



# HANFORD TANKS

## *status update*

### Ecology's report on Hanford tank waste retrieval and closure - Spring 2016

*Tank closure involves an array of activities such as waste retrievals, soil contamination investigations, performance assessments, and permitting. Visit Ecology's website for past Updates and more info.*

#### **Progress of C-Farm SST Retrievals**

Work is ongoing to move waste from Hanford's single-shell tanks (SSTs) in Waste Management Area C (WMA C or C-Farm) to double-shell tanks (DSTs). C-Farm is the first of the tank farms slated for complete waste retrieval and closure.

Retrievals are completed for S-112 and 14 of 16 C-Farm tanks. The MARS-V retrieval system for C-105 has failed with 74,000 gal remaining of the initial 122,000 gal. A new retrieval system is being designed for C-105. C-111 has less than 10,000 gal remaining.

To date, 91% of WMA C waste has been removed (2.1 million gal of initial 2.3 million gal).

Residual waste volume of retrieved tanks ranges between 227-2070 cubic feet (1,698-15485 gal.). Five tanks have residual volume greater than 400 cubic feet (2,992 gal.).

Once C Farm retrieval is complete, work will start on retrieving waste from the four AX-Farm tanks (502,000 gal total volume). Those will be followed by six of the A-Farm tanks (887,000 gal total volume).

*Hose-in-hose transfer lines -shown at right - are temporary systems designed to carry waste from SSTs to DSTs.*

#### **RCRA Facility Investigation (RFI) for WMA C (C-Farm)**

Ecology has reviewed the RFI Report for WMA C and provided comments. The RFI addresses only soils. The remedy for groundwater under C-Farm is being addressed in the Remedial Investigation (RI) Report for the 200-BP-5 Operable Unit.

Ecology's position is that the RFI Report for WMA C needs a summary of groundwater impacts, including identification of any data gaps.

A revised (Final) RFI is due December 30, 2016. The US Department of Energy (USDOE) will submit Corrective Measures Study (CMS) and Performance Assessment (PA) for C Farm together with the Final RFI.

#### **Corrective Measures Study (CMS) for WMA C**

The WMA C CMS report is scheduled for submission to Ecology on December 30, 2016. WMA C CMS will evaluate options for corrective measures for vadose zone soils only, but will not evaluate waste remaining in the SST tanks and ancillary equipment.

Environmental impacts from post-retrieval waste volumes remaining in the SSTs, and post-remedial waste volumes remaining in the ancillary equipment, will be evaluated in the PA and the results incorporated into the Tier 2 Closure Plan for WMA C. (See page two for explanation of Closure Plans.)

USDOE has determined, in "Clean Closure Practicability Demonstration for the Single-Shell Tanks", that SSTs will be landfill-closed. Ecology will make a landfill closure determination through the permit process which includes public comment.



## SST Tier 1, 2, and 3 Closure Plans

Closure plans for the SSTs are defined in Tri-Party Agreement Appendix I. These plans will be part of the Hanford Sitewide Permit.

### Tier 1

Tier 1 is a “Framework Plan” that explains how USDOE intends to meet regulatory requirements pertaining to closure of all tank farms (WAC 173-303-610). Ecology is reviewing the Tier 1 Closure Plan for the SST System for completeness.

### Tier 2

Tier 2 Closure Plans will be developed for each of the WMAs to document how closure requirements will be met that are specific to each WMA.

Environmental impacts from post-retrieval waste volumes remaining in the SSTs and post-remedial waste volumes

remaining in the ancillary equipment will be evaluated in the PA, and the results incorporated into the Tier 2 Closure Plan for WMA C.

USDOE plans to issue Tier 2 Closure Plan for WMA C together with the PA by the end of 2016. However, the schedule for Tier 2 and Tier 3 closure plans is currently in dispute.

### Tier 3

Tier 3 Closure Plans, or “Component Closure Activity Plans,” will be developed for ancillary equipment or other components.

