-03	7551-003
	C01-007-49	B10J01	WATER				11/04/00	1	R011056-04	7551-004
	C01-007-51	B10J03	WATER				11/04/00	1	R011056-05	7551-005
		Method Blank	WATER						R011056-07	7551-007
		Lab Control Sample	WATER						R011056-06	7551-006
		Duplicate (R011056-01)	WATER				11/04/00	1	R011056-08	7551-008
		Duplicate (R011056-04)	WATER				11/04/00	1	R011056-09	7551-009
		Spike (R011056-04)	WATER				11/04/00	1	R011056-10	7551-010

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

PREP BATCH SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Beta Counting												
Y	WATER	Strontium 90 in Water	6962-065	10.0	1			1	1	1/1		
Gas Proportional Counting												
82B	WATER	Gross Beta in Water	6962-065	15.0	4			1	1	1/1		
88A	WATER	Gross Alpha in Water	6962-065	20.0	4			1	1	1/1		
Gamma Scan												
GAM	WATER	Gamma Emitters	6962-065	15.0	4			1	1	1/1		
Liquid Scintillation Counting												
C	WATER	Carbon 14 in Water	6962-065	10.0	1			1	1	1/1	1/1	X
H	WATER	Tritium in Water	6962-065	10.0	5			1	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 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

WORK SUMMARY

SDG 7551
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B10HX5			R011056-01	7551-001	H		12/05/00	01/03/01	MCM	Tritium in Water
Hanford Site		WATER	11/03/00	7551-001	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water
C01-007-11	C01-007		11/04/00							
B10J01			R011056-04	7551-004	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-004	88A/88		12/29/00	12/30/00	MCM	Gross Alpha in Water
C01-007-49	C01-007		11/04/00	7551-004	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-004	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-004	H		12/05/00	01/03/01	MCM	Tritium in Water
B10J03			R011056-05	7551-005	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-005	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
C01-007-51	C01-007		11/04/00	7551-005	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-005	H		12/05/00	01/03/01	MCM	Tritium in Water
B10J29			R011056-02	7551-002	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-002	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
C01-007-27	C01-007		11/04/00	7551-002	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-002	H		12/05/00	01/03/01	MCM	Tritium in Water
B10J37			R011056-03	7551-003	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-003	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
C01-007-47	C01-007		11/04/00	7551-003	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-003	H		12/05/00	01/03/01	MCM	Tritium in Water
Method Blank			R011056-07	7551-007	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
		WATER		7551-007	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
	C01-007			7551-007	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-007	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-007	H		12/05/00	01/03/01	MCM	Tritium in Water
				7551-007	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water
Lab Control Sample			R011056-06	7551-006	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
		WATER		7551-006	88A/88		12/18/00	12/30/00	MCM	Gross Alpha in Water
	C01-007			7551-006	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-006	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-006	H		12/05/00	01/03/01	MCM	Tritium in Water
				7551-006	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

SDG 7551
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1123

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R011056-01)			R011056-08	7551-008	Y		12/08/00	12/30/00	MCM	Strontium 90 in Water
Hanford Site		WATER	11/03/00							
	C01-007		11/04/00							
Duplicate (R011056-04)			R011056-09	7551-009	82B/82		12/19/00	12/30/00	MCM	Gross Beta in Water
Hanford Site		WATER	11/03/00	7551-009	88A/88		12/29/00	12/30/00	MCM	Gross Alpha in Water
	C01-007		11/04/00	7551-009	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
				7551-009	GAM		12/01/00	12/30/00	MCM	Gamma Emitters
				7551-009	H		12/05/00	01/03/01	MCM	Tritium in Water
Spike (R011056-04)			R011056-10	7551-010	C		12/11/00	12/30/00	MCM	Carbon 14 in Water
Hanford Site		WATER	11/03/00	7551-010	H		12/05/00	01/03/01	MCM	Tritium in Water
	C01-007		11/04/00							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
82B/82	C01-007	Gross Beta in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
88A/88	C01-007	Gross Alpha in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
C	C01-007	Carbon 14 in Water	C14_CHEM_LSC	1			1	1	1	1	5
GAM	C01-007	Gamma Emitters	GAMMA_GS	4			1	1	1		7
H	C01-007	Tritium in Water	906.0_H3_LSC	5			1	1	1	1	9
Y	C01-007	Strontium 90 in Water	SRISO_SEP_PRECIP_GPC	1			1	1	1		4
TOTALS				19			6	6	6	2	39

