

H0385-1117/1211-11

Thermo Nutech
W.O. No. N9-04-094-7114

0051538
Bechtel Hanford Inc.
SDG H0385

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0385 is composed of thirteen water samples designated under SAF No. C99-027 with a Project Designation of: 200 UP1 IAM GW MONITORING, APRIL 1999.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. All results were transmitted to Bechtel Hanford via fax on June 8, 1999.

2.0 ANALYSIS NOTES

2.1 Technetium-99 Analyses

Samples BOV290, BOV292, BOV299 and BOV2B0 were reanalyzed because of low yield obtained on the initial analysis. The MDA's of the initial group of results reported are 2 to 16 points higher than the required LLD. This was caused by low, but acceptable recoveries. No other problems were encounter with the analyses.



TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0385

SAMPLE SUMMARY

SDG 7114
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0385

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0V282	HANFORD SITE	LIQUID		N904094-11	C99-027	C99-027-35	04/09/99 13:01
B0V284	HANFORD SITE	LIQUID		N904094-12	C99-027	C99-027-39	04/09/99 11:49
B0V290	HANFORD SITE	LIQUID		N904094-01	C99-027	C99-027-2	04/13/99 10:44
B0V292	HANFORD SITE	LIQUID		N904094-02	C99-027	C99-027-4	04/14/99 10:57
B0V294	HANFORD SITE	LIQUID		N904094-10	C99-027	C99-027-31	04/13/99 09:24
B0V296	HANFORD SITE	LIQUID		N904094-13	C99-027	C99-027-51	04/09/99 11:33
B0V299	HANFORD SITE	LIQUID		N904094-03	C99-027	C99-027-7	04/14/99 09:12
B0V2B0	HANFORD SITE	LIQUID		N904094-04	C99-027	C99-027-8	04/14/99 09:12
B0V2B2	HANFORD SITE	LIQUID		N904094-06	C99-027	C99-027-15	04/09/99 12:45
B0V2B4	HANFORD SITE	LIQUID		N904094-05	C99-027	C99-027-11	04/14/99 11:41
B0V2B6	HANFORD SITE	LIQUID		N904094-09	C99-027	C99-027-27	04/12/99 12:42
B0V2B8	HANFORD SITE	LIQUID		N904094-08	C99-027	C99-027-23	04/12/99 08:54
B0V2C0	HANFORD SITE	LIQUID		N904094-07	C99-027	C99-027-19	04/12/99 13:14
Method Blank		LIQUID		N903149-06	C99-027		
Method Blank		LIQUID		N904094-15	C99-027		
Lab Control Sample		LIQUID		N903149-05	C99-027		
Lab Control Sample		LIQUID		N904094-14	C99-027		
Duplicate (N904094-01)	HANFORD SITE	LIQUID		N904094-16	C99-027		04/13/99 10:44

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CS
 Version 3.06
 Report date 06/08/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0385

SDG 7114
 Contact L.A. Johnson

QC SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0385

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7105		Method Blank	LIQUID					N903149-06	7105-006
		Lab Control Sample	LIQUID					N903149-05	7105-005
7114	C99-027-11	B0V2B4	LIQUID				04/16/99 2	N904094-05	7114-005
	C99-027-15	B0V2B2	LIQUID				04/16/99 7	N904094-06	7114-006
	C99-027-19	B0V2C0	LIQUID				04/16/99 4	N904094-07	7114-007
	C99-027-2	B0V290	LIQUID				04/16/99 3	N904094-01	7114-001
	C99-027-23	B0V2B8	LIQUID				04/16/99 4	N904094-08	7114-008
	C99-027-27	B0V2B6	LIQUID				04/16/99 4	N904094-09	7114-009
	C99-027-31	B0V294	LIQUID				04/16/99 3	N904094-10	7114-010
	C99-027-35	B0V282	LIQUID				04/16/99 7	N904094-11	7114-011
	C99-027-39	B0V284	LIQUID				04/16/99 7	N904094-12	7114-012
	C99-027-4	B0V292	LIQUID				04/16/99 2	N904094-02	7114-002
	C99-027-51	B0V296	LIQUID				04/16/99 7	N904094-13	7114-013
	C99-027-7	B0V299	LIQUID				04/16/99 2	N904094-03	7114-003
	C99-027-8	B0V2B0	LIQUID				04/16/99 2	N904094-04	7114-004
		Method Blank	LIQUID					N904094-15	7114-015
		Lab Control Sample	LIQUID					N904094-14	7114-014
		Duplicate (N904094-01)	LIQUID				04/16/99 3	N904094-16	7114-016

