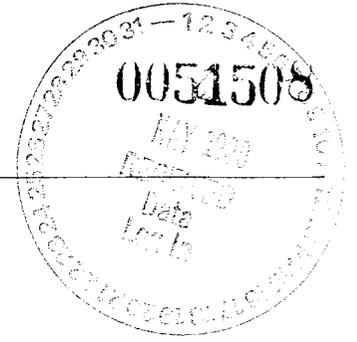




**RECRA
LabNet**

a division of Recra Environmental, Inc.

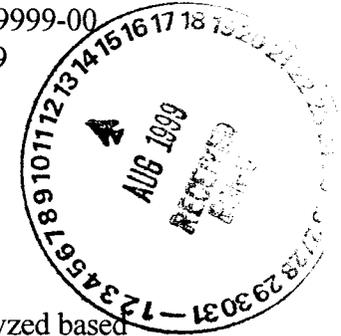
Virtual Laboratories Everywhere



**Recra LabNet Philadelphia
Analytical Report**

Client: TNU-HANFORD B99-046
RFW#: 9903L497
SDG/SAF#: H0360/B99-046

W.O.#: 10985-001-001-9999-00
Date Received: 03-19-99



PCB

The set of samples consisted of eighteen (18) soil samples collected on 03-11,12-99.

The samples and their associated QC samples were extracted on 03-22,31-99 and analyzed based on SW846, 3rd Edition on 03-25,26-99 and 04-02-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature has been recorded on the chain-of-custody.
2. These samples were originally extracted within their required holding time. Sample B0V026 was lost during extraction and was re-extracted five days out of hold. All analyses were performed within hold time. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.
4. All method blanks were below the reporting limits for all target compounds.
5. Four (4) of forty-two (42) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. Several samples required instrument dilutions due to high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.
9. All initial calibrations associated with this data set were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF PESTICIDE/PCB DATA

- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C** = This flag applies to a compound that has been confirmed by GC/MS.



Recra LabNet Philadelphia Sample Discrepancy Report (SDR) SDR #: 99020

Initiator: Am RFW Batch: 9903L 395⁴⁹⁷ am 3/23/99 Parameter: oPCB
 Date: 3/23/99 Samples: 47-3 Matrix: S
 Client: PAU Method: SWB46/MCAWW/CLPI Prep Batch: 99150345

1. Reason for SDR

a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____

b. General Discrepancy
 Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold
 Improper Bottle Type Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)
SAMPLE WENT DRY DURING EXTRACTION ... WILL RE-EXTRACTED

2. Known or Probable Causes(s)
BAD GLASS WEAR

3. Discussion and Proposed Action Other Description: _____

Re-log
 Entire Batch
 Following Samples: _____
 Re-leach
 Re-extract
 Re-digest
 Revise EDD
 Change Test Code to _____
 Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: [Signature] 3/31/99

Concur with Proposed Action
 Disagree with Proposed Action; See Instruction
 Include in Case Narrative
 Client Contacted:
 Date/Person Larry Johnson 3/31/99
 Add
 Cancel

5. Final Action...signature/date: 3/31/99 Bernard Foley Other Explanation: _____

Verified re-[log][leach][extract][digest][analysis] (circle)
 Included in Case Narrative Max 4/5/99
 Hard Copy COC Revised
 Electronic COC Revised
 EDD Corrections Completed

Re-extracted Batch 99150345 3/31/99 - 5 cups out of hold.

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
<input checked="" type="checkbox"/>	Initiator	<input type="checkbox"/>	Metals: Doughty
<input checked="" type="checkbox"/>	Lab Manager: C. Stefanosky	<input type="checkbox"/>	Inorganic: Perrone
<input checked="" type="checkbox"/>	Project Mgr: <u>O. Johnson</u>	<input checked="" type="checkbox"/>	GC/CLC: Rycklak/Schnell
<input checked="" type="checkbox"/>	Section Mgr: Siery/Wesson/Daniels	<input type="checkbox"/>	MS: LeMin/Taylor/Kasdras
<input checked="" type="checkbox"/>	QA (file): Racioppi	<input type="checkbox"/>	Log-in: Toder
<input type="checkbox"/>	Data Management: Feldman	<input type="checkbox"/>	Admin: Soos
<input type="checkbox"/>	Sample Prep: Schnell/Doughty/Kauffman	<input type="checkbox"/>	Other: _____

Recra LabNet Philadelphia Sample Discrepancy Report (SDR) SDR #: 996082

Initiator: G. Lage RFW Batch: 9903497 / 9903492 Parameter: OPCB
 Date: 4-1-99 Samples: all Matrix: MOI
 Client: TNU - Hartford Method: SWB46MCAWW/CLPI Prep Batch: 99LE0345

1. Reason for SDR

a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____

b. General Discrepancy
 Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold
 Improper Bottle Type Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)
 BS and 492-001 MSD have surrogate above criteria.
 TCX recoveries were 128% & 120%, limit are 28-118%
 PCB recoveries were 133% & 134% limit are 38-122%.
 All spikes were within criteria, and surrogate criteria was met for all other samples. 497's MSD & MSD were within.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description: _____

Re-log
 Entire Batch
 Following Samples: _____
 Re-leach
 Re-extract
 Re-digest
 Revise EDD
 Change Test Code to _____
 Place On/Take Off Hold (circle)

Report & note in narrative.

[Signature] 4/1/99

4. Project Manager Instructions...signature/date: _____

Concur with Proposed Action
 Disagree with Proposed Action; See Instruction
 Include in Case Narrative
 Client Contacted:
 Date/Person _____
 Add
 Cancel

5. Final Action...signature/date: Wad 4/1/99 Other Explanation: _____

Verified re-[log][leach][extract][digest][analysis] (circle)
 Included in Case Narrative
 Hard Copy COC Revised
 Electronic COC Revised
 EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
<input checked="" type="checkbox"/>	Initiator	<input type="checkbox"/>	Metals: Doughty
<input checked="" type="checkbox"/>	Lab Manager: J. Michael Taylor	<input type="checkbox"/>	Inorganic: Perrone
<input checked="" type="checkbox"/>	Project Mgr: <u>OS</u>	<input type="checkbox"/>	GC/LC: Rycklak/Schnell
<input checked="" type="checkbox"/>	Section Mgr: Siery/Durke/Daniels	<input type="checkbox"/>	MS: LeMin/McIntyre/Taylor/Kasdras
<input checked="" type="checkbox"/>	QA (file): Racioppi	<input type="checkbox"/>	Log-in: Toder
<input type="checkbox"/>	Data Management: Feldman	<input type="checkbox"/>	Admin: Soos
<input type="checkbox"/>	Sample Prep: Schnell/Doughty/Kauffman	<input type="checkbox"/>	Other: _____

100

Sample Information	RFW#:	Matrix:	D.F.:	Units:	Cust ID:	B0V024	B0V024	B0V024	B0V025	B0V026	B0V027
	001	SOIL	1.00	UG/KG							
	001 MS	SOIL	1.00	UG/KG							
	001 MSD	SOIL	1.00	UG/KG							
	002	SOIL	1.00	UG/KG							
	003	SOIL	1.00	UG/KG							
	004	SOIL	1.00	UG/KG							

Surrogate:	Tetrachloro-m-xylene	Decachlorobiphenyl	108	%	108	%	112	%	130	*	%	102	%	108	%
			118	%	104	%	119	%	109	%	95	%	91	%	
Aroclor-1016			34	U	34	U	34	U	35	U	34	U	34	U	
Aroclor-1221			69	U	69	U	69	U	70	U	69	U	69	U	
Aroclor-1232			34	U	34	U	34	U	35	U	34	U	34	U	
Aroclor-1242			34	U	34	U	34	U	35	U	34	U	34	U	
Aroclor-1248			34	U	34	U	34	U	35	U	34	U	34	U	
Aroclor-1254			34	U	66	%	81	%	35	U	34	U	34	U	
Aroclor-1260			34	U	34	U	34	U	35	U	34	U	34	U	

Sample Information	RFW#:	Matrix:	D.F.:	Units:	Cust ID:	B0V028	B0V029	B0V030	B0V031	B0V032	B0V033
	005	SOIL	1.00	UG/KG							
	006	SOIL	1.00	UG/KG							
	007	SOIL	5.00	UG/KG							
	008	SOIL	2.00	UG/KG							
	009	SOIL	1.00	UG/KG							
	010	SOIL	1.00	UG/KG							

Surrogate:	Tetrachloro-m-xylene	Decachlorobiphenyl	110	%	110	%	D	%	112	%	100	%	108	%
			102	%	105	%	D	%	110	%	101	%	110	%
Aroclor-1016			34	U	34	U	180	U	70	U	35	U	35	U
Aroclor-1221			69	U	69	U	350	U	140	U	69	U	70	U
Aroclor-1232			34	U	34	U	180	U	70	U	35	U	35	U
Aroclor-1242			34	U	34	U	180	U	70	U	35	U	35	U
Aroclor-1248			34	U	34	U	870		460		35	U	35	U
Aroclor-1254			34	U	34	U	180	U	70	U	42		40	
Aroclor-1260			34	U	34	U	180	U	110		35	U	35	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP GC

903
 04-05-99

Recrea LabNet - Lionville Laboratory

PCBS by GC

Report Date: 04/05/99 09:44

RFW Batch Number: 9903I497

Client: TNT-HANFORD B99-046

Work Order: 10985001001 Page: 2

Cust ID: B0V034 B0V035 B0V196 B0V198 B0V1B0 B0V1B2

Sample Information RFW#: 011 012 013 014 015 016
 Matrix: SOIL SOIL SOIL SOIL SOIL SOIL
 D.F.: 5.00 5.00 1.00 1.00 1.00 1.00
 Units: UG/KG UG/KG UG/KG UG/KG UG/KG UG/KG

Surrogate:	Tetrachloro-m-xylene	Decachlorobiphenyl	D	%	D	%	102	%	110	%	92	%	100	%
Aroclor-1016	180	U	170	U	36	U	35	U	36	U	36	U	35	U
Aroclor-1221	360	U	350	U	71	U	70	U	73	U	70	U	70	U
Aroclor-1232	180	U	170	U	36	U	35	U	36	U	35	U	35	U
Aroclor-1242	180	U	170	U	36	U	35	U	36	U	35	U	35	U
Aroclor-1248	500	U	590	U	36	U	35	U	36	U	35	U	35	U
Aroclor-1254	180	U	170	U	36	U	35	U	100	U	100	U	35	U
Aroclor-1260	180	U	170	U	36	U	35	U	36	U	36	U	30	J

Sample Information RFW#: 017 018 991E0345-MB1 991E0345-MB1 991E0387-MB1 991E0387-MB1
 Matrix: SOIL SOIL SOIL SOIL SOIL SOIL
 D.F.: 1.00 1.00 1.00 1.00 1.00 1.00
 Units: UG/KG UG/KG UG/KG UG/KG UG/KG UG/KG

Surrogate:	Tetrachloro-m-xylene	Decachlorobiphenyl	105	%	68	%	102	%	128	%	102	%	100	%
Aroclor-1016	35	U	36	U	33	U	33	U	33	U	33	U	33	U
Aroclor-1221	71	U	71	U	67	U	67	U	67	U	67	U	67	U
Aroclor-1232	35	U	36	U	33	U	33	U	33	U	33	U	33	U
Aroclor-1242	35	U	36	U	33	U	33	U	33	U	33	U	33	U
Aroclor-1248	35	U	36	U	33	U	33	U	33	U	33	U	33	U
Aroclor-1254	35	U	36	U	33	U	33	U	84	%	33	U	93	%
Aroclor-1260	35	U	33	J	33	U	33	U	33	U	33	U	33	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP GC

Handwritten signature
 04/05/99

Recra LabNet - Lionville Laboratory
 PCB ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-046

DATE RECEIVED: 03/19/99

RFW LOT # :9903L497

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0V024	001	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V024	001 MS	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V024	001 MSD	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V025	002	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V026	003	S	99LE0387	03/12/99	03/31/99	04/02/99
B0V027	004	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V028	005	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V029	006	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V030	007	S	99LE0345	03/12/99	03/22/99	03/26/99
B0V031	008	S	99LE0345	03/12/99	03/22/99	03/26/99
B0V032	009	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V033	010	S	99LE0345	03/12/99	03/22/99	03/25/99
B0V034	011	S	99LE0345	03/12/99	03/22/99	03/26/99
B0V035	012	S	99LE0345	03/12/99	03/22/99	03/26/99
B0V196	013	S	99LE0345	03/11/99	03/22/99	03/25/99
B0V198	014	S	99LE0345	03/11/99	03/22/99	03/25/99
B0V1B0	015	S	99LE0345	03/11/99	03/22/99	03/25/99
B0V1B2	016	S	99LE0345	03/11/99	03/22/99	03/25/99
B0V1B4	017	S	99LE0345	03/11/99	03/22/99	03/26/99
B0V1B6	018	S	99LE0345	03/11/99	03/22/99	03/26/99

LAB QC:

PBLKGB	MB1	S	99LE0345	N/A	03/22/99	03/25/99
PBLKGB	MB1 BS	S	99LE0345	N/A	03/22/99	03/25/99
PBLKGT	MB1	S	99LE0387	N/A	03/31/99	04/02/99
PBLKGT	MB1 BS	S	99LE0387	N/A	03/31/99	04/02/99

gw
04-05-99

99031497

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) PCB



Client TNL-Hanford B99-046
 Est. Final Proj. Sampling Date _____
 Project # 10985-001-001-9999-00
 Project Contact/Phone # 05
 RECRA Project Manager Del ATD TAT 30 days
 Date Rec'd 3/19/99 Date Due 4/18/99
 Account # _____

Refrigerator # _____
 #/Type Container _____
 Volume _____
 Preservatives _____
 ANALYSES REQUESTED _____

ORGANIC
 VOA _____ BNA _____ Pest/PCB _____ Herb _____
 INORG
 Metal _____

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EPT/CLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (v)	Matrix Chosen (v)	MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only	
										1	1
	001	B0V024					S	3/12/99	1000		
	2								1012		
	3								1020		
	4								1040		
	5								1107		
	6								1125		
	7								1266		
	8								1316		
	9								1340		
	010								1355		

Special Instructions: DOB # B99-046
 DATE/REVISIONS: 1. Run matrix QC
3/12/99 date due corrected
PCB by 8082

COMPOSITE WASTE

Relinquished by peder Received by Stobler Date 3/19/99 Time 0930

Relinquished by peder Date 3/12/99 Time _____

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

NOTES: *423579523530

RECRA LabNet Use Only

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

COC Tape was:
 1) Present on Outer Package? Y or N (Y)
 2) Unbroken on Outer Package? Y or N (Y)
 3) Present on Sample? Y or N (Y)
 4) Unbroken on Sample? Y or N (Y)
 COC Record Present Upon Sample Rec't? Y or N (Y)
 Cooler Temp. 3.4 °C

ORIGINAL
 REWRITTEN

99036497

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS



Client TWA-Hanford B99-046
 Est. Final Proj. Sampling Date _____
 Project # _____
 Project Contact/Phone # _____
 RECRA Project Manager POS
 QC Del POS
 Date Rec'd _____ Date Due _____
 Account # _____

