



JANUARY 18 2006

EBERLINE
SERVICES

January 16, 2006

Ms. Dorothy Stewart
Pacific Northwest National Laboratory
3110 Port of Benton Boulevard
MSIN K6-96
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R5-11-099-7329, SDG H3378

Dear Ms. Stewart:

Enclosed is the data report for three water samples designated under SAF No. I06-003 received at Eberline Services on November 8, 10, and 11, 2005. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/

Enclosure: Data Package

Analytical Services
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1.0 GENERAL

Pacific Northwest National Laboratory (PNNL) Sample Delivery Group H3378 was composed of three water samples designated under SAF No. I06-003 with a Project Designation of: CERCLA/100HR3IAM(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 Analysis

The gross alpha LCS (63%) was less than the contract lower limit of 70%. No other problems were encountered during the course of the analyses.

2.2 Tritium Analysis

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 C. Mannion
Senior Program Manager



Date

JANUARY 18 2006

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3378

SDG 7329
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H3378

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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 01/16/06

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3378

SDG 7329

Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford

Contract No. 630

Case no SDG_H3378

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 01/16/06

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3378

SDG 7329
Contact Melissa C. Mannion

GUIDE , cont .

Client Hanford
Contract No. 630
Case no SDG H3378

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

LAB SAMPLE SUMMARY

SDG 7329

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG H3378

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R511099-01	B1F920	Hanford Site	WATER		I06-003	I06-003-114	11/07/05 09:03
R511099-02	B1F8T0		WATER		I06-003	I06-003-1	11/09/05 09:58
R511099-03	B1F9W9		WATER		I06-003	I06-003-402	11/10/05 09:05
R511099-04	Lab Control Sample		WATER		I06-003		
R511099-05	Method Blank		WATER		I06-003		
R511099-06	Duplicate (R511099-01)	Hanford Site	WATER		I06-003		11/07/05 09:03
R511099-07	Spike (R511099-01)	Hanford Site	WATER		I06-003		11/07/05 09:03

LAB SUMMARY

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

SDG 7329
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H3378

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7329	I06-003-1	B1F8T0	WATER		5.0 L		11/10/05	1	R511099-02	7329-002
	I06-003-114	B1F920	WATER		5.0 L		11/08/05	1	R511099-01	7329-001
	I06-003-402	B1F9W9	WATER		5.0 L		11/11/05	1	R511099-03	7329-003
		Method Blank	WATER						R511099-05	7329-005
		Lab Control Sample	WATER						R511099-04	7329-004
		Duplicate (R511099-01)	WATER		5.0 L		11/08/05	1	R511099-06	7329-006
		Spike (R511099-01)	WATER		5.0 L		11/08/05	1	R511099-07	7329-007

QC SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLINE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

SDG 7329
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H3378

TEST	MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALI- FIERS
			BATCH	2σ %	CLIENT MORE	RE BLANK	LCS	DUP/ORIG MS/ORIG	
Gas Proportional Counting									
82B	WATER	Gross Beta in Water	7148-131	15.0	3	1	1	1/1	
88A	WATER	Gross Alpha in Water	7148-131	20.0	3	1	1	1/1	
Liquid Scintillation Counting									
H	WATER	Tritium in Water	7148-131	10.0	3	1	1	1/1	1/1 X

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.

