START 9713507.1705

0045892

26561-WES-1280

TELEDYNE ISOTOPES

50 VAN BUREN AVENUE
WESTWOOD, NEW JERSEY 07675
(201) 664-7070

WESTON/WESTINGHOUSE/HANFORD

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

Date 10/20/93

TI #'s 26561 - 26566

WO # 4-3864

RECORD COPY

OCT 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		8		
Gross Alpha	PRO-032-1	3	18	
Gross Beta		-	-	
Sr-90	PRO-032-16	5	80	2
Gamma	PRO-042-5	8	8	
Tc-99	PRO-032-78	5	50	1
Total-Uranium	PRO-032-89	2	11	
H-3	PRO-032-35	2	9	
Pu-238,239/240	PRO-062-114	12	17	4
U-235-238	PRO-062-110	-	-	-
Am-241	PRO-062-111	-	-	-
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

TELEX 134474 TDYISOT WTWD • • • EasyLink 62877198 • • • FAX (201) 664-5586

TELEDYNE ISOTOPES

Spike Activity for TI #26566

Nuclide	Activity pCi/l	Acceptable Range
Technetium-99	98.5	79. - 118.
Gross Alpha	11.2	6. - 17.
Gross Beta	22.	17. - 28.
Strontium-90	80.	68. - 92.
Total Uranium	18.6 ug/l	15.8 - 21.4
Cobalt-60	2.5 E 04	1.7 - 3.2 E 04
Cesium-137	2.16 E 04	1.51 - 2.81 E 04
Plutonium-239	1.09	0.9 - 1.3
Tritium	1.4 E 03	1.1 - 1.7 E 03

Activity for Matrix Spike TI# 26562 & Matrix Spike Duplicate TI# 26563

Nuclide	Activity pCi/l	Acceptable Range
Tritium	1.4 E 03	1.1 - 1.7 E 03

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE
4-3864	LL-1140-F4	09/17/93	10/20/93

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

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26561	9309L907-001	B094Z5	09/12				PH TEST	VERIF IED					3
							TC-99	2.7 +-0.4 E 01		10/05			3
							GR-A	L.T. 2. E 00		09/28			3
							GR-B	2.6 +-0.3 E 01		09/27			3
							SR-90	L.T. 1. E 00		10/08			3
							TOTAL-U	2.6 +-0.4 E 00	UGM/LITER *				3
							TOTAL-U	L.T. 5. E-02	UGM/LITER *				3
							GR-A	2.2 +-1.78E 00		09/28			3
							GR-B	L.T. 2. E 00		09/27			3
							TC-99	L.T. 3. E 00		10/05			3
							SR-90	0.0 +-7.34E-01		10/08			3
							BE-7	L.T. 7. E 01		10/03			4
							BE-7	7.3 +-39.1E 00		10/03			4
							K-40	L.T. 1. E 02		10/03			4
							K-40 -	6.0 +- 6.1E 01		10/03			4
							MN-54	L.T. 6. E 00		10/03			4
							MN-54	9.3 +-38.3E-01		10/03			4
							CO-58	L.T. 7. E 00		10/03			4
							CO-58	7.7 +-43.6E-01		10/03			4
							FE-59	L.T. 2. E 01		10/03			4
							FE-59	1.6 +- 9.1E 00		10/03			4
							CO-60	L.T. 6. E 00		10/03			4
							CO-60	1.9 +-33.7E-01		10/03			4
							ZN-65	L.T. 1. E 01		10/03			4
							ZN-65 -	2.4 +- 7.3E 00		10/03			4
							ZR-95	L.T. 8. E 00		10/03			4
							ZR-95	1.0 +- 4.7E 00		10/03			4
							RU-103	L.T. 9. E 00		10/03			4
							RU-103	3.9 +- 5.0E 00		10/03			4
							RU-106	L.T. 6. E 01		10/03			4
							RU-106	2.2 +- 3.5E 01		10/03			4
							I-131	L.T. 3. E 01		10/03			4

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TELEDYNE ISOTOPES

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4

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 2
4-3864	LL-1140-F4	09/17/93	10/20/93	

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26561	9309L907-001	B094Z5	09/12				I-131 -	1.3 +- 2.2E 01		10/03			4
							CS-134	L.T. 7. E 00		10/03			4
							CS-134 -	5.7 +-41.5E-01		10/03			4
							CS-137	L.T. 7. E 00		10/03			4
							CS-137	1.7 +- 4.0E 00		10/03			4
							BA-140	L.T. 2. E 01		10/03			4
							BA-140 -	1.4 +-10.8E 00		10/03			4
							CE-141	L.T. 1. E 01		10/03			4
							CE-141 -	2.2 +- 7.4E 00		10/03			4
							CE-144	L.T. 4. E 01		10/03			4
							CE-144 -	1.5 +- 2.3E 01		10/03			4
							EU-152	L.T. 2. E 01		10/03			4
							EU-152 -	1.6 +- 1.2E 01		10/03			4
							EU-154	L.T. 3. E 01		10/03			4
							EU-154 -	9.5 +-14.8E 00		10/03			4
							EU-155	L.T. 2. E 01		10/03			4
							EU-155 -	5.6 +- 1.3E 01		10/03			4
							RA-226	L.T. 1. E 02		10/03			4
							RA-226 -	6.6 +- 6.9E 01		10/03			4
							TH-228	L.T. 1. E 01		10/03			4
							TH-228	1.1 +- 6.5E 00		10/03			4
							TH-234	L.T. 1. E 02		10/03			4
							TH-234 -	4.7 +- 7.5E 01		10/03			4
							H-3	2.5 +-0.2 E 03		09/25			5
							H-3	L.T. 2. E 02		09/25			5
							PU-238	L.T. 7. E-02		09/28			6
							PU-239	L.T. 1. E-01		09/28			6
							PU-238	4.6 +-46.3E-03		09/28			6
							PU-239	9.3 +-65.5E-03		09/28			6

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93-09-057 M1.5

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

642

Client WESTON/WESTinghouse
Est. Final Proj. Sampling Date
Work Order # 6168-02-09-9999
Project Contact/Phone #
AD Project Manager Josie Edwards
QC CLP Del CLP TAT 56 Days
Date Rec'd Date Due
Account #

Refrigerator #																	
#/Type Container	Liquid							3/P		1/G		1/P					
	Solid								+		+						
Volume	Liquid							2lts		250ml		1lts					
	Solid																
Preservatives																	
ANALYSES REQUESTED →		ORGANIC						Radio Chem		INORG							
		VOA	BNA	Pest/ PCB	Herb					Metal	CN						

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	WESTON Analytics Use Only											
S - Soil												SEE BELOW				RFW#			
SE - Sediment																			
SO - Solid																			
SL - Sludge																			
W - Water	04	B09425			W	9/12/93						✓				93092907-001			
O - Oil																			
A - Air																			
DS - Drum Solids																			
DL - Drum Liquids																			
L - EP/TCLP Leachate																			
WI - Wipe																			
X - Other																			
F - Fish																			

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

DATE/REVISIONS: GS; GSPEC; 8; SR-90; TOT-U | TC-99 | H-3
B09425 1. 1.60 1.60 1.60 | 1.84 | 8.00
2.
3.
4.
5.
6.

Special Instructions:

Radiochem = Gross Alpha/Beta, Gamma Spec (Cs-137/Co-60, Ru-106), Pu-238/239/240, Sr-90, Total U; Tritium, Tc-99

Received
SEP 16 1993
TMA/Oberline
Oak Ridge Lab

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

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FEDEX	[illegible]	9/16/93	1620	C Duncan	FEDEX	9/16/93	1600
Fed Ex	C Duncan	9/16/93	0900 AM		S. Baker	9-17-93	1200

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

pH TEST Verified. D [illegible]

9/13/07 1709

9213507.1710

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

December 9, 1993

Our ref: 913-1719
S/O/2610

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills, MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: 200-BP-1 DATA VALIDATION, TRANSMITTAL OF DATA VALIDATION PACKAGES, TASK ORDER S91-19

Dear Ms. Duncan:

Enclosed is the following radiochemistry analytical data packages for the 200-BP-1 data validation project:

- SDG-26561-WES-1280
- SDG-26070-WES-1281

The data verification and validation documentation is located in the front of the data package. Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina Jensen
Task Manager

Donald M. Caldwell
Project Director

Enclosures

cc: Mark Buckmaster, WHC
P.K. Brockman, SAIC-Kennewick

DEC 1993 RECEIVED TQO

RECEIVED
DEC 10 1993
VALIDATION DOCUMENTATION
SDLA

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DEC 1993 RECEIVED

MEMORANDUM

TO: 200-BP-1 Project QA Record December 7, 1993

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 26561-WES-1280 (913-1719)

INTRODUCTION

This memo presents the results of data validation on data package 26561-WES-1280 consisting of one (1) water sample submitted for radiochemistry analysis which was performed by the Teledyne Isotopes laboratory. Information concerning the sample validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B094Z5	09/12/93	WATER

Data validation was conducted in accordance with the revised WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992). Attachments 1 through 4 to this memo provide the data validation supporting documentation and a summary of the validated results.

RECEIVED DEC 10 1993 VALIDATION DOCUMENTATION SDLA

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the technetium-99 chemical recovery as summarized under Major Deficiencies.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. One (1) sample was validated in this data set with a total of 30 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan objectives of 90%.

MAJOR DEFICIENCIES

The following presents a summary of the rejected data.

The technetium-99 chemical recovery for the blank spike sample (Teledyne ID 26566) was 29%, less than the 30% minimum control limit. Therefore, the associated result has been qualified as unusable (R).

MINOR DEFICIENCIES

The following qualifications were required as a result of the data validation.

The technetium-99 initial calibration efficiency value for detector C-3 is 0.19. Therefore, the technetium-99 result for the associated sample, B094Z5, has been qualified as estimated (J).

REFERENCES

WHC, 1993, Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision F, April 1993. Westinghouse Hanford Company, Richland, Washington.

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

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GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - The constituent was analyzed for, but was not detected above the minimum detectable activity (MDA). The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory. The data are usable for decision making purposes.

UJ - The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit. The data are usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data are usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data are unusable.

R - Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data are unusable.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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DATA QUALIFICATION SUMMARY - FORM B-7

26561-WFS-1280

SDG:	REVIEWER:	DATE: 12/07/93	PAGE 1 OF 1
COMMENTS: Radiochemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tc-99	R	Blank Spike (TI# 26566)	Chemical recovery <30%
Tc-99	J	B09475	Initial cal. eff. <20%.
		B09475 DUP	
		12/9/93	

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ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

Validated Radiochemistry Sample Results for SDG: 26561-WES-1280

Parameter	Samp# Date Type / Units	B094Z5 09/12/93 Water / Result	Q
TECHNETIUM-99	pCi/L	27.000	J
GROSS ALPHA SCAN	pCi/L	2.000	U
GROSS BETA SCAN	pCi/L	26.000	
STRONTIUM-90	pCi/L	1.000	U
TOTAL URANIUM	UGM/L	2.600	
BERYLLIUM-7	pCi/L	70.000	U
POTASSIUM-40	pCi/L	100.000	U
MANGANESE-54	pCi/L	6.000	U
COBALT-58	pCi/L	7.000	U
IRON-59	pCi/L	20.000	U
COBALT-60	pCi/L	6.000	U
ZINC-65	pCi/L	10.000	U
ZIRCONIUM-95	pCi/L	8.000	U
RUTHENIUM-103	pCi/L	9.000	U
RUTHENIUM-106	pCi/L	60.000	U
IODINE-131	pCi/L	30.000	U
CESIUM-134	pCi/L	7.000	U
CESIUM-137	pCi/L	7.000	U
BARIUM-140	pCi/L	20.000	U
CERIUM-141	pCi/L	10.000	U
CERIUM-144	pCi/L	40.000	U
EUROPIUM-152	pCi/L	20.000	U
EUROPIUM-154	pCi/L	30.000	U
EUROPIUM-155	pCi/L	20.000	U
RADIUM-226	pCi/L	100.000	U
THORIUM-228	pCi/L	10.000	U
THORIUM-234	pCi/L	100.000	U
TRITIUM	pCi/L	2500.000	
PLUTONIUM-238	pCi/L	0.070	U
PLUTONIUM-239	pCi/L	0.100	U

9713507.1718

TELEDYNE ISOTOPES

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							GR-B	2.6 +-0.3 E 01		09/27			3
							SR-90	L.T. 1. E 00		10/08			3
							TOTAL-U	2.6 +-0.4 E 00	UGM/LITER *				3
							~~TOTAL-U~~	~~L.T. 5. E-02~~	~~UGM/LITER *~~				3
							~~GR-A~~	~~2.2 +-1.78E 00~~		09/28			3
							~~GR-B~~	~~L.T. 2. E 00~~		09/27			3
							~~TC-99~~	~~L.T. 3. E 00~~		10/05			3
							~~SR-90~~	~~0.0 +-7.34E-01~~		10/08			3
							BE-7	L.T. 7. E 01		10/03			4
							~~BE-7~~	~~7.3 +-39.1E 00~~		10/03			4
							K-40	L.T. 1. E 02		10/03			4
							~~K-40~~	~~6.0 +- 6.1E 01~~		10/03			4
							MN-54	L.T. 6. E 00		10/03			4
							~~MN-54~~	~~9.3 +-38.3E-01~~		10/03			4
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							FE-59	L.T. 2. E 01		10/03			4
							~~FE-59~~	~~1.6 +- 9.1E 00~~		10/03			4
							CO-60	L.T. 6. E 00		10/03			4
							~~CO-60~~	~~1.9 +-33.7E-01~~		10/03			4
							ZN-65	L.T. 1. E 01		10/03			4
							~~ZN-65~~	~~2.4 +- 7.3E 00~~		10/03			4
							ZR-95	L.T. 8. E 00		10/03			4
							~~ZR-95~~	~~1.0 +- 4.7E 00~~		10/03			4
							RU-103	L.T. 9. E 00		10/03			4
							~~RU-103~~	~~3.9 +- 5.0E 00~~		10/03			4
							RU-106	L.T. 6. E 01		10/03			4
							~~RU-106~~	~~2.2 +- 3.5E 01~~		10/03			4
							I-131	L.T. 3. E 01		10/03			4

12/7/93

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							~~CS-134~~	~~5.7 +-41.5E-01~~		10/03			4
							CS-137	L.T. 7. E 00	U	10/03			4
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							CE-141	L.T. 1. E 01	U	10/03			4
							~~CE-141~~	~~2.2 +- 7.4E 00~~		10/03			4
							CE-144	L.T. 4. E 01	U	10/03			4
							~~CE-144~~	~~1.5 +- 2.3E 01~~		10/03			4
							EU-152	L.T. 2. E 01	U	10/03			4
							~~EU-152~~	~~1.6 +- 1.2E 01~~		10/03			4
							EU-154	L.T. 3. E 01	U	10/03			4
							~~EU-154~~	~~9.5 +-14.8E 00~~		10/03			4
							EU-155	L.T. 2. E 01	U	10/03			4
							~~EU-155~~	~~5.6 +- 1.3E 01~~		10/03			4
							RA-226	L.T. 1. E 02	U	10/03			4
							~~RA-226~~	~~6.6 +- 6.9E 01~~		10/03			4
							TH-228	L.T. 1. E 01	U	10/03			4
							~~TH-228~~	~~1.1 +- 6.5E 00~~		10/03			4
							TH-234	L.T. 1. E 02	U	10/03			4
							~~TH-234~~	~~4.7 +- 7.5E 01~~		10/03			4
							H-3	2.5 +-0.2 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
							PU-238	L.T. 7. E-02	U	09/28			6
							PU-239	L.T. 1. E-01	U	09/28			6
							~~PU-238~~	~~4.6 +-46.3E-03~~		09/28			6
							~~PU-239~~	~~9.3 +-65.5E-03~~		09/28			6

9713507.1720

12/7/93

TELEDYNE ISOTOPES

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

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26562	9309L907-001MS B094Z5		/				H-3	3.5 +-0.2 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
26563	9309L907-001MSDB094Z5		/				H-3	3.6 +-0.2 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
26564	9309L907-001DUPB094Z5		09/12				TC-99	3.3 +-0.5 E 01	U	10/05			3
							GR-A	L.T. 2. E 00	U	09/28			3
							GR-B	2.5 +-0.3 E 01		09/27			3
							SR-90	L.T. 1. E 00	U	10/08			3
							TOTAL-U	2.5 +-0.4 E 00 UGM/LITER *					3
							~~TOTAL-U~~	~~L.T. 5. E 02 UGM/LITER *~~					3
							~~GR-A~~	~~1.6 +-1.68E 00~~		09/28			3
							~~GR-B~~	~~L.T. 2. E 00~~		09/27			3
							~~TC-99~~	~~L.T. 3. E 00~~		10/05			3
							~~SR-90~~	~~1.2 +-7.64E-01~~		10/08			3
							BE-7	L.T. 6. E 01	U	10/05			4
							~~BE-7~~	~~0.0 +- 3.8E 01~~		10/05			4
							K-40	L.T. 1. E 02	U	10/05			4
							~~K-40 -~~	~~1.0 +- 0.7E 02~~		10/05			4
							MN-54	L.T. 6. E 00	U	10/05			4
							~~MN-54~~	~~9.6 +-35.8E-01~~		10/05			4
							CO-58	L.T. 6. E 00	U	10/05			4
							~~CO-58 -~~	~~1.3 +- 3.9E 00~~		10/05			4
							FE-59	L.T. 1. E 01	U	10/05			4
							~~FE-59 -~~	~~4.1 +- 8.7E 00~~		10/05			4
							CO-60	L.T. 6. E 00	U	10/05			4
							~~CO-60~~	~~1.5 +- 3.5E 00~~		10/05			4
							ZN-65	L.T. 1. E 01	U	10/05			4
							~~ZN-65~~	~~7.6 +- 7.5E 00~~		10/05			4
							ZR-95	L.T. 7. E 00	U	10/05			4
							~~ZR-95 -~~	~~1.9 +- 4.2E 00~~		10/05			4

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TELEDYNE ISOTOPES

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W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26564	9309L907-001DUPB094Z5		09/12				RU-103	L.T. 8. E 00	U	10/05			4
							~~RU-103~~	~~8.7 +-48.7E-01~~		10/05			4
							RU-106	L.T. 6. E 01	U	10/05			4
							~~RU-106~~	~~7.6 +-34.8E-00~~		10/05			4
							I-131	L.T. 4. E 01	U	10/05			4
							~~I-131~~	~~1.1 +- 2.3E-01~~		10/05			4
							CS-134	L.T. 7. E 00	U	10/05			4
							~~CS-134~~	~~2.5 +- 4.0E-00~~		10/05			4
							CS-137	L.T. 7. E 00	U	10/05			4
							~~CS-137~~	~~1.1 +- 4.0E-00~~		10/05			4
							BA-140	L.T. 2. E 01	U	10/05			4
							~~BA-140~~	~~2.4 +-11.8E-00~~		10/05			4
							CE-141	L.T. 1. E 01	U	10/05			4
							~~CE-141~~	~~0.0 +- 7.4E-00~~		10/05			4
							CE-144	L.T. 3. E 01	U	10/05			4
							~~CE-144~~	~~1.7 +- 2.2E-01~~		10/05			4
							EU-152	L.T. 2. E 01	U	10/05			4
							~~EU-152~~	~~7.8 +-115.E-01~~		10/05			4
							EU-154	L.T. 2. E 01	U	10/05			4
							~~EU-154~~	~~4.9 +-10.4E-00~~		10/05			4
							EU-155	L.T. 2. E 01	U	10/05			4
							~~EU-155~~	~~4.7 +- 1.1E-01~~		10/05			4
							RA-226	L.T. 1. E 02	U	10/05			4
							~~RA-226~~	~~6.6 +-63.6E-00~~		10/05			4
							TH-228	L.T. 1. E 01	U	10/05			4
							~~TH-228~~	~~9.3 +- 6.4E-00~~		10/05			4
							TH-234	L.T. 1. E 02	U	10/05			4
							~~TH-234~~	~~4.7 +- 6.6E-01~~		10/05			4
							H-3	2.4 +-0.2 E 03	no qual.	09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
							PU-238	L.T. 1. E-01	U	09/28			6
							PU-239	L.T. 2. E-01	U	09/28			6

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W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26564	9309L907-001DUPB094Z5		09/12				~~PU-238~~	~~6.1 +-61.5E-03~~		09/28			6
							~~PU-239~~	~~4.9 +-8.9 E-02~~		09/28			6
26565	DISTILLED BLANK H2O		/				TC-99	L.T. 4. E 00	U	10/05			3
							GR-A	L.T. 7. E-01	U	09/27			3
							GR-B	L.T. 7. E-01	U	09/27			3
							SR-90	L.T. 1. E 00	U	10/08			3
							TOTAL-U	L.T. 5. E-02	UGM/LITER U*				3
							~~TOTAL-U~~	~~3. +-3. E-03~~	~~UGM/LITER *~~				3
							~~GR-A~~	~~1.6 +-4.6 E-01~~		09/27			3
							~~GR-B~~	~~3.5 +-4.8 E-01~~		09/27			3
							~~TC-99~~	~~5.0 +-22.4E-01~~		10/05			3
							~~SR-90~~	~~1.9 +-8.20E-01~~		10/08			3
							BE-7	L.T. 4. E 01	U	10/03			4
							~~BE-7~~	~~1.0 +- 2.6E 01~~		10/03			4
							K-40	L.T. 1. E 02	U	10/03			4
							~~K-40~~	~~5.7 +- 6.2E 01~~		10/03			4
							MN-54	L.T. 5. E 00	U	10/03			4
							~~MN-54~~	~~1.8 +- 3.0E 00~~		10/03			4
							CO-58	L.T. 6. E 00	U	10/03			4
							~~CO-58~~	~~6.9 +-34.0E-01~~		10/03			4
							FE-59	L.T. 1. E 01	U	10/03			4
							~~FE-59~~	~~1.6 +- 5.7E 00~~		10/03			4
							CO-60	L.T. 5. E 00	U	10/03			4
							~~CO-60~~	~~6.6 +-31.8E-01~~		10/03			4
							ZN-65	L.T. 1. E 01	U	10/03			4
							~~ZN-65~~	~~4.8 +- 6.1E 00~~		10/03			4
							ZR-95	L.T. 5. E 00	U	10/03			4
							~~ZR-95~~	~~2.2 +- 3.1E 00~~		10/03			4
							RU-103	L.T. 5. E 00	U	10/03			4
							~~RU-103~~	~~1.8 +-31.7E-01~~		10/03			4
							RU-106	L.T. 5. E 01	U	10/03			4

