

HC 2018-761

0056323

Thermo Nutech
W.O. No. N8-10-126-7043

Bechtel Hanford Inc.
SDG H0278



Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0278 is comprised of four solid (other solid) samples designated under SAF No. B99-007 with a Project Designation of: 105F & 105DR ISS Project - Other Solid.

The samples were received as stated on the Chain-of-Custody documents.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered in the processing of the samples. Positive tritium activity was detected in all the samples except sample B0R4X0.

2.2 Carbon-14 Analyses

Sample B0R4X0 was reanalyzed due to suspected contamination from the other samples in the batch. The reanalysis of the sample indicated no C-14 activity greater than the MDA. Positive C-14 activity was detected in all other samples.

2.3 Nickel-63 Analyses

No problems were encountered in the processing of the samples. Positive Ni-63 activity was detected in all the samples except sample B0R4X0.

2.4 Total Strontium Analyses

No problems were encountered in the processing of the samples. Positive total strontium activity was detected in all samples except B0R4X0.

2.5 Isotopic Uranium Analyses

The aliquot for the analysis was reduced to 0.1g from 1g to expedite the sample preparation. Positive uranium activity was detected in all the samples.

2.6 Isotopic Plutonium Analyses

The aliquot for the analysis was reduced to 0.5g from 1g to expedite the sample preparation. Positive plutonium activity was detected in all the samples.

2.7 Americium-241 Analyses

Americium activity equal to the detection limit was detected in the method blank, however both activities were less than the RDL. The MDA for sample B0R4X0 was slightly greater than the RDL. Positive Am-241 activity was detected in all the samples.

2.8 Gamma Scan Analyses

Much less than the method requirement of 750g of sample was available for the analysis. As a result the gamma nuclide MDA's are all exceeded.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

SAMPLE SUMMARY

SDG 7043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF		COLLECTED
				SAMPLE ID	SAF NO	CUSTODY		
B0R4W7	100 DR/F	SOLID		N810126-01	B99-007	B99-007-01		10/15/98 13:10
B0R4W8	100 DR/F	SOLID		N810126-02	B99-007	B99-007-02		10/14/98 09:13
B0R4W9	100 DR/F	SOLID		N810126-03	B99-007	B99-007-02		10/14/98 09:13
B0R4X0	100 DR/F	SOLID		N810126-04	B99-007	B99-007-02		10/17/98 19:10
Method Blank		SOLID		N810126-06	B99-007			
Lab Control Sample		SOLID		N810126-05	B99-007			
Duplicate (N810126-01)	100 DR/F	SOLID		N810126-07	B99-007			10/15/98 13:10

SAMPLE SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/16/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0278

QC SUMMARY

SDG 7043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7043	B99-007-01	B0R4W7	SOLID				10/21/98	6 N810126-01	7043-001
	B99-007-02	B0R4W8	SOLID				10/21/98	7 N810126-02	7043-002
		B0R4W9	SOLID				10/21/98	7 N810126-03	7043-003
		B0R4X0	SOLID				10/21/98	4 N810126-04	7043-004
		Method Blank	SOLID					N810126-06	7043-006
		Lab Control Sample	SOLID					N810126-05	7043-005
		Duplicate N810126-01)	SOLID				10/21/98	6 N810126-07	7043-007

Lab id TMANC
Protocol Hanford
Version Ver 1
Form DVD-25
Version 1.0
Report date 11/19/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

SDG 7043
 Contact Larry Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0278

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
AM	SOLID	Americium 241 in Soil	2857-027	5.0	4			1	1	1/1
PU	SOLID	Plutonium, Isotopic in Solids	2857-027	5.0	4			1	1	1/1
U	SOLID	Uranium, Isotopic in Soil	2857-027	5.0	4			1	1	1/1
Beta Counting										
SR	SOLID	Total Strontium in Solids	2857-027	10.0	4			1	1	1/1
Gamma Spectroscopy										
RAM	SOLID	Gamma Scan	2857-027	15.0	4			1	1	1/1
Liquid Scintillation Counting										
C	SOLID	Carbon 14 in Soil	2857-027	10.0	4			1	1	1/1 X
H	SOLID	Tritium in Soil	2857-027	10.0	4			1	1	1/1
NI_L	SOLID	Nickel 63 in Soil	2857-027	10.0	4			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.

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-PBS
 Version 3.86
 Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

