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2	1	Cog. Eng. R.A. Esch	<i>R.A. Esch</i>	12/1/95							
2	1	Cog. Mgr. J.G. Kristofzski	<i>J.G. Kristofzski</i>	12/1/95							
2	1	QA Tzu L. Tung	<i>Tzu L. Tung</i>	12/1/95							
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		Env.									
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## 60-Day Waste Compatibility Safety Issue and Final Results for Diversion Box 240-S-151, Grab Samples 240-S-151-TOP, 240-S-151-MIDDLE and 240-S-151-BOTTOM

Ruth A. Esch

Westinghouse Hanford Company, Richland, WA 99352  
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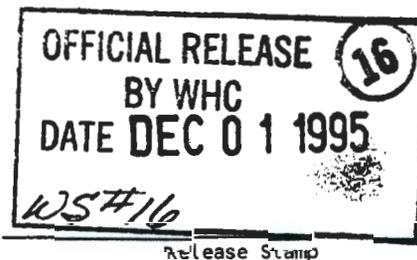
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Abstract: N/A

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Approved for Public Release

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Westinghouse  
Hanford Company

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P.O. Box 1970 Richland, WA 99352

WHC-SD-WM-DP-158, REV. 0

**ANALYTICAL SERVICES**

**60-DAY WASTE COMPATIBILITY SAFETY ISSUE AND FINAL RESULTS  
FOR DIVERSION BOX 240-S-151  
GRAB SAMPLES 240-S-151-TOP, 240-S-151-MIDDLE AND 240-S-151-BOTTOM**

**DATE PRINTED:**

**DECEMBER 1, 1995**

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WMC-SD-WM-DP-158, REV. 0

**NARRATIVE**

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## WHC-SD-WM-DP-158, REV. 0

60 DAY WASTE COMPATIBILITY SAFETY ISSUE AND FINAL RESULTS  
FOR DIVERSION BOX 240-S-151  
GRAB SAMPLES 240-S-151-TOP, 240-S-151-MIDDLE AND 240-S-151-BOTTOM

Summary

Three grab samples (240-S-151-TOP, 240-S-151-MIDDLE AND 240-S-151-BOTTOM) were taken from diversion box 240-S-151. Samples were collected on October 24, 1995, and received by the 222-S Laboratory on the same day. The TOP and MIDDLE samples were expected to be liquids and the BOTTOM sample was expected to have solids. At the direction of West Tank Farms Transition Projects Engineering, only the TOP and MIDDLE samples were analyzed to support the waste compatibility safety program. The BOTTOM sample was not analyzed at this time because there were no solids present (refer to message from M. J. Sutey to R. A. Esch in the correspondence section). The accuracy criterium of 80% - 120% was met for all analyses. One test failed the precision criterium of  $\pm 20\%$ . Refer to the analytical deviations section for an explanation. No notifications were required based on sample results.

Appearance, OTR and Sample Breakdown

Attachment 1 is provided as a cross-reference for relating the tank farm customer ID numbers with the 222-S Laboratory LABCORE sample numbers, and the portion of the sample that was analyzed.

240-S-151-TOP

This sample was collected at a depth of 150 inches. Visual observation indicated that the sample was a clear colorless liquid with no solids. The dose rate was 2.5 mrad/hr. There was no organic layer present.

Two subsamples, approximately 20 mL each, were created for analysis of inorganic analytes and radionuclides. A third 40 mL subsample was created for inductively coupled plasma (ICP) analysis only.

The remainder of the liquid was archived for possible future analysis.

240-S-151-MIDDLE

This sample was collected at a depth of 173 inches. Visual observation indicated that the sample was a clear colorless liquid with no solids. The dose rate was 2.5 mrad/hr. There was no organic layer present.

Two subsamples, approximately 20 mL each, were created for analysis of inorganic analytes and radionuclides. A third 40 mL subsample was created for ICP analysis only.

The remainder of the liquid was archived for possible future analysis.

240-S-151-BOTTOM

This sample was collected at the bottom of the diversion box (196 in.). It was noted on the chain of custody that the sample appeared to be all liquid and clear, no sludge. Visual observation in the lab also indicated that the

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sample was a clear colorless liquid with no solids. The dose rate was 2.5 mrad/hr. There was no organic layer present. West Tank Farms Transition Projects Engineering was immediately informed that there were no solids present in this sample. The Laboratory was directed to not analyze the sample. The sample was archived for possible future analysis.

