



**Savannah River
Remediation**

AECOM | BECHTEL | CH2M | B&W | AREVA

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MERCURY IN THE LIQUID WASTE SYSTEM

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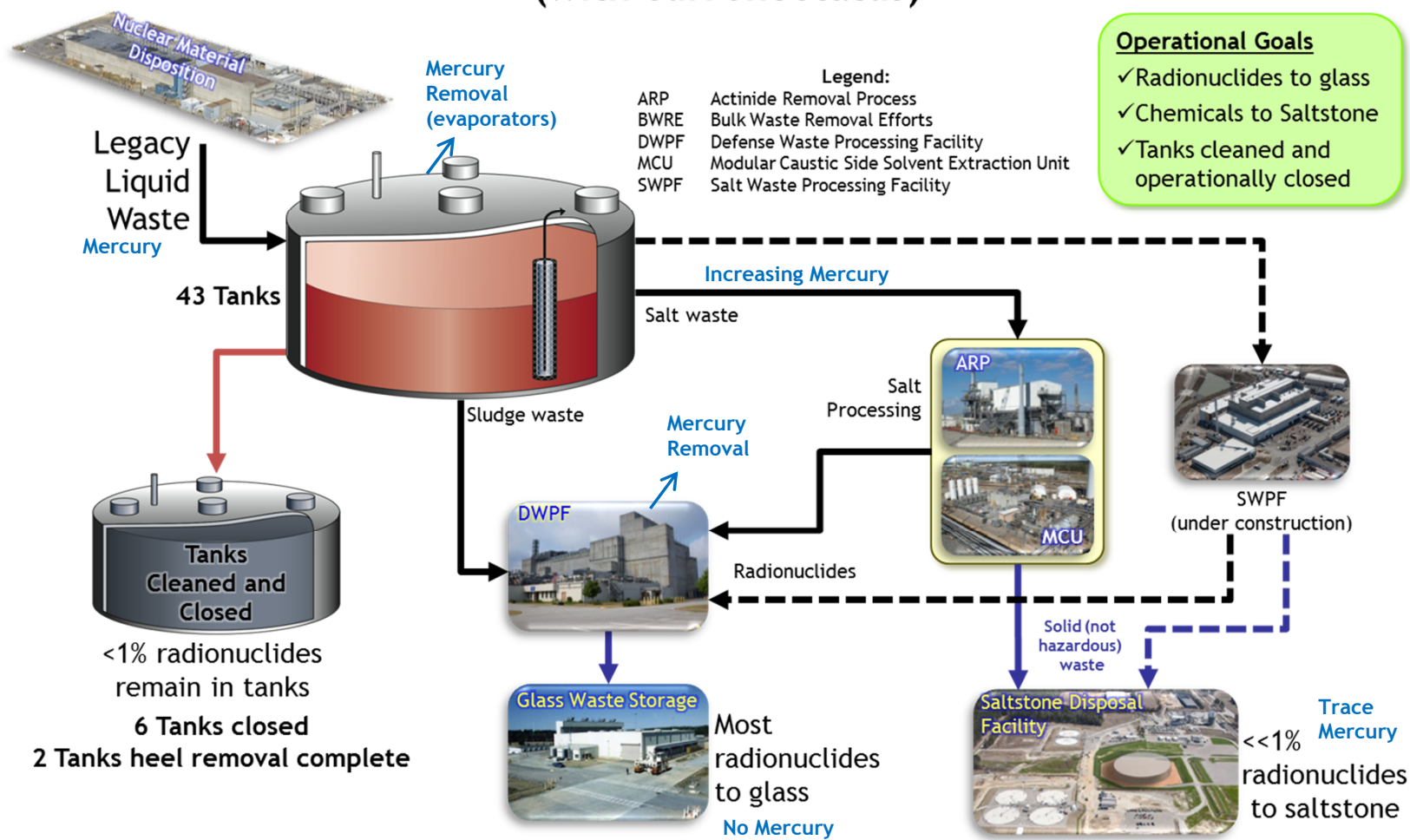