PREP BATCH SUMMARY

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SUMMARY DATA SECTION

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

LAB WORK SUMMARY

SDG 7329
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Case no SDG H3378

LAB SAMPLE	CLIENT SAMPLE ID	COLLECTED	LOCATION	MATRIX	SUF-	RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
R511099-01	B1F920								7329-001	82B/82		12/19/05	01/09/06	MWT	Gross Beta in Water
		11/07/05	Hanford Site	WATER					7329-001	88A/88		12/21/05	01/09/06	MWT	Gross Alpha in Water
		11/08/05	I06-003-114				I06-003		7329-001	H		12/08/05	01/09/06	MWT	Tritium in Water
R511099-02	B1F8T0								7329-002	82B/82		12/21/05	01/09/06	MWT	Gross Beta in Water
		11/09/05		WATER					7329-002	88A/88		12/21/05	01/09/06	MWT	Gross Alpha in Water
		11/10/05	I06-003-1				I06-003		7329-002	H		12/08/05	01/09/06	MWT	Tritium in Water
R511099-03	B1F9W9								7329-003	82B/82		12/19/05	01/09/06	MWT	Gross Beta in Water
		11/10/05		WATER					7329-003	88A/88		12/21/05	01/09/06	MWT	Gross Alpha in Water
		11/11/05	I06-003-402				I06-003		7329-003	H		12/08/05	01/09/06	MWT	Tritium in Water
R511099-04	Lab Control Sample								7329-004	82B/82		12/19/05	01/09/06	MWT	Gross Beta in Water
				WATER					7329-004	88A/88		12/21/05	01/09/06	MWT	Gross Alpha in Water
							I06-003		7329-004	H		12/08/05	01/09/06	MWT	Tritium in Water
R511099-05	Method Blank								7329-005	82B/82		12/19/05	01/09/06	MWT	Gross Beta in Water
				WATER					7329-005	88A/88		12/22/05	01/09/06	MWT	Gross Alpha in Water
							I06-003		7329-005	H		12/08/05	01/09/06	MWT	Tritium in Water
R511099-06	Duplicate (R511099-01)								7329-006	82B/82		12/21/05	01/09/06	MWT	Gross Beta in Water
		11/07/05	Hanford Site	WATER					7329-006	88A/88		12/21/05	01/09/06	MWT	Gross Alpha in Water
		11/08/05					I06-003		7329-006	H		12/08/05	01/09/06	MWT	Tritium in Water
R511099-07	Spike (R511099-01)								7329-007	H		12/08/05	01/09/06	MWT	Tritium in Water
		11/07/05	Hanford Site	WATER											
		11/08/05					I06-003								

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
82B/82	I06-003	Gross Beta in Water	BETA_GPC	3			1	1	1		6
88A/88	I06-003	Gross Alpha in Water	ALPHA_GPC	3			1	1	1		6
H	I06-003	Tritium in Water	TRITIUM_DIST_LSC	3			1	1	1	1	7
TOTALS				9			3	3	3	1	19

WORK SUMMARY

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3378

7329-005

Method Blank

METHOD BLANK

SDG <u>7329</u>	Client/Case no <u>Hanford</u>	SDG <u>H3378</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R511099-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7329-005</u>	Material/Matrix _____	<u>WATER</u>
	SAF No <u>I06-003</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.450	0.89	2.2	3.0	U	88A
Gross Beta	12587-47-2	0.709	1.3	2.2	4.0	U	82B
Tritium	10028-17-8	370	1200	<u>1900</u>	400	U	H

CERCLA/100HR3IAM(1&2)

QC-BLANK #55223

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
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Version <u>3.06</u>
Report date <u>01/16/06</u>

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EBERLINE SERVICES/RICHMOND
 SAMPLE DELIVERY GROUP H3378

7329-006

B1F920

DUPLICATE

SDG <u>7329</u>		Client/Case no <u>Hanford</u> <u>SDG H3378</u>
Contact <u>Melissa C. Mannion</u>		Contract No. <u>630</u>
DUPLICATE	ORIGINAL	
Lab sample id <u>R511099-06</u>	Lab sample id <u>R511099-01</u>	Client sample id <u>B1F920</u>
Dept sample id <u>7329-006</u>	Dept sample id <u>7329-001</u>	Location/Matrix <u>Hanford Site</u> <u>WATER</u>
	Received <u>11/08/05</u>	Collected/Volume <u>11/07/05 09:03</u> <u>5.0 L</u>
		Custody/SAF No <u>I06-003-114</u> <u>I06-003</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	PROT
	pCi/L	(COUNT)	pCi/L	pCi/L	FIERS TEST		pCi/L	(COUNT)	pCi/L	FIERS	%	TOT
Gross Alpha	0.450	0.99	1.8	3.0	U 88A	-0.504	1.0	2.4	U	-		
Gross Beta	4.77	1.4	2.0	4.0	82B	4.86	1.5	2.1		2	71	20
Tritium	472	130	190	400	H	498	130	200		5	61	20

