26049-WES-1334 54

START 9715529.2180

0046265

TELEDYNE ISOTOPES

50 VAN BUREN AVENUE
PO BOX 1235
WESTWOOD NJ 07675-1235
(201) 664-7070

WESTON/WESTINGHOUSE/HANFORD

Case Narrative/Cover Sheet for Reports of Analysis and Lab Data

Date 11/01/93

TI #'s 26056 - 26056

WO # 4-3831

RECORD COPY

1 JAN 1993 RECEIVED EDMC

NOV 1993 RECEIVED SOLA

Comments:

There were no unusual occurrences with these samples.

Contents:

	Procedure #'s	Bench & Work Sheet Pages	Calibration Pages	Tracers/ Carrier Pages
Reports of Analysis		13		
Sr-90	PRO-032-16	10	48	2
Gamma	PRO-042-5	16	12	
Tc-99	PRO-032-78	9	57	1
C-O-C		1		
Other		-		

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature." A. J. Hogan

Spike Activity for TI #26056

Nuclide	Activity pCi/l	Acceptable Range
Technetium-99	98.5	79. - 118.
Strontium-90	80.	68. - 92.
Cobalt-60	2.5 E 04	1.7 - 3.2 E 04
Cesium-137	2.16 E 04	1.51 - 2.81 E 04

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

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MRS JOSIE EDWARDS
WESTON/WESTINGHOUSE/HANFORD
208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26049	9309L885-001	B08YJ0	08/02				SR-90	1.2 +-0.1 E 00		10/20		10.82 *	3
							TC-99	L.T. 9. E-01		10/07			3
							TC-99 -	1.1 +-5.41E-01		10/07			3
							SR-90	L.T. 5. E-02		10/20			3
							BE-7	8.69+-0.87E 00		09/24			4
							BE-7	L.T. 1. E 00		09/24			4
							K-40	5.91+-0.59E 00		09/24			4
							K-40	L.T. 2. E 00		09/24			4
							MN-54	L.T. 6. E-02		09/24			4
							MN-54 -	6.8 +-34.1E-03		09/24			4
							CO-58	L.T. 8. E-02		09/24			4
							CO-58 -	4.9 +- 5.0E-02		09/24			4
							FE-59	L.T. 2. E-01		09/24			4
							FE-59 -	6.1 +-124.E-03		09/24			4
							CO-60	L.T. 5. E-02		09/24			4
							CO-60	2.2 +- 2.8E-02		09/24			4
							ZN-65	L.T. 1. E-01		09/24			4
							ZN-65	1.1 +- 7.0E-02		09/24			4
							ZR-95	L.T. 9. E-02		09/24			4
							ZR-95	2.9 +- 5.1E-02		09/24			4
							RU-103	L.T. 1. E-01		09/24			4
							RU-103	4.9 +- 7.0E-02		09/24			4
							RU-106	L.T. 5. E-01		09/24			4
							RU-106	1.3 +- 3.1E-01		09/24			4
							I-131	L.T. 5. E 00		09/24			4
							I-131	8.2 +-28.0E-01		09/24			4
							CS-134	L.T. 6. E-02		09/24			4
							CS-134	6.9 +-351.E-04		09/24			4
							CS-137	7.80+-0.78E-01		09/24			4
							CS-137	L.T. 1. E-01		09/24			4
							BA-140	L.T. 8. E-01		09/24			4
							BA-140	2.1 +- 4.8E-01		09/24			4

TELEDYNE ISOTOPES

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S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26049	9309L885-001	B08YJ0	08/02				CE-141	L.T. 2. E-01		09/24			4
							CE-141	4.5 +-11.4E-02		09/24			4
							CE-144	L.T. 3. E-01		09/24			4
							CE-144 -	4.0 +-18.8E-02		09/24			4
							EU-152	L.T. 2. E-01		09/24			4
							EU-152 -	2.9 +- 1.0E-01		09/24			4
							EU-154	L.T. 1. E-01		09/24			4
							EU-154 -	4.9 +- 9.1E-02		09/24			4
							EU-155	L.T. 2. E-01		09/24			4
							EU-155 -	5.1 +- 0.9E-01		09/24			4
							RA-226	L.T. 1. E 00		09/24			4
							RA-226 -	1.6 +- 5.6E-01		09/24			4
							TH-228	3.27+-0.47E-01		09/24			4
							TH-228	L.T. 1. E-01		09/24			4
							TH-234	L.T. 1. E 00		09/24			4
							TH-234 -	7.6 +- 5.6E-01		09/24			4
							TOTAL-U	L.T. 1. E 00		09/24			4
							TOTAL-U-	7.58+-5.61E-01		09/24			4
26050	9309L885-002	B08YM0	09/07				SR-90	7.2 +-2.3 E-02		10/20		8.76 *	3
							TC-99	L.T. 5. E-01		10/07			3
							TC-99	2.3 +-3.44E-01		10/07			3
							SR-90	L.T. 2. E-02		10/20			3
							BE-7	4.03+-0.40E 00		09/24			4
							BE-7	L.T. 6. E-01		09/24			4
							K-40	5.90+-0.59E 00		09/24			4
							K-40	L.T. 1. E 00		09/24			4
							MN-54	L.T. 4. E-02		09/24			4
							MN-54	6.5 +-22.3E-03		09/24			4
							CO-58	L.T. 4. E-02		09/24			4
							CO-58 -	7.8 +-24.4E-03		09/24			4
							FE-59	L.T. 8. E-02		09/24			4

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

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4-3831	LL-1140-F4	09/14/93	10/17/93

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S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26050	9309L885-002	B08YM0	09/07				FE-59	2.5 +- 4.9E-02		09/24			4
							CO-60	L.T. 3. E-02		09/24			4
							CO-60	1.6 +- 2.0E-02		09/24			4
							ZN-65	L.T. 8. E-02		09/24			4
							ZN-65	6.2 +-45.7E-03		09/24			4
							ZR-95	L.T. 4. E-02		09/24			4
							ZR-95	3.1 +- 2.6E-02		09/24			4
							RU-103	L.T. 4. E-02		09/24			4
							RU-103	1.2 +- 2.6E-02		09/24			4
							RU-106	L.T. 3. E-01		09/24			4
							RU-106 -	1.0 +- 2.1E-01		09/24			4
							I-131	L.T. I. E-01		09/24			4
							I-131 -	1.0 +- 8.9E-02		09/24			4
							CS-134	L.T. 4. E-02		09/24			4
							CS-134 -	6.1 +-24.2E-03		09/24			4
							CS-137	4.60+-2.12E-02		09/24			4
							CS-137	L.T. 4. E-02		09/24			4
							BA-140	L.T. 8. E-02		09/24			4
							BA-140 -	1.2 +- 5.2E-02		09/24			4
							CE-141	L.T. 6. E-02		09/24			4
							CE-141 -	1.7 +- 3.7E-02		09/24			4
							CE-144	L.T. 2. E-01		09/24			4
							CE-144 -	1.3 +- 1.2E-01		09/24			4
							EU-152	L.T. 1. E-01		09/24			4
							EU-152 -	3.8 +- 0.8E-01		09/24			4
							EU-154	L.T. 2. E-01		09/24			4
							EU-154 -	1.1 +- 0.8E-01		09/24			4
							EU-155	L.T. 1. E-01		09/24			4
							EU-155 -	5.0 +- 0.7E-01		09/24			4
							RA-226	L.T. 7. E-01		09/24			4
							RA-226	2.5 +- 4.0E-01		09/24			4
							TH-228	3.08+-0.33E-01		09/24			4