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SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

TEST	MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALI-
			BATCH	2σ %	CLIENT MORE	RE BLANK	LCS	DUP/ORIG MS/ORIG	
Beta Counting									
TC	LIQUID	Technetium 99 in Water	6880-020	10.0	13	2	2	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.

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0385

SDG 7114
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0385

WORK SUMMARY

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD	
CUSTODY	SAF No	RECEIVED			FIX					
BOV282		N904094-11	7114-011	TC		05/29/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/09/99								
C99-027-35	C99-027	04/16/99								
BOV284		N904094-12	7114-012	TC		05/29/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/09/99								
C99-027-39	C99-027	04/16/99								
BOV290		N904094-01	7114-001	TC	A1	06/01/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/13/99								
C99-027-2	C99-027	04/16/99								
BOV292		N904094-02	7114-002	TC	A1	06/01/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/14/99								
C99-027-4	C99-027	04/16/99								
BOV294		N904094-10	7114-010	TC		05/29/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/13/99								
C99-027-31	C99-027	04/16/99								
BOV296		N904094-13	7114-013	TC		06/01/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/09/99								
C99-027-51	C99-027	04/16/99								
BOV299		N904094-03	7114-003	TC	A1	06/01/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/14/99								
C99-027-7	C99-027	04/16/99								
BOV2B0		N904094-04	7114-004	TC	A1	06/01/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/14/99								
C99-027-8	C99-027	04/16/99								
BOV2B2		N904094-06	7114-006	TC		05/24/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/09/99								
C99-027-15	C99-027	04/16/99								
BOV2B4		N904094-05	7114-005	TC		05/24/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/14/99								
C99-027-11	C99-027	04/16/99								

WORK SUMMARY

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SUMMARY DATA SECTION

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0385

WORK SUMMARY, cont.

SDG 7114
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0385

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	SUF-							
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
B0V2B6		N904094-09	7114-009	TC		06/01/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/12/99								
C99-027-27	C99-027	04/16/99								
B0V2B8		N904094-08	7114-008	TC		05/29/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/12/99								
C99-027-23	C99-027	04/16/99								
B0V2C0		N904094-07	7114-007	TC		05/29/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/12/99								
C99-027-19	C99-027	04/16/99								
Method Blank		N903149-06	7105-006	TC		04/28/99	05/20/99	TAH	Technetium 99 in Water	
	LIQUID									
	C99-027									
Method Blank		N904094-15	7114-015	TC		05/29/99	06/10/99	TAH	Technetium 99 in Water	
	LIQUID									
	C99-027									
Lab Control Sample		N903149-05	7105-005	TC		05/06/99	05/20/99	TAH	Technetium 99 in Water	
	LIQUID									
	C99-027									
Lab Control Sample		N904094-14	7114-014	TC		05/24/99	06/10/99	TAH	Technetium 99 in Water	
	LIQUID									
	C99-027									
Duplicate (N904094-01)		N904094-16	7114-016	TC		05/24/99	06/10/99	TAH	Technetium 99 in Water	
HANFORD SITE	LIQUID	04/13/99								
	C99-027	04/16/99								

WORK SUMMARY

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0385

WORK SUMMARY, cont.