SDG 7043
 Contact Larry Johnson

WORK SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0278

CLIENT SAMPLE ID		LAB SAMPLE ID				SUF-				
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
CUSTODY	SAF No	RECEIVED								
B0R4W7		N810126-01	7043-001	AM		11/11/98	11/12/98	DER	Americium 241 in Soil	
100 DR/F	SOLID	10/15/98	7043-001	C		11/08/98	11/13/98	DER	Carbon 14 in Soil	
B99-007-01	B99-007	10/21/98	7043-001	GAM		10/30/98	11/12/98	DER	Gamma Scan	
			7043-001	H		11/05/98	11/12/98	DER	Tritium in Soil	
			7043-001	NI_L		11/09/98	11/13/98	DER	Nickel 63 in Soil	
			7043-001	PU		11/09/98	11/12/98	DER	Plutonium, Isotopic in Solids	
			7043-001	SR		11/11/98	11/12/98	DER	Total Strontium in Solids	
			7043-001	U		11/11/98	11/12/98	DER	Uranium, Isotopic in Soil	
B0R4W8		N810126-02	7043-002	AM		11/11/98	11/12/98	DER	Americium 241 in Soil	
100 DR/F	SOLID	10/14/98	7043-002	C		11/08/98	11/13/98	DER	Carbon 14 in Soil	
B99-007-02	B99-007	10/21/98	7043-002	GAM		10/30/98	11/12/98	DER	Gamma Scan	
			7043-002	H		11/05/98	11/12/98	DER	Tritium in Soil	
			7043-002	NI_L		11/09/98	11/13/98	DER	Nickel 63 in Soil	
			7043-002	PU		11/09/98	11/12/98	DER	Plutonium, Isotopic in Solids	
			7043-002	SR		11/11/98	11/12/98	DER	Total Strontium in Solids	
			7043-002	U		11/11/98	11/12/98	DER	Uranium, Isotopic in Soil	
B0R4W9		N810126-03	7043-003	AM		11/10/98	11/12/98	DER	Americium 241 in Soil	
100 DR/F	SOLID	10/14/98	7043-003	C		11/08/98	11/13/98	DER	Carbon 14 in Soil	
B99-007-02	B99-007	10/21/98	7043-003	GAM		10/30/98	11/12/98	DER	Gamma Scan	
			7043-003	H		11/05/98	11/12/98	DER	Tritium in Soil	
			7043-003	NI_L		11/09/98	11/13/98	DER	Nickel 63 in Soil	
			7043-003	PU		11/09/98	11/12/98	DER	Plutonium, Isotopic in Solids	
			7043-003	SR		11/11/98	11/12/98	DER	Total Strontium in Solids	
			7043-003	U		11/11/98	11/12/98	DER	Uranium, Isotopic in Soil	
B0R4X0		N810126-04	7043-004	AM		11/10/98	11/12/98	DER	Americium 241 in Soil	
100 DR/F	SOLID	10/17/98	7043-004	C	A1	11/13/98	11/13/98	DER	Carbon 14 in Soil	
B99-007-02	B99-007	10/21/98	7043-004	GAM		10/30/98	11/12/98	DER	Gamma Scan	
			7043-004	H		11/05/98	11/12/98	DER	Tritium in Soil	
			7043-004	NI_L		11/09/98	11/13/98	DER	Nickel 63 in Soil	
			7043-004	PU		11/09/98	11/12/98	DER	Plutonium, Isotopic in Solids	
			7043-004	SR		11/11/98	11/12/98	DER	Total Strontium in Solids	
			7043-004	U		11/11/98	11/12/98	DER	Uranium, Isotopic in Soil	

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

WORK SUMMARY, cont.

SDG 7043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H1278

CLIENT SAMPLE ID	LAB SAMPLE ID	LOCATION	MATRIX	COLLECTED	SUF-	REVIEWED	BY	METHOD
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED		
Method Blank	N810126-06	7043-006	SOLID	AM		11/10/98	11/12/98	DER Americium 241 in Soil
				C		11/08/98	11/13/98	DER Carbon 14 in Soil
				GAM		11/04/98	11/12/98	DER Gamma Scan
				H		11/05/98	11/12/98	DER Tritium in Soil
				NI_L		11/09/98	11/13/98	DER Nickel 63 in Soil
				PU		11/09/98	11/12/98	DER Plutonium, Isotopic in Solids
				SR		11/11/98	11/12/98	DER Total Strontium in Solids
				U		11/11/98	11/12/98	DER Uranium, Isotopic in Soil
Lab Control Sample	N810126-05	7043-005	SOLID	AM		11/10/98	11/12/98	DER Americium 241 in Soil
				C		11/08/98	11/13/98	DER Carbon 14 in Soil
				GAM		11/04/98	11/12/98	DER Gamma Scan
				H		11/05/98	11/12/98	DER Tritium in Soil
				NI_L		11/09/98	11/13/98	DER Nickel 63 in Soil
				PU		11/09/98	11/12/98	DER Plutonium, Isotopic in Solids
				SR		11/11/98	11/12/98	DER Total Strontium in Solids
				U		11/11/98	11/12/98	DER Uranium, Isotopic in Soil
Duplicate (N810126-01) 100 DR/F	N810126-07	7043-007	SOLID	AM		11/11/98	11/12/98	DER Americium 241 in Soil
				C	10/15/98	11/08/98	11/13/98	DER Carbon 14 in Soil
				GAM	10/21/98	11/09/98	11/12/98	DER Gamma Scan
				H		11/06/98	11/12/98	DER Tritium in Soil
				NI_L		11/09/98	11/13/98	DER Nickel 63 in Soil
				PU		11/09/98	11/12/98	DER Plutonium, Isotopic in Solids
				SR		11/11/98	11/12/98	DER Total Strontium in Solids
				U		11/11/98	11/12/98	DER Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.1
Form DVD-CWS
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Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

WORK SUMMARY, cont.

SDG 7043
 Contact Larry Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0278

COUNTS OF TESTS BY SAMPLE TYPE										
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-007	Americium 241 in Soil	AM/CMPLATE	4			1	1	1	7
C	B99-007	Carbon 14 in Soil	C14COXLSC	4			1	1	1	7
GAM	B99-007	Gamma Scan	GAMMAHI	4			1	1	1	7
H	B99-007	Tritium in Soil	EPA906.0	4			1	1	1	7
NI_L	B99-007	Nickel 63 in Soil	NI63LSC	4			1	1	1	7
PU	B99-007	Plutonium, Isotopic in Solids	PUPLATE	4			1	1	1	7
SR	B99-007	Total Strontium in Solids	SR8990	4			1	1	1	7
U	B99-007	Uranium, Isotopic in Soil	UPLATE	4			1	1	1	7
TOTALS				32			8	8	8	56