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/03/01

TMA / RICHMOND
SAMPLE DELIVERY GROUP H1123

R011056-07 Method Blank

METHOD BLANK

SDG	7551	Client/Case no	Hanford	SDG	H1123
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011056-07	Client sample id	Method Blank		
Dept sample id	7551-007	Material/Matrix		WATER	
		SAF No	C01-007		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.821	0.67	0.92	3.0	U	88A
Gross Beta	12587-47-2	0.389	1.2	2.0	4.0	U	82B
Tritium	10028-17-8	-33.0	210	370	400	U	H
Carbon 14	14762-75-5	8.24	22	36	200	U	C
Strontium 90	10098-97-2	-0.088	0.45	1.1	2.0	U	Y
Potassium 40	13966-00-2	U		63		U	GAM
Cobalt 60	10198-40-0	U		6.0	25	U	GAM
Cesium 137	10045-97-3	U		5.0	15	U	GAM
Radium 226	13982-63-3	U		13		U	GAM
Radium 228	15262-20-1	U		20		U	GAM
Europium 152	14683-23-9	U		13	50	U	GAM
Europium 154	15585-10-1	U		16	50	U	GAM
Europium 155	14391-16-3	U		13	50	U	GAM
Thorium 228	14274-82-9	U		6.9		U	GAM
Thorium 232	TH-232	U		20		U	GAM
Uranium 235	15117-96-1	U		18		U	GAM
Uranium 238	U-238	U		640		U	GAM
Americium 241	14596-10-2	U		18		U	GAM

100 KR4 IAM (1 & 2)

QC-BLANK 36717

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-06

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7551
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1123
Case no TRC-SBB-207925

Lab sample id R011056-06
Dept sample id 7551-006

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No C01-007

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	72.3	4.9	1.2	3.0		88A	71.7	2.9	101	67-133	70-130
Gross Beta	77.9	3.7	2.6	4.0		82B	80.7	3.2	97	76-124	70-130
Tritium	9760	480	370	400		H	9940	400	98	83-117	80-120
Carbon 14	17600	180	50	200		C	21300	850	83	86-114	80-120
Strontium 90	25.9	1.4	1.0	2.0		Y	24.2	0.97	107	81-119	80-120
Cobalt 60	526	25	12	25		GAM	472	19	111	73-127	80-120
Cesium 137	608	22	15	15		GAM	554	22	110	74-126	80-120

100 KR4 IAM (1 & 2)

QC-LCS 36716

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-08

B10HX5

DUPLICATE

SDG	7551			Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R011056-08	Lab sample id	R011056-01	Client sample id	B10HX5
Dept sample id	7551-008	Dept sample id	7551-001	Location/Matrix	Hanford Site WATER
		Received	11/04/00	Collected	11/03/00 09:13
				Custody/SAF No	C01-007-11 C01-007

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
Strontium 90	19.2	1.5	1.0	2.0		Y	20.6	1.5	1.1		7	27	

100 KR4 IAM (1 & 2)

QC-DUP#1 36718

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-09

B10J01

DUPLICATE

SDG	7551	Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion	Case no	TRC-SBB-207925
DUPLICATE		ORIGINAL	
Lab sample id	R011056-09	Lab sample id	R011056-04
Dept sample id	7551-009	Dept sample id	7551-004
		Received	11/04/00
Client sample id	B10J01		
Location/Matrix	Hanford Site WATER		
Collected	11/03/00 11:50		
Custody/SAF No	C01-007-49 C01-007		