CERCLA/100HR3IAM(1&2)

QC-DUP#1 55224

DUPLICATES

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>01/16/06</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

7329-007

B1F920

MATRIX SPIKE

SDG 7329

Contact Melissa C. Mannion

MATRIX SPIKE

Lab sample id R511099-07

Dept sample id 7329-007

Client/Case no Hanford SDG H3378

Contract No. 630

ORIGINAL

Lab sample id R511099-01

Dept sample id 7329-001

Received 11/08/05

Client sample id B1F920

Location/Matrix Hanford Site WATER

Collected/Volume 11/07/05 09:03 5.0 L

Custody/SAF No I06-003-114 I06-003

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 % (TOTAL)	LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	18000	570	300	400	X H	18100	720	498	130	97	83-117	60-140

CERCLA/100HR3IAM(1&2)

QC-MS#1 55225

MATRIX SPIKES

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3378

7329-001

B1F920

DATA SHEET

SDG <u>7329</u>	Client/Case no <u>Hanford</u>	SDG <u>H3378</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R511099-01</u>	Client sample id <u>B1F920</u>	
Dept sample id <u>7329-001</u>	Location/Matrix <u>Hanford Site</u>	<u>WATER</u>
Received <u>11/08/05</u>	Collected/Volume <u>11/07/05 09:03</u>	<u>5.0 L</u>
	Custody/SAF No <u>I06-003-114</u>	<u>I06-003</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.504	1.0	2.4	3.0	U	88A
Gross Beta	12587-47-2	4.86	1.5	2.1	4.0		82B
Tritium	10028-17-8	498	130	200	400		H

CERCLA/100HR3IAM(1&2)

DATA SHEETS

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>01/16/06</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3378

7329-002

B1F8T0

DATA SHEET

SDG <u>7329</u>	Client/Case no <u>Hanford</u>	SDG <u>H3378</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R511099-02</u>	Client sample id <u>B1F8T0</u>	
Dept sample id <u>7329-002</u>	Location/Matrix _____	<u>WATER</u>
Received <u>11/10/05</u>	Collected/Volume <u>11/09/05 09:58</u>	<u>5.0 L</u>
	Custody/SAF No <u>I06-003-1</u>	<u>I06-003</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.404	1.1	2.0	3.0	U	88A
Gross Beta	12587-47-2	6.51	1.5	2.0	4.0		82B
Tritium	10028-17-8	1680	160	190	400		H

CERCLA/100HR3IAM(1&2)

Lab id <u>EBRLNE</u>
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3378

7329-003

B1F9W9

DATA SHEET

SDG <u>7329</u>	Client/Case no <u>Hanford</u>	SDG <u>H3378</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R511099-03</u>	Client sample id <u>B1F9W9</u>	
Dept sample id <u>7329-003</u>	Location/Matrix _____	<u>WATER</u>
Received <u>11/11/05</u>	Collected/Volume <u>11/10/05 09:05</u>	<u>5.0 L</u>
	Custody/SAF No <u>I06-003-402</u>	<u>I06-003</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.672	1.5	2.6	3.0	U	88A
Gross Beta	12587-47-2	6.02	1.5	2.0	4.0		82B
Tritium	10028-17-8	320	130	200	400		H

CERCLA/100HR3IAM(1&2)

Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

Test 82B Matrix WATER
 SDG 7329
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS BETA IN WATER
 GAS PROPORTIONAL COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H3378

RESULTS

LAB	RAW	SUF-	SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	1: Gross	2: Sum, Beta	RESULT RATIO (%)		
							Beta	Emitters	2+1	2σ	
Preparation batch 7148-131											
R511099-01	82				7329-001	B1F920	4.86				
R511099-02	82				7329-002	B1F8T0	6.51				
R511099-03	82				7329-003	B1F9W9	6.02				
R511099-04	82				7329-004	LCS (QC ID=55222)	ok				
R511099-05	82				7329-005	BLK (QC ID=55223)	U				
R511099-06	82				7329-006	Duplicate (R511099-01)	ok				
Nominal values and limits from method							RDLs (pCi/L)	4.0	Average		
CERCLA/100HR3IAM(1&2)											