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W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26565	DISTILLED BLANK H2O		/				~~RU-106~~	~~4.5 +-30.4E 00~~		10/03			4
							I-131	L.T. 7. E 00	u	10/03			4
							~~I-131~~	~~3.7 +-41.2E-01~~		10/03			4
							CS-134	L.T. 6. E 00	u	10/03			4
							~~CS-134~~	~~9.9 +-34.3E-01~~		10/03			4
							CS-137	L.T. 6. E 00	u	10/03			4
							~~CS-137~~	~~1.1 +- 3.4E 00~~		10/03			4
							BA-140	L.T. 6. E 00	u	10/03			4
							~~BA-140~~	~~4.8 +-36.2E-01~~		10/03			4
							CE-141	L.T. 7. E 00	u	10/03			4
							~~CE-141~~	~~3.1 +- 4.5E 00~~		10/03			4
							CE-144	L.T. 3. E 01	u	10/03			4
							~~CE-144~~	~~4.3 +-19.0E 00~~		10/03			4
							EU-152	L.T. 2. E 01	u	10/03			4
							~~EU-152~~	~~7.4 +-10.8E 00~~		10/03			4
							EU-154	L.T. 1. E 01	u	10/03			4
							~~EU-154~~	~~4.7 +-89.7E-01~~		10/03			4
							EU-155	L.T. 2. E 01	u	10/03			4
							~~EU-155~~	~~6.1 +- 1.0E 01~~		10/03			4
							RA-226	L.T. 1. E 02	u	10/03			4
							~~RA-226~~	~~1.9 +- 6.4E 01~~		10/03			4
							TH-228	L.T. 1. E 01	u	10/03			4
							~~TH-228~~	~~2.0 +- 5.5E 00~~		10/03			4
							TH-234	L.T. 1. E 02	u	10/03			4
							~~TH-234~~	~~3.2 +- 6.6E 01~~		10/03			4
							H-3	L.T. 2. E 02	u	09/25			5
							~~H-3~~	~~4.7 +-92.2E 00~~		09/25			5
							PU-238	L.T. 9. E-02	u	10/06			6
							PU-239	L.T. 9. E-02	u	10/06			6
							~~PU-238~~	~~5.4 +-54.1E-03~~		10/06			6
							~~PU-239~~	~~2.7 +-6.9 E-02~~		10/06			6

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W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26566	DISTILLED SPIKED H2O		/				TC-99	1.1 +-0.1 E 02	Q R	10/05			3
							GR-A	1.2 +-0.2 E 01		10/08			3
							GR-B	2.5 +-0.2 E 01		09/27			3
							SR-90	7.4 +-0.2 E 01		10/10			3
							TOTAL-U	1.7 +-0.3 E 01	UGM/LITER *				3
							~~TOTAL-U~~	~~L.T. 5. E-02~~	~~UGM/LITER *~~				3
							~~GR-A~~	~~L.T. 5. E-01~~		10/08			3
							~~GR-B~~	~~L.T. 7. E-01~~		09/27			3
							~~TC-99~~	~~L.T. 6. E-00~~		10/05			3
							~~SR-90~~	~~L.T. 8. E-01~~		10/10			3
							BE-7	L.T. 3. E 06	U	10/06			4
							~~BE-7~~	~~5.8 +-15.7E 05~~		10/06			4
							K-40	L.T. 5. E 02	U	10/06			4
							~~K-40~~	~~2.1 +- 3.0E 02~~		10/06			4
							MN-54	L.T. 5. E 02	U	10/06			4
							~~MN-54~~	~~0.0 +- 2.9E 02~~		10/06			4
							CO-58	L.T. 4. E 04	U	10/06			4
							~~CO-58~~	~~2.1 +- 2.6E 04~~		10/06			4
							FE-59	L.T. 3. E 06	U	10/06			4
							~~FE-59~~	~~1.1 +- 1.8E 06~~		10/06			4
							CO-60	2.46+-0.25E 04		10/06			4
							~~CO-60~~	~~L.T. 9. E 02~~		10/06			4
							ZN-65	L.T. 1. E 03	U	10/06			4
							~~ZN-65~~	~~3.6 +- 8.9E 02~~		10/06			4
							ZR-95	L.T. 7. E 04	U	10/06			4
							~~ZR-95~~	~~8.4 +-43.3E 03~~		10/06			4
							RU-103	L.T. 4. E 06	U	10/06			4
							~~RU-103~~	~~1.6 +- 2.6E 06~~		10/06			4
							RU-106	L.T. 3. E 03	U	10/06			4
							~~RU-106~~	~~5.8 +-18.1E 02~~		10/06			4
							CS-134	L.T. 2. E 02	U	10/06			4
							~~CS-134~~	~~3.3 +-13.1E 01~~		10/06			4

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TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26566	DISTILLED SPIKED H2O		/				CS-137	2.21+-0.22E 04	Q	10/06			4
							~~CS-137~~	~~L.T. 6. E 02~~		10/06			4
							CE-141	L.T. 4. E 07	U	10/06			4
							~~CE-141~~	~~8.6 +-24.1E 06~~		10/06			4
							CE-144	L.T. 2. E 03	U	10/06			4
							~~CE-144~~	~~1.2 +- 1.3E 03~~		10/06			4
							EU-152	L.T. 3. E 02	U	10/06			4
							~~EU-152~~	~~1.7 +- 2.0E 02~~		10/06			4
							EU-154	L.T. 2. E 02	U	10/06			4
							~~EU-154~~	~~1.5 +-12.5E 01~~		10/06			4
							EU-155	L.T. 6. E 02	U	10/06			4
							~~EU-155~~	~~7.9 +- 0.3E 03~~		10/06			4
							RA-226	L.T. 2. E 03	U	10/06			4
							~~RA-226~~	~~4.0 +- 9.2E 02~~		10/06			4
							TH-228	L.T. 3. E 02	U	10/06			4
							~~TH-228~~	~~2.0 +-16.0E 01~~		10/06			4
							TH-234	L.T. 1. E 03	U	10/06			4
							~~TH-234~~	~~1.9 +- 0.1E 04~~		10/06			4
							H-3	1.4 +-0.1 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
							PU-238	L.T. 4. E-02	U	10/06			6
							PU-239	1.0 +-0.2 E 00	U	10/06			6
							~~PU-238~~	~~2.6 +-26.4E-03~~		10/06			6
							~~PU-239~~	~~L.T. 6. E-02~~		10/06			6

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LAST PAGE OF REPORT

APPROVED BY J. GUENTHER 10/15/93

SEND 1 COPIES TO WE884S MRS JOSIE EDWARDS

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

12/7/93

9713507.1727

ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

9213507.1728

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

PROJECT: 200-BP-1	VALIDATOR: [illegible]	DATE: 12/6/93
LABORATORY: Weston	DATA PACKAGE: 26561-WES-1280	
SAMPLES/MATRIX: B-9475 (LI# 26561) water		

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:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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).

Has check source been counted ~~daily?~~ regularly? 12/6/93 **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:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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: No qualification required.

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 12/7/93

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:

~~All detection limit requirements are met with the exception of Ruthenium-106. The DL requirement for Ru-106 is 3pCi/L, and the reported MDA is 50pCi/L. No qualification was required.~~ 12/7/93

All MDA values are in accordance with the revised detection limit goals dated August 27th 1992

12/7/93

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? Sample locations were not provided. 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

Comments:

12/6/93 ~~tritium~~ ~~MS %R = 71% MSD %R = 79% (J/UJ)~~

The Tc-99 chemical recovery for the blank spike (TI# 26566) is 29%. The associated result has been qualified as unusable (R).

All other chemical and tracer recoveries are acceptable, within the 30% - 105% requirements.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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? locations are not provided 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: No qualification required.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

7. Laboratory Control Samples

Are LCS results within the control limits of 80-120%

Yes (A) 12/6/93 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: No qualification required.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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)~~. estimated (J). 12/6/93

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:

The Tc-99 efficiency for detector C-3 is 0.19. Therefore, the assoc. sample result (B09475) has been qualified as estimated (J).

12/6/93 The assoc. result has NOT been qualified as ~~unusable~~ unusable since the chemical yield and continuing calibration charts are within the specified control limits.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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: No qualification is required.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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: No qualification is required.

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.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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: No qualification is required.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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

See comments

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

Comments:

Calibration check sample was analyzed before each run, therefore, qualification is not necessary.

12/6/93

FILENAME: 26561-QC.WK1

SDG NO.: 26561-WES-1280

SAMPLE ID: BLANK
MS SAMPLE ID: BLANK SPIKE

PARAMETER	SPIKED AMOUNT	BLANK RESULT	SPIKE RESULT	SPIKE %R
TECHNETIUM-99	98.5	0	110	112
GROSS ALPHA	11.2	0	12	107
GROSS BETA	22	0	25	114
STRONTIUM-90	80	0	74	93
TOTAL URANIUM	18.6	0	17	91
COBALT-60	25000	0	24600	98
CESIUM-137	21600	0	22100	102
TRITIUM	1400	0	1400	100
PLUTONIUM-239	1.09	0	1	92

SAMPLE ID: B094Z5
MS SAMPLE ID: B094Z5 MS
MSD SAMPLE ID: B094Z5 MSD

PARAMETER	SPIKED AMOUNT	SAMPLE RESULT	MS RESULT	MS %R	MSD RESULT	MSD %R	MS/MSD RPD
TRITIUM	1400	2500	3500	71	3600	79	10

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LABORATORY DUPLICATE RELATIVE PERCENT DIFFERENCE 19-Nov-93

FILENAME: 26561-LD.WK1

SDG NO.: 26561-WES-1280

SAMPLE ID: B094Z5
DUPLICATE SAMPLE ID: B094Z5 DUP

PARAMETER	SAMPLE RESULT	DUPLCIATE RESULT	LAB DUP RPD
TECHNETIUM-99	27	33	20
GROSS BETA	26	25	4
TOTAL URANIUM	2.6	2.5	4
TRITIUM	2500	2400	4

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FILENAME: 8QW-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.
25651	B094Z5	25651	10/05/93	C3	0.3	0.543	227	100	0.21	0.21	27	27	3	3
	B094Z5 DUP	26564	10/05/93	C4	0.3	0.5	269	100	0.21	0.224	33	33	3	3
	BLANK	26555	10/05/93	E4	0.2	0.387	9	100	0.11	0.232	-0.50	-0.50	4	4
	BLANK SPIKE	26556	10/05/93	E5	0.2	0.29	369	100	0.15	0.251	110	110	6	6
26070	B094W3	26070	09/24/93	C4	0.3	0.5	11890	100	0.22	0.224	1591	1600	3	3
	B094W3 DUP	26073	09/24/93	C6	0.3	0.446	10290	100	0.19	0.204	1695	1700	3	3
	BLANK	26062	09/24/93	E9	0.2	0.435	13	100	0.23	0.229	-2	<5	5	5
	BLANK SPIKE	26063	09/24/93	E10	0.2	0.408	551	100	0.14	0.243	122	120	4	4
	B094X1	26076	09/24/93	C1	0.3	0.376	1509	100	0.22	0.221	269	270	4	4

