

Contract No:

This document was prepared in conjunction with work accomplished under Contract No. DE-AC09-08SR22470 with the U.S. Department of Energy (DOE) Office of Environmental Management (EM).

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Summary Report for the Analysis of the Sludge Batch 8 (Macrobatch 10) DWPF Pour Stream Glass Sample

D. L. McClane

June, 2019

SRNL-STI-2019-00278



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Printed in the United States of America

**Prepared for
U.S. Department of Energy**

Keywords: *DWPF, Glass, Waste
Compliance, Sludge Batch 8*

Retention: *Permanent*

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contract number DE-AC09-08SR22470.



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EXECUTIVE SUMMARY

In order to comply with the Defense Waste Processing Facility (DWPF) Waste Form Compliance Plan for Sludge Batch 8, Savannah River National Laboratory (SRNL) personnel characterized a pour stream sample that was collected while canister S04274 was being filled. This report summarizes the results of the compositional analysis for reportable oxides and radionuclides, and the normalized Product Consistency Test (PCT) results. The PCT responses indicate that the DWPF produced glass is significantly more durable than the Environmental Assessment glass. Results and further details are documented in SRNL-STI-2018-00699, "Analysis of the Sludge Batch 8 (Macrobatch 10) DWPF Pour Stream Glass Sample."

Table 1. Measured Concentration of Major Components^a

Oxide	Measured (wt%)
Al ₂ O ₃	7.10
B ₂ O ₃	4.71
CaO	0.76
Fe ₂ O ₃	12.30
Li ₂ O	3.88
MnO	3.34
Na ₂ O	14.12
NiO	0.97
SiO ₂	46.42
U ₃ O ₈	2.02
ZnO	0.64

Table 2. Normalized PCT Results (g/L)

Glass ID		SB8 PS	EA Glass	EA Glass [Reported ^b]
<i>NC_B</i>	Average	0.84	20.36	16.7
	St. Dev.	0.048	2.314	1.2
<i>NC_{Li}</i>	Average	0.79	11.19	9.6
	St. Dev.	0.008	1.289	0.7
<i>NC_{Na}</i>	Average	1.26	15.12	13.3
	St. Dev.	0.019	1.631	0.9
<i>NC_{Si}</i>	Average	0.67	4.38	3.9
	St. Dev.	0.013	0.452	0.4

^a Greater than 0.5 wt% on an elemental basis

^b C. M. Jantzen, N. E. Bibler, D. C. Beam, C. L. Crawford, and M. A. Pickett, "Characterization of the Defense Waste Processing Facility (DWPF) Environmental Assessment (EA) Glass Standard Reference Material (U)," [WSRC-TR-92-346, Revision 1], Westinghouse Savannah River Co., Aiken, SC, (1993).

Table 3. Measured Reportable Radionuclide Concentration

Radionuclide	Measured Concentration in Glass (Ci/kg)
Sr-90	5.43E+00
Zr-93	3.00E-04
Tc-99	3.11E-05
Sn-126	9.26E-05
Cs-135	<5.08E-06
Cs-137	9.25E-01
Th-232	4.27E-07
U-233	3.28E-05
U-234	2.24E-05
U-235	2.42E-07
U-236	4.90E-07
Np-237	1.02E-05
Pu-238	6.85E-02
U-238	5.62E-06
Pu-239	3.64E-03
Pu-240	1.25E-03
Am-241	1.20E-02
Pu-241	1.28E-02
Pu-242	1.75E-06

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