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7148-131 2σ prep error 15.0 % Reference Lab Notebook #7148, pg. 131															
R511099-01	82	B1F920	2.1	0.300			111	100				42	12/17/05	12/19	GRB-105
R511099-02	82	B1F8T0	2.0	0.300			118	100				42	12/17/05	12/21	GRB-209
R511099-03	82	B1F9W9	2.0	0.300			120	100				39	12/17/05	12/19	GRB-112
R511099-04	82	LCS (QC ID=55222)	2.0	0.300			59	100					12/17/05	12/19	GRB-115
R511099-05	82	BLK (QC ID=55223)	2.2	0.300			58	100					12/17/05	12/19	GRB-110
R511099-06	82	Duplicate (R511099-01) (QC ID=55224)	2.0	0.300			112	100				44	12/17/05	12/21	GRB-210
Nominal values and limits from method			4.0	0.300			5-250	100				180			

PROCEDURES REFERENCE BETA_GPC
 CP-121 Gross Alpha and Gross Beta in Drinking Water,
 rev 1

AVERAGES ± 2 SD MDA 2.0 ± 0.17
 FOR 6 SAMPLES RESIDUE 96 ± 59

Lab id EBRLNE
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 Form DVD-LMS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

Test 88A Matrix WATER
 SDG 7329
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS ALPHA IN WATER
 GAS PROPORTIONAL COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H3378

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Gross Alpha	
Preparation batch 7148-131					
R511099-01	88	7329-001	B1F920	U	
R511099-02	88	7329-002	B1F8T0	U	
R511099-03	88	7329-003	B1F9W9	U	
R511099-04	88	7329-004	LCS (QC ID=55222)	<u>LOW</u>	
R511099-05	88	7329-005	BLK (QC ID=55223)	U	
R511099-06	88	7329-006	Duplicate (R511099-01)	-	U
Nominal values and limits from method			RDLs (pCi/L)	3.0	
CERCLA/100HR3IAM(1&2)					

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7148-131			2σ prep error 20.0 % Reference Lab Notebook #7148, pg. 131												
R511099-01	88	B1F920	2.4	0.200			74	100				44	12/17/05	12/21	GRB-108
R511099-02	88	B1F8T0	2.0	0.200			71	100				42	12/17/05	12/21	GRB-109
R511099-03	88	B1F9W9	2.6	<u>0.150</u>			54	100				41	12/17/05	12/21	GRB-110
R511099-04	88	LCS (QC ID=55222)	1.8	0.200			58	100					12/17/05	12/21	GRB-112
R511099-05	88	BLK (QC ID=55223)	2.2	0.200			59	100					12/17/05	12/22	GRB-108
R511099-06	88	Duplicate (R511099-01) (QC ID=55224)	1.8	0.200			64	100				44	12/17/05	12/21	GRB-111
Nominal values and limits from method			3.0	0.200			5-250	100				180			

PROCEDURES REFERENCE ALPHA_GPC
 CP-120 Gross Alpha and Gross Beta in Water, rev 6

AVERAGES ± 2 SD MDA 2.1 ± 0.65
 FOR 6 SAMPLES RESIDUE 63 ± 16

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 01/16/06

JANUARY 18 2006
EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3378

Test H Matrix WATER
 SDG 7329
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

TRITIUM IN WATER
 LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H3378

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Tritium
Preparation batch 7148-131					
R511099-01		7329-001	B1F920		498
R511099-02		7329-002	B1F8T0		1680
R511099-03		7329-003	B1F9W9		320
R511099-04		7329-004	LCS (QC ID=55222)		ok
R511099-05		7329-005	BLK (QC ID=55223)		U
R511099-06		7329-006	Duplicate (R511099-01)		ok
R511099-07		7329-007	Spike (R511099-01)		ok X

Nominal values and limits from method RDLs (pCi/L) 400
 CERCLA/100HR3IAM(1&2)