93 13507 1745

FILENAME: 8QW-A.WK1

SDG	HEIS#	Lab No.	Det.	Spl. Amt.	Date Alpha Counted	GROSS ALPHA Gross Counts	Count Time	Bkg. cpm	Eff.	Result Calc	Result Rptd	MDA Calc	MDA Rptd
26561	B094Z5	26561	T3	0.5	09/28/93	33	100	0.16	0.071	2.2	<2	2	2
	B094Z5 DUP	26564	T3	0.5	09/28/93	29	100	0.16	0.072	1.6	<2	2	2
	BLANK	26565	T3	1	09/27/93	11	50	0.16	0.172	0.16	<0.7	0.7	0.7
	BLANK SPIKE	26566	T3	1	10/08/93	245	50	0.16	0.174	12.27	13	0.7	0.7
26070	B094W3	26070	T3	0.5	09/23/93	7	50	0.06	0.076	0.95	<2	2	2
	B094W3 DUP	26073	T3	0.5	09/23/93	10	50	0.06	0.078	1.62	<2	2	2
	BLANK	26074	T3	1	09/22/93	4	50	0.16	0.145	-0.25	<0.8	0.8	0.8
	BLANK SPIKE	26075	T3	1	09/22/93	156	50	0.16	0.143	9.32	9.3	0.8	0.8
	B094X1	26076	T3	0.5	09/23/93	33	50	0.06	0.072	7.51	7.5	2.0	2

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FILENAME: 8QW-B.WK1

SDG	HEIS#	Lab No.	Det.	Date Beta Counted	GROSS BETA Gross Counts	Count Time	Bkg. cpm	Eff.	Spl. Amt.	Result Calc	Result Rptd	MDA Calc	MDA Rptd
26561	B094Z5	25661	T3	09/27/93	456	50	0.92	0.282	0.5	26	26	2	2
	B094Z5 DUP	26564	T3	09/27/93	435	50	0.92	0.283	0.5	25	25	2	2
	BLANK	26565	T3	09/27/93	61	50	0.92	0.386	1	0.35	<0.7	0.7	0.7
	BLANK SPIKE	26566	T3	09/27/93	1103	50	0.92	0.387	1	25	25	0.7	0.7
26070	B094W3	26070	T3	09/22/93	9874	36.68	1.02	0.289	0.5	836	840	2	2
	B094W3 DUP	26073	T3	09/22/93	9851	40.07	1.02	0.293	0.5	753	750	2	2
	BLANK	26074	T3	09/22/93	80	50	1.02	0.367	1	0.7	<0.8	0.8	0.8
	BLANK SPIKE	26075	T3	09/22/93	908	50	1.02	0.366	1	21	21	0.8	0.8
	B094X1	26076	T3	09/22/93	1935	50	1.02	0.284	0.5	120	120	2	2

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FILENAME: 8QW-SR2.WK1

SDG	HEIS	Lab No.	Date Analyzed	Det. ID	Spl Amt.	Y-90 Yield	SR-89 Yield	Ingrowth	Decay	Gross Cnts	Count Time	Bkg. cpm
25651	B094Z5	25651	10/08/93	E2	0.5	0.974	0.494	0.872	0.753	26	200	0.13
	B094Z5 DUP	26564	10/08/93	C9	0.5	1	0.711	0.872	0.789	23	100	0.21
	BLANK	26068	10/08/93	C10	0.5	0.988	0.668	0.872	0.789	19	100	0.22
	BLANK SPIKE	26069	10/10/93	B10	0.5	0.983	0.639	0.872	0.429	6648	800	0.25
26070	B094W3	26070	10/08/93	C4	0.5	1	0.78	0.872	0.789	21	100	0.17
	B094W3 DUP	26073	10/08/93	E5	0.5	0.986	0.717	0.872	0.753	31	200	0.14
	BLANK	26068	10/08/93	C10	0.5	0.988	0.668	0.872	0.789	19	100	0.22
	BLANK SPIKE	26069	10/08/93	B10	0.5	0.983	0.639	0.872	0.429	6648	800	0.25
	B094X1	26076	10/08/93	E4	0.5	0.986	0.575	0.872	0.753	21	200	0.11

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FILENAME: 8QW-SR2.WK1

SDG	HEIS	Lab No.	Det. Eff.	Sr90 Result Calc.	Result Rptd	MDA Calc.	MDA Rptd.
25651	B094Z5	25651	0.28	-0.00	0	1	1
	B094Z5 DUP	26564	0.32	0.12	0.12	1	1
	BLANK	26068	0.31	-0.19	-0.19	1	1
	BLANK SPIKE	26069	0.42	73.58	74	0.8	0.8
26070	B094W3	26070	0.32	0.21	<1	1.0	1
	B094W3 DUP	26073	0.32	0.09	<0.7	0.7	0.7
	BLANK	26068	0.31	-0.19	<1	1	1
	BLANK SPIKE	26069	0.42	73.58	74	0.8	0.8
	B094X1	26076	0.29	-0.04	<0.9	0.9	0.9

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FILENAME: 8QW-U.WK1

SDG	HEIS#	TELEDYNE LAB ID	DATE ANALYZE	SAMPLE AMOUNT	DILUTION FACTOR	WF	WU	R	TOTAL URANIUM CALC. UG/L	TOTAL URANIUM RPTD. UG/L
26561	B094Z5	26561	10/01/93	6	2	0.337	0.515	0.686	2.6	2.6
	B094Z5 DUP	26564	10/01/93	6	2	0.33	0.51	0.686	2.5	2.5
	BLANK	26565	10/01/93	6	1	0.001	0.257	0.686	0.0	<0.05
	BLANK SPIKE	26566	10/01/93	6	10	0.61	0.855	0.686	17.1	17
26070	B094W3	26070	10/01/93	6	2	0.379	0.581	0.686	2.6	2.6
	B094W3 DUP	26073	10/01/93	6	2	0.379	0.583	0.686	2.5	2.5
	BLANK	26074	10/01/93	6	1	0.001	0.257	0.686	0.00	<0.05
	BLANK SPIKE	26075	10/01/93	6	10	0.61	0.855	0.686	17.1	17
	B094X1	26076	10/01/93	6	20	0.403	0.605	0.686	27.4	28

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FILENAME: 8QW-H3.WK1

SDG	HEIS#	Lab No.	Date Analyzed	Gross Counts	Count Time	Sample Amount	Bkgnd cpm	Detect Eff.	Result Calc.	Result Rptd	MDA Calc	MDA Rptd
26561	B094Z5	26561	09/25/93	1230	100	0.01	1.88	0.19	2470	2500	151	200
	B094Z5 MS	26562	09/25/93	1654	100	0.01	1.88	0.19	3476	3500	151	200
	B094Z5 MSD	26563	09/25/93	1689	100	0.01	1.88	0.19	3559	3600	151	200
	B094Z5 DUP	26564	09/25/93	1189	100	0.01	1.88	0.19	2373	2400	151	200
	BLANK	26565	09/25/93	190	100	0.01	1.88	0.19	5	<200	151	200
	BLANK SPIKE	26566	09/25/93	785	100	0.01	1.88	0.19	1415	1400	151	200
26070	B094W3	26070	09/25/93	315	100	0.01	1.74	0.19	334	330	146	100
	B094W3 MS	26071	09/25/93	891	100	0.01	1.74	0.19	1700	1700	146	100
	B094W3 MSD	26072	09/25/93	905	100	0.01	1.74	0.19	1733	1700	146	100
	B094W3 DUP	26073	09/25/93	344	100	0.01	1.74	0.19	403	400	146	100
	BLANK	26074	09/25/93	177	100	0.01	1.74	0.19	7	<100	146	100
	BLANK SPIKE	26075	09/25/93	717	100	0.01	1.74	0.19	1287	1300	146	100
	B094X1	26076	09/28/93	2068	100	0.01	1.87	0.19	4459	4500	151	200

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FILENAME: 8QW-PU.WK1

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	Pu239 Cnts	Pu238 Cnts	Time Secs	Spike Cnts	Spike Act.	Bkg Pu239	Bkg Pu238	Time secs	Spike %R
26561	B094Z5	26561	0.15	09/28/93	43	0.1982	2	1	60000	1452	4.03	2	1	80000	0.8180
	B094Z5 DUP	26564	0.15	09/28/93	44	0.1715	1	1	60000	1093	4.03	4	1	80000	0.7104
	BLANK	26565	0.15	10/06/93	31	0.2018	2	1	60000	1242	4.03	1	1	80000	0.6875
	BLANK SPIKE	26566	0.3	10/06/93	32	0.1772	96	1	60000	1274	4.03	2	1	80000	0.8026
26070	B094W3	26070	0.15	09/28/93	47	0.1908	1	1	60000	1239	4.03	1	1	80000	0.7253
	B094W3 DUP	26073	0.15	09/28/93	48	0.1837	1	1	60000	1284	4.03	1	1	80000	0.7808
	BLANK	26074	0.15	10/01/93	47	0.1908	1	1	60000	1271	4.03	3	1	80000	0.7432
	BLANK SPIKE	26075	0.3	10/01/93	48	0.1837	133	1	60000	1477	4.03	3	1	80000	0.8973
	B094X1	26076	0.15	09/28/93	46	0.1845	1	1	60000	1355	4.03	1	1	80000	0.8204

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FILENAME: 8QW-PU.WK1

SDG	HEIS No.	Lab No.	Pu239 Calc.	Pu239 Rptd	Pu239 MDA Calc	Pu239 MDA Rptd	Pu238 Calc.	Pu238 Rptd.	Pu238 MDA Calc	Pu238 MDA Rptd
26561	B094Z5	26561	0.0093	0.0093	0.1	0.1	0.0046	0.0046	0.07	0.07
	B094Z5 DUP	26564	-0.0493	-0.049	0.2	0.2	0.0062	0.0061	0.1	0.1
	BLANK	26565	0.0271	0.027	0.09	0.09	0.0054	0.0054	0.09	0.09
	BLANK SPIKE	26566	1	1	0.06	0.06	0.0026	0.0026	0.04	0.04
26070	B094W3	26070	0.0054	<0.09	0.09	0.09	0.0054	<0.09	0.09	0.09
	B094W3 DUP	26073	0.0052	<0.08	0.08	0.08	0.0052	<0.08	0.08	0.08
	BLANK	26074	-0.0265	<0.1	0.1	0.1	0.0053	<0.09	0.09	0.09
	BLANK SPIKE	26075	1.2	1.2	0.06	0.06	0.0023	<0.04	0.04	0.04
	B094X1	26076	0.0050	<0.08	0.08	0.08	0.0050	<0.08	0.08	0.08

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9213507.1754

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
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Golder Associates

January 4, 1994

Our ref: 913-1719
S/O/2717

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills, MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Connie Simiele

RE: TRANSMITTAL OF REVISED DATA VALIDATION PACKAGES AND COMMENT RESPONSES

Dear Ms. Simiele:

This letter transmits revised data validation packages for the following analytical data packages:

- 26561-WES-1280
- 26070-WES-1281

Comment responses are provided on the attached pages. If you have any questions regarding the enclosed, please contact us.

Sincerely,

GOLDER ASSOCIATES INC.

Kent M. Angelos
Project Manager

Donald M. Caldwell
Project Director

KMA/DMC/ah 2717.ltr/whc-2

Enclosures

cc: P. K. Brockman

RECEIVED
JAN 5 1994
VALIDATION DOCUMENTATION
SDLA

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COMMENT RESPONSES

DATA PACKAGE: 26561-WES-1280

Comments from J. E. Mitchell

1. Comment: Please attache the Chain of Custody.

   Response: We are unable to attach the Chain of Custody since we did not make a duplicate copy of it when we received the data package. The original record copy of the Chain of Custody form has been returned with the original data package.