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 PROT TOT LIMIT
Gross Alpha	0.770	1.1	1.6	3.0	U	88A	0.013	0.91	1.7	U	-	
Gross Beta	19.1	2.2	2.4	4.0		82B	18.5	2.2	2.4		3	40
Tritium	46800	670	180	400		H	46400	670	180		1	21
Carbon 14	236	27	37	200		C	232	28	39		2	33
Potassium 40	U		180		U	GAM	U		360	U	-	
Cobalt 60	U		13	25	U	GAM	U		16	U	-	
Cesium 137	U		11	15	U	GAM	U		15	U	-	
Radium 226	U		23		U	GAM	U		39	U	-	
Radium 228	U		43		U	GAM	U		58	U	-	
Europium 152	U		29	50	U	GAM	U		36	U	-	
Europium 154	U		34	50	U	GAM	U		34	U	-	
Europium 155	U		27	50	U	GAM	U		46	U	-	
Thorium 228	U		15		U	GAM	U		20	U	-	
Thorium 232	U		43		U	GAM	U		58	U	-	
Uranium 235	U		42		U	GAM	U		51	U	-	
Uranium 238	U		1400		U	GAM	U		1600	U	-	
Americium 241	U		36		U	GAM	U		100	U	-	

100 KR4 IAM (1 & 2)

QC-DUP#4 36719

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-10 B10J01

MATRIX SPIKE

SDG 7551		Client/Case no Hanford	SDG H1123
Contact Melissa C. Mannion		Case no TRC-SBB-207925	
MATRIX SPIKE	ORIGINAL		
Lab sample id R011056-10	Lab sample id R011056-04	Client sample id B10J01	
Dept sample id 7551-010	Dept sample id 7551-004	Location/Matrix Hanford Site	WATER
	Received 11/04/00	Collected 11/03/00 11:50	
		Custody/SAF No C01-007-49	C01-007

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	66800	840	200	400		H	21000	840	46400	670	97	41-159	60-140
Carbon 14	57300	580	110	200	X	C	63800	2600	232	28	89	85-115	60-140

100 KR4 IAM (1 & 2)

QC-MS#4 36720

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	01/03/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-01 B10HX5

DATA SHEET

SDG	7551	Client/Case no	Hanford	SDG H1123	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011056-01	Client sample id	B10HX5		
Dept sample id	7551-001	Location/Matrix	Hanford Site	WATER	
Received	11/04/00	Collected	11/03/00 09:13		
		Custody/SAF No	C01-007-11	C01-007	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	112	110	190	400	U	H
Strontium 90	10098-97-2	20.6	1.5	1.1	2.0		Y

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/03/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-04 B10J01

DATA SHEET

SDG	7551	Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R011056-04	Client sample id	B10J01
Dept sample id	7551-004	Location/Matrix	Hanford Site WATER
Received	11/04/00	Collected	11/03/00 11:50
		Custody/SAF No	C01-007-49 C01-007

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.013	0.91	1.7	3.0	U	88A
Gross Beta	12587-47-2	18.5	2.2	2.4	4.0		82B
Tritium	10028-17-8	46400	670	180	400		H
Carbon 14	14762-75-5	232	28	39	200		C
Potassium 40	13966-00-2	U		360		U	GAM
Cobalt 60	10198-40-0	U		16	25	U	GAM
Cesium 137	10045-97-3	U		15	15	U	GAM
Radium 226	13982-63-3	U		39		U	GAM
Radium 228	15262-20-1	U		58		U	GAM
Europium 152	14683-23-9	U		36	50	U	GAM
Europium 154	15585-10-1	U		34	50	U	GAM
Europium 155	14391-16-3	U		46	50	U	GAM
Thorium 228	14274-82-9	U		20		U	GAM
Thorium 232	TH-232	U		58		U	GAM
Uranium 235	15117-96-1	U		51		U	GAM
Uranium 238	U-238	U		1600		U	GAM
Americium 241	14596-10-2	U		100		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/03/01