WORK SUMMARY

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 11/19/00

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0278

N810126-06

Method Blank

METHOD BLANK

SDG <u>7043</u>	Client/Case no <u>Hanford</u>	SDG <u>H0278</u>
Contact <u>Larry Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N810126-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7043-006</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>B99-007</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.011	0.052	0.089	0.50	U	H
Carbon 14	14762-75-5	-0.013	0.59	0.98	50	U	C
Uranium 233/234	U-233/234	0	0.010	0.018	0.30	U	U
Uranium 235	15117-96-1	0	0.006	0.022	0.30	U	U
Uranium 238	U-238	0.002	0.005	0.018	0.30	U	U
Plutonium 238	13981-16-3	0.010	0.019	0.046	0.050	U	PU
Plutonium 239/240	PU-239/240	0.024	0.029	0.046	0.050	U	PU
Americium 241	14596-10-2	0.022	0.017	0.022	0.050	J	AM
Total Strontium	SR-RAD	-0.064	0.12	0.17	1.0	U	SR
Nickel 63	13981-37-8	0.36	0.66	1.1	20	U	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		0.081		U	GAM
Cobalt 60	10198-40-0	U		0.006	0.050	U	GAM
Cesium 137	10045-97-3	U		0.005	0.050	U	GAM
Europium 152	14683-23-9	U		0.014	0.10	U	GAM
Europium 154	15585-10-1	U		0.013	0.10	U	GAM
Europium 155	14391-16-3	U		0.012	0.10	U	GAM
Americium 241	14596-10-2	U		0.016		U	GAM
Uranium 238	U-238	U		0.60		U	GAM
Uranium 235	15117-96-1	U		0.018		U	GAM

105F & 105DR ISS Project-Othr Solid

QC-BLANK 29441

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

N810126-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7043</u> Contact <u>Larry Johnson</u> Lab sample id <u>N810126-05</u> Dept sample id <u>7043-005</u>	Client/Case no <u>Hanford</u> <u>SDG H0278</u> Case no <u>TRB-SBB-207925</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B99-007</u>
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ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ	LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS	
Tritium	6.0	0.16	0.095	0.50	H	6.60	0.26	91	85-115	80-120	
Carbon 14	2100	42	6.5	50	X C	2260	90	93	94-116		
Uranium 233/234	2.1	0.19	0.098	0.30	U	2.09	0.084	100	93-117	80-120	
Uranium 235	1.6	0.16	0.025	0.30	U	1.71	0.068	94	93-117	80-120	
Uranium 238	2.2	0.19	0.094	0.30	U	2.16	0.086	102	93-117	80-120	
Plutonium 239	4.7	0.36	0.019	0.050	PU	5.05	0.20	93	86-114	80-120	
Plutonium 239/240	5.0	0.38	0.019	0.050	PU	5.29	0.21	95	86-114	80-120	
Americium 241	4.4	0.35	0.018	0.050	B AM	4.80	0.19	92	96-114	80-120	
Total Strontium	13	0.49	0.25	1.0	SR	11.6	0.46	112	80-120		
Nickel 63	68	1.7	1.1	20	X NI_L	67.4	2.7	101	93-117		
GAMMA SCAN ANALYTES											
	U										
Cobalt 60	0.40	0.026	0.014	0.050	GAM	0.377	0.015	106	73-127	80-120	
Cesium 137	0.43	0.023	0.015	0.050	GAM	0.385	0.015	112	73-127	80-120	

105F & 105DR ISS Project-Othr Solid

QC-LCS 29440

LAB CONTROL SAMPLES

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

N810126-07

B0R4W7

DUPLICATE

SDG <u>7043</u>	Client/Case no <u>Hanford</u>	SDG <u>H0278</u>
Contact <u>Larry Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N810126-07</u>	Lab sample id <u>N810126-01</u>	Client sample id <u>B0R4W7</u>
Dept sample id <u>7043-007</u>	Dept sample id <u>7043-001</u>	Location/Matrix <u>100 DR/F</u> <u>SOLID</u>
	Received <u>10/21/98</u>	Collected <u>10/15/98 13:10</u>
		Custody/SAF No <u>B99-007-01</u> <u>B99-007</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Tritium	28	0.35	0.11	0.50		H	24	0.31	0.093		15	22	
Carbon 14	1600	34	13	50		C	1800	37	11		12	22	
Uranium 233/234	5.9	0.98	0.30	0.30		U	6.0	0.90	0.23		2	35	
Uranium 235	0.19	0.19	<u>0.36</u>	0.30	U	U	0.11	0.15	0.28	U	-	-	
Uranium 238	4.7	0.89	0.30	0.30		U	5.6	0.89	0.23		17	38	
Plutonium 238	8.6	1.0	<u>0.087</u>	0.050		PU	9.2	0.61	0.033		7	22	
Plutonium 239/240	18	2.0	<u>0.087</u>	0.050		PU	19	1.2	0.028		5	22	
Americium 241	55	3.3	0.027	0.050	B	AM	57	3.2	0.024	B	4	16	
Total Strontium	430	2.1	0.15	1.0		SR	440	2.1	0.15		2	21	
Nickel 63	110	3.6	2.7	20		NI	100	3.4	2.6		10	24	
GAMMA SCAN ANALYTES	U						U						
Potassium 40	11	1.1	0.92			GAM	10	2.1	1.8		10	47	
Cobalt 60	56	0.39	<u>0.14</u>	0.050		GAM	53	0.88	<u>0.32</u>		6	32	
Cesium 137	1400	1.0	<u>0.36</u>	0.050		GAM	1300	3.0	<u>0.85</u>		7	32	
Europium 152	3.4	0.78	<u>1.1</u>	0.10		GAM	2.7	2.2	<u>2.9</u>	U	23	119	
Europium 154	5.2	0.37	<u>0.38</u>	0.10		GAM	4.4	0.81	<u>0.82</u>		17	42	
Europium 155	U		<u>1.3</u>	0.10	U	GAM	U		<u>1.6</u>	U	-	-	
Radium 226	0.48	0.36	<u>0.50</u>	0.10	U	GAM	U			J	4	191	
Americium 241	51	0.79	1.0			GAM	70	0.89	0.98		31	32	
Uranium 238	U		24		U	GAM	U		69	U	-	-	
Uranium 235	U		1.1		U	GAM	U		2.5	U	-	-	

105F & 105DR ISS Project-Othr Solid

QC-DUP#1 29442

DUPLICATES

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SUMMARY DATA SECTION

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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>11/16/98</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0278