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S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26050	9309L885-002	B08YM0	09/07				TH-228	L.T. 8. E-02		09/24			4
							TH-234	L.T. 7. E-01		09/24			4
							TH-234 -	8.8 +- 4.2E-01		09/24			4
							TOTAL-U	L.T. 7. E-01		09/24			4
							TOTAL-U-	8.76+-4.24E-01		09/24			4
26051	9309L885-003	B08YM1	09/07				SR-90	5.0 +-0.9 E-02		10/20		6.14 *	3
							TC-99	L.T. 6. E-01		10/07			3
							TC-99	3.1 +-34.9E-02		10/07			3
							SR-90	L.T. 7. E-03		10/20			3
							BE-7	1.49+-0.20E 00		09/24			4
							BE-7	L.T. 3. E-01		09/24			4
							K-40	7.26+-0.73E 00		09/24			4
							K-40	L.T. 1. E 00		09/24			4
							MN-54	L.T. 2. E-02		09/24			4
							MN-54 -	1.4 +-14.8E-03		09/24			4
							CD-58	L.T. 3. E-02		09/24			4
							CO-58 -	2.3 +-17.6E-03		09/24			4
							FE-59	L.T. 6. E-02		09/24			4
							FE-59 -	9.7 +-37.1E-03		09/24			4
							CO-60	L.T. 2. E-02		09/24			4
							CO-60 -	8.1 +-140.E-04		09/24			4
							ZN-65	L.T. 5. E-02		09/24			4
							ZN-65	2.9 +-32.1E-03		09/24			4
							ZR-95	L.T. 3. E-02		09/24			4
							ZR-95	8.4 +-16.8E-03		09/24			4
							RU-103	L.T. 3. E-02		09/24			4
							RU-103	8.1 +-17.6E-03		09/24			4
							RU-106	L.T. 2. E-01		09/24			4
							RU-106 -	1.6 +-14.1E-02		09/24			4
							I-131	L.T. 1. E-01		09/24			4
							I-131	7.0 +-59.2E-03		09/24			4

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S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MIO-COUNT TIME DATE	MIO-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26051	9309L885-003	B08YM1	09/07				CS-134	L.T. 3. E-02		09/24			4
							CS-134	8.6 +-16.0E-03		09/24			4
							CS-137	L.T. 3. E-02		09/24			4
							CS-137	0.0 +- 1.6E-02		09/24			4
							BA-140	L.T. 5. E-02		09/24			4
							BA-140	3.8 +-32.6E-03		09/24			4
							CE-141	L.T. 4. E-02		09/24			4
							CE-141 -	3.2 +- 2.4E-02		09/24			4
							CE-144	L.T. 1. E-01		09/24			4
							CE-144 -	3.0 +- 7.8E-02		09/24			4
							EU-152	L.T. 7. E-02		09/24			4
							EU-152 -	3.2 +- 4.5E-02		09/24			4
							EU-154	L.T. 8. E-02		09/24			4
							EU-154	3.1 +- 4.8E-02		09/24			4
							EU-155	L.T. 7. E-02		09/24			4
							EU-155 -	3.6 +- 0.4E-01		09/24			4
							RA-226	L.T. 5. E-01		09/24			4
							RA-226 -	2.2 +- 2.7E-01		09/24			4
							TH-228	5.86+-2.16E-02		09/24			4
							TH-228	L.T. 4. E-02		09/24			4
							TH-234	L.T. 5. E-01		09/24			4
							TH-234 -	4.1 +- 2.7E-01		09/24			4
							TOTAL-U	L.T. 5. E-01		09/24			4
							TOTAL-U-	4.09+-2.72E-01		09/24			4
26052	9309L885-004	B08YM2	09/07				SR-90	L.T. 2. E-02		10/20		9.23 *	3
							TC-99	L.T. 5. E-01		10/07			3
							TC-99 -	7.1 +-27.1E-02		10/07			3
							SR-90	2.0 +-1.62E-02		10/20			3
							BE-7	L.T. 3. E-01		09/24			4
							BE-7	2.9 +-198.E-03		09/24			4
							K-40	7.15+-0.71E 00		09/24			4

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S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26052	9309L885-004	B08YM2	09/07				K-40	L.T. 1. E 00		09/24			4
							MN-54	L.T. 4. E-02		09/24			4
							MN-54	1.2 +- 2.1E-02		09/24			4
							CO-58	L.T. 4. E-02		09/24			4
							CO-58 -	1.7 +- 2.4E-02		09/24			4
							FE-59	L.T. 8. E-02		09/24			4
							FE-59 -	2.3 +- 5.1E-02		09/24			4
							CO-60	L.T. 3. E-02		09/24			4
							CO-60 -	3.2 +-20.5E-03		09/24			4
							ZN-65	L.T. 7. E-02		09/24			4
							ZN-65 -	1.9 +- 4.5E-02		09/24			4
							ZR-95	L.T. 4. E-02		09/24			4
							ZR-95	1.9 +- 2.5E-02		09/24			4
							RU-103	L.T. 4. E-02		09/24			4
							RU-103 -	1.4 +- 2.5E-02		09/24			4
							RU-106	L.T. 3. E-01		09/24			4
							RU-106	1.8 +-20.1E-02		09/24			4
							I-131	L.T. 1. E-01		09/24			4
							I-131 -	2.6 +- 8.7E-02		09/24			4
							CS-134	L.T. 4. E-02		09/24			4
							CS-134	4.1 +-229.E-04		09/24			4
							CS-137	L.T. 4. E-02		09/24			4
							CS-137	1.5 +- 2.3E-02		09/24			4
							BA-140	L.T. 8. E-02		09/24			4
							BA-140 -	8.3 +-48.8E-03		09/24			4
							CE-141	L.T. 6. E-02		09/24			4
							CE-141 -	1.7 +- 3.6E-02		09/24			4
							CE-144	L.T. 2. E-01		09/24			4
							CE-144 -	3.4 +-11.7E-02		09/24			4
							EU-152	L.T. 1. E-01		09/24			4
							EU-152 -	6.4 +- 6.4E-02		09/24			4
							EU-154	L.T. 1. E-01		09/24			4

TELEDYNE ISOTOPES

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S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26052	9309L885-004	B08YM2	09/07				EU-154 -	1.5 +-64.4E-03		09/24			4
							EU-155	L.T. 1. E-01		09/24			4
							EU-155 -	4.1 +- 0.6E-01		09/24			4
							RA-226	L.T. 6. E-01		09/24			4
							RA-226 -	1.1 +- 3.7E-01		09/24			4
							TH-228	L.T. 6. E-02		09/24			4
							TH-228	2.3 +- 3.4E-02		09/24			4
							TH-234	L.T. 6. E-01		09/24			4
							TH-234 -	2.3 +- 3.8E-01		09/24			4
							TOTAL-U	L.T. 6. E-01		09/24			4
							TOTAL-U-	2.34+-3.81E-01		09/24			4
26053	9309L885-005	B08YM3	09/07				SR-90	2.1 +-0.6 E-02		10/20		4.97 *	3
							TC-99	L.T. 4. E-01		10/07			3
							TC-99	2.0 +-2.56E-01		10/07			3
							SR-90	L.T. 7. E-03		10/20			3
							BE-7	L.T. 5. E-01		09/25			4
							BE-7	1.1 +- 3.2E-01		09/25			4
							K-40	4.49+-0.45E 01		09/25			4
							K-40	L.T. 3. E 00		09/25			4
							MN-54	L.T. 6. E-02		09/25			4
							MN-54	3.7 +- 3.4E-02		09/25			4
							CO-58	L.T. 6. E-02		09/25			4
							CO-58 -	2.2 +- 3.8E-02		09/25			4
							FE-59	L.T. 2. E-01		09/25			4
							FE-59 -	3.8 +- 9.3E-02		09/25			4
							CO-60	L.T. 5. E-02		09/25			4
							CO-60	1.6 +-31.9E-03		09/25			4
							ZN-65	L.T. 1. E-01		09/25			4
							ZN-65 -	3.6 +- 8.5E-02		09/25			4
							ZR-95	L.T. 7. E-02		09/25			4
							ZR-95	3.7 +- 4.0E-02		09/25			4

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/28/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 8
4-3831	LL-1140-F4	09/14/93	10/17/93	