Comments from C. J. Simiele

1. Comment: Paginate the entire report

   Response: The entire report has been paginated and the revised report is included with this transmittal.

2. Comment: Please explain all the U qualifiers in the memo section (text) of the report.

   Response: An explanation for the U qualifiers is provided in the revised report under the section titled, MINOR DEFICIENCIES.

COMMENT RESPONSES

DATA PACKAGE: 26070-WES-1281

Comments from J. E. Mitchell

1. Comment: Attachment 4, page 7: Please explain why the Tc-99 result is qualified as "J" instead of "R" as dictated by the table on this page.

   Response: A comment has been added to the page in question and the text of the report to indicate that the qualification of "R" for a minor exceedance of the control limits is too strict, rather the results should be qualified as estimated "J".

2. Comment: Please attach the Chain of Custody.

   Response: We are unable to attach the Chain of Custody since we did not make a duplicate copy of it when we received the data package. The original record copy of the Chain of Custody form has been returned with the original data package.

Comments from C. J. Simiele

1. Comment: Paginate the entire report.

   Response: The entire report has been paginated and the revised report is included with this transmittal.

2. Comment: Please explain all the U qualifiers in the text (memo) section of the report.

   Response: An explanation for the U qualifiers is provided in the revised report under the section titled, MINOR DEFICIENCIES.

3. Comment: Page 2 memo, and page 5, lab data: The narrative indicates that the Tc-99 re-run result should be qualified as an estimate "UJ" as the result is a non-detect. The Tc-99 result needs to be flagged UJ and the memo text should state "qualified as estimated "J/UJ"".

   Response: All positive Tc-99 results are to be flagged as estimated "J" due to minor deficiencies in detector efficiencies and blank spike recoveries. Therefore, we do not feel a change to the memo text is warranted.

9213507.1757

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

January 4, 1994

Our ref: 913-1719
S/O/2717

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills, MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Connie Simiele

RE: TRANSMITTAL OF REVISED DATA VALIDATION PACKAGES AND COMMENT RESPONSES

Dear Ms. Simiele:

This letter transmits revised data validation packages for the following analytical data packages:

- 26561-WES-1280
- 26070-WES-1281

Comment responses are provided on the attached pages. If you have any questions regarding the enclosed, please contact us.

Sincerely,

GOLDER ASSOCIATES INC.

Kent M. Angelos
Project Manager

Donald M. Caldwell
Project Director

KMA/DMC/ah Z717.ltr/whc-2

Enclosures

cc: P. K. Brockman

9713507.1758

COMMENT RESPONSES

DATA PACKAGE: 26561-WES-1280

Comments from J. E. Mitchell

1. Comment: Please attache the Chain of Custody.

   Response: We are unable to attach the Chain of Custody since we did not make a duplicate copy of it when we received the data package. The original record copy of the Chain of Custody form has been returned with the original data package.

Comments from C. J. Simiele

1. Comment: Paginate the entire report

   Response: The entire report has been paginated and the revised report is included with this transmittal.

2. Comment: Please explain all the U qualifiers in the memo section (text) of the report.

   Response: An explanation for the U qualifiers is provided in the revised report under the section titled, MINOR DEFICIENCIES.

COMMENT RESPONSES

DATA PACKAGE: 26070-WES-1281

Comments from J. E. Mitchell

1. Comment: Attachment 4, page 7: Please explain why the Tc-99 result is qualified as "J" instead of "R" as dictated by the table on this page.

   Response: A comment has been added to the page in question and the text of the report to indicate that the qualification of "R" for a minor exceedance of the control limits is too strict, rather the results should be qualified as estimated "J".

2. Comment: Please attach the Chain of Custody.

   Response: We are unable to attach the Chain of Custody since we did not make a duplicate copy of it when we received the data package. The original record copy of the Chain of Custody form has been returned with the original data package.

Comments from C. J. Simiele

1. Comment: Paginate the entire report.

   Response: The entire report has been paginated and the revised report is included with this transmittal.

2. Comment: Please explain all the U qualifiers in the text (memo) section of the report.

   Response: An explanation for the U qualifiers is provided in the revised report under the section titled, MINOR DEFICIENCIES.

3. Comment: Page 2 memo, and page 5, lab data: The narrative indicates that the Tc-99 re-run result should be qualified as an estimate "UJ" as the result is a non-detect. The Tc-99 result needs to be flagged UJ and the memo text should state "qualified as estimated "J/UJ"".

   Response: All positive Tc-99 results are to be flagged as estimated "J" due to minor deficiencies in detector efficiencies and blank spike recoveries. Therefore, we do not feel a change to the memo text is warranted.

9213507.1760

RECEIVED
JAN 5 1994
VALIDATION DOCUMENTATION
SDLA

MEMORANDUM

TO: 200-BP-1 Project QA Record

December 30, 1993

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 26561-WES-1280 (913-1719)

INTRODUCTION

This memo presents the results of data validation on data package 26561-WES-1280 consisting of one (1) water sample submitted for radiochemistry analysis which was performed by the Teledyne Isotopes laboratory. Information concerning the sample validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B094Z5	09/12/93	WATER

Data validation was conducted in accordance with the revise WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992). Attachments 1 through 4 to this memo provide the data validation supporting documentation and a summary of the validated results.

JAN 1994 RECEIVED TQO

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the technetium-99 chemical recovery as summarized under Major Deficiencies.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. One (1) sample was validated in this data set with a total of 30 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the work plan objectives of 90%.

MAJOR DEFICIENCIES

The following presents a summary of the rejected data.

The technetium-99 chemical recovery for the blank spike sample (Teledyne ID 26566) was 29% which is less than the 30% minimum control limit. Therefore, the associated result has been qualified as unusable (R).

1/4/94

000001

MINOR DEFICIENCIES

The following qualifications were required as a result of the data validation.

All results reported as less than (L.T.) by the laboratory have been qualified as undetected. (U).

REFERENCES

WHC, 1993, Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision F, April 1993. Westinghouse Hanford Company, Richland, Washington.

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

Revised Page 6 3/94 MH

9213507.1762

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - The constituent was analyzed for, but was not detected above the minimum detectable activity (MDA). The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory. The data are usable for decision making purposes.

UJ - The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit. The data are usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data are usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data are unusable.

R - Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data are unusable.

9713507.1764

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

26561-WFS-1280

SDG:	REVIEWER:	DATE: 12/07/93	PAGE 1 OF 1
COMMENTS: Radiochemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tc-99	R	Blank Spike	Chemical recovery <30%
		(TI# 26566)	
~~Tc-99~~	~~J~~	B09425	Initial cal. eff. <20%.
		~~B09425 (1&2)~~	
		~~6/12/93~~	MLS
			6/3/94

Replaced Recy 6/3/94 MLS

9713507.1766

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

Validated Data Summary, Data Package: 26561-WES-1280

	Samp#	B09425	
	Date	9-12-93	
	Location	299-E33-39	
	Type	---	
Parameter	Units	Result	Q
Technetium-99	pCi/L	27.000	
Gross Alpha	pCi/L	2.000	U
Gross Beta	pCi/L	26.000	
Strontium-90	pCi/L	1.000	U
Total Uranium	µg/L	2.600	
Beryllium-7	pCi/L	70.000	U
Potassium-40	pCi/L	100.000	U
Manganese-54	pCi/L	6.000	U
Cobalt-58	pCi/L	7.000	U
Iron-59	pCi/L	20.000	U
Cobalt-60	pCi/L	6.000	U
Zinc-65	pCi/L	10.000	U
Zirconium-95	pCi/L	8.000	U
Ruthenium-103	pCi/L	9.000	U
Ruthenium-106	pCi/L	60.000	U
Iodine-131	pCi/L	30.000	U
Cesium-134	pCi/L	7.000	U
Cesium-137	pCi/L	7.000	U
Barium-140	pCi/L	20.000	U
Cerium-141	pCi/L	10.000	U
Cerium-144	pCi/L	40.000	U
Europium-152	pCi/L	20.000	U
Europium-154	pCi/L	30.000	U
Europium-155	pCi/L	20.000	U
Radium-226	pCi/L	100.000	U
Thorium-228	pCi/L	10.000	U
Thorium-234	pCi/L	100.000	U
Tritium	pCi/L	2500.000	
Plutonium-238	pCi/L	0.070	U
Plutonium-239	pCi/L	0.100	U

9213507.1767

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE
4-3864	LL-1140-F4	09/17/93	10/20/93

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

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26561	9309L907-001	B094Z5	09/12				PH TEST	VERIF IED					3
							TC-99	2.7 +-0.4 E 01		10/05			3
							GR-A	L.T. 2. E 00	U	09/28			3
							GR-B	2.6 +-0.3 E 01		09/27			3
							SR-90	L.T. 1. E 00	U	10/08			3
							TOTAL-U	2.6 +-0.4 E 00	UGM/LITER *				3
							~~TOTAL-U~~	~~L.T. 5. E-02~~	~~UGM/LITER *~~				3
							~~GR-A~~	~~2.2 +-1.78E-00~~		09/28			3
							~~GR-B~~	~~L.T. 2. E-00~~		09/27			3
							~~TC-99~~	~~L.T. 3. E-00~~		10/05			3
							~~SR-90~~	~~0.0 +-7.34E-01~~		10/08			3
							BE-7	L.T. 7. E 01	U	10/03			4
							~~BE-7~~	~~7.3 +-39.1E-00~~		10/03			4
							K-40	L.T. 1. E 02	U	10/03			4
							~~K-40~~	~~6.0 +-6.1E-01~~		10/03			4
							MN-54	L.T. 6. E 00	U	10/03			4
							~~MN-54~~	~~9.3 +-38.3E-01~~		10/03			4
							CO-58	L.T. 7. E 00	U	10/03			4
							~~CO-58~~	~~7.7 +-43.6E-01~~		10/03			4
							FE-59	L.T. 2. E 01	U	10/03			4
							~~FE-59~~	~~1.6 +-9.1E-00~~		10/03			4
							CO-60	L.T. 6. E 00	U	10/03			4
							~~CO-60~~	~~1.9 +-33.7E-01~~		10/03			4
							ZN-65	L.T. 1. E 01	U	10/03			4
							~~ZN-65~~	~~2.4 +-7.3E-00~~		10/03			4
							ZR-95	L.T. 8. E 00	U	10/03			4
							~~ZR-95~~	~~1.0 +-4.7E-00~~		10/03			4
							RU-103	L.T. 9. E 00	U	10/03			4
							~~RU-103~~	~~3.9 +-5.0E-00~~		10/03			4
							RU-106	L.T. 6. E 01	U	10/03			4
							~~RU-106~~	~~2.2 +-3.5E-01~~		10/03			4
							I-131	L.T. 3. E 01	U	10/03			4

Replaced page 6/3/94

6/3/94

12/7/93

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

4

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 2
4-3864	LL-1140-F4	09/17/93	10/20/93	