N810126-01

BOR4W7

DATA SHEET

SDG <u>7043</u>	Client/Case no <u>Hanford</u>	SDG <u>H0278</u>
Contact <u>Larry Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N810126-01</u>	Client sample id <u>BOR4W7</u>	
Dept sample id <u>7043-001</u>	Location/Matrix <u>100 DR/F</u>	<u>SOLID</u>
Received <u>10/21/98</u>	Collected <u>10/15/98 13:10</u>	
	Custody/SAF No <u>B99-007-01</u>	<u>B99-007</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	24	0.31	0.093	0.50		H
Carbon 14	14762-75-5	1800	37	11	50		C
Uranium 233/234	U-233/234	6.0	0.90	0.23	0.30		U
Uranium 235	15117-96-1	0.11	0.15	0.28	0.30	U	U
Uranium 238	U-238	5.6	0.89	0.23	0.30		U
Plutonium 238	13981-16-3	9.2	0.61	0.033	0.050		PU
Plutonium 239/240	PU-239/240	19	1.2	0.028	0.050		PU
Americium 241	14596-10-2	57	3.2	0.024	0.050	B	AM
Total Strontium	SR-RAD	440	2.1	0.15	1.0		SR
Nickel 63	13981-37-8	100	3.4	2.6	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	10	2.1	1.8			GAM
Cobalt 60	10198-40-0	53	0.88	<u>0.32</u>	0.050		GAM
Cesium 137	10045-97-3	1300	3.0	<u>0.85</u>	0.050		GAM
Europium 152	14683-23-9	2.7	2.2	<u>2.9</u>	0.10	U	GAM
Europium 154	15585-10-1	4.4	0.81	<u>0.82</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>1.6</u>	0.10	U	GAM
Americium 241	14596-10-2	70	0.89	0.98			GAM
Uranium 238	U-238	U		69		U	GAM
Uranium 235	15117-96-1	U		2.5		U	GAM

105F & 105DR ISS Project-Othr Solid

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>11/16/98</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0278

N810126-02

B0R4W8

DATA SHEET

SDG <u>7043</u>	Client/Case no <u>Hanford</u>	SDG <u>H0278</u>
Contact <u>Larry Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N810126-02</u>	Client sample id <u>B0R4W8</u>	
Lept sample id <u>7043-002</u>	Location/Matrix <u>100 DR/F</u>	<u>SOLID</u>
Received <u>10/21/98</u>	Collected <u>10/14/98 09:13</u>	
	Custody/SAF No <u>B99-007-02</u>	<u>B99-007</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	10	0.21	0.093	0.50		H
Carbon 14	14762-75-5	2400	50	14	50		C
Uranium 233/234	U-233/234	5.4	0.96	0.27	0.30		U
Uranium 235	15117-96-1	0.34	0.26	<u>0.33</u>	0.30		U
Uranium 238	U-238	4.9	0.88	<u>0.34</u>	0.30		U
Plutonium 238	13981-16-3	18	1.0	0.026	0.050		PU
Plutonium 239/240	PU-239/240	13	0.76	0.022	0.050		PU
Americium 241	14596-10-2	37	2.2	0.026	0.050	B	AM
Total Strontium	SR-RAD	190	1.5	0.17	1.0		SR
Nickel 63	13981-37-8	240	5.3	2.9	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	13	2.0	1.6			GAM
Cobalt 60	10198-40-0	44	0.80	<u>0.31</u>	0.050		GAM
Cesium 137	10045-97-3	560	2.1	<u>0.71</u>	0.050		GAM
Europium 152	14683-23-9	2.8	1.3	<u>1.9</u>	0.10		GAM
Europium 154	15585-10-1	7.8	0.98	<u>0.97</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>2.6</u>	0.10	U	GAM
Radium 226	13982-63-3	U		<u>1.2</u>	0.10	U	GAM
Americium 241	14596-10-2	23	1.5	2.1			GAM
Uranium 238	U-238	U		57		U	GAM
Uranium 235	15117-96-1	U		1.9		U	GAM

105F & 105DR ISS Project-Othr Solid

DATA SHEETS

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SUMMARY DATA SECTION

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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>11/16/98</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0278

N810126-03

B0R4W9

DATA SHEET

SDG <u>7043</u>	Client/Case no <u>Hanford</u>	SDG <u>H0278</u>
Contact <u>Larry Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N810126-03</u>	Client sample id <u>B0R4W9</u>	
Dept sample id <u>7043-003</u>	Location/Matrix <u>100 DR/F</u>	<u>SOLID</u>
Received <u>10/21/98</u>	Collected <u>10/14/98 09:13</u>	
	Custody/SAF No <u>B99-007-02</u>	<u>B99-007</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	11	0.21	0.095	0.50		H
Carbon 14	14762-75-5	2700	58	31	50		C
Uranium 233/234	U-233/234	4.8	0.81	0.23	0.30		U
Uranium 235	15117-96-1	0.32	0.22	0.28	0.30		U
Uranium 238	U-238	4.5	0.75	0.23	0.30		U
Plutonium 238	13981-16-3	5.5	0.46	0.029	0.050		PU
Plutonium 239/240	PU-239/240	5.0	0.42	0.029	0.050		PU
Americium 241	14596-10-2	12	1.0	0.041	0.050	E	AM
Total Strontium	SR-RAD	72	0.97	0.19	1.0		SR
Nickel 63	13981-37-8	73	3.2	2.9	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	14	2.0	1.8			GAM
Cobalt 60	10198-40-0	90	0.78	<u>0.27</u>	0.050		GAM
Cesium 137	10045-97-3	630	1.5	<u>0.48</u>	0.050		GAM
Europium 152	14683-23-9	4.9	1.1	<u>1.5</u>	0.10		GAM
Europium 154	15585-10-1	12	0.86	<u>0.80</u>	0.10		GAM
Europium 155	14391-16-3	2.3	0.72	<u>1.1</u>	0.10		GAM
Americium 241	14596-10-2	27	1.2	1.5			GAM
Uranium 238	U-238	U		54		U	GAM
Uranium 235	15117-96-1	U		1.4		U	GAM