Refrigerator # 3
 #/Type Container 3
 Volume 14g
 Preservatives 250

ANALYSES REQUESTED ↓
 VOA ✓ BNA ✓ Pest/PCB ✓ Herb ✓
 ORGANIC ✓
 INORG ✓
 Metal ✓

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum DL - Drum L - Liquids L. - EP/TC/CP WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix OC Chosen (✓)		Matrix	Date Collected	Time Collected	COC	Metal	COC
			MS	MSD						
	011	B99V034			3	3/12/99	1410	✓	✓	✓
	012	T 5			3	T	1435	✓	✓	✓
	113	B99V196				3/11/99	1255	✓	✓	✓
	14	08					1310	✓	✓	✓
	15	B0					1328	✓	✓	✓
	16	B2					1339	✓	✓	✓
	17	B4					1350	✓	✓	✓
	18	B6					1408	✓	✓	✓

Special Instructions:

DATE/REVISIONS:

- _____
- _____
- _____
- _____
- _____
- _____

Relinquished by	Received by	Date	Time
<u>Decker</u>	<u>Sorell</u>	<u>3/11/99</u>	<u>0930</u>

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N _____

NOTES:

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

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-046-02

Price Code

Data Turnaround

15 Days

NO

Collector Doug Bowers	Company Contact Jeff Lerch	Telephone No. 373-5904	Project Coordinator TRENT, SJ
Project Designation 300 FF-1 North Process Pond	Sampling Location 300 FF-1 North process pond		SAF No. B99-046
Ice Chest No. SML-354	Field Logbook No. EEL-1133-EL 1387-1 580 3-192		Method of Shipment Fed Ex
Shipped To EPA/RECRA 528 3-12-89	Offsite Property No. A990089	Bill of Lading/Air Bill No. 423579523530	COA RNPACS-2600

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		None	Cool 4C	Cool 4C	None	None	None
				Type of Container	No. of Container(s)						
B0V024	Soil	3-12-99	1000	aG	60mL	aG	250mL	aG	250mL	aG	1000mL
B0V025	Soil	3-12-99	1012	aG	60mL	aG	250mL	aG	250mL	aG	1000mL
B0V026	Soil	3-12-99	1020	aG	60mL	aG	250mL	aG	250mL	aG	1000mL
B0V027	Soil	3-12-99	1040	aG	60mL	aG	250mL	aG	250mL	aG	1000mL
B0V028	Soil	3-12-99	1107	aG	60mL	aG	250mL	aG	250mL	aG	1000mL

POSSIBLE SAMPLE HAZARDS/REMARKS

DATA

SAMPLE ANALYSIS

Special Handling and/or Storage	Activity Scan	Isotopic Uranium	PCBs - 8082	Semi-VOA - 8270A (TCL) (Benz(a)pyrene, Chrysene)	ICP Metals - 6010A (Add-on) (Arsenic, Thallium)	Gamma Spectroscopy (Cobalt-60)
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SPECIAL INSTRUCTIONS

D. Bowers not available to relinquish due to schedule conflicts DATS 3/18/99

Stored in Refrig 2 @ 3728 3/11/99 thru 3/18/99

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By D. St. John	Date/Time 3/18/99 11:20	Received By Overnight Carrier	Date/Time
Relinquished By D. St. John	Date/Time 3/18/99	Received By D. St. John	Date/Time 3/18/99
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

LABORATORY SECTION	LABORATORY SECTION
Received By	Received By
Date/Time	Date/Time
FINAL SAMPLE DISPOSITION	
Disposal Method	
Disposed By	
Date/Time	

Company Contact: Jeff Letch, Telephone No. 373-5904
 Sampling Location: 300 FF-1 North process pond
 Field Logbook No. EL 1395-2 070 3-1-99
 Offsite Property No. A990089

Collector: Doug Bowers
 Project Designation: 300-FF-1 North Process Pond
 Ice Chest No. SML-354
 Shipped To: TARRANT RECKA
 Date: 3-12-99

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Isotopic Uranium	PCBs - 0082	Semi-VOA - 8270A (TCL) (Benzofluorene, Chrysene)	ICP Metals - 6010A (Add-on) (Arsenic, Thallium)	Gamma Spectroscopy (Cobalt-60)	Preservation	
										Type of Container	No. of Container(s)
BOV029	Soil	3-12-99	1125	60mL	aG	aG	aG	None	None	None	None
BOV030	Soil	3-12-99	1255	60mL	aG	aG	aG	None	None	None	None
BOV031	Soil	3-12-99	1315	60mL	aG	aG	aG	None	None	None	None
BOV032	Soil	3-12-99	1340	60mL	aG	aG	aG	None	None	None	None
BOV033	Soil	3-12-99	1355	60mL	aG	aG	aG	None	None	None	None

SPECIAL INSTRUCTIONS
 D. Bowers not available to relinquish due to schedule conflicts PAS 3/18/99
 Stored in refs 2 @ 372B
 3/11/99

CHAIN OF POSSESSION

Relinquished By: D. St. John	Date/Time: 3/18/99	Received By: D. Bowers	Date/Time: 3/18/99
Relinquished By: D. St. John	Date/Time: 3/18/99	Received By: D. Bowers	Date/Time: 3/18/99
Relinquished By: D. St. John	Date/Time: 3/18/99	Received By: D. Bowers	Date/Time: 3/18/99

LABORATORY SECTION Received By: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION Disposal Method: _____ Date/Time: _____

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Collector: Doug Bowers
Project Designation: 300 FF-1 North Process Pond
Ice Chest No.: SMC-354
Shipped To: JAMA/RECRA
Company Contact: Jeff Lerch
Telephone No.: 373-5904
Project Coordinator: TREN, SJ
Price Code:
Data Turnaround: 15 Days
Sampling Location: 300 FF-1 North process pond
Field Logbook No.: EL 1397-1 8578 3-1-89
Method of Shipment: Fed Ex
Bill of Lading/Air Bill No.: 423579523530
Offsite Property No.: A990089
COA: ZNPACS 2600

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		Cool 4C	Cool 4C	None	None	None	None	None
				Type of Container	No. of Container(s)							
BOV034	Soil	3-12-99	1410	aG	60mL	aG	250mL	aG	250mL	60mL	aG	250mL
BOV035	Soil	3-12-99	1435	I	60mL	I	250mL	I	250mL	I	I	1000mL

SPECIAL INSTRUCTIONS

D. Bowers not available to re-weigh samples due to schedule conflict

Stored in refrigerator @ 3728

2/11/99 - 3/18/99

CHAIN OF POSSESSION

Relinquished By: D. St. John	Date/Time: 3/18/99	Received By: Overnight carrier	Date/Time: 3/18/99
Relinquished By: David J. ...	Date/Time: 3/18/99	Received By: ...	Date/Time: 3/18/99
Relinquished By: ...	Date/Time: ...	Received By: ...	Date/Time: ...
Relinquished By: ...	Date/Time: ...	Received By: ...	Date/Time: ...

LABORATORY SECTION Received By: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION Disposed By: _____ Date/Time: _____

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0360 is comprised of twenty solid (soil) samples designated under SAF No. B99-0546 with a Project Designation of: 300-FF-1 North Process Pond.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. The individual nuclide results were faxed to Bechtel Hanford on the listed date in the table below.

Nuclide	Date Faxed
Uranium	4/29/99 (7103 and 7099)
Gross Alpha/Beta	5/4/99 (7103) and 5/6/99 (7099)
Strontium	5/6/99 (7099)
Tritium	5/13/99 (7099)

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

2.2 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.3 Total Strontium Analyses

The recovery for the laboratory control sample (LCS) was low at 75 percent. This may be associated with the low recovery observed for the LCS.

2.4 Tritium Analyses

No problems were encountered during the processing of the samples.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SAMPLE SUMMARY

SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF		COLLECTED
				SAMPLE ID	SAF NO	CUSTODY		
B0V196	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-01	B99-046	B99-046-05		03/11/99 12:55
B0V198	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-02	B99-046	B99-046-05		03/11/99 13:10
B0V1B0	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-03	B99-046	B99-046-05		03/11/99 13:28
B0V1B2	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-04	B99-046	B99-046-05		03/11/99 13:39
B0V1B4	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-05	B99-046	B99-046-05		03/11/99 13:50
B0V1B6	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-06	B99-046	B99-046-05		03/11/99 14:08
Method Blank		SOLID		N903107-08	B99-046			
Lab Control Sample		SOLID		N903107-07	B99-046			
Duplicate (N903107-01)	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-09	B99-046			03/11/99 12:55

SAMPLE SUMMARY

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SUMMARY DATA SECTION

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 Protocol Hanford
 Version Ver 1.0
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TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0360

SDG 7103
 Contact L.A. Johnson

QC SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7103	B99-046-05	B0V196	SOLID	95.0			03/19/99	8	N903107-01	7103-001
		B0V198	SOLID	96.0			03/19/99	8	N903107-02	7103-002
		B0V1B0	SOLID	93.4			03/19/99	8	N903107-03	7103-003
		B0V1B2	SOLID	96.4			03/19/99	8	N903107-04	7103-004
		B0V1B4	SOLID	94.5			03/19/99	8	N903107-05	7103-005
		B0V1B6	SOLID	94.6			03/19/99	8	N903107-06	7103-006
		Method Blank	SOLID							N903107-08
Lab Control Sample	SOLID							N903107-07	7103-007	
		Duplicate (N903107-01)	SOLID	95.0			03/19/99	8	N903107-09	7103-009

QC SUMMARY

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 Protocol Hanford
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7103
 Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	
Alpha Spectroscopy									
U	SOLID	Uranium, Isotopic in Soil	6880-016	5.0	6		1	1	1/1
Gamma Spectroscopy									
GAM	SOLID	Gamma Scan	6880-016	15.0	6		1	1	1/1

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

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 05/04/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

WORK SUMMARY

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	COLLECTED	PLANCHET	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD
LOCATION		RECEIVED				FIX				
CUSTODY	SAF No									
BOV196		N903107-01	7103-001		GAM		04/27/99	05/04/99	TAH	Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-001		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99								
BOV198		N903107-02	7103-002		GAM		04/27/99	05/04/99	TAH	Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-002		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99								
BOV1B0		N903107-03	7103-003		GAM		04/29/99	05/04/99	TAH	Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-003		U		04/19/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99								
BOV1B2		N903107-04	7103-004		GAM		04/29/99	05/04/99	TAH	Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-004		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99								
BOV1B4		N903107-05	7103-005		GAM		04/29/99	05/04/99	TAH	Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-005		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99								
BOV1B6		N903107-06	7103-006		GAM		04/29/99	05/04/99	TAH	Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-006		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99								
Method Blank		N903107-08	7103-008		GAM		04/30/99	05/04/99	TAH	Gamma Scan
	SOLID		7103-008		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
	B99-046									
Lab Control Sample		N903107-07	7103-007		GAM		04/30/99	05/04/99	TAH	Gamma Scan
	SOLID		7103-007		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
	B99-046									
Duplicate (N903107-01)		N903107-09	7103-009		GAM		04/30/99	05/04/99	TAH	Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-009		U		04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil
	B99-046	03/19/99								

WORK SUMMARY

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

WORK SUMMARY, cont.

SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
GAM	B99-046	Gamma Scan	GAMMAHI	6			1	1	1		9
U	B99-046	Uranium, Isotopic in Soil	UPLATE	6			1	1	1		9
TOTALS				12			2	2	2		18

WORK SUMMARY

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-08

Method Blank

METHOD BLANK

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7103-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-046</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	-0.004	0.007	0.027	0.30	U	U
Uranium 235	15117-96-1	0.004	0.009	0.033	0.30	U	U
Uranium 238	U-238	0.014	0.014	0.027	0.30	U	U
Potassium 40	13966-00-2	U		0.20		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.010	0.050	U	GAM
Europium 152	14683-23-9	U		0.030	0.10	U	GAM
Europium 154	15585-10-1	U		0.030	0.10	U	GAM
Europium 155	14391-16-3	U		0.020	0.10	U	GAM
Americium 241	14596-10-2	U		0.030		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.040		U	GAM

300-FF-1 North Process Pond

QC-BLANK 30386

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>05/04/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

N903107-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-07</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7103-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-046</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	5.56	0.75	<u>0.34</u>	0.30	U	4.75	0.19	117	74-126	80-120
Uranium 235	4.52	0.65	0.097	0.30	U	3.89	0.16	116	73-127	80-120
Uranium 238	5.25	0.71	<u>0.32</u>	0.30	U	4.90	0.20	107	76-124	80-120
Cobalt 60	0.300	0.029	0.020	0.050	GAM	0.304	0.012	99	73-127	80-120
Cesium 137	0.350	0.024	0.020	0.050	GAM	0.347	0.014	101	74-126	80-120

300-FF-1 North Process Pond

QC-LCS 30385

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>05/04/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-09

BOV196

DUPLICATE

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N903107-09</u>	Lab sample id <u>N903107-01</u>	Client sample id <u>BOV196</u>
Dept sample id <u>7103-009</u>	Dept sample id <u>7103-001</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>
	Received <u>03/19/99</u>	Collected <u>03/11/99 12:55</u>
% solids <u>95.0</u>	% solids <u>95.0</u>	Custody/SAF No <u>B99-046-05</u> <u>B99-046</u>

ANALYTE	DUPLICATE		MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
	pCi/g	2σ ERR (COUNT)					pCi/g	2σ ERR (COUNT)					
Uranium 233/234	4.12	0.31	0.054	0.30		U	3.51	0.32	0.058		16	20	
Uranium 235	0.261	0.064	0.030	0.30	J	U	0.166	0.059	0.037	J	44	62	
Uranium 238	3.88	0.30	0.049	0.30		U	3.79	0.33	0.045		2	20	
Potassium 40	12.0	0.33	0.10			GAM	12.6	0.51	0.28		5	33	
Cobalt 60	U		0.010	0.050	U	GAM	U		0.023	U	-		
Cesium 137	U		0.010	0.050	U	GAM	U		0.022	U	-		
Europium 152	U		0.040	0.10	U	GAM	U		0.060	U	-		
Europium 154	U		0.050	0.10	U	GAM	U		0.081	U	-		
Europium 155	U		0.060	0.10	U	GAM	U		0.065	U	-		
Radium 226	0.600	0.032	0.030	0.10		GAM	0.626	0.047	0.043		4	35	
Radium 228	0.770	0.080	0.080	0.20		GAM	0.847	0.11	0.11		10	41	
Thorium 228	0.820	0.022	0.020			GAM	0.768	0.030	0.028		7	33	
Thorium 232	0.770	0.080	0.080			GAM	0.847	0.11	0.11		10	41	
Americium 241	U		0.050		U	GAM	U		0.097	U	-		
Uranium 238	4.50	1.6	2.0			GAM	4.80	2.9	3.3		6	112	
Uranium 235	0.140	0.054	0.080			GAM	0.124	0.077	0.11		12	112	

300-FF-1 North Process Pond

QC-DUP#1 30387

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-01

B0V196

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-01</u>	Client sample id <u>B0V196</u>	
Dept sample id <u>7103-001</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 12:55</u>	
% solids <u>95.0</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	3.51	0.32	0.058	0.30		U
Uranium 235	15117-96-1	0.166	0.059	0.037	0.30	J	U
Uranium 238	U-238	3.79	0.33	0.045	0.30		U
Potassium 40	13966-00-2	12.6	0.51	0.28			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.050	U	GAM
Europium 152	14683-23-9	U		0.060	0.10	U	GAM
Europium 154	15585-10-1	U		0.081	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.626	0.047	0.043	0.10		GAM
Radium 228	15262-20-1	0.847	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.768	0.030	0.028			GAM
Thorium 232	TH-232	0.847	0.11	0.11			GAM
Americium 241	14596-10-2	U		0.097		U	GAM
Uranium 238	U-238	4.80	2.9	3.3			GAM
Uranium 235	15117-96-1	0.124	0.077	0.11			GAM

300-FF-1 North Process Pond

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>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-02