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WESTON/WESTINGHOUSE/HANFORD
208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26053	9309L885-005	B08YM3	09/07				RU-103	L.T. 7. E-02		09/25			4
							RU-103	6.7 +-40.5E-03		09/25			4
							RU-106	L.T. 5. E-01		09/25			4
							RU-106	8.6 +-31.9E-02		09/25			4
							I-131	L.T. 2. E-01		09/25			4
							I-131	3.3 +-141.E-03		09/25			4
							CS-134	L.T. 6. E-02		09/25			4
							CS-134 -	9.0 +-36.6E-03		09/25			4
							CS-137	L.T. 6. E-02		09/25			4
							CS-137	2.7 +- 3.7E-02		09/25			4
							BA-140	L.T. 1. E-01		09/25			4
							BA-140 -	4.1 +- 6.8E-02		09/25			4
							CE-141	L.T. 9. E-02		09/25			4
							CE-141	8.8 +-55.3E-03		09/25			4
							CE-144	L.T. 3. E-01		09/25			4
							CE-144 -	8.1 +-17.7E-02		09/25			4
							EU-152	L.T. 2. E-01		09/25			4
							EU-152 -	1.0 +- 1.0E-01		09/25			4
							EU-154	L.T. 2. E-01		09/25			4
							EU-154	0.0 +- 1.1E-01		09/25			4
							EU-155	L.T. 2. E-01		09/25			4
							EU-155 -	7.3 +- 0.9E-01		09/25			4
							RA-226	L.T. 1. E 00		09/25			4
							RA-226	1.4 +- 5.5E-01		09/25			4
							TH-228	L.T. 1. E-01		09/25			4
							TH-228	6.9 +- 5.5E-02		09/25			4
							TH-234	L.T. 1. E 00		09/25			4
							TH-234 -	9.0 +- 5.6E-01		09/25			4
							TOTAL-U	L.T. 1. E 00		09/25			4
							TOTAL-U-	9.03+-5.64E-01		09/25			4

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

170.

Refrigerator #

#/Type Container

Volume

Preservatives

ANALYSES REQUESTED →

Date Rec'd _____ Date Due _____

Account # _____

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb			INORG Metal	CN						

WESTON Analytics Use Only

SEE BELOW

RFW#

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

Radiochem = Gamma Spec, Sr-90, Total U-, Tc-99

DATE/REVISIONS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Relinquished by	Received by	Date	Time
[illegible] 9-13-93	[illegible]	9-13-93	16:20
[illegible]	[illegible]	9-13-93	16:20

Relinquished by	Received by	Date	Time
	D. Jackson	9/14/93	1200

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

WESTON Analytics Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# _____ 381-596a

97 1520 2189

9413520.2190

MEMORANDUM

TO: 200 Area Biota Project QA Record April 9, 1994

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: 26049-WES-1334 (923-E416, Filename 26049RAD.BIO)

INTRODUCTION

This memo presents the results of data validation on data package 26049-WES-1334 consisting of five (5) solid (vegetation) samples submitted for radiochemistry analysis. The samples were analyzed by the Teledyne Isotopes laboratory using WHC approved methods. A list of samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B08YJ0	08/02/93	SOLID (Vegetation)	SEE NOTE 1
B08YM0*	09/07/93	SOLID (Vegetation)	
B08YM1	09/07/93	SOLID (Vegetation)	
B08YM2	09/07/93	SOLID (Vegetation)	
B08YM3	09/07/93	SOLID (Vegetation)	

* Indicates sample which received 100% validation.
Note 1. All samples were analyzed for technetium-99, strontium-90, total uranium and gamma spectroscopy.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1992). This validation report has been technically reviewed against the revised validation procedures (WHC 1993b) and where appropriate, changes to qualifications have been made. Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Revised 4/11/94

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of five samples were validated in this data package with a total of 125 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following deficiencies were identified during data validation which required qualification of data as estimated.

Chemical Yield

- Technetium-99 chemical yield for samples B08YJ0, B08YM1, and B08YJ0 (duplicate) were less than 30% but greater than 10%. Therefore, the associated results have been qualified as estimated (UJ).

DATA REPORTING

- Sample results reported as less than (L.T.) by the laboratory have been qualified as undetected (U) on the laboratory results form (see Attachment 3).
- Secondary results reported by the laboratory have been crossed out, initialed and dated to clarify reported laboratory results (see Attachment 3).

REFERENCES

WHC 1992, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 0, 1992. Westinghouse Hanford Company, Richland, Washington.

WHC 1993a, Validation of 200 Area Biota Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-16, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

Revised 4/11/94

9713520.2192

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713520.2194

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: 26049-WES-1334	VALIDATOR:	DATE: April 9, 1994	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
TECHNETIUM-99	UJ	B08YJ0 B08YM1 B08YJ0 DUPLICATE	CHEMICAL YIELD < 30% BUT > 10%

Revised 4/11/94

·006

9715520.2196

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: 26049-WES-1334

	Samp#	B08YJ0		B08YM0		B08YM1		B08YM2		B08YM3	
	Date	8-2-93		9-7-93		9-7-93		9-7-93		9-7-93	
	Location	216-A-24		SADDLE LAKE		SADDLE LAKE		SADDLE LAKE		SADDLE LAKE	
	Type	CHEATGRASS		CHEATGRASS		WILLOW		CATTAIL		RUSSIAN THIS.	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
STRONTIUM-90	pCi/g	1.200		0.072		0.050		0.020	U	0.021	
TECHNETIUM-99	pCi/g	0.900	UJ	0.500	U	0.600	UJ	0.500	U	0.400	U
BERYLLIUM-7	pCi/g	8.690		4.030		1.490		0.300	U	0.500	U
POTASSIUM-40	pCi/g	5.910		5.900		7.260		7.150		44.900	
MANGANESE-54	pCi/g	0.060	U	0.040	U	0.020	U	0.040	U	0.060	U
COBALT-58	pCi/g	0.080	U	0.040	U	0.030	U	0.040	U	0.060	U
IRON-59	pCi/g	0.200	U	0.080	U	0.060	U	0.080	U	0.200	U
COBALT-60	pCi/g	0.050	U	0.030	U	0.020	U	0.030	U	0.050	U
ZINC-65	pCi/g	0.100	U	0.080	U	0.050	U	0.070	U	0.100	U
ZIRCONIUM-95	pCi/g	0.090	U	0.040	U	0.030	U	0.040	U	0.070	U
RUTHENIUM-103	pCi/g	0.100	U	0.040	U	0.030	U	0.040	U	0.070	U
RUTHENIUM-106	pCi/g	0.500	U	0.300	U	0.200	U	0.300	U	0.500	U
IODINE-131	pCi/g	5.000	U	0.100	U	0.100	U	0.100	U	0.200	U
CESIUM-134	pCi/g	0.060	U	0.040	U	0.030	U	0.040	U	0.060	U
CESIUM-137	pCi/g	0.780		0.046		0.030	U	0.040	U	0.060	U
BARIUM-140	pCi/g	0.800	U	0.080	U	0.050	U	0.080	U	0.100	U
CERIUM-141	pCi/g	0.200	U	0.060	U	0.040	U	0.060	U	0.090	U
CERIUM-144	pCi/g	0.300	U	0.200	U	0.100	U	0.200	U	0.300	U
EUROPIUM-152	pCi/g	0.200	U	0.100	U	0.070	U	0.100	U	0.200	U
EUROPIUM-154	pCi/g	0.100	U	0.200	U	0.080	U	0.100	U	0.200	U
EUROPIUM-155	pCi/g	0.200	U	0.100	U	0.070	U	0.100	U	0.200	U
RADIUM-226	pCi/g	1.000	U	0.700	U	0.500	U	0.600	U	1.000	U
THORIUM-228	pCi/g	0.327		0.308		0.059		0.060	U	0.100	U
THORIUM-234	pCi/g	1.000	U	0.700	U	0.500	U	0.600	U	1.000	U
TOTAL URANIUM	pCi/g	1.000	U	0.700	U	0.500	U	0.600	U	1.000	U

Revised 4/11/94

Verified 4/11/94

008

SDG 26049-WES-1334

TELEDYNE ISOTOPES

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4-3831	LL-1140-F4	09/14/93	10/17/93	1