105F & 105DR ISS Project-Othr Solid

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>11/16/98</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0278

N810126-04

B0R4X0

DATA SHEET

SDG <u>7043</u>	Client/Case no <u>Hanford</u>	SDG <u>H0278</u>
Contact <u>Larry Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N810126-04</u>	Client sample id <u>B0R4X0</u>	
Dept sample id <u>7043-004</u>	Location/Matrix <u>100 DR/F</u>	<u>SOLID</u>
Received <u>10/21/98</u>	Collected <u>10/17/98 10:10</u>	
	Custody/SAF No <u>B99-007-02</u>	<u>B99-007</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.057	0.057	0.093	0.50	U	H
Carbon 14	14762-75-5	-1.7	3.1	5.3	50	U	C
Uranium 233/234	U-233/234	1.4	0.41	0.19	0.30		U
Uranium 235	15117-96-1	0.12	0.12	0.23	0.30	U	U
Uranium 238	U-238	2.0	0.47	0.19	0.30		U
Plutonium 238	13981-16-3	0.012	0.015	0.029	0.050	U	PU
Plutonium 239/240	PU-239/240	0.065	0.031	0.029	0.050		PU
Americium 241	14596-10-2	0.068	0.046	<u>0.058</u>	0.050		AM
Total Strontium	SR-RAD	0.036	0.12	0.17	1.0	U	SR
Nickel 63	13981-37-8	0.71	1.4	2.3	20	U	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	20	1.2	0.50			GAM
Cobalt 60	10198-40-0	U		<u>0.062</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.044	0.050	U	GAM
Europium 152	14683-23-9	U		<u>0.11</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.19</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Radium 226	13982-63-3	0.18	0.087	0.099	0.10		GAM
Radium 228	15262-20-1	0.28	0.17	0.19	0.20		GAM
Thorium 228	14274-82-9	0.26	0.056	0.059			GAM
Thorium 232	TH-232	0.28	0.17	0.19			GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	U		6.3		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

105F & 105DR ISS Project-Othr Solid

DATA SHEETS

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SUMMARY DATA SECTION

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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>11/16/98</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Test AM Matrix SOLID
SDG 7043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Americium 241
Preparation batch 2857-027					
B0R4W7	N810126-01	7043-001			57
B0R4W8	N810126-02	7043-002			37
B0R4W9	N810126-03	7043-003			12
B0R4X0	N810126-04	7043-004			0.068
BLK (QC ID=29441)	N810126-06	7043-006			0.022 J
LCS (QC ID=29440)	N810126-05	7043-005			ok
Duplicate (N810126-01)	N810126-07	7043-007			ok

Nominal values and limits from method RDLs (pCi/g) 0.050
105F & 105DR ISS Project-Othr Solid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2857-027 2σ prep error 5.0 % Reference Lab Notebook #2857 pg. 027															
B0R4W7	N810126-01			0.024	0.500			76		1306			27	11/10/98	11/11 SS-51
B0R4W8	N810126-02			0.026	0.500			75		1306			28	11/10/98	11/11 SS-0E2
B0R4W9	N810126-03			0.041	0.500			70		627			27	11/10/98	11/10 SS-014
B0R4X0	N810126-04			0.058	0.500			52		627			24	11/10/98	11/10 SS-0 5
BLK (QC ID=29441)	N810126-06			0.022	1.00			69		627				11/10/98	11/10 SS-017
LCS (QC ID=29440)	N810126-05			0.018	1.00			80		627				11/10/98	11/10 SS-011
Duplicate (N810126-01)	N810126-07			0.027	0.500			82		1306			27	11/10/98	11/11 SS-038
															(QC ID=29442)

Nominal values and limits from method 0.050 1.00 20-105 700 100 180

Lab id TMANC
Protocol Hanford
Version Ver 2.0
Form DVD-CMS
Version 3.06
Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Test AM Matrix SOLID
SDG 0043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

PROCEDURES	REFERENCE	AM/CMPLATE
	JP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	<u>2.031</u> ± <u>0.628</u>
FOR 7 SAMPLES	YIELD	<u>72</u> ± <u>20</u>

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.00
Report date 11/26/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

Test PU Matrix SOLID
 SDG 7043
 Contact Larry Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0278

METHOD SUMMARY
 PLUTONIUM, ISCTOPIC IN SOLIDS
 ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	Plutonium 238	Plutonium 239/240
Preparation batch 2857-027					
B0R4W7	N810126-01	7043-001		9.2	19
B0R4W8	N810126-02	7043-002		18	13
B0R4W9	N810126-03	7043-003		5.5	5.0
B0R4X0	N810126-04	7043-004		U	0.065
BLK (QC ID=29441)	N810126-06	7043-006		U	U
LCS (QC ID=29440)	N810126-05	7043-005		ok	ok
Duplicate (N810126-01)	N810126-07	7043-007		ok	ok
Nominal values and limits from method		RDLs (pCi/g)		0.050	0.050
105F & 105DR ISS Project-Othr Solid					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR	
Preparation batch 2857-027		2σ prep error 5.0 %		Reference Lab		Notebook #2857 pg. 027											
B0R4W7	N810126-01			0.033	0.500			79		1087			25	11/09/98	11/09	SS-001	
B0R4W8	N810126-02			0.026	0.500			96		1087			26	11/09/98	11/09	SS-002	
B0R4W9	N810126-03			0.029	0.500			57		1087			26	11/09/98	11/09	SS-004	
B0R4X0	N810126-04			0.029	0.500			59		1087			23	11/09/98	11/09	SS-005	
BLK (QC ID=29441)	N810126-06			0.046	1.00			22		1086				11/09/98	11/09	SS-01	
LCS (QC ID=29440)	N810126-05			0.019	1.00			56		1087				11/09/98	11/09	SS-01	
Duplicate (N810126-01)	N810126-07			0.087	0.500			24		1086			25	11/09/98	11/09	SS-01	
				(QC ID=29442)													
Nominal values and limits from method				0.050	1.00			20-105		10	100		180				