B0V198

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-02</u>	Client sample id <u>B0V198</u>	
Dept sample id <u>7103-002</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 13:10</u>	
% solids <u>96.0</u>	Custody/SAF No <u>B99-046-05</u> <u>B99-046</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	13.7	1.3	0.20	0.30		U
Uranium 235	15117-96-1	1.78	0.31	0.075	0.30		U
Uranium 238	U-238	14.0	1.3	0.18	0.30		U
Potassium 40	13966-00-2	14.0	0.31	0.13			GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.050	U	GAM
Europium 152	14683-23-9	U		0.033	0.10	U	GAM
Europium 154	15585-10-1	U		0.045	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.11</u>	0.10	U	GAM
Radium 226	13982-63-3	0.450	0.027	0.026	0.10		GAM
Radium 228	15262-20-1	0.693	0.056	0.053	0.20		GAM
Thorium 228	14274-82-9	0.668	0.019	0.017			GAM
Thorium 232	TH-232	0.693	0.056	0.053			GAM
Americium 241	14596-10-2	U		0.060		U	GAM
Uranium 238	U-238	15.5	1.7	1.7			GAM
Uranium 235	15117-96-1	0.500	0.067	0.083			GAM

300-FF-1 North Process Pond

DATA SHEETS

Page 2

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>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-03

BOV1B0

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-03</u>	Client sample id <u>BOV1B0</u>	
Dept sample id <u>7103-003</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 13:28</u>	
% solids <u>93.4</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	12.2	0.44	0.052	0.30		U
Uranium 235	15117-96-1	1.03	0.081	0.010	0.30		U
Uranium 238	U-238	11.7	0.42	0.049	0.30		U
Potassium 40	13966-00-2	10.8	0.50	0.25			GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Cesium 137	10045-97-3	U		0.025	0.050	U	GAM
Europium 152	14683-23-9	U		0.060	0.10	U	GAM
Europium 154	15585-10-1	U		0.082	0.10	U	GAM
Europium 155	14391-16-3	U		0.075	0.10	U	GAM
Radium 226	13982-63-3	0.463	0.046	0.046	0.10		GAM
Radium 228	15262-20-1	0.673	0.10	0.11	0.20		GAM
Thorium 228	14274-82-9	0.597	0.030	0.029			GAM
Thorium 232	TH-232	0.673	0.10	0.11			GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	11.7	3.3	3.6			GAM
Uranium 235	15117-96-1	0.447	0.097	0.13			GAM

300-FF-1 North Process Pond

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>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-04

B0V1B2

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-04</u>	Client sample id <u>B0V1B2</u>	
Dept sample id <u>7103-004</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 13:39</u>	
% solids <u>96.4</u>	Custody/SAF No <u>B99-046-05</u> <u>B99-046</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	2.73	0.24	0.050	0.30		U
Uranium 235	15117-96-1	0.218	0.057	0.030	0.30	J	U
Uranium 238	U-238	2.70	0.24	0.047	0.30		U
Potassium 40	13966-00-2	14.1	0.34	0.13			GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.050	U	GAM
Europium 152	14683-23-9	U		0.033	0.10	U	GAM
Europium 154	15585-10-1	U		0.047	0.10	U	GAM
Europium 155	14391-16-3	U		0.059	0.10	U	GAM
Radium 226	13982-63-3	0.448	0.028	0.025	0.10		GAM
Radium 228	15262-20-1	0.608	0.062	0.062	0.20		GAM
Thorium 228	14274-82-9	0.640	0.019	0.017			GAM
Thorium 232	TH-232	0.608	0.062	0.062			GAM
Americium 241	14596-10-2	U		0.049		U	GAM
Uranium 238	U-238	4.49	1.6	1.8			GAM
Uranium 235	15117-96-1	0.119	0.044	0.063			GAM

300-FF-1 North Process Pond

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>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-05

B0V1B4

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-05</u>	Client sample id <u>B0V1B4</u>	
Dept sample id <u>7103-005</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl)</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/11/99 13:50</u>	
% solids <u>94.5</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	4.86	0.38	0.070	0.30		U
Uranium 235	15117-96-1	0.449	0.092	0.034	0.30		U
Uranium 238	U-238	5.10	0.39	0.068	0.30		U
Potassium 40	13966-00-2	14.4	0.47	0.22			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.021	0.050	U	GAM
Europium 152	14683-23-9	U		0.048	0.10	U	GAM
Europium 154	15585-10-1	U		0.078	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.482	0.042	0.040	0.10		GAM
Radium 228	15262-20-1	0.713	0.079	0.081	0.20		GAM
Thorium 228	14274-82-9	0.705	0.024	0.022			GAM
Thorium 232	TH-232	0.713	0.079	0.081			GAM
Americium 241	14596-10-2	U		0.031		U	GAM
Uranium 238	U-238	5.38	3.0	3.3			GAM
Uranium 235	15117-96-1	0.218	0.066	0.084			GAM

300-FF-1 North Process Pond

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>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-06

B0V1B6

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-06</u>	Client sample id <u>B0V1B6</u>	
Dept sample id <u>7103-006</u>	Location/Matrix <u>300 FF-1 NPP (BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 14:08</u>	
% solids <u>94.6</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	3.23	0.25	0.049	0.30		U
Uranium 235	15117-96-1	0.254	0.065	0.027	0.30	J	U
Uranium 238	U-238	3.26	0.25	0.044	0.30		U
Potassium 40	13966-00-2	12.5	0.45	0.21			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.019	0.050	U	GAM
Europium 152	14683-23-9	U		0.051	0.10	U	GAM
Europium 154	15585-10-1	U		0.069	0.10	U	GAM
Europium 155	14391-16-3	U		0.076	0.10	U	GAM
Radium 226	13982-63-3	0.503	0.039	0.039	0.10		GAM
Radium 228	15262-20-1	0.671	0.10	0.10	0.20		GAM
Thorium 228	14274-82-9	0.657	0.027	0.025			GAM
Thorium 232	TH-232	0.671	0.10	0.10			GAM
Americium 241	14596-10-2	U		0.088		U	GAM
Uranium 238	U-238	3.02	2.2	2.8			GAM
Uranium 235	15117-96-1	0.157	0.067	0.093			GAM

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Protocol <u>Hanford</u>
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TMA/RICHMOND
SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY
URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7103
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)						
					233/234	235	238	1+3	2σ	2+3	2σ			
Preparation batch 6880-016														
BOV196	N903107-01			7103-001	3.51	0.166 J	3.79	93	12	4	2			
BOV198	N903107-02			7103-002	13.7	1.78	14.0	98	13	<u>13</u>	3			
BOV1B0	N903107-03			7103-003	12.2	1.03	11.7	104	5	<u>9</u>	1			
BOV1B2	N903107-04			7103-004	2.73	0.218 J	2.70	101	13	<u>8</u>	2			
BOV1B4	N903107-05			7103-005	4.86	0.449	5.10	95	10	<u>9</u>	2			
BOV1B6	N903107-06			7103-006	3.23	0.254 J	3.26	99	11	<u>8</u>	2			
BLK (QC ID=30386)	N903107-08			7103-008	U	U	U							
LCS (QC ID=30385)	N903107-07			7103-007	ok	ok	ok							
Duplicate (N903107-01)	N903107-09			7103-009	ok	ok J	ok	106	11	<u>7</u>	2			
Nominal values and limits from method					RDLs (pCi/g)	0.30	0.30	0.30	100		4			
300-FF-1 North Process Pond								Averages	99		8			

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 6880-016 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.16																
BOV196	N903107-01			0.058	1.00			67	449			36	04/15/99	04/16	SS-009	
BOV198	N903107-02			0.20	1.00			89	174			36	04/15/99	04/16	SS-001	
BOV1B0	N903107-03			0.052	1.00			89	1195			39	04/16/99	04/19	SS-006	
BOV1B2	N903107-04			0.050	1.00			81	449			36	04/15/99	04/16	SS-011	
BOV1B4	N903107-05			0.070	1.00			71	449			36	04/15/99	04/16	SS-012	
BOV1B6	N903107-06			0.049	1.00			89	449			36	04/15/99	04/16	SS-013	
BLK (QC ID=30386)	N903107-08			0.033	1.00			75	449				04/15/99	04/16	SS-015	
LCS (QC ID=30385)	N903107-07			<u>0.34</u>	1.00			68	174				04/15/99	04/16	SS-002	
Duplicate (N903107-01)	N903107-09			0.054	1.00			82	449			36	04/15/99	04/16	SS-016	
(QC ID=30387)																
Nominal values and limits from method				0.30	1.00			30-105	150	100		180				

Lab id TMANC
Protocol Hanford
Version Ver 1.0
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7103
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

PROCEDURES	REFERENCE	UPLATE
	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	<u>0.10</u>	±	<u>0.21</u>
FOR 9 SAMPLES	YIELD	<u>79</u>	±	<u>18</u>

Lab id	<u>TMANC</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
 SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6880-016						
B0V196	N903107-01	7103-001			U	U
B0V198	N903107-02	7103-002			U	U
B0V1B0	N903107-03	7103-003			U	U
B0V1B2	N903107-04	7103-004			U	U
B0V1B4	N903107-05	7103-005			U	U
B0V1B6	N903107-06	7103-006			U	U
BLK (QC ID=30386)	N903107-08	7103-008			U	U
LCS (QC ID=30385)	N903107-07	7103-007			ok	ok
Duplicate (N903107-01)	N903107-09	7103-009			- U	- U

Nominal values and limits from method RDLs (pCi/g) 0.050 0.050
 300-FF-1 North Process Pond

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 6880-016 2σ prep error 15.0 % Reference Lab Notebook 6880 pg.16																
B0V196	N903107-01	0.068		707						456			47	04/09/99	04/27	02,03,00
B0V198	N903107-02	0.039		738						456			47	04/09/99	04/27	02,04,00
B0V1B0	N903107-03	0.071		682						409			49	04/09/99	04/29	02,03,00
B0V1B2	N903107-04	0.042		737						409			49	04/09/99	04/29	02,04,00
B0V1B4	N903107-05	0.071		642						700			49	04/09/99	04/29	02,01,00
B0V1B6	N903107-06	0.064		707						552			49	04/09/99	04/29	02,03,00
BLK (QC ID=30386)	N903107-08	0.020		750						388				04/09/99	04/30	01,03,00
LCS (QC ID=30385)	N903107-07	0.020		750						388				04/09/99	04/30	01,01,00
Duplicate (N903107-01)	N903107-09	0.040		707						388			50	04/09/99	04/30	02,04,00
	(QC ID=30387)															

Nominal values and limits from method 0.050 750 100 180

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SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY, cont.

GAMMA SCAN
GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
SDG 7103
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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

AVERAGES \pm 2 SD MDA 0.048 \pm 0.042
FOR 9 SAMPLES YIELD _____ \pm _____

Lab id TMANC
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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SDG 7103
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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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SAMPLE DELIVERY GROUP H0360

SDG 7103
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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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SAMPLE DELIVERY GROUP H0360

SDG 7103
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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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 H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

DATA SHEET

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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Form DVD-RG
Version 3.06
Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Protocol Hanford
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Form DVD-RG
Version 3.06
Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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.

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 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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'

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 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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Protocol Hanford
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
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METHOD SUMMARY

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

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

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

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

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

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

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

1599-046-US

Page 1 of 2

Bechtel Hanford Inc.

Project Coordinator
TRENT, SJ
Price Code
Data Turnaround
15 Days

Company Contact
Jeff Lerch
Telephone No.
373-5904

Project Designation
300 FF-1 North Process Pond
Field Logbook No.
EL 1395-2

Project Coordinator
TRENT, SJ
SAF No.
B99-046
Method of Shipment
Fed Ex

Sampling Location
300 FF-1 North process pond
Field Logbook No.
EL 1395-2

Offsite Property No.
A990687

Bill of Lading/Air Bill No.
423579523508
COA RNPACS 2600

Shipped To
TMA/RESEARCH
B70 J.B. 99

Ice Chest No. **ZML-528**

Shipped To
TMA/RESEARCH
B70 J.B. 99

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		Activity Scan	Isotopic Uranium; Strontium-90-TOTAL Strontium-90	FCB - 802	Cool 4C	None	Gamma Spectroscopy (Cobalt-60); Cesium-137	Matrix *
				Type of Container	No. of Container(s)							
BOV196	Soil	3-11-99	1255			60mL		250mL				Soil
BOV198	Soil	3-11-99	1310			60mL		250mL				Soil
BOV190	Soil	3-11-99	1328			60mL		250mL				Soil
BOV192	Soil	3-11-99	1339			60mL		250mL				Soil
BOV194	Soil	3-11-99	1350			60mL		250mL				Soil

SAMPLE ANALYSIS

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By	Date/Time	Received By	Date/Time
D. St. John	3-19-99 12:20	Overnight Courier	
Relinquished By	Date/Time	Received By	Date/Time
Daniel St. John for D. Bowers	3-19-99 12:20	J. Bowers	3-18-99
Relinquished By	Date/Time	Received By	Date/Time
Fred Ex	3-19-99 12:20	J. Bowers	3-18-99

SPECIAL INSTRUCTIONS

A Bowers not available to relinquish samples due to scheduling conflicts. DAS 3/18/99

Stored in Refrig 2 @ 3728 3/11/99 thru 3/18/99

LABORATORY SECTION	Received By	Date/Time	Disposal Method
FINAL SAMPLE DISPOSITION			

Disposed By

Collector: **Doug Bowers** Telephone No. **373-5904** Project Coordinator: **TRENT, SJ** Data Turnaround: **15 Days**
 Project Designation: **300-FF-1 North Process Pond** Sampling Location: **300 FF-1 North process pond BCL stock p.i.c** SAF No. **B99-046**
 Ice Chest No. **SML-264** Field Logbook No. **EL 1395-2** Method of Shipment: **Fed Ex**
 Shipped To: **TMA/RECORD** Offsite Property No. **A990686** Bill of Lading/Air Bill No. **423579523493**
R28 3-10-99 COA **RNFACS 2600**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		None	Cool 4C	None	Activity Scan	Isotopic Uranium, Thorium, Potassium, Strontium, Radium	PCBa - 8082	Gamma Spectroscopy (Cobalt-60), Cesium-137	Matrix *
				Type of Container	No. of Container(s)								
BOV1B6	Soil	3-11-99	1408			aG	aG	aG					

SPECIAL INSTRUCTIONS
 D. Bowers not available to relinquish to overnight carrier due to field scheduled conflict. **DAB**
 Stored in Refrigerator #12 @ 3728
 3/11/99 thru 3/18/99

CHAIN OF POSSESSION
 Relinquished By: **D. St. John** Date/Time: **3/11/99 12:20**
 Relinquished By: **D. Bowers** Date/Time: **3/11/99 10:00**
 Fed Ex **3-19-99 10:00**
 Relinquished By: **Alcorno JR** Date/Time: **3-19-99**
 Relinquished By: _____ Date/Time: _____
 Relinquished By: _____ Date/Time: _____

LABORATORY SECTION Received By: _____ Date/Time: _____ Title: _____
FINAL SAMPLE DISPOSITION Disposal Method: _____ Date/Time: _____

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Howard Date/Time received 3-17-99 10:02

CoC No. B99-046-03 & B99-046-05

Container I.D. No. SML-528 Requested TAT (Days) 15 P.O. Received Yes [] No [X]

