Retrieving Tank Wastes at Hanford

The Basics

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TANK WASTE RETRIEVAL BASICS

At Hanford, 149 single-shell tanks (SSTs) containing "tank wastes" are underground. Only seven tanks have undergone waste retrieval; six of those are in Waste Management Area C (WMA-C), commonly referred to as C-Farm. Retrieving waste has proven very difficult for many reasons, such as pump failure, obstructions in the tank, or line blockages. The depth to the bottom of a tank from ground surface is about 55 feet, so work must be done remotely using cameras and robotically controlled sprayers and vacuum hoses. Waste from the SSTs will be retrieved and stored in double-shell tanks (DSTs) until it can go to the Waste Treatment Plant and be safely stored in glass.

THE LIMITS OF TECHNOLOGY

Milestone M-45-00 of the Tri-Party Agreement (TPA)[1] calls for retrieving as much tank waste as is possible. Tank waste residues shall not exceed 360 cubic feet in each of the large tanks, 30 cubic feet in each of the smaller tanks, or the limit of waste retrieval technology capability, whichever is less[1]. The US Department of Energy (USDOE) is expected to reach the "limits of technology" before completing retrieval. If USDOE cannot meet the 360- or 30-cubic-foot goal, then they must use another technology or request a wavier as described in Appendix H of the TPA.

As part of the Proposed Consent Decree[2], if USDOE cannot meet the 360- or 30-cubic-foot goal, they will be required to use two or more technologies for retrieving tank waste, and each must reach their limits of technology. The Proposed Consent Decree[2] states:

> *The 'limits of technology' means that the recovery rate of that retrieval technology for that tank is, or has become, limited to such an extent that it extends the retrieval duration to the point at which continued operation of the retrieval technology is not practicable with the consideration of practicability to include matters such as risk reduction, facilitating tank closures, costs, the potential for exacerbating leaks, worker safety, and the overall impact on the tank waste retrieval and (waste) treatment mission.*

The goal is to retrieve enough waste so that the remaining waste is less than 360 or 30 cubic feet in the tanks, depending on tank size. If this is not achieved, then agreement on what "practicable" means will be important as we prepare for completing retrievals and for tank closure. This will allow for a smooth transition to the next technology.

CLOSURE

TPA milestone M-45-00 begins with "Complete Closure of all Single Shell Tank Farms." Appendix I of the TPA discusses the process for making the closure decision. After we retrieve all of the tanks and complete other necessary cleanup activities in WMA-C, we will make a final decision on closure for this area. The proposed goal for completing all necessary closure activities is June 30, 2019[2]. If any waste is left in the tank, it will be very important to determine the risk of that residue. More waste may have to be removed to meet final WMA-C closure requirements, even after we have met these retrieval goals. To evaluate the risk of waste remaining after remediation and cleanup, USDOE, the Nuclear Regulatory Commission, and Ecology are working together on the SST WMA-C Performance Assessment. Ecology is hosting this collaborative effort in a series of work sessions taking place through October 2011.

Citations

[1]Appendix D of the Tri-Party Agreement (1989), Hanford Federal Facility Agreement and Consent Order.
[2]The 2009 Proposed Consent Decree No. 08-5085-FV and Tri-Party Agreement Modifications for Hanford Tank Waste Treatment.

Tank Waste Retrieval Work Plan

USDOE-Office of River Protection (ORP) and Ecology share a goal of removing as much waste as possible from all the SSTs, so closure of the tank farms can proceed. Removing the waste is a task that requires extensive planning, procurement, field operations, and funding.

Ecology and USDOE-ORP have agreed, through the TPA and the 2009 Proposed Consent Decree and TPA Modifications for tank waste treatment, to use a Tank Waste Retrieval Work Plan, or TWRWP ("twerp"). The TWRWP explains how waste is expected to be safely retrieved and allows Ecology to approve the waste retrieval actions.

What are the major parts of a TWRWP?

1. Tank identification information, including waste type and volume and whether a tank is assumed to be leaking.
2. Waste retrieval system description, including lessons learned from previous waste retrieval operations, the amount and timing of liquid that may be added during waste retrieval, and expected retrieval performance.
3. Associated pipelines and related equipment, including existing information on the condition of equipment, waste volume and characteristics, and unplanned releases from the related equipment.
4. Retrieval start dates for each component. Waste retrieval is to be completed within 12 months of the retrieval start date.
5. Descriptions of leak detection and monitoring technologies including:
   - An electrical system called high-resolution resistivity
   - SST and DST liquid level monitoring activities
   - Transfer lines and pits
   - Drywell monitoring
   - Groundwater monitoring
6. Pre-retrieval, scoping-level risk assessment, which helps inform the Tri-Party Agencies of possible impacts of a leak during retrieval.
7. Air monitoring plan for tank exhausts around the tank farm vicinity.

Watch for more information on retrieval methods!

WMA-C Closure Actions Complete 2019

DEPARTMENT OF ECOLOGY
State of Washington

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