SDG 7114
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0385

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
TC	C99-027	Technetium 99 in Water	TC99TRLSC	13			2	2	1		18
TOTALS				13			2	2	1		18

WORK SUMMARY

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N903149-06

Method Blank

METHOD BLANK

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903149-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7105-006</u>	Material/Matrix <u>LIQUID</u>	
	SAF No <u>C99-027</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Beta	12587-47-2	N.A.			4.0		80B
Carbon 14	14762-75-5	N.A.					C
Technetium 99	14133-76-7	<u>2.70</u>	0.25	0.40	15	J	TC
Iodine 129	15046-84-1	N.A.			5.0		I
Total Uranium (ug/L)	7440-61-1	N.A.			0.10		U_T

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QC-BLANK 30433

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-15

Method Blank

METHOD BLANK

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-15</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7114-015</u>	Material/Matrix <u>LIQUID</u>	
	SAF No <u>C99-027</u>	

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TRST
Technetium 99	14133-76-7	0.039	0.20	0.55	15	U	TC

200 UP1 IAM GW MONITORING, APRIL 99

QC-BLANK 30588

METHOD BLANKS

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0385

N903149-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7114</u> Contact <u>L.A. Johnson</u> Lab sample id <u>N903149-05</u> Dept sample id <u>7105-005</u>	Client/Case no <u>Hanford</u> <u>SDG-H0385</u> Case no <u>TRB-SBB-207925</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>LIQUID</u> SAF No <u>C99-027</u>
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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 LMES (TOTAL)	PROTOCOL LIMITS
Gross Beta	N.A.			4.0		80B					80-120
Carbon 14	N.A.					C					
Technetium 99	330	9.7	6.0	15	B	TC	327	13	101	83-117	80-120
Iodine 129	N.A.			5.0		I					80-120
Total Uranium (ug/L)	N.A.			0.10		U_T					80-120

200 UP1 IAM GW MONITORING, APRIL 99

QC-LCS 30432

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 06/08/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-14

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7114</u> Contact <u>L.A. Johnson</u> Lab sample id <u>N904094-14</u> Dept sample id <u>7114-014</u>	Client/Case no <u>Hanford</u> <u>SDG-H0385</u> Case no <u>TRB-SBB-207925</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>LIQUID</u> SAF No <u>C99-027</u>
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ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ	LMTS	PROTOCOL
	pCi/L	(COUNT)	pCi/L	pCi/L	FIERS	TEST	pCi/L	‡	(TOTAL)	LIMITS	
Technetium 99	68.2	2.2	0.78	15	B	TC	69.8	2.8	98	83-117	80-120

200 UP1 IAM GW MONITORING, APRIL 99

QC-LCS 30587

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 06/08/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0385

N904094-16

B0V290

DUPLICATE

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N904094-16</u>	Lab sample id <u>N904094-01</u>	Client sample id <u>B0V290</u>
Dept sample id <u>7114-016</u>	Dept sample id <u>7114-001</u>	Location/Matrix <u>HANFORD SITE</u> <u>LIQUID</u>
	Received <u>04/16/99</u>	Collected <u>04/13/99 10:44</u>
		Custody/SAF No <u>C99-027-2</u> <u>C99-027</u>

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
Technetium 99	7450	170	<u>34</u>	15	B	TC	7070	99	11	B	5	22	

200 UP1 IAM GW MONITORING, APRIL 99

QC-DUP#1 30589

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-11

B0V282

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-11</u>	Client sample id <u>B0V282</u>	
Dept sample id <u>7114-011</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/09/99 13:01</u>	
	Custody/SAF No <u>C99-027-35</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	5510	82	11	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
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Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-12

BOV284

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-12</u>	Client sample id <u>BOV284</u>	
Dept sample id <u>7114-012</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/09/99 11:49</u>	
	Custody/SAF No <u>C99-027-39</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	3010	67	14	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-01

BOV290

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-01</u>	Client sample id <u>BOV290</u>	
Dept sample id <u>7114-001</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/13/99 10:44</u>	
	Custody/SAF No <u>C99-027-2</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	7070	99	11	15	B	TC

200 UPI IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-02

B0V292

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-02</u>	Client sample id <u>B0V292</u>	
Dept sample id <u>7114-002</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/14/99 10:57</u>	
	Custody/SAF No <u>C99-027-4</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	3220	69	12	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-10

BOV294

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-10</u>	Client sample id <u>BOV294</u>	
Dept sample id <u>7114-010</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/13/99 09:24</u>	
	Custody/SAF No <u>C99-027-31</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	466	20	11	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-13