INSPECTION

- 1. Custody seals on shipping container intact? Yes [X] No [] N/A []
- 2. Custody seals on shipping container dated & signed? Yes [X] No [] N/A []
- 3. Custody seals on sample containers intact? Yes [X] No [] N/A []
- 4. Custody seals on sample containers dated & signed? Yes [X] No [] N/A []
- 5. Cooler Temperature: _____ Packing material is: Wet [] Dry [X]
- 6. Number of samples in shipping container: 7
- 7. Number of containers per sample: 3 (Or see CoC _____)
- 8. Paperwork agrees with samples? Yes [X] No []
- 9. Samples have: Tape [X] Hazard labels [] Rad labels [] Appropriate sample labels [X]
- 10. Samples are: In good condition [X] Leaking [] Broken Container [] Missing []
- 11. Describe any anomalies: _____

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

14. Received by [Signature] Date: 3-19-99 Time: 10:00

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [] No []

Client Notified: Name _____ Date/time _____

Contractor BH1 - HANFORD	OFF-SITE PROPERTY CONTROL	CONTROL NO. <i>(To be obtained from PROPERTY MANAGEMENT)</i> A99087
------------------------------------	--------------------------------------	--

PART I - TO BE COMPLETED BY ORIGINATOR

Department EPC ENGINEERING SUPPORT	Section FIELD ANALYTICAL SUPPORT	Unit FIELD SAMPLING
--	--	-------------------------------

The following items are to be shipped from Contractor Vendor

Routing **FEDERAL EXPRESS** Prepaid Collect

Shipped to THERMO RETEC	Off-site Custodian
Company 2030 WRIGHT AVE.	On-site Custodian
Address RICHMOND, CA. 94804-0040	Payroll No.
City 510 235-2633 State Zip Code	
Country ATTN: LARRY JOHNSON	

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1	48 LBS	SAMPLE #S: BOV196, BOV198, BOV130, BOV132 BOV134, BOV074, BOV076 ICE CHEST # SML 528 POLYCOOLER WITH ENVIRONMENTAL SAMPLES PACKED WITH PACKING PEANUTS BILL OF LADING # 423579523508	N/A

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) _____

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

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

Location of and Contact for Property (Name/Phone No./Bldg./Area)
SJ GALE 509 372-9701 3728 BLDG/300 AREA

Date Ready for Shipment 3-18-99	Cost Code to be Charged RNPACS2600	Approximate Date This Property will be Returned
---	--	---

Originated By SJ GALE	Date 3-18-99	Authorized By <i>[Signature]</i>	Date 3-18-99
---------------------------------	------------------------	-------------------------------------	------------------------

Property Representative Signature <i>[Signature]</i>	Date 3/18/99	Property Management Approval <i>[Signature]</i>	Date 3/18/99
---	------------------------	--	------------------------

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature <i>[Signature]</i>	Date 3-18-99
---	------------------------

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

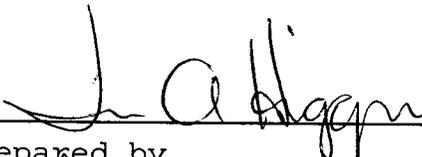
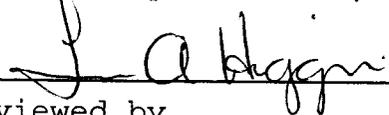
T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S				
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Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
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Prepared by _____

Reviewed by _____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 05/26/99

T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

A B O U T T H E D A T A S U M M A R Y S E C T I O N

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/26/99

T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

G U I D E , c o n t .

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

A B O U T T H E D A T A S U M M A R Y S E C T I O N

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 2

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/26/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7099

Contact L.A. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0360

SAMPLE SUMMARY

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF CUSTODY	COLLECTED
				SAMPLE ID	SAP NO		
BOV024	300 FF-1 NPP	SOLID		N903094-01	B99-046	B99-046-02	03/12/99 10:00
BOV025	300 FF-1 NPP	SOLID		N903094-02	B99-046	B99-046-02	03/12/99 10:12
BOV026	300 FF-1 NPP	SOLID		N903094-03	B99-046	B99-046-02	03/12/99 10:20
BOV027	300 FF-1 NPP	SOLID		N903094-04	B99-046	B99-046-02	03/12/99 10:40
BOV028	300 FF-1 NPP	SOLID		N903094-05	B99-046	B99-046-02	03/12/99 11:07
BOV029	300 FF-1 NPP	SOLID		N903094-06	B99-046	B99-046-02	03/12/99 11:25
BOV030	300 FF-1 NPP	SOLID		N903094-07	B99-046	B99-046-02	03/12/99 12:55
BOV031	300 FF-1 NPP	SOLID		N903094-08	B99-046	B99-046-02	03/12/99 13:15
BOV032	300 FF-1 NPP	SOLID		N903094-09	B99-046	B99-046-02	03/12/99 13:40
BOV033	300 FF-1 NPP	SOLID		N903094-10	B99-046	B99-046-02	03/12/99 13:55
BOV034	300 FF-1 NPP	SOLID		N903094-11	B99-046	B99-046-02	03/12/99 14:10
BOV035	300 FF-1 NPP	SOLID		N903094-12	B99-046	B99-046-02	03/12/99 14:35
BOV074	300 FF-1 NPP	SOLID		N903094-13	B99-046	B99-046-03	03/11/99 09:30
BOV076	300 FF-1 NPP	SOLID		N903094-14	B99-046	B99-046-03	03/11/99 09:40
Method Blank		SOLID		N903094-16	B99-046		
Method Blank		SOLID		N903094-20	B99-046		
Lab Control Sample		SOLID		N903094-15	B99-046		
Lab Control Sample		SOLID		N903094-19	B99-046		
Duplicate (N903094-01)	300 FF-1 NPP	SOLID		N903094-17	B99-046		03/12/99 10:00
Duplicate (N903094-01)	300 FF-1 NPP	SOLID		N903094-21	B99-046		03/12/99 10:00
Duplicate (N903094-13)	300 FF-1 NPP	SOLID		N903094-18	B99-046		03/11/99 09:30
Duplicate (N903094-13)	300 FF-1 NPP	SOLID		N903094-22	B99-046		03/11/99 09:30

SAMPLE SUMMARY

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Lab id TMANC

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7099
 Contact L.A. Johnson

QC SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7099	B99-046-02	B0V024	SOLID	97.2			03/19/99	7	N903094-01	7099-001
		B0V025	SOLID	96.7			03/19/99	7	N903094-02	7099-002
		B0V026	SOLID	97.3			03/19/99	7	N903094-03	7099-003
		B0V027	SOLID	97.1			03/19/99	7	N903094-04	7099-004
		B0V028	SOLID	97.2			03/19/99	7	N903094-05	7099-005
		B0V029	SOLID	97.3			03/19/99	7	N903094-06	7099-006
		B0V030	SOLID	96.1			03/19/99	7	N903094-07	7099-007
		B0V031	SOLID	96.8			03/19/99	7	N903094-08	7099-008
		B0V032	SOLID	97.4			03/19/99	7	N903094-09	7099-009
		B0V033	SOLID	95.4			03/19/99	7	N903094-10	7099-010
		B0V034	SOLID	95.2			03/19/99	7	N903094-11	7099-011
		B0V035	SOLID	96.5			03/19/99	7	N903094-12	7099-012
B99-046-03		B0V074	SOLID	97.6			03/19/99	8	N903094-13	7099-013
		B0V076	SOLID	96.9			03/19/99	8	N903094-14	7099-014
		Method Blank	SOLID						N903094-16	7099-016
		Method Blank	SOLID						N903094-20	7099-020
		Lab Control Sample	SOLID						N903094-15	7099-015
		Lab Control Sample	SOLID						N903094-19	7099-019
		Duplicate (N903094-01)	SOLID				03/19/99	7	N903094-17	7099-017
		Duplicate (N903094-01)	SOLID	97.2			03/19/99	7	N903094-21	7099-021
		Duplicate (N903094-13)	SOLID				03/19/99	8	N903094-18	7099-018
		Duplicate (N903094-13)	SOLID	97.6			03/19/99	8	N903094-22	7099-022

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SAMPLE DELIVERY GROUP H0360

SDG 7099
 Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
U	SOLID	Uranium, Isotopic in Soil	2857-192	5.0	14			1	1	1/1
Beta Counting										
SR	SOLID	Total Strontium in Soil	2857-192	10.0	2			1	1	1/1
Gamma Spectroscopy										
GAM	SOLID	Gamma Scan	2857-192	15.0	14			1	1	1/1
Liquid Scintillation Counting										
H	SOLID	Tritium in Soil	2857-192	10.0	2			1	1	1/1

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

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TMA / RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7099
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

WORK SUMMARY

CLIENT SAMPLE ID		LAB SAMPLE ID								
LOCATION	MATRIX	COLLECTED		SUF-						
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
BOV024		N903094-01	7099-001	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-001	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV025		N903094-02	7099-002	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-002	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV026		N903094-03	7099-003	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-003	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV027		N903094-04	7099-004	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-004	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV028		N903094-05	7099-005	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-005	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV029		N903094-06	7099-006	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-006	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV030		N903094-07	7099-007	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-007	U	A1	04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV031		N903094-08	7099-008	GAM		04/16/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-008	U	A1	04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV032		N903094-09	7099-009	GAM		04/17/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-009	U	A1	04/16/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								
BOV033		N903094-10	7099-010	GAM		04/17/99	05/06/99	TAH	Gamma Scan	
300 FF-1 NPP	SOLID	03/12/99	7099-010	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
B99-046-02	B99-046	03/19/99								

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7099
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

WORK SUMMARY, cont.

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	COLLECTED	SUF-	REVIEWED BY	METHOD			
LOCATION		RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
CUSTODY	SAF No								
B0V034		N903094-11	7099-011	GAM		04/22/99	05/06/99	TAH	Gamma Scan
300 FF-1 NPP	SOLID	03/12/99	7099-011	U	A1	04/19/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-02	B99-046	03/19/99							
B0V035		N903094-12	7099-012	GAM		04/28/99	05/06/99	TAH	Gamma Scan
300 FF-1 NPP	SOLID	03/12/99	7099-012	U	A1	04/19/99	04/29/99	TAH	Uranium, Isotopic in Soil
B99-046-02	B99-046	03/19/99							
B0V074		N903094-13	7099-013	GAM		04/28/99	05/06/99	TAH	Gamma Scan
300 FF-1 NPP	SOLID	03/11/99	7099-013	H		04/09/99	05/13/99	TAH	Tritium in Soil
B99-046-03	B99-046	03/19/99	7099-013	SR	A1	04/20/99	05/06/99	TAH	Total Strontium in Soil
			7099-013	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil
B0V076		N903094-14	7099-014	GAM		04/28/99	05/06/99	TAH	Gamma Scan
300 FF-1 NPP	SOLID	03/11/99	7099-014	H		04/09/99	05/13/99	TAH	Tritium in Soil
B99-046-03	B99-046	03/19/99	7099-014	SR	A1	04/20/99	05/06/99	TAH	Total Strontium in Soil
			7099-014	U	A1	04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil
Method Blank		N903094-16	7099-016	GAM		04/29/99	05/06/99	TAH	Gamma Scan
	SOLID		7099-016	H		04/09/99	05/13/99	TAH	Tritium in Soil
	B99-046		7099-016	SR		04/10/99	05/06/99	TAH	Total Strontium in Soil
Method Blank		N903094-20	7099-020	U		04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil
	SOLID								
	B99-046								
Lab Control Sample		N903094-15	7099-015	GAM		04/29/99	05/06/99	TAH	Gamma Scan
	SOLID		7099-015	H		04/09/99	05/13/99	TAH	Tritium in Soil
	B99-046		7099-015	SR		04/10/99	05/06/99	TAH	Total Strontium in Soil
Lab Control Sample		N903094-19	7099-019	U		04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil
	SOLID								
	B99-046								
Duplicate (N903094-01)		N903094-17	7099-017	GAM		04/29/99	05/06/99	TAH	Gamma Scan
300 FF-1 NPP	SOLID	03/12/99							
	B99-046	03/19/99							

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SAMPLE DELIVERY GROUP H0360

SDG 7099
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

WORK SUMMARY, cont.

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD	
CUSTODY	SAF No	RECEIVED			FIX					
Duplicate (N903094-01)		N903094-21	7099-021	U		04/15/99	04/29/99	TAH	Uranium, Isotopic in Soil	
300 FF-1 NPP	SOLID	03/12/99								
	B99-046	03/19/99								
Duplicate (N903094-13)		N903094-18	7099-018	H		04/09/99	05/13/99	TAH	Tritium in Soil	
300 FF-1 NPP	SOLID	03/11/99								
	B99-046	03/19/99								
Duplicate (N903094-13)		N903094-22	7099-022	SR		04/20/99	05/06/99	TAH	Total Strontium in Soil	
300 FF-1 NPP	SOLID	03/11/99								
	B99-046	03/19/99								

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
GAM	B99-046	Gamma Scan	GAMMAHI	14			1	1	1		17
H	B99-046	Tritium in Soil	EPA906.0	2			1	1	1		5
SR	B99-046	Total Strontium in Soil		2			1	1	1		5
U	B99-046	Uranium, Isotopic in Soil	UPLATE	14			1	1	1		17
TOTALS				32			4	4	4		44

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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-16

Method Blank

M E T H O D B L A N K

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-16</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7099-016</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>B99-046</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.020	0.051	0.089	0.50	U	H
Total Strontium	SR-RAD	-0.067	0.20	0.29	1.0	U	SR
Potassium 40	13966-00-2	U		0.15		U	GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Cesium 137	10045-97-3	U		0.010	0.050	U	GAM
Europium 152	14683-23-9	U		0.025	0.10	U	GAM
Europium 154	15585-10-1	U		0.032	0.10	U	GAM
Europium 155	14391-16-3	U		0.023	0.10	U	GAM
Americium 241	14596-10-2	U		0.031		U	GAM
Uranium 238	U-238	U		1.2		U	GAM
Uranium 235	15117-96-1	U		0.040		U	GAM

300-FF-1 North Process Pond

QC-BLANK 30404

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>05/26/99</u>

T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

N903094-20

Method Blank

M E T H O D B L A N K

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-20</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7099-020</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-046</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.010	0.013	0.025	0.30	U	U
Uranium 235	15117-96-1	0.008	0.008	0.031	0.30	U	U
Uranium 238	U-238	0	0.007	0.025	0.30	U	U

300-FF-1 North Process Pond

QC-BLANK 30461

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>05/26/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

N903094-15

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-15</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7099-015</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-046</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	3.84	0.14	0.090	0.50		H	4.28	0.17	90	84-116	80-120
Total Strontium	8.59	0.47	0.25	1.0		SR	11.5	0.46	<u>75</u>	86-114	
Potassium 40	U		0.13		U	GAM					
Cobalt 60	0.347	0.028	0.011	0.050		GAM	0.304	0.012	114	70-130	80-120
Cesium 137	0.389	0.026	0.018	0.050		GAM	0.347	0.014	112	72-128	80-120
Europium 152	U		0.037	0.10	U	GAM					
Europium 154	U		0.043	0.10	U	GAM					
Europium 155	U		0.019	0.10	U	GAM					
Americium 241	U		0.010		U	GAM					
Uranium 238	U		2.4		U	GAM					
Uranium 235	U		0.038		U	GAM					

300-FF-1 North Process Pond

QC-LCS 30403

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>05/26/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

N903094-19

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-19</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7099-019</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-046</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	4.24	0.55	0.27	0.30	U	4.56	0.18	93	80-120	80-120
Uranium 235	3.46	0.48	0.081	0.30	U	3.73	0.15	93	79-121	80-120
Uranium 238	4.72	0.59	0.26	0.30	U	4.70	0.19	100	79-121	80-120