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7148-131 2σ prep error 10.0 % Reference Lab Notebook #7148, pg. 131															
R511099-01		B1F920	200	0.0100			100		120			31	12/08/05	12/08	LSC-007
R511099-02		B1F8T0	190	0.0100			100		120			29	12/08/05	12/08	LSC-007
R511099-03		B1F9W9	200	0.0100			100		120			28	12/08/05	12/08	LSC-007
R511099-04		LCS (QC ID=55222)	<u>1900</u>	0.0100			10		120				12/08/05	12/08	LSC-007
R511099-05		BLK (QC ID=55223)	<u>1900</u>	0.0100			10		120				12/08/05	12/08	LSC-007
R511099-06		Duplicate (R511099-01)	190	0.0100			100		120			31	12/08/05	12/08	LSC-007
		(QC ID=55224)													
R511099-07		Spike (R511099-01)	300	0.0500			20		53			31	12/08/05	12/08	LSC-007
		(QC ID=55225)													

Nominal values and limits from method 400 0.0100 25 180

PROCEDURES REFERENCE TRITIUM_DIST_LSC
 CP-210 Tritium in Water Samples by Distillation, rev 8

AVERAGES ± 2 SD MDA 700 ± 1600
 FOR 7 SAMPLES YIELD 63 ± 93

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SAMPLE DELIVERY GROUP H3378

SDG 7329
Contact Melissa C. Mannion

REPORT GUIDE

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SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

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PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

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WORK SUMMARY

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

The following notes apply to this report:

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

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DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

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

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

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

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

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

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DUPLICATE

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

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

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

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

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REPORT GUIDE

MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

2. The error of ADDED.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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

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

MDAs are underlined if greater than the printed RDL.

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

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METHOD SUMMARY

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

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

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

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

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

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

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RICHMOND, CA LABORATORY
SAMPLE RECEIPT CHECKLIST

Client: PNNL (F. HANFORD) City MCHLAND State WA

Date/Time received 1/11/05 9:25 CoC No. 106-003-402

Container I.D. No. SAWS-105 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. Packing material is: Wet [] Dry []
6. Number of samples in shipping container: 1 Sample Matrix W
7. Number of containers per sample: 6 (Or see CoC _____)
8. Samples are in correct container Yes [] No []
9. Paperwork agrees with samples? Yes [] No []
10. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
11. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
12. Samples are: Preserved [] Not preserved [] pH 1/7 Preservative _____
13. Describe any anomalies:

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
15. Inspected by MFU Date: 1/12/05 Time: 11:30

Customer Sample No.	cpm	mR/hr	Wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. _____ Calibration date _____



RICHMOND, CA LABORATORY
SAMPLE RECEIPT CHECKLIST

Client: PNNL (F. HANFORD) City RICHLAND State WA
 Date/Time received 11/10/05 9:15 CoC No. 106-003-1
 Container I.D. No. IA 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. Packing material is: Wet [] Dry []
6. Number of samples in shipping container: 1 Sample Matrix W
7. Number of containers per sample: 6 (Or see CoC _____)
8. Samples are in correct container Yes [] No []
9. Paperwork agrees with samples? Yes [] No []
10. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
11. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
12. Samples are: Preserved [] Not preserved [] pH 1/7 Preservative _____
13. Describe any anomalies:

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
15. Inspected by MFW Date: 11/10/05 Time: 11:15

Customer Sample No.	cpm	mR/hr	Wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. _____ Calibration date _____

JANUARY 18 2006



RICHMOND, CA LABORATORY
SAMPLE RECEIPT CHECKLIST

Client: PNNL (F. HANFORD) City MCHLAND State WA

Date/Time received 11/08/05 9:45 CoC No. 106-003-114

Container I.D. No. SAWS-370 Requested TAT (Days) _____ 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. Packing material is: Wet [] Dry []
- 6. Number of samples in shipping container: 1 Sample Matrix W
- 7. Number of containers per sample: 6 (Or see CoC _____)
- 8. Samples are in correct container Yes [] No []
- 9. Paperwork agrees with samples? Yes [] No []
- 10. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
- 11. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
- 12. Samples are: Preserved [] Not preserved [] pH 1/7 Preservative _____
- 13. Describe any anomalies:

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

15. Inspected by MFW Date: 11/08/05 Time: 10:15

Customer Sample No.	cpm	mR/hr	Wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. _____ Calibration date _____