MRS JOSIE EDWARDS
WESTON/WESTINGHOUSE/HANFORD
208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	Q	LAB.
26049	9309L885-001	B08YJ0	08/02				SR-90	1.2 +-0.1 E 00		10/20		10.82 *		3
							TC-99	L.T. 9. E-01		10/07			UJ	3
							~~TC-99~~	~~1.1 +-5.41E-01~~		~~10/07~~				3
							~~SR-90~~	~~L.T. 5. E-02~~		~~10/20~~				3
							BE-7	8.69+-0.87E 00		09/24				4
							~~BE-7~~	~~L.T. 1. E 00~~		~~09/24~~				4
							K-40	5.91+-0.59E 00		09/24				4
							~~K-40~~	~~L.T. 2. E 00~~		~~09/24~~				4
							MN-54	L.T. 6. E-02		09/24			U	4
							~~MN-54~~	~~6.8 +-34.1E-03~~		~~09/24~~				4
							CO-58	L.T. 8. E-02		09/24			U	4
							~~CO-58~~	~~4.9 +- 5.0E-02~~		~~09/24~~				4
							FE-59	L.T. 2. E-01		09/24			U	4
							~~FE-59~~	~~6.1 +-124.E-03~~		~~09/24~~				4
							CO-60	L.T. 5. E-02		09/24			U	4
							~~CO-60~~	~~2.2 +- 2.8E-02~~		~~09/24~~				4
							ZN-65	L.T. 1. E-01		09/24			U	4
							~~ZN-65~~	~~1.1 +- 7.0E-02~~		~~09/24~~				4
							ZR-95	L.T. 9. E-02		09/24			U	4
							~~ZR-95~~	~~2.9 +- 5.1E-02~~		~~09/24~~				4
							RU-103	L.T. 1. E-01		09/24			U	4
							~~RU-103~~	~~4.9 +- 7.0E-02~~		~~09/24~~				4
							RU-106	L.T. 5. E-01		09/24			U	4
							~~RU-106~~	~~1.3 +- 3.1E-01~~		~~09/24~~				4
							I-131	L.T. 5. E 00		09/24			U	4
							~~I-131~~	~~8.2 +-28.0E-01~~		~~09/24~~				4
							CS-134	L.T. 6. E-02		09/24			U	4
							~~CS-134~~	~~6.9 +-351.E-04~~		~~09/24~~				4
							CS-137	7.80+-0.78E-01		09/24				4
							~~CS-137~~	~~L.T. 1. E-01~~		~~09/24~~				4
							BA-140	L.T. 8. E-01		09/24			U	4
							~~BA-140~~	~~2.1 +- 4.8E-01~~		~~09/24~~				4

216-A-24
Cheatgrass

Verified 2/9/94

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

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MRS JOSIE EDWARDS
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208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

Q

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26049	9309L885-001	B08YJ0	08/02				CE-141	L.T. 2. E-01		09/24	U		4
							~~CE-141~~	~~4.5 +- 11.4E-02~~		~~09/24~~			4
							CE-144	L.T. 3. E-01		09/24	U		4
							~~CE-144~~	~~4.0 +-18.8E-02~~		~~09/24~~			4
							EU-152	L.T. 2. E-01		09/24	U		4
							~~EU-152~~	~~2.9 +- 1.0E-01~~		~~09/24~~			4
							EU-154	L.T. 1. E-01		09/24	U		4
							~~EU-154~~	~~4.9 +- 9.1E-02~~		~~09/24~~			4
							EU-155	L.T. 2. E-01		09/24	U		4
							~~EU-155~~	~~5.1 +- 0.9E-01~~		~~09/24~~			4
							RA-226	L.T. 1. E 00		09/24	U		4
							~~RA-226~~	~~1.6 +- 5.6E-01~~		~~09/24~~			4
							TH-228	3.27+-0.47E-01		09/24			4
							~~TH-228~~	~~L.T. 1. E-01~~		~~09/24~~			4
							TH-234	L.T. 1. E 00		09/24	U		4
							~~TH-234~~	~~7.6 +- 5.6E-01~~		~~09/24~~			4
							TOTAL-U	L.T. 1. E 00		09/24	U		4
							~~TOTAL-U~~	~~7.58+-5.61E-01~~		~~09/24~~			4
26050	9309L885-002	B08YM0	09/07				SR-90	7.2 +-2.3 E-02		10/20		8.76 *	3
							TC-99	L.T. 5. E-01		10/07	U		3
							~~TC-99~~	~~2.3 +-3.44E-01~~		~~10/07~~			3
							~~SR-90~~	~~L.T. 2. E-02~~		~~10/20~~			3
							BE-7	4.03+-0.40E 00		09/24			4
							~~BE-7~~	~~L.T. 6. E-01~~		~~09/24~~			4
							K-40	5.90+-0.59E 00		09/24			4
							~~K-40~~	~~L.T. 1. E 00~~		~~09/24~~			4
							MN-54	L.T. 4. E-02		09/24	U		4
							~~MN-54~~	~~6.5 +-22.3E-03~~		~~09/24~~			4
							CO-58	L.T. 4. E-02		09/24	U		4
							~~CO-58~~	~~7.8 +-24.4E-03~~		~~09/24~~			4
							FE-59	L.T. 8. E-02		09/24	U		4

216-A-24
Cheatgrass

Saddle Lake
Cheatgrass

Verified
2/9/94

010

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

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S O L I D S

Q

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26050	9309L885-002	B08YM0	09/07				~~FE-59~~	~~2.5 +- 4.9E-02~~		~~09/24~~			4
							CO-60	L.T. 3. E-02		09/24	U		4
							~~CO-60~~	~~1.6 +- 2.0E-02~~		~~09/24~~			4
							ZN-65	L.T. 8. E-02		09/24	U		4
							~~ZN-65~~	~~6.2 +-45.7E-03~~		~~09/24~~			4
							ZR-95	L.T. 4. E-02		09/24	U		4
							~~ZR-95~~	~~3.1 +- 2.6E-02~~		~~09/24~~			4
							RU-103	L.T. 4. E-02		09/24	U		4
							~~RU-103~~	~~1.2 +- 2.6E-02~~		~~09/24~~			4
							RU-106	L.T. 3. E-01		09/24	U		4
							~~RU-106~~	~~1.0 +- 2.1E-01~~		~~09/24~~			4
							I-131	L.T. 1. E-01		09/24	U		4
							~~I-131~~	~~1.0 +- 8.9E-02~~		~~09/24~~			4
							CS-134	L.T. 4. E-02		09/24	U		4
							~~CS-134~~	~~6.1 +-24.2E-03~~		~~09/24~~			4
							CS-137	4.60+-2.12E-02		09/24			4
							~~CS-137~~	~~L.T. 4. E-02~~		~~09/24~~			4
							BA-140	L.T. 8. E-02		09/24	U		4
							~~BA-140~~	~~1.2 +- 5.2E-02~~		~~09/24~~			4
							CE-141	L.T. 6. E-02		09/24	U		4
							~~CE-141~~	~~1.7 +- 3.7E-02~~		~~09/24~~			4
							CE-144	L.T. 2. E-01		09/24	U		4
							~~CE-144~~	~~1.3 +- 1.2E-01~~		~~09/24~~			4
							EU-152	L.T. 1. E-01		09/24	U		4
							~~EU-152~~	~~3.8 +- 0.8E-01~~		~~09/24~~			4
							EU-154	L.T. 2. E-01		09/24	U		4
							~~EU-154~~	~~1.1 +- 0.8E-01~~		~~09/24~~			4
							EU-155	L.T. 1. E-01		09/24	U		4
							~~EU-155~~	~~5.0 +- 0.7E-01~~		~~09/24~~			4
							RA-226	L.T. 7. E-01		09/24	U		4
							~~RA-226~~	~~2.5 +- 4.0E-01~~		~~09/24~~			4
							TH-228	3.08+-0.33E-01		09/24			4

Saddle Lake
Cheatgrass

Verified
2/9/94

011

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/28/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
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MRS JOSIE EDWARDS
WESTON/WESTINGHOUSE/HANFORD
208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