B0V296

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG-H0385
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-13</u>	Client sample id <u>B0V296</u>	
Dept sample id <u>7114-013</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/09/99 11:33</u>	
	Custody/SAF No <u>C99-027-51</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	210	14	<u>17</u>	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-03

B0V299

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG-H0385
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-03</u>	Client sample id <u>B0V299</u>	
Dept sample id <u>7114-003</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/14/99 09:12</u>	
	Custody/SAF No <u>C99-027-7</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	6440	130	<u>21</u>	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-04

B0V2B0

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-04</u>	Client sample id <u>B0V2B0</u>	
Dept sample id <u>7114-004</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/14/99 09:12</u>	
	Custody/SAF No <u>C99-027-8</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	6910	99	11	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-06

BOV2B2

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-06</u>	Client sample id <u>BOV2B2</u>	
Dept sample id <u>7114-006</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/09/99 12:45</u>	
	Custody/SAF No <u>C99-027-15</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	2510	72	<u>19</u>	15	B	TC

200 UPI IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-05

B0V2B4

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-05</u>	Client sample id <u>B0V2B4</u>	
Dept sample id <u>7114-005</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/14/99 11:41</u>	
	Custody/SAF No <u>C99-027-11</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	10000	200	<u>31</u>	15	B	TC

200 UPI IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-09

B0V2B6

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-09</u>	Client sample id <u>B0V2B6</u>	
Dept sample id <u>7114-009</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/12/99 12:42</u>	
	Custody/SAF No <u>C99-027-27</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	270	14	14	15	B	TC

200 UPI IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-08

B0V2B8

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-08</u>	Client sample id <u>B0V2B8</u>	
Dept sample id <u>7114-008</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/12/99 08:54</u>	
	Custody/SAF No <u>C99-027-23</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	4600	78	12	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

N904094-07

B0V2C0

DATA SHEET

SDG <u>7114</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0385</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904094-07</u>	Client sample id <u>B0V2C0</u>	
Dept sample id <u>7114-007</u>	Location/Matrix <u>HANFORD SITE</u>	<u>LIQUID</u>
Received <u>04/16/99</u>	Collected <u>04/12/99 13:14</u>	
	Custody/SAF No <u>C99-027-19</u>	<u>C99-027</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	25200	200	15	15	B	TC

200 UP1 IAM GW MONITORING, APRIL 99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/08/99</u>

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0385

Test TC Matrix LIQUID
 SDG 7114
 Contact L.A. Johnson

METHOD SUMMARY
 TECHNETIUM 99 IN WATER
 BETA COUNTING

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0385

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Technetium 99
Preparation batch 6880-020					
B0V282	N904094-11			7114-011	5510
B0V284	N904094-12			7114-012	3010
B0V290	N904094-01	A1		7114-001	7070
B0V292	N904094-02	A1		7114-002	3220
B0V294	N904094-10			7114-010	466
B0V296	N904094-13			7114-013	210
B0V299	N904094-03	A1		7114-003	6440
B0V2B0	N904094-04	A1		7114-004	6910
B0V2B2	N904094-06			7114-006	2510
B0V2B4	N904094-05			7114-005	10000
B0V2B6	N904094-09			7114-009	270
B0V2B8	N904094-08			7114-008	4600
B0V2C0	N904094-07			7114-007	25200
BLK (QC ID=30433)	N903149-06			7105-006	2.70 J
BLK (QC ID=30588)	N904094-15			7114-015	U
LCS (QC ID=30432)	N903149-05			7105-005	ok
LCS (QC ID=30587)	N904094-14			7114-014	ok
Duplicate (N904094-01)	N904094-16			7114-016	ok
Nominal values and limits from method		RDLs (pCi/L)		15	
200 UP1 IAM GW MONITORING, APRIL 99					

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
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 Report date 06/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0385