Purpose

- Mercury has long been a consideration in the Liquid Waste System, both from a hazard and a processing perspective
- There have been no exposures, no releases, and all waste treatment complies with requirements
- However, there have been several recent examples of new information related to mercury in the Liquid Waste System
 - January 7, 2015 - Larger than expected amount of mercury collected from the 3H evaporator
 - February 3, 2015 - DOE requested SRR to conduct an evaluation of mercury through the entire Liquid Waste System
 - February 3, 2015 - 4th quarter 2014 TCLP (Toxic Characteristic Leaching Procedure) result for Saltstone grout (sample taken October 2, 2014) above the LDR (Land Disposal Restriction) control limit of 0.025 mg/L but well below the toxicity limit of 0.2 mg/l
 - April 1, 2015 - Special analysis of a sample from Tank 50 (feed to Saltstone) showed higher than expected amounts of mercury in the form of mono-methyl mercury (~50 ppm vs. ~1 ppm)
- This presentation provides an overview of this new information and the near and long term actions related to mercury

Mercury in Liquid Waste

SRR Liquid Waste Program (with current status)



Mercury in Liquid Waste

We do the right thing.

Mercury

- **Originated from decades of canyon processing (used to aid reactor fuel dissolution)**
- **Is present throughout the liquid waste system (~60 metric tons)**
- **Is not a new issue**
 - Removed at evaporators
 - Stripped and removed at DWPF
 - Removed at Effluent Treatment Plant
 - DOE approved an SRR plan to look for mercury accumulation in DWPF systems in FY2014 (identified that some mercury was being recycled to the tank farms)
 - Will need to remove about one 55-gal drum of mercury from the Liquid Waste System every year for the remaining life of the program
- **But the issue is changing**
 - Higher mercury concentrations in H-area waste (H-area Tank Farm contains ~96% of the mercury)
 - Some amount of mercury recycling from DWPF
 - Chemical forms of mercury may be changing (increases in soluble mercury and methylated mercury)
- **Poses several challenges to waste processing**
 - Equipment impacts
 - Saltstone grout performance
 - Performance Assessment

We do the right thing.

- **Industrial hygiene and worker protection actions**
 - Most radiological work practices also protect from mercury
 - Training conducted on methyl mercury hazards
 - As a precaution, prescribed use of nitrile gloves for all radiological work pending permeability testing of latex gloves and other materials (testing completed last week; removing this control)
- **Increased the frequency of mercury removal from evaporators**
- **Evaluated potential processing impacts of increased concentrations of methyl mercury prior to facility resumption (following outage activities last Spring)**
- **Performing additional sampling throughout the Liquid Waste System to determine concentrations and chemical forms of mercury (sampling scheme is defined, prioritized, and in-progress)**
 - Over 40 Samples analyzed for chemical form of mercury by commercial laboratory

We do the right thing.

- **An integrated, system-wide evaluation of mercury behavior in the Liquid Waste System to identify**
 - The inventory and chemical form of mercury throughout the Liquid Waste System
 - The chemical processing behavior and accumulation of mercury in the liquid waste facilities
 - The impacts of mercury, including worker safety and equipment degradation
 - Mercury removal and disposal alternatives
- **Established Mercury Expert Advisory Panel**
 - Panel Members:
 - Dr. Lou Papouchado, Retired SRS/SRNL Chemistry Expertise
 - Dr. Eric Pierce, ORNL Mercury Expert
 - Mandi Richardson, AECOM Mercury Consultant
 - Dr. Eric Prestbo, Tekran Corp. Chief Scientist, Mercury Behavior & Speciation Expert
 - First review May 13 & 14
 - SRR's near-term approach and sampling schemes appear to be sound
 - Mercury is recycling back to the tank farm because mercury recovery in DWPF is not working efficiently
- **Phase 1 Mercury behavior in liquid waste processing systems review completed**
- **Phase 2 Integrated Assessment Underway**
 - System Engineering Evaluations (SEE) completed
 - Re-Establish Mercury Removal Capability within DWPF
 - Determine Best Alternative Mercury Removal Location within Liquid Waste System
- **Developing long-term action plan to address overall mercury management and removal.**

Summary

We do the right thing.

- Mercury is pervasive throughout the Liquid Waste System
- This is not a new issue, but we are seeing elevated levels
- There is no risk to the public or the environment
- Represents both a current and a long term challenge to liquid waste processing
- Worker safety continues to be a priority, worker protection continues to be effective, and conservative actions have been taken in response to new information
- Long term action plan under development