Q

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26050	9309L885-002	B08YM0	09/07				~~TH-228~~	~~L.T. 8. E-02~~		~~09/24~~			4
							TH-234	L.T. 7. E-01		09/24	U		4
							~~TH-234~~	~~8.8 +- 4.2E-01~~		~~09/24~~			4
							TOTAL-U	L.T. 7. E-01		09/24	U		4
							~~TOTAL-U~~	~~8.76+-4.24E-01~~		~~09/24~~			4
26051	9309L885-003	B08YM1	09/07				SR-90	5.0 +-0.9 E-02		10/20		6.14 *	3
							TC-99	L.T. 6. E-01		10/07 ~~UR~~		UJ	3
							~~TC-99~~	~~3.1 +-34.9E-02~~		~~10/07~~			3
							~~SR-90~~	~~L.T. 7. E-03~~		~~10/20~~			3
							BE-7	1.49+-0.20E 00		09/24			4
							~~BE-7~~	~~L.T. 3. E-01~~		~~09/24~~			4
							K-40	7.26+-0.73E 00		09/24			4
							~~K-40~~	~~L.T. 1. E 00~~		~~09/24~~			4
							MN-54	L.T. 2. E-02		09/24	U		4
							~~MN-54~~	~~1.4 +-14.8E-03~~		~~09/24~~			4
							CO-58	L.T. 3. E-02		09/24	U		4
							~~CO-58~~	~~2.3 +-17.6E-03~~		~~09/24~~			4
							FE-59	L.T. 6. E-02		09/24	U		4
							~~FE-59~~	~~9.7 +-37.1E-03~~		~~09/24~~			4
							CO-60	L.T. 2. E-02		09/24	U		4
							~~CO-60~~	~~8.1 +-140.E-04~~		~~09/24~~			4
							ZN-65	L.T. 5. E-02		09/24	U		4
							~~ZN-65~~	~~2.9 +-32.1E-03~~		~~09/24~~			4
							ZR-95	L.T. 3. E-02		09/24	U		4
							~~ZR-95~~	~~8.4 +-16.8E-03~~		~~09/24~~			4
							RU-103	L.T. 3. E-02		09/24	U		4
							~~RU-103~~	~~8.1 +-17.6E-03~~		~~09/24~~			4
							RU-106	L.T. 2. E-01		09/24	U		4
							~~RU-106~~	~~1.6 +-14.1E-02~~		~~09/24~~			4
							I-131	L.T. 1. E-01		09/24	U		4
							~~I-131~~	~~7.0 +-59.2E-03~~		~~09/24~~			4

Saddle Lake
Willow

verified 2/9/94

012

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

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MRS JOSIE EDWARDS
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PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

Q

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26051	9309L885-003	B08YM1	09/07				CS-134	L.T. 3. E-02		09/24	u		4
							~~CS-134~~	~~8.6 +-16.0E-03~~		~~09/24~~			4
							CS-137	L.T. 3. E-02		09/24	u		4
							~~CS-137~~	~~0.0 +- 1.6E-02~~		~~09/24~~			4
							BA-140	L.T. 5. E-02		09/24	u		4
							~~BA-140~~	~~3.8 +-32.6E-03~~		~~09/24~~			4
							CE-141	L.T. 4. E-02		09/24	u		4
							~~CE-141~~	~~3.2 +- 2.4E-02~~		~~09/24~~			4
							CE-144	L.T. 1. E-01		09/24	u		4
							~~CE-144~~	~~3.0 +- 7.8E-02~~		~~09/24~~			4
							EU-152	L.T. 7. E-02		09/24	u		4
							~~EU-152~~	~~3.2 +- 4.5E-02~~		~~09/24~~			4
							EU-154	L.T. 8. E-02		09/24	u		4
							~~EU-154~~	~~3.1 +- 4.8E-02~~		~~09/24~~			4
							EU-155	L.T. 7. E-02		09/24	u		4
							~~EU-155~~	~~3.6 +- 0.4E-01~~		~~09/24~~			4
							RA-226	L.T. 5. E-01		09/24	u		4
							~~RA-226~~	~~2.2 +- 2.7E-01~~		~~09/24~~			4
							TH-228	5.86+-2.16E-02		09/24			4
							~~TH-228~~	~~L.T. 4. E-02~~		~~09/24~~			4
							TH-234	L.T. 5. E-01		09/24	u		4
							~~TH-234~~	~~4.1 +- 2.7E-01~~		~~09/24~~			4
							TOTAL-U	L.T. 5. E-01		09/24	u		4
							~~TOTAL-U~~	~~4.09+-2.72E-01~~		~~09/24~~			4
26052	9309L885-004	B08YM2	09/07				SR-90	L.T. 2. E-02		10/20	u	9.23 *	3
							TC-99	L.T. 5. E-01		10/07	u		3
							~~TC-99~~	~~7.1 +-27.1E-02~~		~~10/07~~			3
							~~SR-90~~	~~2.0 +-1.62E-02~~		~~10/20~~			3
							BE-7	L.T. 3. E-01		09/24	u		4
							~~BE-7~~	~~2.9 +-198.5E-03~~		~~09/24~~			4
							K-40	7.15+-0.71E 00		09/24			4

Saddle Lake
willow

Saddle Lake
Cattail

verified
2/9/94

013

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

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PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

Q

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26052	9309L885-004	B08YM2	09/07				~~K-40~~	~~L.T. 1. E-00~~		~~09/24~~			4
							MN-54	L.T. 4. E-02		09/24	U		4
							~~MN-54~~	~~1.2 +- 2.1E-02~~		~~09/24~~			4
							CO-58	L.T. 4. E-02		09/24	U		4
							~~CO-58~~	~~1.7 +- 2.4E-02~~		~~09/24~~			4
							FE-59	L.T. 8. E-02		09/24	U		4
							~~FE-59~~	~~2.3 +- 5.1E-02~~		~~09/24~~			4
							CO-60	L.T. 3. E-02		09/24	U		4
							~~CO-60~~	~~3.2 +-20.5E-03~~		~~09/24~~			4
							ZN-65	L.T. 7. E-02		09/24	U		4
							~~ZN-65~~	~~1.9 +- 4.5E-02~~		~~09/24~~			4
							ZR-95	L.T. 4. E-02		09/24	U		4
							~~ZR-95~~	~~1.9 +- 2.5E-02~~		~~09/24~~			4
							RU-103	L.T. 4. E-02		09/24	U		4
							~~RU-103~~	~~1.4 +- 2.5E-02~~		~~09/24~~			4
							RU-106	L.T. 3. E-01		09/24	U		4
							~~RU-106~~	~~1.8 +-20.1E-02~~		~~09/24~~			4
							I-131	L.T. 1. E-01		09/24	U		4
							~~I-131~~	~~2.6 +- 8.7E-02~~		~~09/24~~			4
							CS-134	L.T. 4. E-02		09/24	U		4
							~~CS-134~~	~~4.1 +-229.E-04~~		~~09/24~~			4
							CS-137	L.T. 4. E-02		09/24	U		4
							~~CS-137~~	~~1.5 +- 2.3E-02~~		~~09/24~~			4
							BA-140	L.T. 8. E-02		09/24	U		4
							~~BA-140~~	~~8.3 +-48.8E-03~~		~~09/24~~			4
							CE-141	L.T. 6. E-02		09/24	U		4
							~~CE-141~~	~~1.7 +- 3.6E-02~~		~~09/24~~			4
							CE-144	L.T. 2. E-01		09/24	U		4
							~~CE-144~~	~~3.4 +-11.7E-02~~		~~09/24~~			4
							EU-152	L.T. 1. E-01		09/24	U		4
							~~EU-152~~	~~6.4 +- 6.4E-02~~		~~09/24~~			4
							EU-154	L.T. 1. E-01		09/24	U		4