METHOD SUMMARY

TECHNETIUM 99 IN WATER
BETA COUNTING

Test TC Matrix LIQUID
SDG 7114
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-020 2σ prep error 10.0 % Reference Lab Notebook 6880 pg.20															
BOV282	N904094-11		11	<u>0.0500</u>			65		101			50	05/26/99	05/29	GRB-207
BOV284	N904094-12		14	<u>0.0500</u>			54		101			50	05/26/99	05/29	GRB-208
BOV290	N904094-01	A1	11	<u>0.0500</u>			60		101			49	05/28/99	06/01	GRB-217
BOV292	N904094-02	A1	12	<u>0.0500</u>			56		101			48	05/28/99	06/01	GRB-218
BOV294	N904094-10		11	<u>0.0500</u>			60		101			46	05/26/99	05/29	GRB-230
BOV296	N904094-13		<u>17</u>	<u>0.0500</u>			40		101			53	05/26/99	06/01	GRB-205
BOV299	N904094-03	A1	<u>21</u>	<u>0.0500</u>			33		101			48	05/28/99	06/01	GRB-219
BOV2B0	N904094-04	A1	11	<u>0.0500</u>			59		101			48	05/28/99	06/01	GRB-220
BOV2B2	N904094-06		<u>19</u>	<u>0.0500</u>			36		101			45	05/21/99	05/24	GRB-230
BOV2B4	N904094-05		<u>31</u>	<u>0.0500</u>			23		101			40	05/21/99	05/24	GRB-229
BOV2B6	N904094-09		14	<u>0.0500</u>			56	90				50	05/26/99	06/01	GRB-231
BOV2B8	N904094-08		12	<u>0.0500</u>			60		101			47	05/26/99	05/29	GRB-207
BOV2C0	N904094-07		15	<u>0.0500</u>			50		101			47	05/26/99	05/29	GRB-206
BLK (QC ID=30433)	N903149-06		0.40	1.00			64		200			04/22/99	04/28	GRB-230	
BLK (QC ID=30588)	N904094-15		0.55	1.00			63		101			05/26/99	05/29	GRB-202	
LCS (QC ID=30432)	N903149-05		6.0	<u>0.200</u>			26		137			04/22/99	05/06	GRB-206	
LCS (QC ID=30587)	N904094-14		0.78	1.00			46		101			05/21/99	05/24	GRB-231	
Duplicate (N904094-01) (QC ID=30589)	N904094-16		<u>34</u>	<u>0.0500</u>			21		101			41	05/21/99	05/24	GRB-232
Nominal values and limits from method			15	1.00			20-105		50			180			

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

AVERAGES ± 2 SD MDA 13 ± 18
FOR 18 SAMPLES YIELD 48 ± 30

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/08/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/08/99

SDG 7114
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
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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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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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).

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
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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.

REPORT GUIDES

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Report date 06/08/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/08/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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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Version Ver 1.0
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TMA / RICHMOND
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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

2. The error of ADDED.

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

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

REPORT GUIDES

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Form DVD-RG
Version 3.06
Report date 06/08/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

MATRIX SPIKE

for the recovery.

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

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

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/08/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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'

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/08/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

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Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

METHOD SUMMARY

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

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
 - * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
 - * Preparation factors are underlined if greater than the nominal value specified for the method.
 - * Dilution factors are underlined if greater than the nominal value specified for the method.
 - * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
 - * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
 - * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0385

SDG 7114
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0385

METHOD SUMMARY

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

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

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

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

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/08/99

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C99-027-4

Page 1 of 1

Collector AG RIZZO	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688	MSIN	FAX
SAF No. C99-027	Sampling Origin HANFORD SITE	Purchase Order/Charge Code		
Project Title 200 UPI IAM GW MONITORING APRIL 1999	Logbook No. WIN-SML H 24, PAGE 29	Ice Chest No. RTS	Temp. 20/4°C	
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT VEHICLE	Bill of Lading/Air Bill No. 4235-7952-4743		
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.		