300-FF-1 North Process Pond

QC-LCS 30460

LAB CONTROL SAMPLES

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

N903094-17

B0V024

DUPLICATE

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N903094-17</u>	Lab sample id <u>N903094-01</u>	Client sample id <u>B0V024</u>
Dept sample id <u>7099-017</u>	Dept sample id <u>7099-001</u>	Location/Matrix <u>300 FF-1 NPP</u> <u>SOLID</u>
	Received <u>03/19/99</u>	Collected <u>03/12/99 10:00</u>
	% solids <u>97.2</u>	Custody/SAF No <u>B99-046-02</u> <u>B99-046</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
Potassium 40	8.59	0.23	0.094			GAM	8.91	0.23	0.089		4	32	
Cobalt 60	0.086	0.013	0.013	0.050		GAM	0.090	0.012	0.011		5	44	
Cesium 137	U		0.010	0.050	U	GAM	U		0.010	U	-		
Europium 152	U		0.026	0.10	U	GAM	U		0.026	U	-		
Europium 154	U		0.034	0.10	U	GAM	U		0.033	U	-		
Europium 155	U		0.032	0.10	U	GAM	U		0.033	U	-		
Radium 226	0.385	0.022	0.021	0.10		GAM	0.381	0.021	0.020		1	34	
Radium 228	0.474	0.045	0.045	0.20		GAM	0.531	0.048	0.046		11	37	
Thorium 228	0.492	0.015	0.014			GAM	0.475	0.015	0.014		4	33	
Thorium 232	0.474	0.045	0.045			GAM	0.531	0.048	0.046		11	37	
Americium 241	U		0.030		U	GAM	U		0.036	U	-		
Uranium 238	2.02	1.2	1.4			GAM	2.89	1.4	1.5		35	117	
Uranium 235	0.083	0.034	0.049			GAM	0.087	0.034	0.050		5	91	

300-FF-1 North Process Pond

DUPLICATES

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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>05/26/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0360

N903094-21

B0V024

DUPLICATE

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N903094-21</u>	Lab sample id <u>N903094-01</u>	Client sample id <u>B0V024</u>
Dept sample id <u>7099-021</u>	Dept sample id <u>7099-001</u>	Location/Matrix <u>300 FF-1 NPP</u> <u>SOLID</u>
	Received <u>03/19/99</u>	Collected <u>03/12/99 10:00</u>
% solids <u>97.2</u>	% solids <u>97.2</u>	Custody/SAF No <u>B99-046-02</u> <u>B99-046</u>

ANALYTE	DUPLICATE			ORIGINAL			QUALI- FIERS	TEST	3σ	PROT
	pCi/g	2σ ERR (COUNT)	MDA pCi/g	pCi/g	2σ ERR (COUNT)	MDA pCi/g				
Uranium 233/234	17.4	1.8	0.22	0.30	U	17.7	2.4	<u>0.31</u>	2	28
Uranium 235	1.98	0.35	0.090	0.30	U	1.86	0.44	0.16	6	45
Uranium 238	15.7	1.6	0.22	0.30	U	15.0	2.1	0.29	5	28

300-FF-1 North Process Pond

QC-DUP#1 30462

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>05/26/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0360

N903094-18

B0V074

DUPLICATE

SDG <u>7099</u>		Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>		Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL		
Lab sample id <u>N903094-18</u>	Lab sample id <u>N903094-13</u>	Client sample id <u>B0V074</u>	
Dept sample id <u>7099-018</u>	Dept sample id <u>7099-013</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
	Received <u>03/19/99</u>	Collected <u>03/11/99 09:30</u>	
	% solids <u>97.6</u>	Custody/SAF No <u>B99-046-03</u>	<u>B99-046</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	PROT
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		TEST	pCi/g	(COUNT)	pCi/g	FIERS	%
Tritium	0.019	0.025	0.041	0.50	U	H	0.001	0.022	0.037	U	-	

300-FF-1 North Process Pond

QC-DUP#13 30406

DUPLICATES

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-DUP

Version 3.06

Report date 05/26/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

N903094-22

B0V074

DUPLICATE

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N903094-22</u>	Lab sample id <u>N903094-13</u>	Client sample id <u>B0V074</u>
Dept sample id <u>7099-022</u>	Dept sample id <u>7099-013</u>	Location/Matrix <u>300 FF-1 NPP</u> <u>SOLID</u>
	Received <u>03/19/99</u>	Collected <u>03/11/99 09:30</u>
% solids <u>97.6</u>	% solids <u>97.6</u>	Custody/SAF No <u>B99-046-03</u> <u>B99-046</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
Total Strontium	0.215	0.090	0.11	1.0	J	SR	0.297	0.11	0.15	J	32	86	

300-FF-1 North Process Pond

QC-DUP#13 30518

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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-01

B0V024

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-01</u>	Client sample id <u>B0V024</u>	
Dept sample id <u>7099-001</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 10:00</u>	
% solids <u>97.2</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	17.7	2.4	0.31	0.30		U
Uranium 235	15117-96-1	1.86	0.44	0.16	0.30		U
Uranium 238	U-238	15.0	2.1	0.29	0.30		U
Potassium 40	13966-00-2	8.91	0.23	0.089			GAM
Cobalt 60	10198-40-0	0.090	0.012	0.011	0.050		GAM
Cesium 137	10045-97-3	U		0.010	0.050	U	GAM
Europium 152	14683-23-9	U		0.026	0.10	U	GAM
Europium 154	15585-10-1	U		0.033	0.10	U	GAM
Europium 155	14391-16-3	U		0.033	0.10	U	GAM
Radium 226	13982-63-3	0.381	0.021	0.020	0.10		GAM
Radium 228	15262-20-1	0.531	0.048	0.046	0.20		GAM
Thorium 228	14274-82-9	0.475	0.015	0.014			GAM
Thorium 232	TH-232	0.531	0.048	0.046			GAM
Americium 241	14596-10-2	U		0.036		U	GAM
Uranium 238	U-238	2.89	1.4	1.5			GAM
Uranium 235	15117-96-1	0.087	0.034	0.050			GAM

300-FF-1 North Process Pond

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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-02

B0V025

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-02</u>	Client sample id <u>B0V025</u>	
Dept sample id <u>7099-002</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 10:12</u>	
% solids <u>96.7</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	21.0	2.2	0.26	0.30		U
Uranium 235	15117-96-1	2.55	0.42	0.095	0.30		U
Uranium 238	U-238	17.8	1.9	0.25	0.30		U
Potassium 40	13966-00-2	9.03	0.25	0.12			GAM
Cobalt 60	10198-40-0	0.066	0.011	0.012	0.050		GAM
Cesium 137	10045-97-3	0.031	0.011	0.012	0.050	J	GAM
Europium 152	14683-23-9	U		0.026	0.10	U	GAM
Europium 154	15585-10-1	U		0.034	0.10	U	GAM
Europium 155	14391-16-3	U		0.034	0.10	U	GAM
Radium 226	13982-63-3	0.384	0.022	0.021	0.10		GAM
Radium 228	15262-20-1	0.546	0.049	0.048	0.20		GAM
Thorium 228	14274-82-9	0.502	0.015	0.014			GAM
Thorium 232	TH-232	0.546	0.049	0.048			GAM
Americium 241	14596-10-2	U		0.038		U	GAM
Uranium 238	U-238	2.30	0.91	1.2			GAM
Uranium 235	15117-96-1	0.113	0.041	0.056			GAM

300-FF-1 North Process Pond

Lab id <u>TMANC</u>
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Version <u>Ver 1.0</u>
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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-03

B0V026

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-03</u>	Client sample id <u>B0V026</u>	
Dept sample id <u>7099-003</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 10:20</u>	
% solids <u>97.3</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	4.53	0.69	0.13	0.30		U
Uranium 235	15117-96-1	0.263	0.13	0.13	0.30	J	U
Uranium 238	U-238	4.09	0.64	0.13	0.30		U
Potassium 40	13966-00-2	8.46	0.39	0.22			GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.050	U	GAM
Europium 152	14683-23-9	U		0.041	0.10	U	GAM
Europium 154	15585-10-1	U		0.067	0.10	U	GAM
Europium 155	14391-16-3	U		0.038	0.10	U	GAM
Radium 226	13982-63-3	0.402	0.034	0.031	0.10		GAM
Radium 228	15262-20-1	0.703	0.11	0.092	0.20		GAM
Thorium 228	14274-82-9	0.494	0.021	0.020			GAM
Thorium 232	TH-232	0.703	0.11	0.092			GAM
Americium 241	14596-10-2	U		0.023		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Uranium 235	15117-96-1	U		0.065		U	GAM

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T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

N903094-04

B0V027

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-04</u>	Client sample id <u>B0V027</u>	
Dept sample id <u>7099-004</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 10:40</u>	
% solids <u>97.1</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	95.0	9.5	<u>0.57</u>	0.30		U
Uranium 235	15117-96-1	12.2	1.5	0.11	0.30		U
Uranium 238	U-238	79.0	8.0	<u>0.54</u>	0.30		U
Potassium 40	13966-00-2	8.63	0.38	0.20			GAM
Cobalt 60	10198-40-0	0.063	0.022	0.023	0.050		GAM
Cesium 137	10045-97-3	U		0.028	0.050	U	GAM
Europium 152	14683-23-9	U		0.050	0.10	U	GAM
Europium 154	15585-10-1	U		0.062	0.10	U	GAM
Europium 155	14391-16-3	U		0.072	0.10	U	GAM
Radium 226	13982-63-3	0.398	0.034	0.035	0.10		GAM
Radium 228	15262-20-1	0.495	0.089	0.099	0.20		GAM
Thorium 228	14274-82-9	0.499	0.024	0.026			GAM
Thorium 232	TH-232	0.495	0.089	0.099			GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	21.8	3.0	3.0			GAM
Uranium 235	15117-96-1	0.960	0.10	0.12			GAM

300-FF-1 North Process Pond

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-05

BOV028

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-05</u>	Client sample id <u>BOV028</u>	
Dept sample id <u>7099-005</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 11:07</u>	
% solids <u>97.2</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	2.52	0.41	0.080	0.30		U
Uranium 235	15117-96-1	0.126	0.076	0.096	0.30	J	U
Uranium 238	U-238	2.98	0.45	0.080	0.30		U
Potassium 40	13966-00-2	8.55	0.24	0.11			GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.009	0.050	U	GAM
Europium 152	14683-23-9	U		0.025	0.10	U	GAM
Europium 154	15585-10-1	U		0.036	0.10	U	GAM
Europium 155	14391-16-3	U		0.031	0.10	U	GAM
Radium 226	13982-63-3	0.368	0.020	0.018	0.10		GAM
Radium 228	15262-20-1	0.480	0.046	0.044	0.20		GAM
Thorium 228	14274-82-9	0.453	0.015	0.013			GAM
Thorium 232	TH-232	0.480	0.046	0.044			GAM
Americium 241	14596-10-2	U		0.035		U	GAM
Uranium 238	U-238	1.15	1.1	1.4		U	GAM
Uranium 235	15117-96-1	0.056	0.037	0.052			GAM

300-FF-1 North Process Pond

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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-06

B0V029

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-06</u>	Client sample id <u>B0V029</u>	
Dept sample id <u>7099-006</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 11:25</u>	
% solids <u>97.3</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	13.3	1.5	0.23	0.30		U
Uranium 235	15117-96-1	1.95	0.35	0.097	0.30		U
Uranium 238	U-238	11.9	1.3	0.22	0.30		U
Potassium 40	13966-00-2	9.12	0.32	0.17			GAM
Cobalt 60	10198-40-0	0.103	0.022	0.020	0.050		GAM
Cesium 137	10045-97-3	U		0.016	0.050	U	GAM
Europium 152	14683-23-9	U		0.036	0.10	U	GAM
Europium 154	15585-10-1	U		0.056	0.10	U	GAM
Europium 155	14391-16-3	U		0.046	0.10	U	GAM
Radium 226	13982-63-3	0.431	0.034	0.030	0.10		GAM
Radium 228	15262-20-1	0.548	0.079	0.078	0.20		GAM
Thorium 228	14274-82-9	0.509	0.018	0.017			GAM
Thorium 232	TH-232	0.548	0.079	0.078			GAM
Americium 241	14596-10-2	U		0.021		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Uranium 235	15117-96-1	0.122	0.042	0.057			GAM

300-FF-1 North Process Pond

Lab id <u>TMANC</u>
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Version <u>Ver 1.0</u>
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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-07

B0V030

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-07</u>	Client sample id <u>B0V030</u>	
Dept sample id <u>7099-007</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 12:55</u>	
% solids <u>96.1</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	115	5.0	0.21	0.30		U
Uranium 235	15117-96-1	9.93	0.53	0.020	0.30		U
Uranium 238	U-238	101	4.4	0.20	0.30		U
Potassium 40	13966-00-2	10.9	0.37	0.20			GAM
Cobalt 60	10198-40-0	0.165	0.024	0.024	0.050		GAM
Cesium 137	10045-97-3	0.210	0.024	0.026	0.050		GAM
Europium 152	14683-23-9	U		0.053	0.10	U	GAM
Europium 154	15585-10-1	U		0.063	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.27</u>	0.10	U	GAM
Radium 226	13982-63-3	0.468	0.036	0.038	0.10		GAM
Radium 228	15262-20-1	0.837	0.10	0.11	0.20		GAM
Thorium 228	14274-82-9	0.873	0.025	0.026			GAM
Thorium 232	TH-232	0.837	0.10	0.11			GAM
Americium 241	14596-10-2	U		0.32		U	GAM
Uranium 238	U-238	47.8	3.2	2.9			GAM
Uranium 235	15117-96-1	2.12	0.11	0.13			GAM

300-FF-1 North Process Pond

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>05/26/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-08

BOV031

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-08</u>	Client sample id <u>BOV031</u>	
Dept sample id <u>7099-008</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 13:15</u>	
% solids <u>96.8</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	56.6	2.6	0.17	0.30		U
Uranium 235	15117-96-1	5.85	0.36	0.021	0.30		U
Uranium 238	U-238	43.7	2.0	0.16	0.30		U
Potassium 40	13966-00-2	10.1	0.21	0.088			GAM
Cobalt 60	10198-40-0	0.269	0.015	0.012	0.050		GAM
Cesium 137	10045-97-3	0.236	0.012	0.012	0.050		GAM
Europium 152	14683-23-9	U		0.025	0.10	U	GAM
Europium 154	15585-10-1	U		0.030	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.11</u>	0.10	U	GAM
Radium 226	13982-63-3	0.420	0.019	0.019	0.10		GAM
Radium 228	15262-20-1	0.685	0.045	0.044	0.20		GAM
Thorium 228	14274-82-9	0.646	0.014	0.013			GAM
Thorium 232	TH-232	0.685	0.045	0.044			GAM
Americium 241	14596-10-2	U		0.047		U	GAM
Uranium 238	U-238	14.0	1.5	1.6			GAM
Uranium 235	15117-96-1	0.628	0.044	0.057			GAM

300-FF-1 North Process Pond

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>05/26/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-09

B0V032

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-09</u>	Client sample id <u>B0V032</u>	
Dept sample id <u>7099-009</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 13:40</u>	
% solids <u>97.4</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	45.1	2.0	0.15	0.30		U
Uranium 235	15117-96-1	4.94	0.32	0.021	0.30		U
Uranium 238	U-238	34.9	1.6	0.15	0.30		U
Potassium 40	13966-00-2	9.06	0.42	0.21			GAM
Cobalt 60	10198-40-0	0.171	0.025	0.023	0.050		GAM
Cesium 137	10045-97-3	0.136	0.024	0.027	0.050		GAM
Europium 152	14683-23-9	U		0.055	0.10	U	GAM
Europium 154	15585-10-1	U		0.067	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.429	0.042	0.042	0.10		GAM
Radium 228	15262-20-1	0.573	0.097	0.10	0.20		GAM
Thorium 228	14274-82-9	0.582	0.026	0.027			GAM
Thorium 232	TH-232	0.573	0.097	0.10			GAM
Americium 241	14596-10-2	U		0.30		U	GAM
Uranium 238	U-238	10.9	3.3	3.4			GAM
Uranium 235	15117-96-1	0.319	0.085	0.11			GAM