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	0.038	-	0.042
FOR 7 SAMPLES	YIELD	86	±	84

Lab id TMANC
 Protocol Hanford
 Version Ver 1
 Form DVD-0MS
 Version 3.00
 Report date 11/26/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-217925
Case no SDG H0278

RESULTS

CLIENT SAMPLE ID	LAB	RAW	SUF-	1: Uranium			RESULT RATIOS (%)				
	SAMPLE ID	TEST	FIX	PLANCHET	233/234	235	238	1-3	2σ	2+3	2σ
Preparation batch 2857-027											
BOR4W7	N810126-01	7043-001			6.0	U	5.6	107	03	2	3
BOR4W8	N810126-02	7043-002			5.4	0.34	4.9	110	1-	7	6
BOR4W9	N810126-03	7043-003			4.8	0.32	4.5	107	05	7	5
BOR4X0	N810126-04	7043-004			1.4	U	2.0	70	17	0	6
BLK (QC ID=29441)	N810126-06	7043-006			U	U	U				
LCS (QC ID=29440)	N810126-05	7043-005			ok	ok	ok				
Duplicate (N810126-01)	N810126-07	7043-007			ok	-	U	ok	126	10	4
Nominal values and limits from method				RDLs (pCi/g)	0.30	0.30	0.30	100		4	
105F & 105DR ISS Project-Othr Solid								Averages	104		5

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2857-027												2σ prep error	5.0 %	Reference Lab	Notebook #2857 pg.	027
BOR4W7	N810126-01			0.28	0.100			78		513			27	11/11/98	11-11	SS-009
BOR4W8	N810126-02			0.34	0.100			64		513			28	11/11/98	11-11	SS-010
BOR4W9	N810126-03			0.28	0.100			79		513			28	11/11/98	11-11	SS-011
BOR4X0	N810126-04			0.23	0.100			92		513			25	11/11/98	11-11	SS-012
BLK (QC ID=29441)	N810126-06			0.022	1.00			94		513				11/11/98	11-11	SS-014
LCS (QC ID=29440)	N810126-05			0.098	1.00			86		513				11/11/98	11-11	SS-013
Duplicate (N810126-01)	N810126-07			0.36	0.100			61		513			27	11/11/98	11-11	SS-015
(QC ID=29442)																
Nominal values and limits from method				0.30	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPDATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-910		Uranium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	0.23 ± 0.25
FOR 7 SAMPLES	YIELD	79 ± 26

Lab id	TMA/NC
Protocol	Hanford
Version	Ver 1.0
Form	STD-GMS
Version	1.0
Report Date	11-16/98

METHOD SUMMARIES

Page 4

SUMMARY DATA SECTION

Page 19

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS
BETA COUNTING

Test SR Matrix SOLID
SDG 7043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 2857-027					
BCR4W7	N810126-01			7043-001	440
BCR4W8	N810126-02			7043-002	190
BCR4W9	N810126-03			7043-003	72
BCR4X0	N810126-04			7043-004	U
BLK (QC ID=29441)	N810126-06			7043-006	U
LCS (QC ID=29440)	N810126-05			7043-005	ok
Duplicate (N810126-01)	N810126-07			7043-007	ok

Nominal values and limits from method RDLs (pCi/g) 1.0
105F & 105DR ISS Project-Othr Solid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX pCi/g	MDA g	ALIQ g	PREP FAC	DILU TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2857-027 2σ prep error 10.0 % Reference Lab Notebook #2857 pg. 027																
BCR4W7	N810126-01			0.15	1.00				93		400			27	11/10/98	11/11 GRB-217
BCR4W8	N810126-02			0.17	1.00				78		400			28	11/10/98	11/11 GRB-218
BCR4W9	N810126-03			0.19	1.00				70		400			28	11/10/98	11/11 GRB-219
BCR4X0	N810126-04			0.17	1.00				78		400			25	11/10/98	11/11 GRB-220
BLK (QC ID=29441)	N810126-06			0.17	1.00				80		400				11/10/98	11/11 GRB-230
LCS (QC ID=29440)	N810126-05			0.25	1.00				57		400				11/10/98	11/11 GRB-229
Duplicate (N810126-01)	N810126-07			0.15	1.00				92		400			27	11/10/98	11/11 GRB-232
																QC ID=29442)

Nominal values and limits from method 1.0 1.00 20-105 150 180

PROCEDURES	REFERENCE	SR8990
EP-060	Soil Preparation, rev 0	
EP-070	Soil Dissolution, rev 0	
EP-500	Strontium-89,90 - Purification, rev 0	

AVERAGES ± 2 SD	MDA	0.18	±	0.069
FOR 7 SAMPLES	YIELD	78	±	05

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.04
Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
 SDG 7043
 Contact Larry Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0278

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2857-027					
B0R4W7	N810126-01	7043-001		53	1300
B0R4W8	N810126-02	7043-002		44	560
B0R4W9	N810126-03	7043-003		90	630
B0R4X0	N810126-04	7043-004		U	U
BLK (QC ID=29441)	N810126-06	7043-006		U	U
LCS (QC ID=29440)	N810126-05	7043-005		ok	ok
Duplicate (N810126-01)	N810126-07	7043-007		ok	ok

Nominal values and limits from method RDLs (pCi/g) 0.050 0.050
 105F & 105DR ISS Project-Othr Solid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF-	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 2857-027 2σ prep error 15.0 % Reference Lab Notebook #2857 pg. 027																
B0R4W7	N810126-01			1.1	51.5					492			15	10/22/98	10/30	PD, 01, 00
B0R4W8	N810126-02			1.1	46.7					493			16	10/22/98	10/30	PD, 03, 00
B0R4W9	N810126-03			0.86	46.1					492			16	10/22/98	10/30	PD, 04, 00
B0R4X0	N810126-04			0.13	61.1					401			13	10/22/98	10/30	PD, 04, 00
BLK (QC ID=29441)	N810126-06			0.010	750					503				10/22/98	11/04	PD, 03, 00
LCS (QC ID=29440)	N810126-05			0.015	750					327				10/22/98	11/04	PD, 03, 00
Duplicate (N810126-01)	N810126-07			0.44	51.5					1101			25	10/22/98	11/09	PD, 04, 00
	(QC ID=29442)															