TMA/RICHMOND
SAMPLE DELIVERY GROUP H1123

R011056-05 B10J03

DATA SHEET

SDG	7551	Client/Case no	Hanford	SDG H1123	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011056-05	Client sample id	B10J03		
Dept sample id	7551-005	Location/Matrix	Hanford Site	WATER	
Received	11/04/00	Collected	11/03/00 10:33		
		Custody/SAF No	C01-007-51	C01-007	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.13	1.6	1.6	3.0		88A
Gross Beta	12587-47-2	5.84	1.7	2.4	4.0		82B
Tritium	10028-17-8	48.7	110	190	400	U	H
Potassium 40	13966-00-2	U		440		U	GAM
Cobalt 60	10198-40-0	U		15	25	U	GAM
Cesium 137	10045-97-3	U		23	15	U	GAM
Radium 226	13982-63-3	U		32		U	GAM
Radium 228	15262-20-1	U		70		U	GAM
Europium 152	14683-23-9	U		37	50	U	GAM
Europium 154	15585-10-1	U		47	50	U	GAM
Europium 155	14391-16-3	U		27	50	U	GAM
Thorium 228	14274-82-9	U		19		U	GAM
Thorium 232	TH-232	U		70		U	GAM
Uranium 235	15117-96-1	U		45		U	GAM
Uranium 238	U-238	U		1900		U	GAM
Americium 241	14596-10-2	U		16		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/03/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-02 B10J29

DATA SHEET

SDG	7551	Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R011056-02	Client sample id	B10J29
Dept sample id	7551-002	Location/Matrix	Hanford Site WATER
Received	11/04/00	Collected	11/03/00 10:50
		Custody/SAF No	C01-007-27 C01-007

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.13	1.7	1.7	3.0		88A
Gross Beta	12587-47-2	28.0	3.3	3.3	4.0		82B
Tritium	10028-17-8	2160	180	190	400		H
Potassium 40	13966-00-2	U		340		U	GAM
Cobalt 60	10198-40-0	U		17	25	U	GAM
Cesium 137	10045-97-3	U		20	15	U	GAM
Radium 226	13982-63-3	45.0	29	30			GAM
Radium 228	15262-20-1	U		81		U	GAM
Europium 152	14683-23-9	U		44	50	U	GAM
Europium 154	15585-10-1	U		56	50	U	GAM
Europium 155	14391-16-3	U		43	50	U	GAM
Thorium 228	14274-82-9	U		24		U	GAM
Thorium 232	TH-232	U		81		U	GAM
Uranium 235	15117-96-1	U		67		U	GAM
Uranium 238	U-238	U		2300		U	GAM
Americium 241	14596-10-2	U		56		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/03/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1123

R011056-03 B10J37

DATA SHEET

SDG	7551	Client/Case no	Hanford SDG H1123
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R011056-03	Client sample id	B10J37
Dept sample id	7551-003	Location/Matrix	Hanford Site WATER
Received	11/04/00	Collected	11/03/00 12:11
		Custody/SAF No	C01-007-47 C01-007

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.42	1.1	1.6	3.0	U	88A
Gross Beta	12587-47-2	35.7	3.5	3.2	4.0		82B
Tritium	10028-17-8	1240	150	180	400		H
Potassium 40	13966-00-2	U		100		U	GAM
Cobalt 60	10198-40-0	U		8.8	25	U	GAM
Cesium 137	10045-97-3	U		7.7	15	U	GAM
Radium 226	13982-63-3	U		29		U	GAM
Radium 228	15262-20-1	U		33		U	GAM
Europium 152	14683-23-9	U		19	50	U	GAM
Europium 154	15585-10-1	U		20	50	U	GAM
Europium 155	14391-16-3	U		20	50	U	GAM
Thorium 228	14274-82-9	U		11		U	GAM
Thorium 232	TH-232	U		33		U	GAM
Uranium 235	15117-96-1	U		29		U	GAM
Uranium 238	U-238	U		1100		U	GAM
Americium 241	14596-10-2	U		29		U	GAM