POSSIBLE SAMPLE HAZARDS/REMARKS
 ** **
SD010385

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 FAX copies of TMA log-in to DL Stewart (372-1704) & JH Keasner (372-9487)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
✓ B0V292		W	4-14-99	1057	1x20-mL P	Activity Scan	None
✓ B0V292		W	↓	↓	1x1000-mL G/P	Technetium-99	HCl to pH <2

Relinquished By AG RIZZO	Print 	Sign	Date/Time 4-15-99 11:00	Received By Feal Ex	Print	Sign	Date/Time 4-15-99
Relinquished By Feal Ex			Date/Time 4-16-99 10:00	Received By JR Corso			Date/Time 4-16-99 10:00
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

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

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C99-027-8

Page 1 of 1

Collector AG RIZZO	Contact/Requester JH KESSNER	Telephone No. MSIN FAX (509) 375-4688
SAF No. C99-027	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title 200 UPLIAM GW MONITORING APRIL 1999	Logbook No. WIM-SMIL H 24, PAGE 29	Ice Chest No. RTS Temp. 100/4°C
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235-7952-4743
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
.. ..

SDA H0385

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
FAX copies of TMA log-in to DL Stewart (372-1704) & JH Kessner (372-9487)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
✓ BOV2B0		W	4-14-99	0912	1x20-mL P	Activity Scan	None
✓ BOV2B0		W	↓	↓	1x1000-mL G/P	Technetium-99	HCl to pH <2

Relinquished By AG RIZZO	Print 	Sign	Date/Time 4-15-99 1000	Received By Feed Ex	Print	Sign	Date/Time 4-15-99	Matrix * S = Soil DS = Drum Solid SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By Feed Ex			Date/Time 4-16-99 10:00	Received By John R Louso			Date/Time 4-16-99 10:00	
Relinquished By			Date/Time	Received By			Date/Time	

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C99-027-23

Page 1 of 1

Collector AG RIZZO	Contact/Requester JH KESSNER	Telephone No. MSIN FAX (509) 375-4688
SAMP No. C99-027	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title 200 IUP1 IAM GW MONITORING, APRIL 1999	Logbook No. WM-SHM H 22, PAGE 65	Ice Chest No. Temp. RTS 60/4°C
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235-7952-4743
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS <div style="font-size: 2em; text-align: center;">SDG H0385</div>	SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> FAX copies of TMA log-in to DL Stewart (372-1704) & JH Kessner (372-9487)
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Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
BOV2B8		W	4-12-99	0854	1x20-mL P	Activity Scan	None
BOV2B8		W	↓	↓	1x1000-mL G/P	Technetium-99	HCl to pH <2

Relinquished By AG RIZZO Print Sign 	Received By Fred Ex Print Sign 	Matrix * S = Soil DS = Drum Solid SE = Sediment DL = Drum Liqui SO = Solid T = Tissue SL = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By Fred Ex Date/Time 4-15-99 10:00	Received By Alonso JA Corso Date/Time 4-15-99	
Relinquished By Date/Time 4-16-99 10:00	Received By Date/Time 4-16-99 20:00	
Relinquished By Date/Time	Received By Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
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Contractor Waste Management	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT) W99-0-0193
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PART I - TO BE COMPLETED BY ORIGINATOR

Department Hanford Technical Services	Section Environmental Operations	Unit Sampling & Mobile Labs
The following items are to be shipped from		<input checked="" type="checkbox"/> Contractor <input type="checkbox"/> Vendor
Routing Fed Ex 4235 795 2 4743		<input checked="" type="checkbox"/> Prepaid <input type="checkbox"/> Collect
Shipped to TMA Company 2030 Knight Ave Address Richmond, CA 94804 City State Zip Code Country	Off-site Custodian Att: Delores Sanchez	On-site Custodian Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1	Cooler	C.O.C #s (99-027-4, -27, -23, -19, -35, -39, -15, -51, -2, -31, -8, -11, -7. Cooler # RTS Weight 64 lbs Samples double bagged and packed on wet ice	

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

Necessity for the off-site use of this property

Required for Project Work. List Project No. _____

Business Trip

Off-site Assignment

Shipment to Subcontractor. List Subcontract No. _____

Other (Please specify) Samples require analysis not available on site.