Nominal values and limits from method 0.050 750 100 180

PROCEDURES REFERENCE GAMMAHI
 EP-060 Soil Preparation, rev 0
 EP-100 Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD MDA 0.52 ± 0.99
 FOR 7 SAMPLES YIELD _____ ± _____

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMR
 Version 1.2b
 Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Test C Matrix SOLID
SDG 7043
Contact Larry Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Carbon 14
Preparation batch 2857-027					
B0R4W7	N810126-01			7043-001	1800
B0R4W8	N810126-02			7043-002	2400
B0R4W9	N810126-03			7043-003	2700
B0R4X0	N810126-04	A1		7043-004	U
Method Blank	N810126-06			7043-006	U
Lab Control Sample	N810126-05			7043-005	ok X
Duplicate (N810126-01)	N810126-07			7043-007	ok

Nominal values and limits from method RDLs (pCi/g) 50
105F & 105DR ISS Project-Othr Solid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2857-027 2σ prep error 10.0 % Reference Lab Notebook #2857 pg. 027															
B0R4W7	N810126-01			11	0.242					14		24	11/16/98	11/08	LSC-004
B0R4W8	N810126-02			14	0.257					10		25	11/16/98	11/08	LSC-004
B0R4W9	N810126-03			31	0.220					10		25	11/16/98	11/08	LSC-004
B0R4X0	N810126-04	A1		5.3	0.210					100		27	11/10/98	11/13	LSC-004
Method Blank	N810126-06			0.98	1.00					100		11/16/98	11/08	LSC-004	
Lab Control Sample	N810126-05			6.5	1.00					3		11/16/98	11/08	LSC-004	
Duplicate (N810126-01)	N810126-07			13	0.210					17		24	11/16/98	11/08	LSC-004

Nominal values and limits from method 50 0.100 25 180

PROCEDURES REFERENCE C14COXLSC
EP-060 Soil Preparation, rev 0
EP-251 Tritium / Carbon-14 Oxidation, rev 0

AVERAGES ± 2 SD MDA 12 ± 19
FOR 7 SAMPLES YIELD _____ ± _____

Lab id TMANC
Protocol Hanford
Version Ver 1
Form DVE-CMS
Version 3.06
Report date 11/16/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

Test H Matrix SOLID
 SDG 7043
 Contact Larry Johnson

METHOD SUMMARY
 TRITIUM IN SOIL
 LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0278

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Tritium
Preparation batch 2857-027					
BOR4W7	N810126-01	7043-001			24
BOR4W8	N810126-02	7043-002			10
BOR4W9	N810126-03	7043-003			11
BOR4X0	N810126-04	7043-004			U
BLK (QC ID=29441)	N810126-06	7043-006			U
LCS (QC ID=29440)	N810126-05	7043-005			ok
Duplicate (N810126-01)	N810126-07	7043-007			ok

Nominal values and limits from method RDLs (pCi/g) 0.50
 105F & 105DR ISS Project-Othr Solid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 2857-027 2σ prep error 10.0 % Reference Lab Notebook #2857 pg. 027																
BOR4W7	N810126-01			0.093	20.0					120			21	11/04/98	11/05	LSC-005
BOR4W8	N810126-02			0.093	20.1					120			22	11/04/98	11/05	LSC-005
BOR4W9	N810126-03			0.095	20.3					120			22	11/04/98	11/05	LSC-005
BOR4X0	N810126-04			0.093	20.2					120			19	11/04/98	11/05	LSC-005
BLK (QC ID=29441)	N810126-06			0.089	20.0					120				11/04/98	11/05	LSC-005
LCS (QC ID=29440)	N810126-05			0.095	20.0					120				11/04/98	11/05	LSC-005
Duplicate (N810126-01)	N810126-07			0.11	20.0					120			22	11/04/98	11/06	LSC-005
	(QC ID=29442)															

Nominal values and limits from method 0.50 20.0 25 180

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

AVERAGES ± 2 SD	MDA <u>0.095</u> ± <u>0.013</u>
FOR 7 SAMPLES	YIELD _____ ± _____

Lab id TMANC
 Protocol Hanford
 Version Ver 1
 Form DVD-CMS
 Version 3.05
 Report date 11/19/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0278

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
 SDG 7043
 Contact Larry Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0278

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Nickel 63
Preparation batch 2857-027					
BOR4W7	N810126-01	7043-001			100
BOR4W8	N810126-02	7043-002			240
BOR4W9	N810126-03	7043-003			73
BOR4X0	N810126-04	7043-004			U
Method Blank	N810126-06	7043-006			U
Lab Control Sample	N810126-05	7043-005			ok X
Duplicate (N810126-01)	N810126-07	7043-007			ok

Nominal values and limits from method RDLs (pCi/g) 20
 105F & 105DR ISS Project-Othr Solid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR	
Preparation batch 2857-027 2σ prep error 10.0 % Reference Lab Notebook #2857 pg. 027																
BOR4W7	N810126-01			2.6	0.500					100			25	11/07/98	LSC-004	
BOR4W8	N810126-02			2.9	0.500					93			26	11/07/98	LSC-004	
BOR4W9	N810126-03			2.9	0.500					100			26	11/07/98	LSC-004	
BOR4X0	N810126-04			2.3	0.500					100			23	11/07/98	LSC-004	
Method Blank	N810126-06			1.1	1.00					100			11/07/98	11/09	LSC-004	
Lab Control Sample	N810126-05			1.1	1.00					100			11/07/98	11/09	LSC-004	
Duplicate (N810126-01)	N810126-07			2.7	0.500					100			25	11/07/98	11/09	LSC-004
Nominal values and limits from method				20	0.500					10			180			

PROCEDURES REFERENCE NI63LSC
 EP-060 Soil Preparation, rev 0
 EP-431 Nickel-63 Purification, rev 0

AVERAGES ± 2 SD MDA 2.3
 FOR 7 SAMPLES YIELD 93

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version: 1.0
 Report date 11/10/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0278

SDG 7043
Contact Larry Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
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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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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/16/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0278

SDG 7043
Contact Larry Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

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.