300-FF-1 North Process Pond

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>05/26/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-10

B0V033

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-10</u>	Client sample id <u>B0V033</u>	
Dept sample id <u>7099-010</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 13:55</u>	
% solids <u>95.4</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	35.6	3.9	0.30	0.30		U
Uranium 235	15117-96-1	2.68	0.48	0.12	0.30		U
Uranium 238	U-238	35.2	3.9	0.29	0.30		U
Potassium 40	13966-00-2	12.4	0.31	0.13			GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	0.133	0.014	0.015	0.050		GAM
Europium 152	14683-23-9	U		0.034	0.10	U	GAM
Europium 154	15585-10-1	U		0.043	0.10	U	GAM
Europium 155	14391-16-3	U		0.052	0.10	U	GAM
Radium 226	13982-63-3	0.504	0.027	0.025	0.10		GAM
Radium 228	15262-20-1	0.717	0.061	0.060	0.20		GAM
Thorium 228	14274-82-9	0.674	0.020	0.019			GAM
Thorium 232	TH-232	0.717	0.061	0.060			GAM
Americium 241	14596-10-2	U		0.064		U	GAM
Uranium 238	U-238	17.6	1.9	1.8			GAM
Uranium 235	15117-96-1	0.587	0.066	0.084			GAM

300-FF-1 North Process Pond

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>05/26/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-11

B0V034

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-11</u>	Client sample id <u>B0V034</u>	
Dept sample id <u>7099-011</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 14:10</u>	
% solids <u>95.2</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	147	11	<u>0.49</u>	0.30		U
Uranium 235	15117-96-1	15.2	1.4	0.066	0.30		U
Uranium 238	U-238	119	9.2	<u>0.46</u>	0.30		U
Potassium 40	13966-00-2	10.2	0.26	0.13			GAM
Cobalt 60	10198-40-0	0.746	0.026	0.017	0.050		GAM
Cesium 137	10045-97-3	0.592	0.022	0.020	0.050		GAM
Europium 152	14683-23-9	U		0.042	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.24</u>	0.10	U	GAM
Radium 226	13982-63-3	0.499	0.029	0.030	0.10		GAM
Radium 228	15262-20-1	1.06	0.074	0.074	0.20		GAM
Thorium 228	14274-82-9	0.996	0.022	0.022			GAM
Thorium 232	TH-232	1.06	0.074	0.074			GAM
Americium 241	14596-10-2	U		0.45		U	GAM
Uranium 238	U-238	56.9	2.8	2.5			GAM
Uranium 235	15117-96-1	2.42	0.091	0.11			GAM

300-FF-1 North Process Pond

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>05/26/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-12

B0V035

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-12</u>	Client sample id <u>B0V035</u>	
Dept sample id <u>7099-012</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/12/99 14:35</u>	
% solids <u>96.5</u>	Custody/SAF No <u>B99-046-02</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	73.2	3.4	0.18	0.30		U
Uranium 235	15117-96-1	5.90	0.37	0.023	0.30		U
Uranium 238	U-238	66.1	3.1	0.17	0.30		U
Potassium 40	13966-00-2	9.89	0.44	0.23			GAM
Cobalt 60	10198-40-0	0.142	0.027	0.029	0.050		GAM
Cesium 137	10045-97-3	0.242	0.027	0.029	0.050		GAM
Europium 152	14683-23-9	U		0.063	0.10	U	GAM
Europium 154	15585-10-1	U		0.067	0.10	U	GAM
Europium 155	14391-16-3	U		0.088	0.10	U	GAM
Radium 226	13982-63-3	0.473	0.042	0.043	0.10		GAM
Radium 228	15262-20-1	0.711	0.090	0.098	0.20		GAM
Thorium 228	14274-82-9	0.678	0.030	0.031			GAM
Thorium 232	TH-232	0.711	0.090	0.098			GAM
Americium 241	14596-10-2	U		0.30		U	GAM
Uranium 238	U-238	27.2	3.3	3.3			GAM
Uranium 235	15117-96-1	1.24	0.12	0.15			GAM

300-FF-1 North Process Pond

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>05/26/99</u>

T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

N903094-13

B0V074

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-13</u>	Client sample id <u>B0V074</u>	
Dept sample id <u>7099-013</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/11/99 09:30</u>	
% solids <u>97.6</u>	Custody/SAF No <u>B99-046-03</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.001	0.022	0.037	0.50	U	H
Uranium 233/234	U-233/234	0.930	0.13	0.042	0.30		U
Uranium 235	15117-96-1	0.037	0.025	0.031	0.30	J	U
Uranium 238	U-238	0.882	0.12	0.032	0.30		U
Total Strontium	SR-RAD	0.297	0.11	0.15	1.0	J	SR
Potassium 40	13966-00-2	11.3	0.28	0.11			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	0.092	0.014	0.015	0.050		GAM
Europium 152	14683-23-9	U		0.029	0.10	U	GAM
Europium 154	15585-10-1	U		0.039	0.10	U	GAM
Europium 155	14391-16-3	U		0.035	0.10	U	GAM
Radium 226	13982-63-3	0.414	0.025	0.024	0.10		GAM
Radium 228	15262-20-1	0.593	0.061	0.059	0.20		GAM
Thorium 228	14274-82-9	0.577	0.017	0.015			GAM
Thorium 232	TH-232	0.593	0.061	0.059			GAM
Americium 241	14596-10-2	U		0.039		U	GAM
Uranium 238	U-238	U		1.4		U	GAM
Uranium 235	15117-96-1	0.059	0.037	0.054			GAM

300-FF-1 North Process Pond

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>05/26/99</u>

T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

N903094-14

B0V076

D A T A S H E E T

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903094-14</u>	Client sample id <u>B0V076</u>	
Dept sample id <u>7099-014</u>	Location/Matrix <u>300 FF-1 NPP</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/11/99 09:40</u>	
% solids <u>96.9</u>	Custody/SAF No <u>B99-046-03</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.006	0.022	0.037	0.50	U	H
Uranium 233/234	U-233/234	0.504	0.12	0.054	0.30		U
Uranium 235	15117-96-1	0.027	0.027	0.052	0.30	U	U
Uranium 238	U-238	0.560	0.12	0.043	0.30		U
Total Strontium	SR-RAD	0.395	0.12	0.17	1.0	J	SR
Potassium 40	13966-00-2	11.0	0.34	0.16			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	U		0.015	0.050	U	GAM
Europium 152	14683-23-9	U		0.037	0.10	U	GAM
Europium 154	15585-10-1	U		0.054	0.10	U	GAM
Europium 155	14391-16-3	U		0.041	0.10	U	GAM
Radium 226	13982-63-3	0.436	0.031	0.031	0.10		GAM
Radium 228	15262-20-1	0.645	0.073	0.073	0.20		GAM
Thorium 228	14274-82-9	0.556	0.020	0.018			GAM
Thorium 232	TH-232	0.645	0.073	0.073			GAM
Americium 241	14596-10-2	U		0.059		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Uranium 235	15117-96-1	U		0.064		U	GAM

300-FF-1 North Process Pond

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>05/26/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

URANIUM, ISOTOPIIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7099
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)						
					233/234	235	238	1+3	2σ	2+3	2σ			
Preparation batch 2857-192														
B0V024	N903094-01	A1	7099-001		17.7	1.86	15.0	118	23	<u>12</u>	3			
B0V025	N903094-02	A1	7099-002		21.0	2.55	17.8	118	18	<u>14</u>	3			
B0V026	N903094-03	A1	7099-003		4.53	0.263 J	4.09	111	24	6	3			
B0V027	N903094-04	A1	7099-004		95.0	12.2	79.0	<u>120</u>	17	<u>15</u>	2			
B0V028	N903094-05	A1	7099-005		2.52	0.126 J	2.98	85	19	4	3			
B0V029	N903094-06	A1	7099-006		13.3	1.95	11.9	112	18	<u>16</u>	3			
B0V030	N903094-07	A1	7099-007		115	9.93	101	<u>114</u>	7	<u>10</u>	1			
B0V031	N903094-08	A1	7099-008		56.6	5.85	43.7	<u>130</u>	8	<u>13</u>	1			
B0V032	N903094-09	A1	7099-009		45.1	4.94	34.9	<u>129</u>	8	<u>14</u>	1			
B0V033	N903094-10	A1	7099-010		35.6	2.68	35.2	101	16	<u>8</u>	2			
B0V034	N903094-11	A1	7099-011		147	15.2	119	<u>124</u>	13	<u>13</u>	2			
B0V035	N903094-12	A1	7099-012		73.2	5.90	66.1	<u>111</u>	7	<u>9</u>	1			
B0V074	N903094-13	A1	7099-013		0.930	0.037 J	0.882	105	21	4	3			
B0V076	N903094-14	A1	7099-014		0.504	U	0.560	90	29	5	5			
BLK (QC ID=30461)	N903094-20		7099-020		U	U	U							
LCS (QC ID=30460)	N903094-19		7099-019		ok	ok	ok							
Duplicate (N903094-01)	N903094-21		7099-021		ok	ok	ok	111	16	<u>13</u>	3			
Nominal values and limits from method			RDLs (pCi/g)		0.30	0.30	0.30	100		4				
300-FP-1 North Process Pond								Averages 112		10				

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 05/26/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7099
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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- PREPARED	YZED	DETECTOR
Preparation batch 2857-192 2σ prep error 5.0 % Reference Lab Notebook #2857 pg. 192																	
BOV024	N903094-01	A1		<u>0.31</u>	1.00				53		<u>129</u>			34	04/15/99	04/15	SS-016
BOV025	N903094-02	A1		0.26	1.00				92		<u>129</u>			34	04/15/99	04/15	SS-009
BOV026	N903094-03	A1		0.13	1.00				67		<u>129</u>			34	04/15/99	04/15	SS-010
BOV027	N903094-04	A1		<u>0.57</u>	1.00				78		<u>129</u>			34	04/15/99	04/15	SS-011
BOV028	N903094-05	A1		0.096	1.00				88		<u>129</u>			34	04/15/99	04/15	SS-012
BOV029	N903094-06	A1		0.23	1.00				87		<u>128</u>			34	04/15/99	04/15	SS-005
BOV030	N903094-07	A1		0.21	1.00				78		1563			35	04/15/99	04/16	SS-032
BOV031	N903094-08	A1		0.17	1.00				76		1563			35	04/15/99	04/16	SS-033
BOV032	N903094-09	A1		0.15	1.00				83		1563			35	04/15/99	04/16	SS-034
BOV033	N903094-10	A1		0.30	1.00				77		<u>128</u>			34	04/15/99	04/15	SS-001
BOV034	N903094-11	A1		<u>0.49</u>	1.00				31		1195			38	04/15/99	04/19	SS-032
BOV035	N903094-12	A1		0.18	1.00				90		1195			38	04/15/99	04/19	SS-033
BOV074	N903094-13	A1		0.042	<u>0.990</u>				76		485			35	04/15/99	04/15	SS-001
BOV076	N903094-14	A1		0.054	<u>0.500</u>				91		450			35	04/15/99	04/15	SS-055
BLK (QC ID=30461)	N903094-20			0.031	1.00				77		485				04/15/99	04/15	SS-002
LCS (QC ID=30460)	N903094-19			0.27	1.00				103		<u>129</u>				04/15/99	04/15	SS-013
Duplicate (N903094-01)	N903094-21			0.22	1.00				95		<u>129</u>			34	04/15/99	04/15	SS-015
(QC ID=30462)																	
Nominal values and limits from method				0.30	1.00				30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
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 <u>0.22</u> ± <u>0.29</u>
FOR 17 SAMPLES	YIELD <u>79</u> ± <u>34</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Test SR Matrix SOLID
SDG 7099
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 2857-192					
B0V074	N903094-13	A1		7099-013	0.297 J
B0V076	N903094-14	A1		7099-014	0.395 J
BLK (QC ID=30404)	N903094-16			7099-016	U
LCS (QC ID=30403)	N903094-15			7099-015	<u>LOW</u>
Duplicate (N903094-13)	N903094-22			7099-022	ok J

Nominal values and limits from method RDLs (pCi/g) 1.0
300-FF-1 North Process Pond

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX pCi/g	MDA g	ALIQ g	PREP PAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2857-192 2σ prep error 10.0 % Reference Lab Notebook #2857 pg. 192																
B0V074	N903094-13	A1		0.15	1.00				79	200			40	04/15/99	04/20	GRB-202
B0V076	N903094-14	A1		0.17	1.00				69	200			40	04/15/99	04/20	GRB-203
BLK (QC ID=30404)	N903094-16			0.29	1.00				54	400				04/06/99	04/10	GRB-220
LCS (QC ID=30403)	N903094-15			0.25	1.00				53	194				04/06/99	04/10	GRB-230
Duplicate (N903094-13) (QC ID=30518)	N903094-22			0.11	1.00				72	400			40	04/15/99	04/20	GRB-205

Nominal values and limits from method 1.0 1.00 100 180

PROCEDURES RP-500 Strontium - Initial Separation, rev 0
RP-519 Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD MDA 0.19 ± 0.15
FOR 5 SAMPLES YIELD 65 ± 23

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
 SDG 7099
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2857-192					
B0V024	N903094-01	7099-001		0.090	U
B0V025	N903094-02	7099-002		0.066	0.031 J
B0V026	N903094-03	7099-003		U	U
B0V027	N903094-04	7099-004		0.063	U
B0V028	N903094-05	7099-005		U	U
B0V029	N903094-06	7099-006		0.103	U
B0V030	N903094-07	7099-007		0.165	0.210
B0V031	N903094-08	7099-008		0.269	0.236
B0V032	N903094-09	7099-009		0.171	0.136
B0V033	N903094-10	7099-010		U	0.133
B0V034	N903094-11	7099-011		0.746	0.592
B0V035	N903094-12	7099-012		0.142	0.242
B0V074	N903094-13	7099-013		U	0.092
B0V076	N903094-14	7099-014		U	U
BLK (QC ID=30404)	N903094-16	7099-016		U	U
LCS (QC ID=30403)	N903094-15	7099-015		ok	ok
Duplicate (N903094-01)	N903094-17	7099-017		ok	- U
Nominal values and limits from method					
		RDLs (pCi/g)		0.050	0.050
300-FF-1 North Process Pond					