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

RM Clearance for Public Release N/A <i>per Young</i>	RM Survey No. N/A	Date N/A
Location of and Contact for Property (Name/Phone No./Bldg./Area) K.J. Young / 372-0060 / 345 Hills / 600		
Date Ready for Shipment 4-15-99	Cost Code to be Charged 08000	Approximate Date This Property will be Returned N/A
Originated By K.J. Young	Date 4-15-99	Authorized By <i>per Young</i>
Property Representative Signature	Date	Property Management Approval <i>Walter M. Zwick</i>

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature <i>CR Nelson</i>	Date 4/15/99
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DISTRIBUTION (AFTER FINAL SIGNATURES)

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

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

U.S.C. #

C99-027-51

Page 1 of 1

Collector R.T SICKLE	Contact/Requester JH KESSNER	Telephone No. MSIN FAX (509) 375-4688
SAF No. C99-027	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title 200 UPLI AM GW MONITORING, APRIL 1999	Logbook No. WM-SML-H26	Ice Chest No. RTS Temp. 4°C
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT VEHICLE	Bill of Lading/Air Bill No. 41235-7952-4743
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
* * *

SDG H0385

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
FAX copies of TMA log-in to DL Stewart (372-1704) & JH Kessner (372-9487)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0V296		W	4-9-99	1133	1x20-mL P	Activity Scan	None
B0V296		W	↓	↓	1x1000-mL G/P	Technetium-99	HCl to pH <2

Relinquished By R.T SICKLE	Print	Sign	Date/Time 4-15-99 1000	Received By Fed Ex	Print	Sign	Date/Time 4-15-99	Matrix * S = Soil DS = Drum Solid SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WT = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By Fed Ex			Date/Time 4-16-99 10:00	Received By JR Corso JR Corso			Date/Time 4-16-99 10:00	
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	

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

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client: <u>Beecham Hartford (PNNL)</u>		Date/Time received <u>4-16-99 10:00</u>	
CoC No. <u>C99-027-2, 4, 7, 8, 11, 15, 19, 23, 27, 31, 35, 39 & 51</u>			
Container I.D. No. <u>RTS</u>		Requested TAT (Days) <u>45</u> P.O. Received Yes [] No []	
INSPECTION			
1.	Custody seals on shipping container intact?	Yes [<input checked="" type="checkbox"/>]	No [<input type="checkbox"/>] N/A [<input type="checkbox"/>]
2.	Custody seals on shipping container dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [<input type="checkbox"/>] N/A [<input type="checkbox"/>]
3.	Custody seals on sample containers intact?	Yes [<input checked="" type="checkbox"/>]	No [<input type="checkbox"/>] N/A [<input type="checkbox"/>]
4.	Custody seals on sample containers dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [<input type="checkbox"/>] N/A [<input type="checkbox"/>]
5.	Cooler Temperature: _____	Packing material is:	Wet [<input checked="" type="checkbox"/>] Dry [<input type="checkbox"/>]
6.	Number of samples in shipping container: <u>13</u>		
7.	Number of containers per sample: <u>2</u> (Or see CoC _____)		
8.	Paperwork agrees with samples?	Yes [<input checked="" type="checkbox"/>]	No [<input type="checkbox"/>]
9.	Samples have: Tape [<input checked="" type="checkbox"/>] Hazard labels [<input type="checkbox"/>] Rad labels [<input type="checkbox"/>] Appropriate sample labels [<input checked="" type="checkbox"/>]		
10.	Samples are: In good condition [<input type="checkbox"/>] Leaking [<input type="checkbox"/>] Broken Container [<input type="checkbox"/>] Missing [<input type="checkbox"/>]		
11.	Describe any anomalies: <u>Sample # B04290 has the wrong date sampled</u> <u>Sample # B04194 has the wrong date sampled</u>		
13.	Was P.M. notified of any anomalies? Yes [<input checked="" type="checkbox"/>] No [<input type="checkbox"/>]		Date <u>4-16-99</u>
14.	Received by <u>[Signature]</u>		Date: <u>4-16-99</u> Time: <u>10:00</u>
LOGIN			
TNU W.O. No. _____	Group No. _____	Client W.O. No. _____	
PROGRAM MANAGER			
Sample holding times exceeded?		Yes [<input type="checkbox"/>]	No [<input type="checkbox"/>]
Client Notified: Name _____		Date/time _____	