100 KR4 IAM (1 & 2)

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/03/01

Test Y Matrix WATER
SDG 7551
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

METHOD SUMMARY

STRONTIUM 90 IN WATER

BETA COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Strontium 90
Preparation batch 6962-065					
B10HX5	R011056-01			7551-001	20.6
BLK (QC ID=36717)	R011056-07			7551-007	U
LCS (QC ID=36716)	R011056-06			7551-006	ok
Duplicate (R011056-01)	R011056-08			7551-008	ok
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	2.0

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 6962-065	2σ prep error 10.0 % Reference Lab Notebook 6962 pg. 065															
B10HX5	R011056-01			1.1	0.500			70		100			35	12/08/00	12/08	GRB-217
BLK (QC ID=36717)	R011056-07			1.1	0.500			72		100				12/08/00	12/08	GRB-219
LCS (QC ID=36716)	R011056-06			1.0	0.500			73		100				12/08/00	12/08	GRB-218
Duplicate (R011056-01) (QC ID=36718)	R011056-08			1.0	0.500			72		100			35	12/08/00	12/08	GRB-220
Nominal values and limits from method				2.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	SRISO_SEP_PRECIP_GPC
	CP-040	Environmental Water Dissolution, rev 3
	CP-520	Yttrium Purification, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.0 ± 0.12
YIELD 72 ± 3

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/03/01

Test 82B Matrix WATER
SDG 7551
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Gross Beta	2: Sum, Beta Emitters	RESULT RATIO (%) 2÷1	2σ
Preparation batch 6962-065								
B10J01	R011056-04	82		7551-004	18.5			
B10J03	R011056-05	82		7551-005	5.84			
B10J29	R011056-02	82		7551-002	28.0	45.0	161	111
B10J37	R011056-03	82		7551-003	35.7			
BLK (QC ID=36717)	R011056-07	82		7551-007	U			
LCS (QC ID=36716)	R011056-06	82		7551-006	ok			
Duplicate (R011056-04)	R011056-09	82		7551-009	ok			
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	4.0		Average 161	

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 6962-065	2σ prep error 15.0 % Reference Lab Notebook 6962 pg. 065															
B10J01	R011056-04	82		2.4	0.300			59		100			46	12/01/00	12/19	GRB-110
B10J03	R011056-05	82		2.4	0.300			64		100			46	12/01/00	12/19	GRB-112
B10J29	R011056-02	82		3.3	0.300			71		58			46	12/01/00	12/19	GRB-110
B10J37	R011056-03	82		3.2	0.300			61		58			46	12/01/00	12/19	GRB-112
BLK (QC ID=36717)	R011056-07	82		2.0	0.300			24		100				12/01/00	12/19	GRB-115
LCS (QC ID=36716)	R011056-06	82		2.6	0.300			22		100				12/01/00	12/19	GRB-114
Duplicate (R011056-04) (QC ID=36719)	R011056-09	82		2.4	0.300			48		100			46	12/01/00	12/19	GRB-110
Nominal values and limits from method				4.0	0.300			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 2.6 ± 0.94
RESIDUE 50 ± 39

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/03/01

Test 88A Matrix WATER
SDG 7551
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 6962-065					
B10J01	R011056-04	88		7551-004	U
B10J03	R011056-05	88		7551-005	4.13
B10J29	R011056-02	88		7551-002	4.13
B10J37	R011056-03	88		7551-003	U
BLK (QC ID=36717)	R011056-07	88		7551-007	U
LCS (QC ID=36716)	R011056-06	88		7551-006	ok
Duplicate (R011056-04)	R011056-09	88		7551-009	- U
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	3.0