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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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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/16/98

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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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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
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GUIDE, cont.

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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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GUIDE, cont.

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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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/16/98

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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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

2. The error of ADDED.

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

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

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
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Version 3.06
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GUIDE, cont.

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Case no SDG H0278

MATRIX SPIKE

for the recovery.

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/16/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0278

SDG 7043
Contact Larry Johnson

REPORT GUIDE

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Contract TRB-SBB-207925
Case no SDG H0278

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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GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

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.

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 11/16/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0278

SDG 7043
Contact Larry Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.05
Report date 11/16/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0278

SDG 7043
Contact Larry Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0278

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.

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 11/16/98

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B99-007-02		Page 1 of 1				
Collector R Fahlberg		Company Contact D Bryant		Telephone No. 373-7251		Project Coordinator TRENT, SJ		Data Turnaround 21 Days						
Project Designation 105F & 105DR ISS Project - Other Solid		Sampling Location 100DR/F		SAF No. B99-007										
Ice Chest No. SML-161		Field Logbook No. EL 1309-3		Method of Shipment										
Shipped To TMA/REGA 10-13-98 TFS Thermo Nutech		Offsite Property No. AG910013		Bill of Lading/Air Bill No. 423579519376										
Waste Designation Client determined no waste codes associated with this project.				COA										
POSSIBLE SAMPLE HAZARDS/REMARKS				Preservation		None		None		None				
				Type of Container		aG	aG	aG	aG	aG	aG	aG		
				No. of Container(s)		0	0	0	0	0	0	1		
Special Handling and/or Storage 2-C <i>per 10/19/98</i> 1-C				Volume		120mL	120mL	120mL	120mL	120mL	120mL	120mL		
SAMPLE ANALYSIS				Activity Scan	Carbon-14	Isotopic Plutonium; Isotopic Uranium; Americium-241	Nickel-63	Strontium-89,90 - Total Sr	Tritium - H3	See item (1) in Special Instructions				
				Sample No.	Matrix *	Sample Date	Sample Time							
✓ B0R4W8	Other Solid	10-13-98 ¹⁴	0913	X	X	X	X	X	X	X		B0R 4X3		
✓ B0R4W9	Other solid	10-13-98 ¹⁴	0913	X	X	X	X	X	X	X		B0R 4X7		
✓ B0R4X0	Other solid	10-13-98 ¹⁴	1010	X	X	X	X	X	X	X		B0R4X3		
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *						
Relinquished By <i>Fix R. Fahlberg</i>		Date/Time 10/20/98		Received By <i>Fred Ex</i>		Date/Time 10-20-98		** The laboratory is requested to report Ba-133 results using GEA analyses.						
Relinquished By <i>Blue Nelson R Nelson</i>		Date/Time 10/20/98		Received By <i>Fred Ex</i>		Date/Time 10-20-98		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)						
Relinquished By <i>Fed Ex</i>		Date/Time 10-21-98 10:32		Received By <i>Alonso JR Louso</i>		Date/Time 10-21-98		Note: entire contents of sample contained in one 120ml bottle labeled Gamma spec.						
Relinquished By		Date/Time		Received By		Date/Time		Samples stored in Refrigerator NO ZB prior to shipment to Lab.						
Relinquished By		Date/Time		Received By		Date/Time								
LABORATORY SECTION		Received By		Title		Date/Time								
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time								

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B99-007-01		Page 1 of 1		
Collector R Fahlberg		Company Contact D Bryant		Telephone No. 373-7251		Project Coordinator TRENT, SJ		Data Turnaround 21 Days				
Project Designation 10SF & 105DR ISS Project - Other Solid		Sampling Location 100DR/F		SAF No. B99-007								
Ice Chest No. SML-161		Field Logbook No. EL 1309-3		Method of Shipment								
Shipped To TMA/RECRA RJN 10/20/98 ThermoNutech		Offsite Property No. A990013		Bill of Lading/Air Bill No. 42357951 9376								
Waste Designation Client determined no waste codes associated with this project.				COA								
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage 1-C				Preservation		None		None		None		
				Type of Container		aG	aG	aG	aG	aG	aG	aG
				No. of Container(s)		0	0	0	0	0	0	1
				Volume		250mL	250mL	250mL	250mL	250mL	250mL	250mL
SAMPLE ANALYSIS				Activity Scan	Carbon-14	Isotopic Plutonium, Isotopic Uranium, Americium-241	Nickel-63	Strontium- 89,90 -- Total Sr	Tritium - H3	See item (1) in Special Instructions.		
Sample No.	Matrix *	Sample Date	Sample Time									
2-BOR4W7	Other Solid	10-15-98	1310	X	X	X	X	X	X	X		
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *				
Sign/Print Names				** The laboratory is requested to report Ba-133 results using GEA analyses.				(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Samples stored in Refrigerator No 1C @ 3728 Bldg prior to Shipment to Lab				
Relinquished By R. Nielsen		Date/Time 10/20		Received By Fed Ex		Date/Time 10-20-98						
Relinquished By Fed Ex		Date/Time 10-21-98 10:30		Received By R. Nielsen		Date/Time 10-21-98						
Relinquished By		Date/Time		Received By		Date/Time						
Relinquished By		Date/Time		Received By		Date/Time						
LABORATORY SECTION		Received By		Title				Date/Time				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time				