Saddle Lake
Cattail

verified
2/9/94

014

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

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MRS JOSIE EDWARDS
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208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26052	9309L885-004	B08YM2	09/07				~~EU-154~~	~~1.5 +-64.4E-03~~		~~09/24~~			4
							EU-155	L.T. 1. E-01		09/24	U		4
							~~EU-155~~	~~4.1 +- 0.6E-01~~		~~09/24~~			4
							RA-226	L.T. 6. E-01		09/24	U		4
							~~RA-226~~	~~1.1 +- 3.7E-01~~		~~09/24~~			4
							TH-228	L.T. 6. E-02		09/24	U		4
							~~TH-228~~	~~2.3 +- 3.4E-02~~		~~09/24~~			4
							TH-234	L.T. 6. E-01		09/24	U		4
							~~TH-234~~	~~2.3 +- 3.8E-01~~		~~09/24~~			4
							TOTAL-U	L.T. 6. E-01		09/24	U		4
							~~TOTAL-U~~	~~2.34+-3.81E-01~~		~~09/24~~			4
26053	9309L885-005	B08YM3	09/07				SR-90	2.1 +-0.6 E-02		10/20		4.97 *	3
							TC-99	L.T. 4. E-01		10/07	U		3
							~~TC-99~~	~~2.0 +-2.56E-01~~		~~10/07~~			3
							~~SR-90~~	~~L.T. 7. E-03~~		~~10/20~~			3
							BE-7	L.T. 5. E-01		09/25	U		4
							~~BE-7~~	~~1.1 +- 3.2E-01~~		~~09/25~~			4
							K-40	4.49+-0.45E 01		09/25			4
							~~K-40~~	~~L.T. 3. E 00~~		~~09/25~~			4
							MN-54	L.T. 6. E-02		09/25	U		4
							~~MN-54~~	~~3.7 +- 3.4E-02~~		~~09/25~~			4
							CO-58	L.T. 6. E-02		09/25	U		4
							~~CO-58~~	~~2.2 +- 3.8E-02~~		~~09/25~~			4
							FE-59	L.T. 2. E-01		09/25	U		4
							~~FE-59~~	~~3.8 +- 9.3E-02~~		~~09/25~~			4
							CO-60	L.T. 5. E-02		09/25	U		4
							~~CO-60~~	~~1.6 +-31.9E-03~~		~~09/25~~			4
							ZN-65	L.T. 1. E-01		09/25	U		4
							~~ZN-65~~	~~3.6 +- 8.5E-02~~		~~09/25~~			4
							ZR-95	L.T. 7. E-02		09/25	U		4
							~~ZR-95~~	~~3.7 +- 4.0E-02~~		~~09/25~~			4

Saddle Lake
Cattail

Saddle Lake
Russian thistle

Verified
2/9/94

015

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/28/93

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PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O L I D S

Q

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM WET)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26053	9309L885-005	B08YM3	09/07				RU-103	L.T. 7. E-02		09/25	U		4
							~~RU-103~~	~~6.7 +- 40.5E-03~~		~~09/25~~			4
							RU-106	L.T. 5. E-01		09/25	U		4
							~~RU-106~~	~~8.6 +- 31.9E-02~~		~~09/25~~			4
							I-131	L.T. 2. E-01		09/25	U		4
							~~I-131~~	~~3.3 +- 141.E-03~~		~~09/25~~			4
							CS-134	L.T. 6. E-02		09/25	U		4
							~~CS-134~~	~~9.0 +- 36.6E-03~~		~~09/25~~			4
							CS-137	L.T. 6. E-02		09/25	U		4
							~~CS-137~~	~~2.7 +- 3.7E-02~~		~~09/25~~			4
							BA-140	L.T. 1. E-01		09/25	U		4
							~~BA-140~~	~~4.1 +- 6.8E-02~~		~~09/25~~			4
							CE-141	L.T. 9. E-02		09/25	U		4
							~~CE-141~~	~~8.8 +- 55.3E-03~~		~~09/25~~			4
							CE-144	L.T. 3. E-01		09/25	U		4
							~~CE-144~~	~~8.1 +- 17.7E-02~~		~~09/25~~			4
							EU-152	L.T. 2. E-01		09/25	U		4
							~~EU-152~~	~~1.0 +- 1.0E-01~~		~~09/25~~			4
							EU-154	L.T. 2. E-01		09/25	U		4
							~~EU-154~~	~~0.0 +- 1.1E-01~~		~~09/25~~			4
							EU-155	L.T. 2. E-01		09/25	U		4
							~~EU-155~~	~~7.3 +- 0.9E-01~~		~~09/25~~			4
							RA-226	L.T. 1. E 00		09/25	U		4
							~~RA-226~~	~~1.4 +- 5.5E-01~~		~~09/25~~			4
							TH-228	L.T. 1. E-01		09/25	U		4
							~~TH-228~~	~~6.9 +- 5.5E-02~~		~~09/25~~			4
							TH-234	L.T. 1. E 00		09/25	U		4
							~~TH-234~~	~~9.0 +- 5.6E-01~~		~~09/25~~			4
							TOTAL-U	L.T. 1. E 00		09/25	U		4
							~~TOTAL-U~~	~~9.03+-5.64E-01~~		~~09/25~~			4

Saddle Lake

Russian Thistle

verified

2/9/94

016

971620.2306

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9715520.2607

TELEDYNE ISOTOPES
50 VAN BUREN AVENUE
PO BOX 1235
WESTWOOD NJ 07675-1235
(201) 664-7070

WESTON/WESTINGHOUSE/HANFORD

Case Narrative/Cover Sheet for Reports of Analysis and Lab Data

Date 11/01/93

TI #'s 26049 - 26056

WO # 4-3831

RECORD COPY

NOV 1993 RECEIVED SDLA

Comments:

There were no unusual occurrences with these samples.

Contents:

	Procedure #'s	Bench & Work Sheet Pages	Calibration Pages	Tracers/ Carrier Pages
Reports of Analysis		13		
Sr-90	PRO-032-16	10	48	2
Gamma	PRO-042-5	16	12	
Tc-99	PRO-032-78	9	57	1
C-O-C		1		
Other		-		

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature." A. J. Hogan

Spike Activity for TI #26056

Nuclide	Activity pCi/l	Acceptable Range
Technetium-99	98.5	79. - 118.
Strontium-90	80.	68. - 92.
Cobalt-60	2.5 E 04	1.7 - 3.2 E 04
Cesium-137	2.16 E 04	1.51 - 2.81 E 04

9213520.2208

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator Jon Lucas

Company Contact Jon Lucas

Telephone 509-376-2789

Project Designation/Sampling Locations 200 Biota Investigation

Collection Date 8-2-93 & 9-7-93

Ice Chest No. 216-A-24 & Saddle Mountain Lake B-1

Field Logbook No. EFL-1094

Bill of Lading/Airbill No. 997 333024

Offsite Property No. W93-0-0667-5

Method of Shipment Burlington

Shipped to Weston Lionville, PA

Possible Sample Hazards/Remarks None

Sample Identification

B08YJ0
~~B08YL9~~
B08YM0
B08YM1
B08YM2
B08YM3

9-10-93

1 paper bag of vegetation per sample #

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
[signature]	9-10-93				
Burlington Air	9-11-93	11:20	Bob Burnett	9-11-93	11:20

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/92) WEF061

~~020~~

019

~~0005~~

9715520.2209

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

PROJECT: 200 Area Biota	VALIDATOR: [illegible] DATE: 2/09/94
LABORATORY: Weston/Teledyne	DATA PACKAGE: 26049-WES-1334
SAMPLES/MATRIX: Solids	
B08YJ0 B08YM3	
B08YM0	
B08YM1	
B08YM2	

1. Completeness

1.1 Completeness Checklist (Complete the appropriate checklist for each analysis type and attach).

2. Calibration

2.1 Initial Calibration

Was instrument calibrated within specified time period or annually? (Yes) No N/A

If NO, qualify all associated data as unusable (R).

Was each detector used for the associated data calibrated? (Yes) No N/A

If NO, qualify all associated data as unusable (R).

Are calibration standards NIST traceable or equivalent? (Yes) No N/A

If NO, qualify all associated data as unusable (R).