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 6962-065	2σ prep error 20.0 % Reference Lab Notebook 6962 pg. 065															
B10J01	R011056-04	88		1.7	0.300			65		100			56	12/02/00	12/29	GRB-105
B10J03	R011056-05	88		1.6	0.300			70		100			45	12/02/00	12/18	GRB-114
B10J29	R011056-02	88		1.7	0.300			79		100			45	12/02/00	12/18	GRB-111
B10J37	R011056-03	88		1.6	0.300			72		100			45	12/02/00	12/18	GRB-112
BLK (QC ID=36717)	R011056-07	88		0.92	0.300			22		100				12/02/00	12/18	GRB-116
LCS (QC ID=36716)	R011056-06	88		1.2	0.300			21		100				12/02/00	12/18	GRB-115
Duplicate (R011056-04) (QC ID=36719)	R011056-09	88		1.6	0.300			74		100			56	12/02/00	12/29	GRB-107
Nominal values and limits from method				3.0	0.300			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 1.5 ± 0.60
RESIDUE 58 ± 50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

Test GAM Matrix WATER
SDG 7551
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA EMITTERS
GAMMA SCAN

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 6962-065								
B10J01	R011056-04			7551-004	U		U	
B10J03	R011056-05			7551-005	U		U	
B10J29	R011056-02			7551-002	U		U	
B10J37	R011056-03			7551-003	U		U	
BLK (QC ID=36717)	R011056-07			7551-007	U		U	
LCS (QC ID=36716)	R011056-06			7551-006	ok		ok	
Duplicate (R011056-04)	R011056-09			7551-009	-	U	-	U
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	25		15	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX 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 6962-065 2σ prep error 15.0 % Reference Lab Notebook 6962 pg. 065																
B10J01	R011056-04			15	0.500					310			28	12/01/00	12/01	MB,05,00
B10J03	R011056-05			23	0.500					310			28	12/01/00	12/01	MB,07,00
B10J29	R011056-02			20	0.500					309			28	12/01/00	12/01	01,03,00
B10J37	R011056-03			7.7	0.500					309			28	12/01/00	12/01	01,04,00
BLK (QC ID=36717)	R011056-07			5.0	0.500					752				12/01/00	12/01	01,04,00
LCS (QC ID=36716)	R011056-06			15	0.500					753				12/01/00	12/01	MB,05,00
Duplicate (R011056-04) (QC ID=36719)	R011056-09			11	0.500					752			28	12/01/00	12/01	01,03,00
Nominal values and limits from method				15	0.500					100			180			

PROCEDURES REFERENCE GAMMA_GS
CP-100 Ge(Li) Preparation for Commercial Samples, rev 2

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 14 ± 13
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

Test C Matrix WATER
SDG 7551
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6962-065						
B10J01	R011056-04			7551-004	232	
BLK (QC ID=36717)	R011056-07			7551-007	U	
LCS (QC ID=36716)	R011056-06			7551-006	LOW	
Duplicate (R011056-04)	R011056-09			7551-009	ok	
Spike (R011056-04)	R011056-10			7551-010	ok	X
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	200	

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 6962-065 2σ prep error 10.0 % Reference Lab Notebook 6962 pg. 065																
B10J01	R011056-04			39	0.0300			100		100			38	12/08/00	12/11	LSC-005
BLK (QC ID=36717)	R011056-07			36	0.0300			100		100				12/08/00	12/11	LSC-005
LCS (QC ID=36716)	R011056-06			50	0.0300			100		54				12/08/00	12/11	LSC-005
Duplicate (R011056-04) (QC ID=36719)	R011056-09			37	0.0300			100		100			38	12/08/00	12/11	LSC-005
Spike (R011056-04) (QC ID=36720)	R011056-10			110	0.0200			100		27			38	12/08/00	12/11	LSC-005
Nominal values and limits from method				200	0.0300					50			180			