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

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26561	9309L907-001	B094Z5	09/12				~~I-131~~	~~1.3 +- 2.2E 01~~		10/03			4
							CS-134	L.T. 7. E 00	U	10/03			4
							~~CS-134~~	~~5.7 +-41.5E-01~~		10/03			4
							CS-137	L.T. 7. E 00	U	10/03			4
							~~CS-137~~	~~1.7 +- 4.0E 00~~		10/03			4
							BA-140	L.T. 2. E 01	U	10/03			4
							~~BA-140~~	~~1.4 +-10.8E 00~~		10/03			4
							CE-141	L.T. 1. E 01	U	10/03			4
							~~CE-141~~	~~2.2 +- 7.4E 00~~		10/03			4
							CE-144	L.T. 4. E 01	U	10/03			4
							~~CE-144~~	~~1.5 +- 2.3E 01~~		10/03			4
							EU-152	L.T. 2. E 01	U	10/03			4
							~~EU-152~~	~~1.6 +- 1.2E 01~~		10/03			4
							EU-154	L.T. 3. E 01	U	10/03			4
							~~EU-154~~	~~9.5 +-14.8E 00~~		10/03			4
							EU-155	L.T. 2. E 01	U	10/03			4
							~~EU-155~~	~~5.6 +- 1.3E 01~~		10/03			4
							RA-226	L.T. 1. E 02	U	10/03			4
							~~RA-226~~	~~6.6 +- 6.9E 01~~		10/03			4
							TH-228	L.T. 1. E 01	U	10/03			4
							~~TH-228~~	~~1.1 +- 6.5E 00~~		10/03			4
							TH-234	L.T. 1. E 02	U	10/03			4
							~~TH-234~~	~~4.7 +- 7.5E 01~~		10/03			4
							H-3	2.5 +-0.2 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
							PU-238	L.T. 7. E-02	U	09/28			6
							PU-239	L.T. 1. E-01	U	09/28			6
							~~PU-238~~	~~4.6 +-46.3E-03~~		09/28			6
							~~PU-239~~	~~9.3 +-65.5E-03~~		09/28			6

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12/7/93

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

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4-3864	LL-1140-F4	09/17/93	10/20/93

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LIONVILLE PA 19341-1313

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26562	9309L907-001MS B094Z5		/				H-3	3.5 +-0.2 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
26563	9309L907-001MSDB094Z5		/				H-3	3.6 +-0.2 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
26564	9309L907-001DUPB094Z5		09/12				TC-99	3.3 +-0.5 E 01		10/05			3
							GR-A	L.T. 2. E 00	"	09/28			3
							GR-B	2.5 +-0.3 E 01		09/27			3
							SR-90	L.T. 1. E 00	"	10/08			3
							TOTAL-U	2.5 +-0.4 E 00	UGM/LITER *				3
							~~TOTAL-U~~	~~L.T. 5. E-02~~	~~UGM/LITER *~~				3
							~~GR-A~~	~~1.6 +-1.68E-00~~		09/28			3
							~~GR-B~~	~~L.T. 2. E-00~~		09/27			3
							~~TC-99~~	~~L.T. 3. E-00~~		10/05			3
							~~SR-90~~	~~1.2 +-7.64E-01~~		10/08			3
							BE-7	L.T. 6. E 01	"	10/05			4
							~~BE-7~~	~~0.0 +- 3.8E-01~~		10/05			4
							K-40	L.T. 1. E 02	"	10/05			4
							~~K-40~~	~~1.0 +- 0.7E-02~~		10/05			4
							MN-54	L.T. 6. E 00	"	10/05			4
							~~MN-54~~	~~9.6 +-35.8E-01~~		10/05			4
							CO-58	L.T. 6. E 00	"	10/05			4
							~~CO-58~~	~~1.3 +- 3.9E-00~~		10/05			4
							FE-59	L.T. 1. E 01	"	10/05			4
							~~FE-59~~	~~4.1 +- 8.7E-00~~		10/05			4
							CO-60	L.T. 6. E 00	"	10/05			4
							~~CO-60~~	~~1.5 +- 3.5E-00~~		10/05			4
							ZN-65	L.T. 1. E 01	"	10/05			4
							~~ZN-65~~	~~7.6 +- 7.5E-00~~		10/05			4
							ZR-95	L.T. 7. E 00	"	10/05			4
							~~ZR-95~~	~~1.9 +- 4.2E-00~~		10/05			4

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10/7/93

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
4-3864	LL-1140-F4	09/17/93	10/20/93	4

MRS JOSIE EDWARDS
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LIONVILLE PA 19341-1313

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26564	9309L907-001DUPB094Z5		09/12				RU-103	L.T. 8. E 00	u	10/05			4
							~~RU-103~~	~~8.7 +-48.7E-01~~		10/05			4
							RU-106	L.T. 6. E 01	u	10/05			4
							~~RU-106~~	~~7.6 +-34.8E 00~~		10/05			4
							I-131	L.T. 4. E 01	u	10/05			4
							~~I-131~~	~~1.1 +- 2.3E 01~~		10/05			4
							CS-134	L.T. 7. E 00	u	10/05			4
							~~CS-134~~	~~2.5 +- 4.0E 00~~		10/05			4
							CS-137	L.T. 7. E 00	u	10/05			4
							~~CS-137~~	~~1.1 +- 4.0E 00~~		10/05			4
							BA-140	L.T. 2. E 01	u	10/05			4
							~~BA-140~~	~~2.4 +-11.8E 00~~		10/05			4
							CE-141	L.T. 1. E 01	u	10/05			4
							~~CE-141~~	~~0.0 +- 7.4E 00~~		10/05			4
							CE-144	L.T. 3. E 01	u	10/05			4
							~~CE-144~~	~~1.7 +- 2.2E 01~~		10/05			4
							EU-152	L.T. 2. E 01	u	10/05			4
							~~EU-152~~	~~7.8 +-115.E 01~~		10/05			4
							EU-154	L.T. 2. E 01	u	10/05			4
							~~EU-154~~	~~4.9 +-10.4E 00~~		10/05			4
							EU-155	L.T. 2. E 01	u	10/05			4
							~~EU-155~~	~~4.7 +- 1.1E 01~~		10/05			4
							RA-226	L.T. 1. E 02	u	10/05			4
							~~RA-226~~	~~6.6 +-63.6E 00~~		10/05			4
							TH-228	L.T. 1. E 01	u	10/05			4
							~~TH-228~~	~~9.3 +- 6.4E 00~~		10/05			4
							TH-234	L.T. 1. E 02	u	10/05			4
							~~TH-234~~	~~4.7 +- 6.6E 01~~		10/05			4
							H-3	2.4 +-0.2 E 03	no qual.	09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
							PU-238	L.T. 1. E-01	u	09/28			6
							PU-239	L.T. 2. E-01	u	09/28			6

12/7/93

9/15507.1271

12/7/93

C:2

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 5
4-3864	LL-1140-F4	09/17/93	10/20/93	

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

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26564	9309L907-001DUPB094Z5		09/12				~~PU-238~~	~~6.1 +-61.5E-03~~		09/28			6
							~~PU-239~~	~~4.9 +-8.9 E-02~~		09/28			6
26565	DISTILLED BLANK H2O		/				TC-99	L.T. 4. E 00	U	10/05			3
							GR-A	L.T. 7. E-01	U	09/27			3
							GR-B	L.T. 7. E-01	U	09/27			3
							SR-90	L.T. 1. E 00	U	10/08			3
							TOTAL-U	L.T. 5. E-02	UGM/LITER U*				3
							~~TOTAL-U~~	~~3. +-3. E-03~~	~~UGM/LITER *~~				3
							~~GR-A~~	~~1.6 +-4.6 E-01~~		09/27			3
							~~GR-B~~	~~3.5 +-4.8 E-01~~		09/27			3
							~~TC-99~~	~~5.0 +-22.4E-01~~		10/05			3
							~~SR-90~~	~~1.9 +-8.20E-01~~		10/08			3
							BE-7	L.T. 4. E 01	U	10/03			4
							~~BE-7~~	~~1.0 +- 2.6E 01~~		10/03			4
							K-40	L.T. 1. E 02	U	10/03			4
							~~K-40~~	~~5.7 +- 6.2E 01~~		10/03			4
							MN-54	L.T. 5. E 00	U	10/03			4
							~~MN-54~~	~~1.8 +- 3.0E 00~~		10/03			4
							CO-58	L.T. 6. E 00	U	10/03			4
							~~CO-58~~	~~6.9 +-34.0E-01~~		10/03			4
							FE-59	L.T. 1. E 01	U	10/03			4
							~~FE-59~~	~~1.6 +- 5.7E 00~~		10/03			4
							CO-60	L.T. 5. E 00	U	10/03			4
							~~CO-60~~	~~6.6 +-31.8E-01~~		10/03			4
							ZN-65	L.T. 1. E 01	U	10/03			4
							~~ZN-65~~	~~4.8 +- 6.1E 00~~		10/03			4
							ZR-95	L.T. 5. E 00	U	10/03			4
							~~ZR-95~~	~~2.2 +- 3.1E 00~~		10/03			4
							RU-103	L.T. 5. E 00	U	10/03			4
							~~RU-103~~	~~1.8 +-31.7E-01~~		10/03			4
							RU-106	L.T. 5. E 01	U	10/03			4

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

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

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26565	DISTILLED BLANK H2O		/				~~RU-106~~	~~4.5 +- 30.4E 00~~		10/03			4
							I-131	L.T. 7. E 00	U	10/03			4
							~~I-131~~	~~3.7 +- 41.2E-01~~		10/03			4
							CS-134	L.T. 6. E 00	U	10/03			4
							~~CS-134~~	~~9.9 +- 34.3E-01~~		10/03			4
							CS-137	L.T. 6. E 00	U	10/03			4
							~~CS-137~~	~~1.1 +- 3.4E 00~~		10/03			4
							BA-140	L.T. 6. E 00	U	10/03			4
							~~BA-140~~	~~4.8 +- 36.2E-01~~		10/03			4
							CE-141	L.T. 7. E 00	U	10/03			4
							~~CE-141~~	~~3.1 +- 4.5E 00~~		10/03			4
							CE-144	L.T. 3. E 01	U	10/03			4
							~~CE-144~~	~~4.3 +- 19.0E 00~~		10/03			4
							EU-152	L.T. 2. E 01	U	10/03			4
							~~EU-152~~	~~7.4 +- 10.8E 00~~		10/03			4
							EU-154	L.T. 1. E 01	U	10/03			4
							~~EU-154~~	~~4.7 +- 89.7E-01~~		10/03			4
							EU-155	L.T. 2. E 01	U	10/03			4
							~~EU-155~~	~~6.1 +- 1.0E 01~~		10/03			4
							RA-226	L.T. 1. E 02	U	10/03			4
							~~RA-226~~	~~1.9 +- 6.4E-01~~		10/03			4
							TH-228	L.T. 1. E 01	U	10/03			4
							~~TH-228~~	~~2.0 +- 5.5E 00~~		10/03			4
							TH-234	L.T. 1. E 02	U	10/03			4
							~~TH-234~~	~~3.2 +- 6.6E-01~~		10/03			4
							H-3	L.T. 2. E 02	U	09/25			5
							~~H-3~~	~~4.7 +- 92.2E 00~~		09/25			5
							PU-238	L.T. 9. E-02	U	10/06			6
							PU-239	L.T. 9. E-02	U	10/06			6
							~~PU-238~~	~~5.4 +- 54.1E-03~~		10/06			6
							~~PU-239~~	~~2.7 +- 6.9 E-02~~		10/06			6