Were calibration standards expired? Yes (No) N/A

If YES, qualify all associated data as unusable (R).

Comments:

2.2 Continuing Calibration

Is check source identified by activity and radionuclides? Yes No N/A

If NO, qualify all associated data as estimated (J).

2/8/94 Has check source been counted ~~daily?~~ regularly? Yes No N/A

If NO, qualify all associated data as unusable (R).

Are check source counts within ±3S control limits? Yes No N/A

If NO, qualify all associated data as unusable (R).

Have background counts been performed at least weekly and before and after all field and QC samples associated with the SDG? Yes No N/A

If NO, qualify all associated results as unusable (R).

Are background counts within ±3S control limits? Yes No N/A

If NO, qualify all associated results as unusable (R).

Comments:

3. Blanks

Have reagent/method/field blanks been analyzed with the SDG? Yes No N/A

If NO, qualify all results >LLD as estimated (J).

Are positive results reported in the reagent/method/field blanks? Yes No N/A

If YES, qualify positive results less than the MDA as nondetects (U). Qualify sample results <10X the blank value but greater than the MDA as estimated (J).

Can blank results be verified/calculated properly? Yes No N/A

Comments:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

4. Detection Limits and Sample Results

Can LLDs and MDAs be verified? Yes No N/A

If NO, qualify all results as estimated detects (J) or estimated nondetects (UJ).

Do reported results meet the detection limit requirements? Yes No N/A

Note discrepancies in the validation report narrative.

Can reported results be verified? Yes No N/A

If NO, note missing data in the validation report. Correct results on the photocopied report forms and include in the validation report.

Comments:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

5. Radiometric and Gravimetric Yields

Were spikes/tracers/chemical yields analyzed in each SDG and/or sample as appropriate for the analytical method? (Yes) No N/A

If NO or if inappropriate tracers were used qualify associated results as unusable (R).

Was a field blank used for the spike/tracer/chemical yield analysis? Yes (No) N/A

If YES, note in the validation narrative.

Is spike/tracer/chemical yield recovery within the limits of 30-105% for sample results <4X the spike activity? Yes (No) N/A

Verify the spike recoveries and qualify associated results as follows:

%R:	<30%	30-105%	>105%	>115%
<LLD	R	acceptable	UJ	R
~~>LLD~~	R	acceptable	J	R

Not Applic. See Page 5-6 of WHC-SD-EN-SPP-001 Rev. 1, 1993.

Comments:

All chemical yields are within the control limits with the exception of:

Parameter	Sample	chemical yield (%)	Qualifier
Tc-99	B084J0	17.2%	~~UR~~ UJ*
	B084M1	28.5%	~~UR~~ UJ*
	B084J0 Dup	27.9%	~~UR~~ UJ*

As Per WHC-SD-EN-SPP-001, Rev 1 UJ for yields between 10-30%

MAS 2/10/94

6. Duplicate Samples and Analyses

Has at least one duplicate analysis been performed for every 10 samples in the SDG? Yes No N/A

If NO, qualify all associated results as estimated (J).

Has the field blank been used for duplicate or MS/MSD analysis? Yes No N/A

Are RPD values ≤35% for results >5X the LLD and within ±2X the LLD for results <5X the LLD? Yes No N/A

If NO, qualify associated results <LLD as estimated nondetects (UJ) and all associated results >LLD as estimated detects (J).

Comments:

LABORATORY DUPLICATE PRECISION CALCULATION WORKSHEET 07-Feb-94

FILENAME: 26049-LD.WK1

SDG NO.: 26049-WES-1334

SAMPLE ID: B08YJ0
DUPLICATE SAMPLE ID: B08YJ0 DUP

PARAMETER	SAMPLE RESULT	DUPLICATE RESULT	RPD	QUALIFIER APPLIED
STRONTIUM-90	1.2	1.4	15	NONE
BERYLLIUM-7	8.69	8.35	4	NONE
POTASSIUM-40	5.91	6.02	2	NONE
CESIUM-137	0.78	0.797	2	NONE
THORIUM-228	0.327	0.251	26	NONE

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

7. Laboratory Control Samples

Are LCS results within the control limits of 80-120% — Yes No N/A

If NO, qualify results as follows:

%R:	<50%	50-79%	>120%
Results < LLD:	R	UJ	R
Results > LLD:	R	J	R

Has at least one LCS been analyzed with the SDG? — Yes No N/A

If NO, qualify all associated results as estimated (J).

Comments:

2/9/94

Europium-155 is present in the laboratory spike, however, it is not a spiked ~~compound~~ radionuclide. Since Eu-155 was not ~~present~~ detected in any other associated sample or in the lab blank, it may be laboratory contamination. No qualification is required.

2/10/94

4/9/94

~~Gamma spec LCS was analyzed in a different geometry than the associated samples, therefore, all gamma spec results have been qualified as estimated (J/UJ).~~

4/8/94

Gamma spec samples, LCS, and blanks were all analyzed in Marinelli geometry. No qualification is required. 4/9/94

Revised 4/12/94

FILENAME: 26049-QC.WK1

SDG NO.: 26049-WES-1334

SAMPLE: LABORATORY BLANK (TI# 26055)
SPIKE SAMPLE: LABORATORY BLANK SPIKE SAMPLE (TI# 26056)

PARAMETER	SPIKED AMOUNT	BLANK SAMPLE	SPIKE SAMPLE	%R	QUALIFIER APPLIED
TECHNETIUM-99	98.5	0	95	96	NONE
STRONTIUM-90	80	0	73	91	NONE
COBALT-60	25000	0	24800	99	NONE
CESIUM-137	21600	0	22400	104	NONE

8. Holding Times

Have all samples/analyses been completed within 5 half-lives or 180 days, whichever comes first? Yes No N/A

If NO, qualify all associated results >LLD as estimated detects (J) and all associated results <LLD as estimated non-detects (UJ). For gross exceedances (>2X criteria) qualify all associated results as unusable (R).

Comments:

9. Method Specific and Other Quality Control

9.1 Gas Proportional Counters

Are field and QC sample preparations outside the range of the self absorption curves? Yes No N/A

If YES, qualify all associated data as estimated (J).

Are initial detector efficiencies <20%? Yes No N/A

If YES, qualify all associated data as unusable (R).

Have statistical tests been performed routinely (at least weekly)? Yes No N/A

If NO, qualify all associated data as estimated (J).

Have stability verifications been performed after each gas change? Yes No N/A

If NO, qualify all associated data as estimated (J).

Comments:

9.2 Alpha Spectroscopy

Has detector system been calibrated across the energy range of interest? Yes No N/A

If NO, qualify all results as unusable (R).

Is detector resolution adequate to identify each peak centroid? Yes No N/A

If NO or if resolution cannot be determined, qualify all results as unusable (R).

Is resolution at least 20 keV FWHM? Yes No N/A

If NO, qualify all results as estimated (J).

Do check source efficiencies agree within 5% of initial calibration efficiencies or are they within the control limits or ±3S of the mean? Yes No N/A

If NO, qualify all associated results as unusable (R).

Was each sample spiked with a tracer? Yes No N/A

If NO, qualify all associated results as unusable (R).

Are tracer recoveries within the control limits of 30 to 105%? Yes No N/A

If NO, qualify all results as follows:

%R:	<30%	30-105%	>105%	>115%
Results <LLD:	R	acceptable	UJ	R
Results >LLD:	R	acceptable	J	R

Comments: This analysis was not performed.

9.3 Gamma Spectroscopy

Does efficiency calibration approximate a smooth semi-log curve? Yes No N/A

If NO, qualify all results as unusable (R).

Have geometry or matrix factors been accounted for in all analyses? Yes No N/A

If NO, qualify all associated results as unusable (R).

Does the detector calibration cover the energy range of interest and at least 0 to 2 MeV? Yes No N/A

If NO, qualify all results outside the energy range as unusable (R).

Is resolution of the detector system adequate and less than 5 FWHM? Yes No N/A

If NO, qualify all results as estimated (J).