PROCEDURES REFERENCE C14_CHEM_LSC
CP-241 Carbon-14 in Aqueous Samples, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 54 ± 63
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

Test H Matrix WATER
SDG 7551
Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN WATER
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1123

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium
Preparation batch 6962-065					
B10HX5	R011056-01			7551-001	U
B10J01	R011056-04			7551-004	46400
B10J03	R011056-05			7551-005	U
B10J29	R011056-02			7551-002	2160
B10J37	R011056-03			7551-003	1240
BLK (QC ID=36717)	R011056-07			7551-007	U
LCS (QC ID=36716)	R011056-06			7551-006	ok
Duplicate (R011056-04)	R011056-09			7551-009	ok
Spike (R011056-04)	R011056-10			7551-010	ok
Nominal values and limits from method 100 KR4 IAM (1 & 2)				RDLs (pCi/L)	400

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 6962-065	2σ prep error 10.0 %				Reference Lab Notebook 6962 pg. 065											
B10HX5	R011056-01			190	0.0500			20		100			32	12/05/00	12/05	LSC-005
B10J01	R011056-04			180	0.0500			20		100			32	12/05/00	12/05	LSC-005
B10J03	R011056-05			190	0.0500			20		100			32	12/05/00	12/05	LSC-005
B10J29	R011056-02			190	0.0500			20		100			32	12/05/00	12/05	LSC-005
B10J37	R011056-03			180	0.0500			20		100			32	12/05/00	12/05	LSC-005
BLK (QC ID=36717)	R011056-07			370	0.0500			10		100				12/05/00	12/05	LSC-005
LCS (QC ID=36716)	R011056-06			370	0.0500			10		100				12/05/00	12/05	LSC-005
Duplicate (R011056-04) (QC ID=36719)	R011056-09			180	0.0500			20		100			32	12/05/00	12/05	LSC-005
Spike (R011056-04) (QC ID=36720)	R011056-10			200	0.0500			18		100			32	12/05/00	12/05	LSC-005
Nominal values and limits from method				400	0.0500					25			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/03/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1123

Test	H
Matrix	WATER
SDG	7551
Contact	Melissa C. Mannion

METHOD SUMMARY, cont.

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1123

PROCEDURES	REFERENCE	906.0_H3_LSC
	CP-210	Tritium in Water Samples by Distillation, rev 3

AVERAGES ± 2 SD	MDA	230	±	160
FOR 9 SAMPLES	YIELD	18	±	9

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	01/03/01

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-11

Collector: D Parchen	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H39	Ice Chest No.: GWS107 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0280
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W010 0024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10HX5		W	11-3-00	0918	1x20-mL P	Activity Scan	None
B10HX5		W			2x1000-mL G/P	Strontium-89,90 – Sr-90	HNO3 to pH <2
B10HX5		W			1x250-mL P	Tritium - H3	None

11-3-00

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D Parchen	D. E. PARCHEN		NOV 0 3 2000 1830	Fed Ex			11/03/00
Relinquished By: FED. EXPRESS			Date/Time: 11/04/00 10:30	Received By: E. Ragsu			Date/Time: 11/04/00 10:30
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-27

Page 1 of 1

Collector: D. P. CONNOLLY	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-1137	Ice Chest No.: GWS 107 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795 40280
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J28 (F)		W	11-3-00	1050	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J29		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J29		W			1x20-mL P	Activity Scan	None
B10J29		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J29		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J29		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J29		W			1x250-mL P	Tritium - H3	None

11-3-00

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D. P. CONNOLLY	NOV 03 2000	Fed Ex	11/03/00
FED-Express	11/04/00 10:30	B Aguirre	11/04/00 9:30

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-47

Page 1 of 1

Collector D. P. CONNOLLY	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-007	Sampling Origin HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title 100 KR4 IAM (1 & 2)	Logbook No. WM-SAWS-1139	Ice Chest No. GWS 107 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235 7954 0280
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No. W01000024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