Analytical Results

Attachments

Two result tables are attached. Table 1 is the summary report from the Laboratory Information Management System (LABCORE).

Table 2 provides the ICP serial dilution results. The serial dilution values were obtained from the raw data. The accuracy of the ICP results was assessed using these results in addition to matrix spikes. In those instances where an analyte concentration significantly exceeds the spike added the matrix spike recovery result may not be meaningful. In these cases the serial dilution results are used to assess accuracy. The sample was analyzed both undiluted and with a 5-fold serial dilution. For acceptable performance, the relative percent difference (RPD) between the serial dilution and the undiluted results must be  $\leq 10\%$ .

Analytical Deviations

240-S-151-TOP

The parent sample, S95T003121 was subsampled for analysis. The subsamples were not filtered. Sample number S95T003124 was analyzed for inorganic analytes, S95T003126 for radionuclides, and S95T003715 for ICP.

For gamma energy analysis (GEA)  $^{60}\text{Co}$  results are given in Table 1 with the  $^{137}\text{Cs}$  results.

240-S-151-MIDDLE

The parent sample, S95T003122 was subsampled for analysis. The subsamples were not filtered. Sample number S95T003125 was analyzed for inorganic analytes, S95T003127 for radionuclides, and S95T003716 for ICP.

For GEA  $^{60}\text{Co}$  results are given in Table 1 with the  $^{137}\text{Cs}$  results.

The RPD between the sample duplicate for the TOC analysis was slightly above of the required limit of  $\pm 20\%$ . No rerun was performed because the result for sample was less than 5 times the detection limit.

Procedures

The volume percent solids by centrifugation test was not performed on any of the samples because there were no solids present to perform the test.

Procedure LA-514-114 Rev. C-1 was used to perform the differential scanning calorimetry (DSC) analysis. This procedure is for DSC analysis using the Perkin Elmer instrument. Procedure LA-514-113, referenced in the TSAP, is the

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procedure for DSC analysis using the Mettler instrument. The two procedures are analytically equivalent. The analysis was performed on direct samples. No analytical problems were noted.

Procedures LA-560-112 Rev. B-0 and LA-514-114 Rev. C-1 were used to perform the thermogravimetric analysis (TGA) for percent moisture. These procedures are for TGA analysis using the Mettler and Perkin Elmer instruments, respectively. The two procedures are analytically equivalent. The analysis was performed on direct samples. No analytical problems were noted.

Procedure LA-548-121 Rev. D-1 was used for the GEA for  $^{60}\text{Co}$  and  $^{137}\text{Cs}$ . The samples were analyzed directly. No analytical problems were noted.

Procedure LA-220-101 Rev. D-1 was used for the analysis of  $^{90}\text{Sr}$ . The samples were analyzed directly. No analytical problems were noted.

Procedure LA-505-161 Rev. B-0 was used to perform the ICP analysis for Al, Fe, and Na. This procedure is for ICP analysis using the Thermo Jarrell Ash (TJA) ICP instrument. Procedure LA-505-151, referenced in the TSAP, is the procedure for ICP analysis using the Analytical Research Laboratory (ARL) instrument. The two procedures are analytically equivalent. The samples were acidified and then analyzed directly. This acidification is denoted with a "D" in the aliquot class column (A#) in Table 1. No analytical problems were noted.

Procedure LA-533-105 Rev. D-1 was used to perform the ion chromatography (IC) analysis for  $\text{Cl}^-$ ,  $\text{F}^-$ ,  $\text{PO}_4^{3-}$ ,  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ , and  $\text{NO}_2^-$ . The analysis was performed on direct samples.

Procedure LA-212-106 Rev. A-0 was used to perform the pH analysis on the supernate sample. No analytical problems were noted.

Procedure LA-344-105 Rev. C-0 was used to perform the total organic carbon (TOC) analysis. The analysis was performed on direct samples. No analytical problems were noted.

Procedure LA-622-102 Rev. C-0 was used to perform the total inorganic carbon (TIC) analysis. The procedure referenced in the TSAP (LA-344-105) is incorrect for this analysis. All analyses were performed on direct samples. No analytical problems were noted.