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

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

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26566	DISTILLED SPIKED H2O		/				TC-99	1.1 +-0.1 E 02	pCi/L	10/05			3
							GR-A	1.2 +-0.2 E 01		10/08			3
							GR-B	2.5 +-0.2 E 01		09/27			3
							SR-90	7.4 +-0.2 E 01		10/10			3
							TOTAL-U	1.7 +-0.3 E 01	UGM/LITER *				3
							~~TOTAL-U~~	~~L.T. 5. E-02~~	~~UGM/LITER *~~				3
							~~GR-A~~	~~L.T. 5. E-01~~		10/08			3
							~~GR-B~~	~~L.T. 7. E-01~~		09/27			3
							~~TC-99~~	~~L.T. 6. E-00~~		10/05			3
							~~SR-90~~	~~L.T. 8. E-01~~		10/10			3
							BE-7	L.T. 3. E 06	U	10/06			4
							~~BE-7~~	~~5.8 +-15.7E 05~~		10/06			4
							K-40	L.T. 5. E 02	U	10/06			4
							~~K-40~~	~~2.1 +- 3.0E 02~~		10/06			4
							MN-54	L.T. 5. E 02	U	10/06			4
							~~MN-54~~	~~0.0 +- 2.9E 02~~		10/06			4
							CO-58	L.T. 4. E 04	U	10/06			4
							~~CO-58~~	~~2.1 +- 2.6E 04~~		10/06			4
							FE-59	L.T. 3. E 06	U	10/06			4
							~~FE-59~~	~~1.1 +- 1.8E 06~~		10/06			4
							CO-60	2.46+-0.25E 04		10/06			4
							~~CO-60~~	~~L.T. 9. E 02~~		10/06			4
							ZN-65	L.T. 1. E 03	U	10/06			4
							~~ZN-65~~	~~3.6 +- 8.9E 02~~		10/06			4
							ZR-95	L.T. 7. E 04	U	10/06			4
							~~ZR-95~~	~~8.4 +-43.3E 03~~		10/06			4
							RU-103	L.T. 4. E 06	U	10/06			4
							~~RU-103~~	~~1.6 +- 2.6E 06~~		10/06			4
							RU-106	L.T. 3. E 03	U	10/06			4
							~~RU-106~~	~~5.8 +-18.1E 02~~		10/06			4
							CS-134	L.T. 2. E 02	U	10/06			4
							~~CS-134~~	~~3.3 +-13.1E 01~~		10/06			4

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12/7/93

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 10/15/93

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MRS JOSIE EDWARDS
WESTON/WESTINGHOUSE/HANFORD
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LIONVILLE PA 19341-1313

W A T E R

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
26566	DISTILLED SPIKED H2O		/				CS-137	2.21+-0.22E 04		10/06			4
							~~CS-137~~	~~L.T. 6. E 02~~		10/06			4
							CE-141	L.T. 4. E 07	3	10/06			4
							~~CE-141~~	~~8.6 +-24.1E 06~~		10/06			4
							CE-144	L.T. 2. E 03	3	10/06			4
							~~CE-144~~	~~1.2 +- 1.3E 03~~		10/06			4
							EU-152	L.T. 3. E 02	3	10/06			4
							~~EU-152~~	~~1.7 +- 2.0E 02~~		10/06			4
							EU-154	L.T. 2. E 02	3	10/06			4
							~~EU-154~~	~~1.5 +-12.5E 01~~		10/06			4
							EU-155	L.T. 6. E 02	3	10/06			4
							~~EU-155~~	~~7.9 +- 0.3E 03~~		10/06			4
							RA-226	L.T. 2. E 03	3	10/06			4
							~~RA-226~~	~~4.0 +- 9.2E 02~~		10/06			4
							TH-228	L.T. 3. E 02	3	10/06			4
							~~TH-228~~	~~2.0 +-16.0E 01~~		10/06			4
							TH-234	L.T. 1. E 03	3	10/06			4
							~~TH-234~~	~~1.9 +- 0.1E 04~~		10/06			4
							H-3	1.4 +-0.1 E 03		09/25			5
							~~H-3~~	~~L.T. 2. E 02~~		09/25			5
							PU-238	L.T. 4. E-02	3	10/06			6
							PU-239	1.0 +-0.2 E 00	3	10/06			6
							~~PU-238~~	~~2.6 +-26.4E-03~~		10/06			6
							~~PU-239~~	~~L.T. 6. E-02~~		10/06			6

LAST PAGE OF REPORT

APPROVED BY J. GUENTHER 10/15/93

SEND 1 COPIES TO WE884S MRS JOSIE EDWARDS

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

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12/7/93

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ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

PROJECT: 200-BP-1	VALIDATOR: [illegible] DATE: 12/6/93
LABORATORY: Weston	DATA PACKAGE: 26561-WES-1280
SAMPLES/MATRIX: B-9475 (ID# 26561)	
water	

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:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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).

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

12/6/93

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:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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: No qualification required.

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 12/7/93

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:

~~All detection limit requirements are met. with the exception of Ruthenium-106. The DL requirement for Ru-106 is 3pCi/L, and the reported MDA is 50 pCi/L. No qualification was required.~~ 12/7/93

All MDA values are in accordance with the revised detection limit goals dated August 27th 1992

12/7/93

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? Sample locations were not provided. 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

12/6/93 ~~tritium~~

Comments:

~~MS %R = 71% MSD %R = 79% (J/UJ)~~

The Tc-99 chemical recovery for the blank spike (TI# 26566) is 29%. The associated result has been qualified as unusable (R).

All other chemical and tracer recoveries are acceptable, within the 30% - 105% requirements.

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? locations are not provided 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: No qualification required.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

7. Laboratory Control Samples

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

12/6/93

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: No qualification required.

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:

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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)~~. ~~estimated (J)~~. ~~12/6/93~~ MW 6/3/94

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:

~~The Tc-99 efficiency for detector C-3 is 0.19. Therefore, the assoc. sample result (B09475) has been qualified as estimated (J).~~

12/6/93 ~~The assoc. result has NOT been qualified as unusable since the chemical yield and continuing calibration checks are within the specified control limits.~~

MW 6/3/94

Initial detector efficiencies based on Cs137 were >20% therefore no qualification is necessary

MW 6/3/94

Reviewed MW 6/3/94

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: No qualification is required.

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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: No qualification is required.

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.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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: No qualification is required.

RADIOCHEMISTRY DATA VALIDATION CHECKLIST

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

See comments

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

Comments:

Calibration check sample was analyzed before each run, therefore, qualification is not necessary

12/6/93

FILENAME: 26561-QC.WK1

SDG NO.: 26561-WES-1280

SAMPLE ID: BLANK
MS SAMPLE ID: BLANK SPIKE

PARAMETER	SPIKED AMOUNT	BLANK RESULT	SPIKE RESULT	SPIKE %R
TECHNETIUM-99	98.5	0	110	112
GROSS ALPHA	11.2	0	12	107
GROSS BETA	22	0	25	114
STRONTIUM-90	80	0	74	93
TOTAL URANIUM	18.6	0	17	91
COBALT-60	25000	0	24600	98
CESIUM-137	21600	0	22100	102
TRITIUM	1400	0	1400	100
PLUTONIUM-239	1.09	0	1	92

SAMPLE ID: B094Z5
MS SAMPLE ID: B094Z5 MS
MSD SAMPLE ID: B094Z5 MSD

PARAMETER	SPIKED AMOUNT	SAMPLE RESULT	MS RESULT	MS %R	MSD RESULT	MSD %R	MS/MSD RPD
TRITIUM	1400	2500	3500	71	3600	79	10

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LABORATORY DUPLICATE RELATIVE PERCENT DIFFERENCE 19-Nov-93

FILENAME: 26561-LD.WK1

SDG NO.: 26561-WES-1280

SAMPLE ID: B094Z5
DUPLICATE SAMPLE ID: B094Z5 DUP

PARAMETER	SAMPLE RESULT	DUPLCIATE RESULT	LAB DUP RPD
TECHNETIUM-99	27	33	20
GROSS BETA	26	25	4
TOTAL URANIUM	2.6	2.5	4
TRITIUM	2500	2400	4

FILENAME: 8QW-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.
25651	B094Z5	25651	10/05/93	C3	0.3	0.543	227	100	0.21	0.21	27	27	3	3
	B094Z5 DUP	26564	10/05/93	C4	0.3	0.5	269	100	0.21	0.224	33	33	3	3
	BLANK	26555	10/05/93	E4	0.2	0.387	9	100	0.11	0.232	-0.50	-0.50	4	4
	BLANK SPIKE	26556	10/05/93	E5	0.2	0.29	369	100	0.15	0.251	110	110	6	6
26070	B094W3	26070	09/24/93	C4	0.3	0.5	11890	100	0.22	0.224	1591	1600	3	3
	B094W3 DUP	26073	09/24/93	C6	0.3	0.446	10290	100	0.19	0.204	1695	1700	3	3
	BLANK	26062	09/24/93	E9	0.2	0.435	13	100	0.23	0.229	-2	<5	5	5
	BLANK SPIKE	26063	09/24/93	E10	0.2	0.408	551	100	0.14	0.243	122	120	4	4
	B094X1	26076	09/24/93	C1	0.3	0.376	1509	100	0.22	0.221	269	270	4	4

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FILENAME: 8QW-A.WK1

SDG	HEIS#	Lab No.	Det.	Spl. Amt.	Date Alpha Counted	GROSS ALPHA Gross Counts	Count Time	Bkg. cpm	Eff.	Result Calc	Result Rptd	MDA Calc	MDA Rptd
26561	B094Z5	26561	T3	0.5	09/28/93	33	100	0.16	0.071	2.2	<2	2	2
	B094Z5 DUP	26564	T3	0.5	09/28/93	29	100	0.16	0.072	1.6	<2	2	2
	BLANK	26565	T3	1	09/27/93	11	50	0.16	0.172	0.16	<0.7	0.7	0.7
	BLANK SPIKE	26566	T3	1	10/08/93	245	50	0.16	0.174	12.27	13	0.7	0.7
26070	B094W3	26070	T3	0.5	09/23/93	7	50	0.06	0.076	0.95	<2	2	2
	B094W3 DUP	26073	T3	0.5	09/23/93	10	50	0.06	0.078	1.62	<2	2	2
	BLANK	26074	T3	1	09/22/93	4	50	0.16	0.145	-0.25	<0.8	0.8	0.8
	BLANK SPIKE	26075	T3	1	09/22/93	156	50	0.16	0.143	9.32	9.3	0.8	0.8
	B094X1	26076	T3	0.5	09/23/93	33	50	0.06	0.072	7.51	7.5	2.0	2

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FILENAME: 8QW-B.WK1

SDG	HEIS#	Lab No.	Det.	Date Beta Counted	GROSS BETA Gross Counts	Count Time	Bkg. cpm	Eff.	Spl. Amt.	Result Calc	Result Rptd	MDA Calc	MDA Rptd
26561	B094Z5	25661	T3	09/27/93	456	50	0.92	0.282	0.5	26	26	2	2
	B094Z5 DUP	26564	T3	09/27/93	435	50	0.92	0.283	0.5	25	25	2	2
	BLANK	26565	T3	09/27/93	61	50	0.92	0.386	1	0.35	<0.7	0.7	0.7
	BLANK SPIKE	26566	T3	09/27/93	1103	50	0.92	0.387	1	25	25	0.7	0.7
26070	B094W3	26070	T3	09/22/93	9874	36.68	1.02	0.289	0.5	836	840	2	2
	B094W3 DUP	26073	T3	09/22/93	9851	40.07	1.02	0.293	0.5	753	750	2	2
	BLANK	26074	T3	09/22/93	80	50	1.02	0.367	1	0.7	<0.8	0.8	0.8
	BLANK SPIKE	26075	T3	09/22/93	908	50	1.02	0.366	1	21	21	0.8	0.8
	B094X1	26076	T3	09/22/93	1935	50	1.02	0.284	0.5	120	120	2	2