Comments:

9.4 Alpha Emitting Radium Isotopes

Have single radium isotopes (Ra-223, Ra-224, Ra-226) been reported? Yes No N/A

If YES, qualify all results attributed to a single radium isotope as estimated (J) if the contribution to the total from individual isotopes is unknown.

Can time from sample precipitation to counting be verified? Yes No N/A

If NO, qualify all associated results >MDA as estimated (J).

Have barium interferences been identified and accounted for? Yes No N/A

If NO, qualify all associated results with elevated barium levels as estimated (J).

Has counting efficiency for Ra-226 been determined for each SDG? Yes No N/A

If NO, qualify all associated results as unusable (R).

Have blanks been analyzed with each group to check for possible radium contamination in the reagents? Yes No N/A

If NO, qualify all associated results as estimated (J).

If sample was preserved at collection has analysis been completed within 180 days or 5 half-lives? Yes No N/A

If NO, qualify results >LLD as estimated detects (J) and results < LLD as estimated non-detects (UJ).

If samples were not preserved, were samples received within 5 days of sampling? Yes No N/A

- Were samples preserved at the laboratory upon receipt? Yes No N/A
- Were samples held after preservation for at least 16 days? Yes No N/A

If NO, to any of the above, qualify associated sample results as estimated (J).

Comments: this analysis was not performed.

9.5 Radium 226 Analysis using Scintillation (Lucas) Cell Counting

Is calibration data present and can it be associated with the samples? Yes No N/A

If NO, qualify associated sample results as unusable (R).

Was the counting system calibrated each day that samples were analyzed? Yes No N/A

If NO, qualify associated results as estimated (J).

Was the counting system calibrated after replacing the scintillation cell? Yes No N/A

If NO, qualify associated results as estimated (J) if the cell has a previously determined calibration constant and unusable (R) if no constant is available for the replacement cell.

Were blanks analyzed with each sample group to check for radium contamination in reagents? Yes No N/A

If NO, qualify associated results as estimated (J).

If sample was preserved at collection has analysis been completed within 180 days or 5 half-lives? Yes No N/A

If NO, qualify results >LLD as estimated detects (J) and results < LLD as estimated non-detects (UJ).

If samples were not preserved, were samples received within 5 days of sampling? Yes No N/A

- Were samples preserved at the laboratory upon receipt? Yes No N/A
- Were samples held after preservation for at least 16 days? Yes No N/A

If NO, to any of the above, qualify associated sample results as estimated (J).

Comments: This analysis was not performed.

9.6 Tritium Analysis by Liquid Scintillation Counting

Do calibration standard matrices match the sample matrices? Yes No N/A

If NO, qualify associated results as estimated (J).

Has at least one calibration standard been processed with the samples? Yes No N/A

If NO, qualify results associated with runs lacking calibration standards as unusable (R).

Have results for counting efficiency determination been provided? Yes No N/A

If NO, qualify all associated results as unusable (R).

Do tritium levels in the blanks exceed the MDA? Yes No N/A

If YES, qualify associated results less than 10X the background tritium level (blanks) as estimated (J).

Have blanks been analyzed with each sample run to check for potential contamination in the chemical reagents? Yes No N/A

If NO, qualify associated results as estimated (J).

Comments: This analysis was not performed.

9.7 Fluorometric Analysis of Uranium

Has the laboratory provided evidence that cation and anion interferences are negligible for the matrix or that matrix interferences have been accounted for? Yes No N/A

If NO, qualify associated results as estimated (J).

Has the laboratory provided a description of the method of fusion standardization or provided data supporting fusion standardization? Yes No N/A

If NO, qualify associated results as estimated (J).

Was calibration performed immediately prior to sample analysis? Yes No N/A

If NO, qualify associated results as estimated (J).

Comments:

Total Uranium was analyzed by gamma spectroscopy.

FILENAME: BIOTA-TC.WK1

SDG	HEIS	Lab No.	Date Analyzed	Det. ID	Spl Amt.	Yield	Gross cnts	Count Time	Bkg. cpm	Det. Eff.	Tc99 Result Calc.	Result Rptd	MDA Calc.	MDA Rptd.
26049	B08YJ0	26049	10/07/93	E7	2	0.172	12	100	0.14	0.247	-0.11	-0.11	0.9	0.9
	B08YM0	26050	10/07/93	E9	2	0.333	22	100	0.14	0.236	0.23	0.23	0.5	0.5
	B08YM1	26051	10/07/93	E10	2	0.285	16	100	0.15	0.252	0.03	0.031	0.6	0.6
	B08YM2	26052	10/07/93	B1	2	0.392	15	100	0.18	0.244	-0.07	-0.07	0.5	0.5
	B08YM3	26053	10/07/93	B2	2	0.468	25	100	0.15	0.238	0.20	0.2	0.4	0.4
	B08YJ0 DUP	26054	10/07/93	B3	2	0.279	25	100	0.13	0.252	0.38	0.38	0.5	0.5
	BLANK	26055	10/07/93	E3	0.2	0.554	18	100	0.14	0.232	0.70	0.7	3.1	3
	BLANK SPIKE	26056	10/07/93	E4	0.2	0.645	593	100	0.11	0.214	94.97	95	2.5	3

FILENAME: BIOTASR2.WK1

SDG	HEIS	Lab No.	Date Analyzed	Det. ID	Spl Amt.	Ash Content	Y-90 Yield	SR-89 Yield	Ingrowth	Decay	Gross Cnts	Count Time
26049	B08YJ0	26049	10/20/93	C4	2.2	0.1082	1	0.477	0.827	0.778	542	100
	B08YM0	26050	10/20/93	C7	3.6	0.0876	0.979	0.546	0.827	0.778	77	100
	B08YM1	26051	10/20/93	C8	5.9	0.0614	0.977	0.708	0.827	0.778	162	100
	B08YM2	26052	10/20/93	C9	3	0.0923	0.965	0.662	0.827	0.778	39	100
	B08YM3	26053	10/20/93	C10	3.7	0.0497	0.988	0.714	0.827	0.778	88	100
	B08YJ0 DUP	26054	10/20/93	D2	2.2	0.1082	1	0.659	0.826	0.774	1071	100
	BLANK	26055	10/20/93	D3	0.5	---	1	0.711	0.827	0.778	1511	100
	BLANK SPIKE	26056	10/20/93	D4	0.5	---	1	0.754	0.827	0.778	18	100

FILENAME: BIOTASR2.WK1

SDG	HEIS	Lab No.	Bkg. cpm	Det. Eff.	Sr90 Result Calc.	Result Rptd	MDA Calc.	MDA Rptd.
26049	B08YJ0	26049	0.22	0.32	1.1730	1.2	0.05	0.05
	B08YM0	26050	0.16	0.27	0.0720	0.072	0.02	0.02
	B08YM1	26051	0.19	0.3	0.0502	0.05	0.007	0.007
	B08YM2	26052	0.2	0.32	0.0200	0.02	0.022	0.02
	B08YM3	26053	0.21	0.31	0.0288	0.021	0.009	0.007
	B08YJ0 DUP	26054	0.19	0.4	1.3829	1.4	0.027	0.03
	BLANK	26055	0.22	0.4	73.3090	73	1.076	1
	BLANK SPIKE	26056	0.19	0.39	-0.0476	-0.048	0.967	1

FILENAME: BIOTA-GS.WK1

SDG	HEIS#	Lab No.	Date Analyzed	Spl Amt	Geometry	Det. No.
26049	B08YJ0	26049	09/24/93	69	MARINELLI	40312
	B08YM0	26050	09/24/93	104	MARINELLI	20654
	B08YM1	26051	09/24/93	131	MARINELLI	20651
	B08YM2	26052	09/24/93	116	MARINELLI	10760
	B08YM3	26053	09/25/93	60	MARINELLI	40312
	B08YJ0 DUP	26054	09/25/93	69	MARINELLI	20654
	BLANK	26055	09/25/93	1	MARINELLI	20651
	BLANK SPIKE	26056	09/27/93	1	MARINELLI	10760

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