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Results from the Second MCU Flush DSSHT Sample

Ref:
1. X-ESR-H-01003, Rev.0, J. Medina, "Sample Plan for the Second Phase of the Strategy for the Interim Lay-Up of MCU During Initial SWPF Operation", November 2019.
2. SRNL-L3100-2021-00019, Rev.0, T. B Peters, "Results from the First MCU Flush DSSHT Sample and the Second SEHT Flush Sample", June 16, 2021.

The Modular Caustic-Side Solvent Extraction Unit (MCU) stopped operations on May 22, 2019. As part of a plan to de-inventory the remainder of the liquids in the system, samples are sent to the Savannah River National Laboratory (SRNL) for analysis.[1] A recent set of samples was pulled from the Decontaminated Salt Solution (DSS) Hold Tank (DSSHT) on 6/25/21, and arrived on the same day. The current DSSHT contents includes heel from the first flush of DSSHT (reference SRNL-L3100-2021-00019),[2] deionized water (DIW) backflush of the DSS Coalescer, DIW flushes of the DSS Hydraulic Accumulator (DSSHA), DIW flush of the Contactor Drain Tank (CDT), and DSS Decanter drain material. The DIW flushes from the coalescer, DSSHA, and CDT were pumped through the DSS Decanter to allow for flushing of the DSS Decanter.

The samples were received in three p-nut vials, with sample identities of MCU-21-10, -11 and -12. No obvious second phases were noted. The entirety of MCU-21-10 was transferred for semi-volatile organic analysis (SVOA) for Isopar-L ™. A subsample of MCU-21-11 was sent for gamma scan analysis without dilution. The reminder of MCU-21-11 and the entirety of MCU-21-12 were stored for any additional analysis that may be requested. The results of these analyses are listed in Table 1.

Table 1. Results from the Second DSSHT Flush Sample

Analysis	Result
Isopar-L ™	<7 mg/L
^{137}Cs	6.31E+03 pCi/mL

The analytical uncertainty (1-σ) for the Isopar-L ™ is 20%, and 8.18% for the ^{137}Cs.

Upon review of the gamma scan data, and comparison to the estimated values based upon process knowledge, the SRR customer noted the DSSHT gamma scan from MCU-21-11 was lower than expected. This is likely due to not fully recirculating the DSSHT contents prior to sampling. Following the DSSHT first batch transfer, a heel of approximately 256 gallons remained in the tank. As part of compiling the second DSSHT batch, the volume was increased to approximately 1783 gallons with DIW flush material and samples were pulled. The first DSSHT batch had a reported ^{137}Cs rate of 5.99E+06 pCi/mL (reference SRNL-L3100-2021-00019).[2] With a dilution factor of 6.96 (1783 gal/256 gal) from the 5/27/21 samples, the expected ^{137}Cs rate for the second batch would be approximately 8.61E+05 pCi/mL. Despite the discrepancy in the ^{137}Cs rate, both the estimated and measured ^{137}Cs rates are well below the Tank 50 Waste Acceptance Criteria limit.

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