METHOD SUMMARIES

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SUMMARY DATA SECTION

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
 SDG 7099
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX pCi/g	MDA g	ALIQ	PREP FAC	DILU- TION	YIELD %	EPF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2857-192		2σ prep error		15.0 %		Reference Lab		Notebook #2857		pg. 192							
BOV024	N903094-01			0.032	919						432			35	04/14/99	04/16	02,04,00
BOV025	N903094-02			0.032	881						436			35	04/14/99	04/16	02,04,00
BOV026	N903094-03			<u>0.057</u>	992						430			35	04/14/99	04/16	02,01,00
BOV027	N903094-04			0.047	891						430			35	04/14/99	04/16	02,03,00
BOV028	N903094-05			0.030	855						430			35	04/14/99	04/16	02,04,00
BOV029	N903094-06			<u>0.051</u>	893						702			35	04/14/99	04/16	02,01,00
BOV030	N903094-07			0.045	778						702			35	04/14/99	04/16	02,03,00
BOV031	N903094-08			0.028	866						702			35	04/14/99	04/16	02,04,00
BOV032	N903094-09			<u>0.055</u>	858						403			36	04/14/99	04/17	02,03,00
BOV033	N903094-10			0.039	797						402			36	04/14/99	04/17	02,04,00
BOV034	N903094-11			0.042	879						457			41	04/14/99	04/22	02,04,00
BOV035	N903094-12			<u>0.067</u>	821						403			47	04/14/99	04/28	02,03,00
BOV074	N903094-13			0.036	867						403			48	04/14/99	04/28	02,04,00
BOV076	N903094-14			0.046	842						736			48	04/14/99	04/28	02,03,00
BLK (QC ID=30404)	N903094-16			0.022	750						422				04/14/99	04/29	01,03,00
LCS (QC ID=30403)	N903094-15			0.040	750						422				04/14/99	04/29	01,01,00
Duplicate (N903094-01)	N903094-17			0.032	919						422			48	04/14/99	04/29	01,04,00
(QC ID=30405)																	
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 0.041 ± 0.024
 FOR 17 SAMPLES YIELD _____ ± _____

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

Test H Matrix SOLID
 SDG 7099
 Contact L.A. Johnson

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Tritium
Preparation batch 2857-192					
B0V074	N903094-13	7099-013			U
B0V076	N903094-14	7099-014			U
BLK (QC ID=30404)	N903094-16	7099-016			U
LCS (QC ID=30403)	N903094-15	7099-015			ok
Duplicate (N903094-13)	N903094-18	7099-018			- U

Nominal values and limits from method RDLs (pCi/g) 0.50
 300-FF-1 North Process Pond

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 2857-192 2σ prep error 10.0 % Reference Lab Notebook #2857 pg. 192															
B0V074	N903094-13			0.037	49.9			100		120			29	04/07/99	04/09 LSC-005
B0V076	N903094-14			0.037	50.3			100		120			29	04/07/99	04/09 LSC-005
BLK (QC ID=30404)	N903094-16			0.089	20.0			100		120				04/07/99	04/09 LSC-005
LCS (QC ID=30403)	N903094-15			0.090	20.0			100		120				04/07/99	04/09 LSC-005
Duplicate (N903094-13)	N903094-18			0.041	45.0			100		120			29	04/07/99	04/09 LSC-005
	(QC ID=30406)														

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 0.059 ± 0.056
 FOR 5 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

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T M A / R I C H M O N D
S A M P L E D E L I V E R Y G R O U P H 0 3 6 0

SDG 7099
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
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S A M P L E S U M M A R Y

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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T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

P R E P A R A T I O N B A T C H S U M M A R Y

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

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SAMPLE DELIVERY GROUP H0360

SDG 7099
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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D A T A S H E E T

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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T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

G U I D E , c o n t .

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

D A T A S H E E T

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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SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

G U I D E , c o n t .

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D A T A S H E E T

- * 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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SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
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L A B C O N T R O L S A M P L E

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

The following notes apply to this report:

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

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

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

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

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 1. A fixed percentage specified in the protocol.

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T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

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G U I D E , c o n t .

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D U P L I C A T E

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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SUMMARY DATA SECTION

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Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/26/99

T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

M A T R I X S P I K E

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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T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0360

SDG 7099
Contact L.A. Johnson

G U I D E , c o n t .

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

M A T R I X S P I K E

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.

REPORT GUIDES

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Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0360 is comprised of six solid (soil) samples designated under SAF No. B99-0546 with a Project Designation of: 300-FF-1 North Process Pond.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. Isotopic Uranium results were sent to Bechtel Hanford via fax on April 29, 1999 and Gamma Spec answers were transmitted to BHI on May 4, 1999.

2.0 ANALYSIS NOTES

2.4 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SAMPLE SUMMARY

SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0V196	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-01	B99-046	B99-046-05	03/11/99 12:55
B0V198	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-02	B99-046	B99-046-05	03/11/99 13:10
B0V1B0	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-03	B99-046	B99-046-05	03/11/99 13:28
B0V1B2	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-04	B99-046	B99-046-05	03/11/99 13:39
B0V1B4	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-05	B99-046	B99-046-05	03/11/99 13:50
B0V1B6	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-06	B99-046	B99-046-05	03/11/99 14:08
Method Blank		SOLID		N903107-08	B99-046		
Lab Control Sample		SOLID		N903107-07	B99-046		
Duplicate (N903107-01)	300 FF-1 NPP(BCL Stckpl)	SOLID		N903107-09	B99-046		03/11/99 12:55

SAMPLE SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7103
 Contact L.A. Johnson

QC SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7103	B99-046-05	B0V196	SOLID	95.0			03/19/99 8	N903107-01	7103-001
		B0V198	SOLID	96.0			03/19/99 8	N903107-02	7103-002
		B0V1B0	SOLID	93.4			03/19/99 8	N903107-03	7103-003
		B0V1B2	SOLID	96.4			03/19/99 8	N903107-04	7103-004
		B0V1B4	SOLID	94.5			03/19/99 8	N903107-05	7103-005
		B0V1B6	SOLID	94.6			03/19/99 8	N903107-06	7103-006
		Method Blank	SOLID						N903107-08
Lab Control Sample	SOLID						N903107-07	7103-007	
		Duplicate (N903107-01)	SOLID	95.0			03/19/99 8	N903107-09	7103-009

Lab id TMANC
 Protocol Hanford
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7103
 Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

TEST	MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALI-
			BATCH	2σ %	CLIENT MORE	RE BLANK	LCS	DUP/ORIG MS/ORIG	
Alpha Spectroscopy									
U	SOLID	Uranium, Isotopic in Soil	6880-016	5.0	6	1	1	1/1	
Gamma Spectroscopy									
GAM	SOLID	Gamma Scan	6880-016	15.0	6	1	1	1/1	

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

Lab id TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

WORK SUMMARY

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	COLLECTED	PLANCHET	TEST	SUF-	FIX	ANALYZED	REVIEWED	BY	METHOD
LOCATION	SAF No	RECEIVED									
B0V196		N903107-01	7103-001		GAM		04/27/99	05/04/99	TAH		Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-001		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99									
B0V198		N903107-02	7103-002		GAM		04/27/99	05/04/99	TAH		Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-002		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99									
B0V1B0		N903107-03	7103-003		GAM		04/29/99	05/04/99	TAH		Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-003		U		04/19/99	04/29/99	TAH		Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99									
B0V1B2		N903107-04	7103-004		GAM		04/29/99	05/04/99	TAH		Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-004		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99									
B0V1B4		N903107-05	7103-005		GAM		04/29/99	05/04/99	TAH		Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-005		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99									
B0V1B6		N903107-06	7103-006		GAM		04/29/99	05/04/99	TAH		Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-006		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
B99-046-05	B99-046	03/19/99									
Method Blank		N903107-08	7103-008		GAM		04/30/99	05/04/99	TAH		Gamma Scan
	SOLID		7103-008		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
	B99-046										
Lab Control Sample		N903107-07	7103-007		GAM		04/30/99	05/04/99	TAH		Gamma Scan
	SOLID		7103-007		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
	B99-046										
Duplicate (N903107-01)		N903107-09	7103-009		GAM		04/30/99	05/04/99	TAH		Gamma Scan
300 FF-1 NPP(BCL Stckpl)	SOLID	03/11/99	7103-009		U		04/16/99	04/29/99	TAH		Uranium, Isotopic in Soil
	B99-046	03/19/99									

WORK SUMMARY

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

WORK SUMMARY, cont.

SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
GAM	B99-046	Gamma Scan	GAMMAHI	6			1	1	1		9
U	B99-046	Uranium, Isotopic in Soil	UPLATE	6			1	1	1		9
TOTALS				12			2	2	2		18

WORK SUMMARY

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
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 Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-08

Method Blank

METHOD BLANK

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7103-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-046</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	-0.004	0.007	0.027	0.30	U	U
Uranium 235	15117-96-1	0.004	0.009	0.033	0.30	U	U
Uranium 238	U-238	0.014	0.014	0.027	0.30	U	U
Potassium 40	13966-00-2	U		0.20		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.010	0.050	U	GAM
Europium 152	14683-23-9	U		0.030	0.10	U	GAM
Europium 154	15585-10-1	U		0.030	0.10	U	GAM
Europium 155	14391-16-3	U		0.020	0.10	U	GAM
Americium 241	14596-10-2	U		0.030		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.040		U	GAM

300-FF-1 North Process Pond

QC-BLANK 30386

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>05/04/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-09

BOV196

DUPLICATE

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N903107-09</u>	Lab sample id <u>N903107-01</u>	Client sample id <u>BOV196</u>
Dept sample id <u>7103-009</u>	Dept sample id <u>7103-001</u>	Location/Matrix <u>300 FF-1 NPP(ECL Stckpl) SOLID</u>
	Received <u>03/19/99</u>	Collected <u>03/11/99 12:55</u>
% solids <u>95.0</u>	% solids <u>95.0</u>	Custody/SAF No <u>B99-046-05</u> <u>B99-046</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	PROT
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		TEST	pCi/g	(COUNT)	pCi/g	FIERS	%
Uranium 233/234	4.12	0.31	0.054	0.30		U	3.51	0.32	0.058		16	20
Uranium 235	0.261	0.064	0.030	0.30	J	U	0.166	0.059	0.037	J	44	62
Uranium 238	3.88	0.30	0.049	0.30		U	3.79	0.33	0.045		2	20
Potassium 40	12.0	0.33	0.10			GAM	12.6	0.51	0.28		5	33
Cobalt 60	U		0.010	0.050	U	GAM	U		0.023	U	-	
Cesium 137	U		0.010	0.050	U	GAM	U		0.022	U	-	
Europium 152	U		0.040	0.10	U	GAM	U		0.060	U	-	
Europium 154	U		0.050	0.10	U	GAM	U		0.081	U	-	
Europium 155	U		0.060	0.10	U	GAM	U		0.065	U	-	
Radium 226	0.600	0.032	0.030	0.10		GAM	0.626	0.047	0.043		4	35
Radium 228	0.770	0.080	0.080	0.20		GAM	0.847	0.11	0.11		10	41
Thorium 228	0.820	0.022	0.020			GAM	0.768	0.030	0.028		7	33
Thorium 232	0.770	0.080	0.080			GAM	0.847	0.11	0.11		10	41
Americium 241	U		0.050		U	GAM	U		0.097	U	-	
Uranium 238	4.50	1.6	2.0			GAM	4.80	2.9	3.3		6	112
Uranium 235	0.140	0.054	0.080			GAM	0.124	0.077	0.11		12	112

300-FF-1 North Process Pond

QC-DUP#1 30387

DUPLICATES

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
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Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-01

B0V196

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-01</u>	Client sample id <u>B0V196</u>	
Dept sample id <u>7103-001</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl)</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/11/99 12:55</u>	
% solids <u>95.0</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	3.51	0.32	0.058	0.30		U
Uranium 235	15117-96-1	0.166	0.059	0.037	0.30	J	U
Uranium 238	U-238	3.79	0.33	0.045	0.30		U
Potassium 40	13966-00-2	12.6	0.51	0.28			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.050	U	GAM
Europium 152	14683-23-9	U		0.060	0.10	U	GAM
Europium 154	15585-10-1	U		0.081	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.626	0.047	0.043	0.10		GAM
Radium 228	15262-20-1	0.847	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.768	0.030	0.028			GAM
Thorium 232	TH-232	0.847	0.11	0.11			GAM
Americium 241	14596-10-2	U		0.097		U	GAM
Uranium 238	U-238	4.80	2.9	3.3			GAM
Uranium 235	15117-96-1	0.124	0.077	0.11			GAM

300-FF-1 North Process Pond

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
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Report date <u>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-02

B0V198

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-02</u>	Client sample id <u>B0V198</u>	
Dept sample id <u>7103-002</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 13:10</u>	
% solids <u>96.0</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	13.7	1.3	0.20	0.30		U
Uranium 235	15117-96-1	1.78	0.31	0.075	0.30		U
Uranium 238	U-238	14.0	1.3	0.18	0.30		U
Potassium 40	13966-00-2	14.0	0.31	0.13			GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.050	U	GAM
Europium 152	14683-23-9	U		0.033	0.10	U	GAM
Europium 154	15585-10-1	U		0.045	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.11</u>	0.10	U	GAM
Radium 226	13982-63-3	0.450	0.027	0.026	0.10		GAM
Radium 228	15262-20-1	0.693	0.056	0.053	0.20		GAM
Thorium 228	14274-82-9	0.668	0.019	0.017			GAM
Thorium 232	TH-232	0.693	0.056	0.053			GAM
Americium 241	14596-10-2	U		0.060		U	GAM
Uranium 238	U-238	15.5	1.7	1.7			GAM
Uranium 235	15117-96-1	0.500	0.067	0.083			GAM

300-FF-1 North Process Pond

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>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-03

B0V1B0

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-03</u>	Client sample id <u>B0V1B0</u>	
Dept sample id <u>7103-003</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 13:28</u>	
% solids <u>93.4</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	12.2	0.44	0.052	0.30		U
Uranium 235	15117-96-1	1.03	0.081	0.010	0.30		U
Uranium 238	U-238	11.7	0.42	0.049	0.30		U
Potassium 40	13966-00-2	10.8	0.50	0.25			GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Cesium 137	10045-97-3	U		0.025	0.050	U	GAM
Europium 152	14683-23-9	U		0.060	0.10	U	GAM
Europium 154	15585-10-1	U		0.082	0.10	U	GAM
Europium 155	14391-16-3	U		0.075	0.10	U	GAM
Radium 226	13982-63-3	0.463	0.046	0.046	0.10		GAM
Radium 228	15262-20-1	0.673	0.10	0.11	0.20		GAM
Thorium 228	14274-82-9	0.597	0.030	0.029			GAM
Thorium 232	TH-232	0.673	0.10	0.11			GAM
Americium 241	14596-10-2	U		0.12		U	GAM
Uranium 238	U-238	11.7	3.3	3.6			GAM
Uranium 235	15117-96-1	0.447	0.097	0.13			GAM

300-FF-1 North Process Pond

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>
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-04

B0V1B2

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG-H0360
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-04</u>	Client sample id <u>B0V1B2</u>	
Dept sample id <u>7103-004</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 13:39</u>	
% solids <u>96.4</u>	Custody/SAF No <u>B99-046-05</u> <u>B99-046</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	2.73	0.24	0.050	0.30		U
Uranium 235	15117-96-1	0.218	0.057	0.030	0.30	J	U
Uranium 238	U-238	2.70	0.24	0.047	0.30		U
Potassium 40	13966-00-2	14.1	0.34	0.13			GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.050	U	GAM
Europium 152	14683-23-9	U		0.033	0.10	U	GAM
Europium 154	15585-10-1	U		0.047	0.10	U	GAM
Europium 155	14391-16-3	U		0.059	0.10	U	GAM
Radium 226	13982-63-3	0.448	0.028	0.025	0.10		GAM
Radium 228	15262-20-1	0.608	0.062	0.062	0.20		GAM
Thorium 228	14274-82-9	0.640	0.019	0.017			GAM
Thorium 232	TH-232	0.608	0.062	0.062			GAM
Americium 241	14596-10-2	U		0.049		U	GAM
Uranium 238	U-238	4.49	1.6	1.8			GAM
Uranium 235	15117-96-1	0.119	0.044	0.063			GAM