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FILENAME: 8QW-SR2.WK1

SDG	HEIS	Lab No.	Date Analyzed	Det. ID	Spl Amt.	Y-90 Yield	SR-89 Yield	Ingrowth	Decay	Gross Cnts	Count Time	Bkg. cpm
25651	B094Z5	25651	10/08/93	E2	0.5	0.974	0.494	0.872	0.753	26	200	0.13
	B094Z5 DUP	26564	10/08/93	C9	0.5	1	0.711	0.872	0.789	23	100	0.21
	BLANK	26068	10/08/93	C10	0.5	0.988	0.668	0.872	0.789	19	100	0.22
	BLANK SPIKE	26069	10/10/93	B10	0.5	0.983	0.639	0.872	0.429	6648	800	0.25
26070	B094W3	26070	10/08/93	C4	0.5	1	0.78	0.872	0.789	21	100	0.17
	B094W3 DUP	26073	10/08/93	E5	0.5	0.986	0.717	0.872	0.753	31	200	0.14
	BLANK	26068	10/08/93	C10	0.5	0.988	0.668	0.872	0.789	19	100	0.22
	BLANK SPIKE	26069	10/08/93	B10	0.5	0.983	0.639	0.872	0.429	6648	800	0.25
	B094X1	26076	10/08/93	E4	0.5	0.986	0.575	0.872	0.753	21	200	0.11

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FILENAME: 8QW-SR2.WK1

SDG	HEIS	Lab No.	Det. Eff.	Sr90 Result Calc.	Result Rptd	MDA Calc.	MDA Rptd.
25651	B094Z5	25651	0.28	-0.00	0	1	1
	B094Z5 DUP	26564	0.32	0.12	0.12	1	1
	BLANK	26068	0.31	-0.19	-0.19	1	1
	BLANK SPIKE	26069	0.42	73.58	74	0.8	0.8
26070	B094W3	26070	0.32	0.21	<1	1.0	1
	B094W3 DUP	26073	0.32	0.09	<0.7	0.7	0.7
	BLANK	26068	0.31	-0.19	<1	1	1
	BLANK SPIKE	26069	0.42	73.58	74	0.8	0.8
	B094X1	26076	0.29	-0.04	<0.9	0.9	0.9

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FILENAME: 8QW-U.WK1

SDG	HEIS#	TELEDYNE LAB ID	DATE ANALYZE	SAMPLE AMOUNT	DILUTION FACTOR	WF	WU	R	TOTAL URANIUM CALC. UG/L	TOTAL URANIUM RPTD. UG/L
26561	B094Z5	26561	10/01/93	6	2	0.337	0.515	0.686	2.6	2.6
	B094Z5 DUP	26564	10/01/93	6	2	0.33	0.51	0.686	2.5	2.5
	BLANK	26565	10/01/93	6	1	0.001	0.257	0.686	0.0	<0.05
	BLANK SPIKE	26566	10/01/93	6	10	0.61	0.855	0.686	17.1	17
26070	B094W3	26070	10/01/93	6	2	0.379	0.581	0.686	2.6	2.6
	B094W3 DUP	26073	10/01/93	6	2	0.379	0.583	0.686	2.5	2.5
	BLANK	26074	10/01/93	6	1	0.001	0.257	0.686	0.00	<0.05
	BLANK SPIKE	26075	10/01/93	6	10	0.61	0.855	0.686	17.1	17
	B094X1	26076	10/01/93	6	20	0.403	0.605	0.686	27.4	28

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FILENAME: 8QW-H3.WK1

SDG	HEIS#	Lab No.	Date Analyzed	Gross Counts	Count Time	Sample Amount	Bkgnd cpm	Detect Eff.	Result Calc.	Result Rptd	MDA Calc	MDA Rptd
26561	B094Z5	26561	09/25/93	1230	100	0.01	1.88	0.19	2470	2500	151	200
	B094Z5 MS	26562	09/25/93	1654	100	0.01	1.88	0.19	3476	3500	151	200
	B094Z5 MSD	26563	09/25/93	1689	100	0.01	1.88	0.19	3559	3600	151	200
	B094Z5 DUP	26564	09/25/93	1189	100	0.01	1.88	0.19	2373	2400	151	200
	BLANK	26565	09/25/93	190	100	0.01	1.88	0.19	5	<200	151	200
	BLANK SPIKE	26566	09/25/93	785	100	0.01	1.88	0.19	1415	1400	151	200
26070	B094W3	26070	09/25/93	315	100	0.01	1.74	0.19	334	330	146	100
	B094W3 MS	26071	09/25/93	891	100	0.01	1.74	0.19	1700	1700	146	100
	B094W3 MSD	26072	09/25/93	905	100	0.01	1.74	0.19	1733	1700	146	100
	B094W3 DUP	26073	09/25/93	344	100	0.01	1.74	0.19	403	400	146	100
	BLANK	26074	09/25/93	177	100	0.01	1.74	0.19	7	<100	146	100
	BLANK SPIKE	26075	09/25/93	717	100	0.01	1.74	0.19	1287	1300	146	100
	B094X1	26076	09/28/93	2068	100	0.01	1.87	0.19	4459	4500	151	200

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FILENAME: 8QW-PU.WK1

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	Pu239 Cnts	Pu238 Cnts	Time Secs	Spike Cnts	Spike Act.	Bkg Pu239	Bkg Pu238	Time secs	Spike %R
26561	B094Z5	26561	0.15	09/28/93	43	0.1982	2	1	60000	1452	4.03	2	1	80000	0.8180
	B094Z5 DUP	26564	0.15	09/28/93	44	0.1715	1	1	60000	1093	4.03	4	1	80000	0.7104
	BLANK	26565	0.15	10/06/93	31	0.2018	2	1	60000	1242	4.03	1	1	80000	0.6875
	BLANK SPIKE	26566	0.3	10/06/93	32	0.1772	96	1	60000	1274	4.03	2	1	80000	0.8026
26070	B094W3	26070	0.15	09/28/93	47	0.1908	1	1	60000	1239	4.03	1	1	80000	0.7253
	B094W3 DUP	26073	0.15	09/28/93	48	0.1837	1	1	60000	1284	4.03	1	1	80000	0.7808
	BLANK	26074	0.15	10/01/93	47	0.1908	1	1	60000	1271	4.03	3	1	80000	0.7432
	BLANK SPIKE	26075	0.3	10/01/93	48	0.1837	133	1	60000	1477	4.03	3	1	80000	0.8973
	B094X1	26076	0.15	09/28/93	46	0.1845	1	1	60000	1355	4.03	1	1	80000	0.8204

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FILENAME: 8QW-PU.WK1

SDG	HEIS No.	Lab No.	Pu239 Calc.	Pu239 Rptd	Pu239 MDA Calc	Pu239 MDA Rptd	Pu238 Calc.	Pu238 Rptd.	Pu238 MDA Calc	Pu238 MDA Rptd
26561	B094Z5	26561	0.0093	0.0093	0.1	0.1	0.0046	0.0046	0.07	0.07
	B094Z5 DUP	26564	-0.0493	-0.049	0.2	0.2	0.0062	0.0061	0.1	0.1
	BLANK	26565	0.0271	0.027	0.09	0.09	0.0054	0.0054	0.09	0.09
	BLANK SPIKE	26566	1	1	0.06	0.06	0.0026	0.0026	0.04	0.04
26070	B094W3	26070	0.0054	<0.09	0.09	0.09	0.0054	<0.09	0.09	0.09
	B094W3 DUP	26073	0.0052	<0.08	0.08	0.08	0.0052	<0.08	0.08	0.08
	BLANK	26074	-0.0265	<0.1	0.1	0.1	0.0053	<0.09	0.09	0.09
	BLANK SPIKE	26075	1.2	1.2	0.06	0.06	0.0023	<0.04	0.04	0.04
	B094X1	26076	0.0050	<0.08	0.08	0.08	0.0050	<0.08	0.08	0.08

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SDG 26561-WES-1280

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 200-BP-1

Collection Date 9/12/93

Ice Chest No. GWS058

Field Logbook No. IEFL-1020

Bill of Lading/Airbill No. 2536956059

Offsite Property No. W93-O-0718-30

Method of Shipment ~~WESTON~~ EMERY

Shipped to WESTON LCS 9/14/93

Possible Sample Hazards/Remarks

Sample Identification

BO 9425

1, 1L, P, WATER: METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) UNFILTERED
1, 500ml, G, WATER; IC ANIONS(F,Cl,SO4,NO2,PO4)
1, 500ml, P, WATER; NO2/NO3(H2SO4 pH<2)
1, 250ml, P, WATER; ALKALINITY
1, 250ml, P, WATER; TDS
1, 250ml, P, WATER; SULFATE
1, 1L, P, WATER; CYANIDE(NaOH pH>12)
3, 2L, P, WATER; GROSS ALPHA/BETA, GAMMA SPEC(Cs-137,Co-60,Ru-106), Pu-238, Pu-239/240, Sr-90, TOTAL URANIUM(HNO3 pH<2)
1, 250ml, Gs, WATER; TRITIUM
1, 1L, G/P, WATER; Tc-99(HCl pH<2)

BO 9426

1, 1L, P, WATER; METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) FILTERED

Temp: 5.1°C

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee K.D. Lee	9/12/93	1359	L. Sweeney L. Sweeney	9/13/93	0800
L. Sweeney L. Sweeney	9/13/93	0900			
[illegible]	9/14/93	1140	[illegible]		

Final Sample Disposition

Disposal Method:	Disposed By:	Date/Time:

Comments: Relinq. to Frg. # 7A by K.D. Lee 9/12/93 1359

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A-6000-407 (12/92) WEF061

9213507.1E04

SDG 26561-WES-1280

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 9/12/93 Time 1647 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
BO 9425	1, 1L, P	WATER	METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi),
			SELENIUM (HNO3 pH<2)
	1, 500ml, G	WATER	IC ANIONS(F,Cl,SO4,NO2,PO4)
	1, 500ml, P	WATER	NO2/NO3(H2SO4 pH<2)
	1, 250ml, P	WATER	ALKALINITY
	1, 250ml, P	WATER	TDS
	1, 250ml, P	WATER	SULFATE
	1, 1L, P	WATER	CYANIDE (NaOH pH>12)
	3, 2L, P	WATER	GROSS ALPHA/BETA, GAMMA SPEC(Cs-137,Co-60,
			Ru-106), Pu-238, Pu-239/240, Sr-90, TOTAL
			URANIUM (HNO3 pH<2)
	1, 250ml, Gs	WATER	TRITIUM
	1, 1L, G/P	WATER	Tc-99 (HCl pH<2)
BO 9426	1, 1L, P	WATER	METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi),
			SELENIUM (HNO3 pH<2)
			TASK #: 93-266
			OPC #: W93-0-0718-30
			BOL #: 2536955 6059

Field Information**

Special Handling and/or Storage

LABORATORY COPY

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information [illegible]