MM 11/8/00

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J36 (F)		W	11/3/00	1211	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J37		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J37		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J37		W			1x20-mL P	Activity Scan	None
B10J37		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J37		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J37		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J37		W			1x250-mL P	Tritium - H3	None
						H-3 ONLY	

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	D. P. CONNOLLY	D Conn	11-3-00 1330	Fed Ex			11/03/00
Relinquished By			Date/Time	Received By			Date/Time
Fed Express			11/04/00 9:30	E. Aguirre			11/04/00 9:30
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
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

PNNL	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # C01-007-49
		Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H37	Ice Chest No.: SML-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J00 (F)		W	11/3/00	1150	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J01		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J01		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J01		W			1x20-mL P	Activity Scan	None
B10J01		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J01		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J01		W			1x1000-mL G/P	Carbon-14	None
B10J01		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J01		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		11-3-00 1330	FEDX			11/03/00
Relinquished By: FED. Express			Date/Time 11/04/00 9:22	Received By: E. Agnew			Date/Time 11/04/00 9:20
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-007-51

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-007	Sampling Origin: HANFORD SITE H1123 (7551)	Purchase Order/Charge Code
Project Title: 100 KR4 IAM (1 & 2)	Logbook No.: WM-SAWS-H37	Ice Chest No.: SML-598 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 0279
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100024

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit deliverables & invoices to JH Kessner
FAX TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10J02 (F)		W	11/3/00	1033	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10J03		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10J03		W			1x20-mL P	Activity Scan	None
B10J03		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10J03		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10J03		W			1x1000-mL G/P	Gamma Spectroscopy(Water)	HNO3 to pH <2
B10J03		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	11-3-00 1330		FEDX		11/03/00
Relinquished By			Date/Time	Received By			Date/Time
FED Express			11/04/00 10:30	E. Reguer			11/04/00 10:30
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
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

ThermoRetec
Richmond Laboratory

Analytical Services

ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: (WMTS) BECHTEL HANFORD (PNNL) Date: 11-04-00 11:AM

Ice chest # or description	GWS-107					
Thermometer: time in	11:45					
Thermometer: time out	12:30					
Thermometer reading	4°C					
Thermometer number	6536					
Correction factor	NONE					
Actual temperature*	—					
Custody seals on ice chest intact?	NO					
Custody seals dated ?	—					
Custody seals signed?	—					
Custody seals on samples?	Yes					
Ice chest scanned for activity?	Yes					

* Temperature is in degrees centigrade.

Technician:_____

Comments:_____

ThermoRetec
Richmond Laboratory

Analytical Services

ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: (WMTS) BECHTEL HANFORD (PNNL) Date: 11/04/00 11:AM

Ice chest # or description	SML-598					
Thermometer: time in	11:35					
Thermometer: time out	12:25					
Thermometer reading	4°C					
Thermometer number	2132					
Correction factor	NONE					
Actual temperature*	—					
Custody seals on ice chest intact?	NO					
Custody seals dated ?	—					
Custody seals signed?	—					
Custody seals on samples?	Yes					
Ice chest scanned for activity?	Yes					

* Temperature is in degrees centigrade.

Technician:_____

Comments:_____

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: (WMTS) BECHTEL HANFORD (PNNL) Date/Time received 11/04/12 10:30 AM

CoC No. C01-007-11, →27, 47, - 49 AND C01, 007-51.

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

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [ ]
6. Number of samples in shipping container: 9
7. Number of containers per sample: PLEASE REFER (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: C01-007-49 – No time listed for B1DJ00 on CoC
    C01-007-47 – No time or date listed on CoC for B1DJ37
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by E. Degner Date: 11/04/12 Time: 10:30 AM

Customer Sample No.	cpm	mr/hr	Customer Sample No.	Cpm	mr/hr

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____