300-FF-1 North Process Pond

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-05

B0V1B4

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-05</u>	Client sample id <u>B0V1B4</u>	
Dept sample id <u>7103-005</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl)</u>	<u>SOLID</u>
Received <u>03/19/99</u>	Collected <u>03/11/99 13:50</u>	
% solids <u>94.5</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	4.86	0.38	0.070	0.30		U
Uranium 235	15117-96-1	0.449	0.092	0.034	0.30		U
Uranium 238	U-238	5.10	0.39	0.068	0.30		U
Potassium 40	13966-00-2	14.4	0.47	0.22			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.021	0.050	U	GAM
Europium 152	14683-23-9	U		0.048	0.10	U	GAM
Europium 154	15585-10-1	U		0.078	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.482	0.042	0.040	0.10		GAM
Radium 228	15262-20-1	0.713	0.079	0.081	0.20		GAM
Thorium 228	14274-82-9	0.705	0.024	0.022			GAM
Thorium 232	TH-232	0.713	0.079	0.081			GAM
Americium 241	14596-10-2	U		0.031		U	GAM
Uranium 238	U-238	5.38	3.0	3.3			GAM
Uranium 235	15117-96-1	0.218	0.066	0.084			GAM

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/04/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

N903107-06

B0V1B6

DATA SHEET

SDG <u>7103</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0360</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N903107-06</u>	Client sample id <u>B0V1B6</u>	
Dept sample id <u>7103-006</u>	Location/Matrix <u>300 FF-1 NPP(BCL Stckpl) SOLID</u>	
Received <u>03/19/99</u>	Collected <u>03/11/99 14:08</u>	
% solids <u>94.6</u>	Custody/SAF No <u>B99-046-05</u>	<u>B99-046</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	3.23	0.25	0.049	0.30		U
Uranium 235	15117-96-1	0.254	0.065	0.027	0.30	J	U
Uranium 238	U-238	3.26	0.25	0.044	0.30		U
Potassium 40	13966-00-2	12.5	0.45	0.21			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.019	0.050	U	GAM
Europium 152	14683-23-9	U		0.051	0.10	U	GAM
Europium 154	15585-10-1	U		0.069	0.10	U	GAM
Europium 155	14391-16-3	U		0.076	0.10	U	GAM
Radium 226	13982-63-3	0.503	0.039	0.039	0.10		GAM
Radium 228	15262-20-1	0.671	0.10	0.10	0.20		GAM
Thorium 228	14274-82-9	0.657	0.027	0.025			GAM
Thorium 232	TH-232	0.671	0.10	0.10			GAM
Americium 241	14596-10-2	U		0.088		U	GAM
Uranium 238	U-238	3.02	2.2	2.8			GAM
Uranium 235	15117-96-1	0.157	0.067	0.093			GAM

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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>05/04/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test U Matrix SOLID
 SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)						
					233/234	235	238	1+3	2σ	2+3	2σ			
Preparation batch 6880-016														
BOV196	N903107-01			7103-001	3.51	0.166 J	3.79	93	12	4	2			
BOV198	N903107-02			7103-002	13.7	1.78	14.0	98	13	<u>13</u>	3			
BOV1B0	N903107-03			7103-003	12.2	1.03	11.7	104	5	<u>9</u>	1			
BOV1B2	N903107-04			7103-004	2.73	0.218 J	2.70	101	13	<u>8</u>	2			
BOV1B4	N903107-05			7103-005	4.86	0.449	5.10	95	10	<u>9</u>	2			
BOV1B6	N903107-06			7103-006	3.23	0.254 J	3.26	99	11	<u>8</u>	2			
BLK (QC ID=30386)	N903107-08			7103-008	U	U	U							
LCS (QC ID=30385)	N903107-07			7103-007	ok	ok	ok							
Duplicate (N903107-01)	N903107-09			7103-009	ok	ok J	ok	106	11	<u>7</u>	2			
Nominal values and limits from method				RDLs (pCi/g)	0.30	0.30	0.30	100			4			
300-FF-1 North Process Pond								Averages	99		8			

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQUOT g	PREP FAC	DILUTION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL-			
														PREPARED	YZED	DETECTOR	
Preparation batch 6880-016														2σ prep error	5.0 %	Reference Lab Notebook	6880 pg.16
BOV196	N903107-01			0.058	1.00			67	449				36	04/15/99	04/16	SS-009	
BOV198	N903107-02			0.20	1.00			89	174				36	04/15/99	04/16	SS-001	
BOV1B0	N903107-03			0.052	1.00			89	1195				39	04/16/99	04/19	SS-006	
BOV1B2	N903107-04			0.050	1.00			81	449				36	04/15/99	04/16	SS-011	
BOV1B4	N903107-05			0.070	1.00			71	449				36	04/15/99	04/16	SS-012	
BOV1B6	N903107-06			0.049	1.00			89	449				36	04/15/99	04/16	SS-013	
BLK (QC ID=30386)	N903107-08			0.033	1.00			75	449					04/15/99	04/16	SS-015	
LCS (QC ID=30385)	N903107-07			<u>0.34</u>	1.00			68	174					04/15/99	04/16	SS-002	
Duplicate (N903107-01)	N903107-09			0.054	1.00			82	449				36	04/15/99	04/16	SS-016	
(QC ID=30387)																	
Nominal values and limits from method				0.30	1.00			30-105	150	100			180				

METHOD SUMMARIES

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7103
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

PROCEDURES	REFERENCE	UPLATE
	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 <u>0.10</u> ± <u>0.21</u>
FOR 9 SAMPLES	YIELD <u>79</u> ± <u>18</u>

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0360

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
 SDG 7103
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0360

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	PLANCHET	Cobalt 60	Cesium 137
------------------	---------------	-------------------	----------	-----------	------------

Preparation batch 6880-016

B0V196	N903107-01	7103-001		U	U
B0V198	N903107-02	7103-002		U	U
B0V1B0	N903107-03	7103-003		U	U
B0V1B2	N903107-04	7103-004		U	U
B0V1B4	N903107-05	7103-005		U	U
B0V1B6	N903107-06	7103-006		U	U
BLK (QC ID=30386)	N903107-08	7103-008		U	U
LCS (QC ID=30385)	N903107-07	7103-007		ok	ok
Duplicate (N903107-01)	N903107-09	7103-009		- U	- U

Nominal values and limits from method RDLs (pCi/g) 0.050 0.050
 300-FF-1 North Process Pond

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST 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 6880-016 2σ prep error 15.0 % Reference Lab Notebook 6880 pg.16

B0V196	N903107-01		0.068	707					456			47	04/09/99	04/27	02,03,00
B0V198	N903107-02		0.039	738					456			47	04/09/99	04/27	02,04,00
B0V1B0	N903107-03		0.071	682					409			49	04/09/99	04/29	02,03,00
B0V1B2	N903107-04		0.042	737					409			49	04/09/99	04/29	02,04,00
B0V1B4	N903107-05		0.071	642					700			49	04/09/99	04/29	02,01,00
B0V1B6	N903107-06		0.064	707					552			49	04/09/99	04/29	02,03,00
BLK (QC ID=30386)	N903107-08		0.020	750					388				04/09/99	04/30	01,03,00
LCS (QC ID=30385)	N903107-07		0.020	750					388				04/09/99	04/30	01,01,00
Duplicate (N903107-01)	N903107-09		0.040	707					388			50	04/09/99	04/30	02,04,00
	(QC ID=30387)														

Nominal values and limits from method 0.050 750 100 180

METHOD SUMMARIES

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METHOD SUMMARY, cont.

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
SDG 7103
Contact L.A. Johnson

Client Hanford
Contract TRE-SBB-207925
Case no SDG-H0360

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

AVERAGES \pm 2 SD	MDA <u>0.048</u> \pm <u>0.042</u>
FOR 9 SAMPLES	YIELD _____ \pm _____

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. 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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SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
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PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of 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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SDG 7103
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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SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
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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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SAMPLE DELIVERY GROUP H0360

SDG 7103
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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.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
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.

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SDG 7103
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REPORT GUIDE

Client Hanford
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LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

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Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

REPORT GUIDE

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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GUIDE, cont.

Client Hanford
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DUPLICATE

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

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

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

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

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REPORT GUIDE

Client Hanford
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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

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 05/04/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/99

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SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
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Report date 05/04/99

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SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
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Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

METHOD SUMMARY

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

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

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

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

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

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

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SAMPLE DELIVERY GROUP H0360

SDG 7103
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0360

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 05/04/99

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-046-05

Page 1 of 2

Collector: Doug Bowers
 Project Designation: 300-FF-1 North Process Pond
 Ice Chest No.: ZML-528
 Company Contact: Jeff Lerch
 Telephone No.: 373-5904
 Project Coordinator: TRENT, SJ
 Price Code: 1-10360
 SAF No.: B99-046
 Method of Shipment: Fed Ex
 Data Turnaround: 15 Days

Sampling Location: 300 FF-1 North process pond
 Field Logbook No.: EL 1395-2
 Offsite Property No.: A990687
 Bill of Lading/Air Bill No.: 423579523508
 COA: RN PACS 2600

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		None	Cool 4C	None	Activity Scan	Isotopic Uranium; Strontium-90; Tritium	PCBs - 8082	Gamma Spectroscopy (Cobalt-60); Cesium-137	None
				Type of Container	No. of Container(s)								
BOV196	Soil	3-11-99	1255	aG	60mL	aG	aG	aG	60mL	1	250mL	1000mL	
BOV198	Soil	3-11-99	1310	aG	60mL	aG	aG	aG	60mL	1	250mL	1000mL	
BOV1B0	Soil	3-11-99	1328	aG	60mL	aG	aG	aG	60mL	1	250mL	1000mL	
BOV1B2	Soil	3-11-99	1339	aG	60mL	aG	aG	aG	60mL	1	250mL	1000mL	
BOV1B4	Soil	3-11-99	1350	aG	60mL	aG	aG	aG	60mL	1	250mL	1000mL	

SPECIAL INSTRUCTIONS
 P. Bowers not available to relinquish samples due to schedule conflicts. DAS 3/18/99

CHAIN OF POSSESSION

Relinquished By: D. St. John	Date/Time: 3-19-99 12:20	Received By: Overnighit Courier	Date/Time: 3-18-99
Relinquished By: David St. John for P. Bowers	Date/Time: 3-19-99 12:20	Received By: P. Bowers	Date/Time: 3-18-99
Relinquished By: Fed Ex	Date/Time: 3-19-99 12:20	Received By: Fed Ex	Date/Time: 3-18-99

LABORATORY SECTION
 Received By: [Signature] Date/Time: 3/18/99

FINAL SAMPLE DISPOSITION
 Disposed By: [Signature] Date/Time: 3/18/99

Matrix *
 Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION
 Received By: [Signature] Date/Time: 3/18/99

FINAL SAMPLE DISPOSITION
 Disposed By: [Signature] Date/Time: 3/18/99

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-046-05

Page 2 of 2

Collector: Doug Bowers
 Project Designation: 300-FE-1 North Process Pond
 Ice Chest No.: *SML-264*
 Shipped To: *TMA/RECEIVED*
 Company Contact: Jeff Lerch, Telephone No. 373-5904
 Sampling Location: 300 FE-1 North process pond
 Field Logbook No.: EL 1395-2
 Offsite Property No.: *A990686*
 Project Coordinator: TRENT, SJ
 SAF No.: B99-046
 Method of Shipment: Fed Ex
 Bill of Lading/Air Bill No.: *423579523493*
 COA: *RNFACS 2600*
 Price Code: *H0360*
 Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Isotopic Uranium, Thorium, Protactinium, Plutonium, Americium, Curium, Neptunium, Technetium, Radium, Polonium, Francium, Actinium, Protactinium, Uranium, Thorium, Protactinium, Plutonium, Americium, Curium, Neptunium, Technetium, Radium, Polonium, Francium, Actinium	FCBs - 8082	Cool 4C	None
B0V1B6	Soil	3-11-99	1408				aG	None
							aG	aG
							1	1
							60ml	1000mL
								Gamma Spectroscopy (Cobalt-60); Cesium-137

SPECIAL INSTRUCTIONS
 D. Bowers not available to relinquish to overnight courier due to field scheduled contact. *DAB*
 Stored in Refrigerator #12 @ 3728
 3/11/99 thru 3/18/99

CHAIN OF POSSESSION

Relinquished By: <i>D. St. John</i>	Date/Time: <i>3/11/99 12:20</i>	Received By: <i>D. Bowers</i>	Date/Time: <i>3-11-99 12:20</i>
Relinquished By: <i>Fed Ex</i>	Date/Time: <i>3-19-99 10:12</i>	Received By: <i>McCano JR</i>	Date/Time: <i>3-19-99</i>

Sign/Print Names: _____
 Received By: _____ Date/Time: _____
 Received By: _____ Date/Time: _____
 Received By: _____ Date/Time: _____

LABORATORY SECTION Received By: _____ Title: _____
FINAL SAMPLE DISPOSITION Disposal Method: _____ Date/Time: _____

Contractor BHI - HANFORD	OFF-SITE PROPERTY CONTROL	CONTROL NO. <i>(To be obtained from PROPERTY MANAGEMENT)</i> A99087
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PART I - TO BE COMPLETED BY ORIGINATOR

Department EPC ENGINEERING SUPPORT	Section FIELD ANALYTICAL SUPPORT	Unit FIELD SAMPLING
The following items are to be shipped from <input checked="" type="checkbox"/> Contractor <input type="checkbox"/> Vendor		
Routing FEDERAL EXPRESS <input checked="" type="checkbox"/> Prepaid <input type="checkbox"/> Collect		
Shipped to THERMO RETEC Company 2030 WRIGHT AVE. Address RICHMOND, CA. 94804-0040 City 510 235-2633 State Zip Code Country ATTN: LARRY JOHNSON	Off-site Custodian	Payroll No.
	On-site Custodian	

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1	48 LBS	SAMPLE #S: BOV196, BOV198, BOV180, BOV182 BOV184, BOV074, BOV076 ICE CHEST # SML 528 POLYCOOLER WITH ENVIRONMENTAL SAMPLES PACKED WITH PACKING PEANUTS BILL OF LADING # 4235 7952 3508	N/A

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) _____

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

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

Location of and Contact for Property (Name/Phone No./Bidg./Area)
SJ GALE 509 372-9701 3728 BLDG/300 AREA

Date Ready for Shipment 3-18-99	Cost Code to be Charged RNPACS2600	Approximate Date This Property will be Returned
---	--	---

Originated By SJ GALE	Date 3-18-99	Authorized By <i>[Signature]</i>	Date 3-18-99
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Property Representative Signature <i>[Signature]</i>	Date 3/18/99	Property Management Approval <i>[Signature]</i>	Date 3/18/99
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PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature <i>[Signature]</i>	Date 3-18-99
---	------------------------

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 3-19-99 10:00

CoC No. B99-046-03 & B99-046-05

Container I.D. No. SML-528 Requested TAT (Days) 15 P.O. Received Yes [] No []

INSPECTION

1. Custody seals on shipping container intact? Yes [] No [] N/A []
2. Custody seals on shipping container dated & signed? Yes [] No [] N/A []
3. Custody seals on sample containers intact? Yes [] No [] N/A []
4. Custody seals on sample containers dated & signed? Yes [] No [] N/A []
5. Cooler Temperature: _____ Packing material is: Wet [-] Dry []
6. Number of samples in shipping container: 7
7. Number of containers per sample: 3 (Or see CoC _____)
8. Paperwork agrees with samples? Yes [] No []
9. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
10. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [] No [] Date _____
14. Received by J.P. Corao Date: 3-19-99 Time: 10:00

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [] No []

Client Notified: Name _____ Date/time _____