Procedure LA-943-127 Rev. B-0 was used to perform the  $^{239/240}\text{Pu}$  analysis. The procedure specified in the TSAP (LA-503-156) was superseded by the above procedure. The analysis was performed on direct samples. No analytical problems were noted.

Procedure LA-953-103 Rev. A-4 was used for the analysis of  $^{241}\text{Am}$ . The samples were analyzed directly. No analytical problems were noted.

Procedure LA-510-112 Rev. C-3 was used to perform the specific gravity (SpG) analysis. The analysis was performed on direct samples. No analytical problems were noted.

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Reference

WHC-SD-WM-TSAP-037, REV. 1B, "Compatibility Grab Sampling and Analysis Plan", dated October 19, 1995, Westinghouse Hanford Company, Richland, WA 99352

Due to the large volume,  
a copy of the data  
supporting the Data  
Validation Report and  
the Sample Data Summary,

Pages 6 thru 13,

is available only from  
Central Files.

Westinghouse Hartford  
Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround  
 Priority  
 Normal

Collector <b>JAMES SICKELS</b>	Company Contact <b>N/A</b>	Telephone No. <b>373-3578</b>
Project Designation <b>N/A</b>	Sampling Location <b>240-5-151</b>	SAF No. <b>N/A</b>
Ice Chest No. <b>N/A</b>	Field Logbook No. <b>N/A</b>	Method of Shipment <b>WMC TRANSPORTATION</b>
Shipped To <b>2223</b>	Office Property No. <b>N/A</b>	Bill of Lading/Air Bill No. <b>N/A</b>
Possible Sample Hazard/Remarks <b>RADIOACTIVE</b>	Preservative <b>N/A</b>	
	Type of Container <b>GLASS</b>	
	No. of Container(s) <b>2</b>	
Special Handling/and/or Storage <b>N/A</b>	Volume <b>125ml (EA)</b>	

SAMPLE ANALYSIS

Sent<sup>A</sup> Top 1642 Middle 1641

Sample No.	Matrix*	Date Sampled	Time Sampled	
240-5-151-Top	L	10/24/95	1400	← USE ON CONTACT ← S. Sample
240-5-151-Middle	L	10/24/95	1408	

CHAIN OF POSSESSION		Sign/Print Name	
Relinquished By <b>JAMES SICKELS</b>	Date/Time <b>10/24/95</b>	Received By <b>JAMES SICKELS</b>	Date/Time <b>10-24-95</b>
Relinquished By <b>JAMES SICKELS</b>	Date/Time <b>10-24-95</b>	Received By <b>JAMES SICKELS</b>	Date/Time <b>10-24-95</b>
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

COPY

Matrix*	
S	= Soil
SE	= Sediment
SO	= Solid
SL	= Sludge
W	= Water
O	= Oil
A	= Air
DS	= Drum Solids
DL	= Drum Liquids
T	= Tar
WI	= Waste
L	= Liquid
V	= Vegetation
X	= Other

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

DISTRIBUTION: Original - Sample Yellow - Sample

GC-8000-628 11/2/92

14

9613389, 1453

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SDWM-01-158,  
REV D, 240-5151

Due to the large volume,  
a copy of the data  
supporting the Data  
Validation Report and  
the Sample Data Summary,

Pages 14 thru 183,

is available only from  
Central Files.

## DISTRIBUTION SHEET

To Distribution	From Characterization Plans, Coordination and Reports	Page 1 of 1		
		Date:	12/01/95	
Project Title/Work Order WHC-SD-WM-DP-158, Rev. 0, "60-Day Waste Compatibility Safety Issue and Final Results for Diversion Box 240-S-151, Grab Samples 240-S-151-TOP, 240-S-151-MIDDLE and 240-S-151-BOTTOM"		EDT NO.:	EDT-610069	
		ECN NO.:	N/A	
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M. J. Kupfer	H5-49	X	
J. E. Meacham	S7-15	X	
P. M. Morant	H4-25	X	
K. L. Powell	T6-04		X
L. W. Shelton	H5-49	X	
B. C. Simpson	R2-12		X
M. J. Sutey	T4-07	X	
J. A. Voogd	H5-03		X
Central Files	A3-88	2	
EDMC	H6-08	X	
LTIC	T6-03		X
TCRC	R2-12	X	
TFIC (Tank Farm Information Center)	R1-20		X

Washington State Department of Ecology

Single-Shell Tank Unit Manager

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