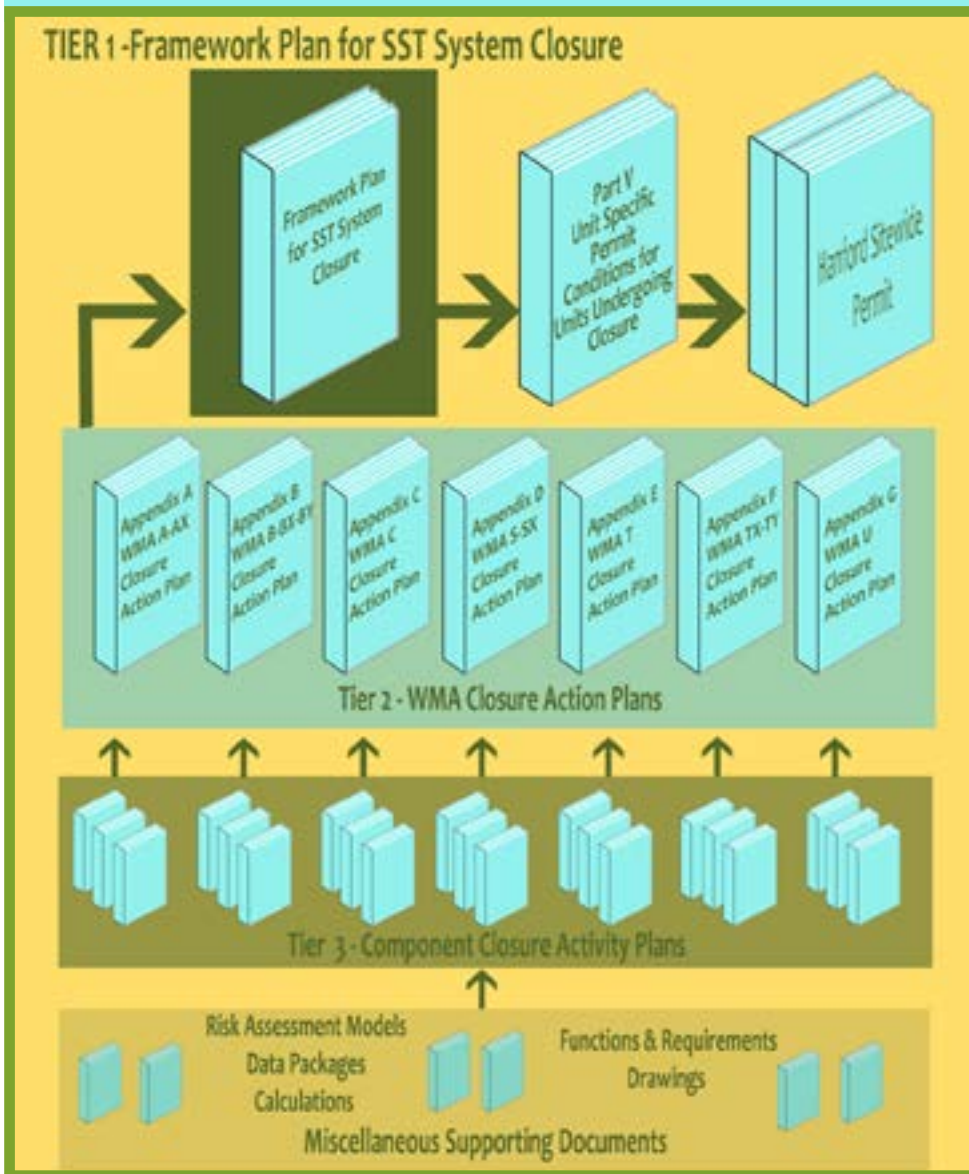
## Performance Assessment (PA)

USDOE transmitted a Draft PA for WMA C tank residuals (DOE Order 435.1 Analysis of Residual Tank Waste Impacts) to their Low-Level Waste Disposal Facility Federal Review Group (LFRG) in January 2016. Ecology and Nuclear Regulatory Commission (NRC) will be invited to observe the LFRG review process.

After the LFRG review comments are resolved and incorporated, USDOE will host a public meeting to introduce the Draft PA for WMA C tank residuals.

DOE expects to transmit the TPA Appendix I PA to Ecology and USDOE HQ in October 2016. It will include an updated PA for tank residuals and PA analysis of contaminants (radiological and chemical waste) in the vadose zone and ancillary equipment.

Also in October 2016, the Waste Incidental to Reprocessing (WIR) report is expected to be sent to USDOE headquarters (Washington DC) for NRC review.



Ecology’s mission is to protect, preserve and enhance Washington’s land, air and water for current and future generations.





*The 242-A Evaporator*

Evaporator Runs (Campaign)	Net Waste Volume Reduction (millions of gallons)
September 2014 - 13-01	0.791
May 2015 - EC-01	0.381
July 2015 - EC-02	0.384
September 2015 - EC-03	0.375
<b>TOTAL</b>	<b>1.931 (~2)</b>

## 242-A Evaporator

The 242-A Evaporator is integral to increasing space in Hanford double-shell tanks (DSTs) by decreasing liquid volumes. The most recent evaporator campaign (EC) EC-03 was completed in September 2015. It processed 0.833 million gallons of waste, resulting in a net waste volume reduction of 0.375 million gallons (after equipment and line flushes and water additions). About 2 million gallons of DST space has been recovered altogether since the restart in 2014. The following campaigns have been completed since the restart:

- EC-01 start was delayed due to equipment upgrades, safety basis revision, a cold run, and contractor and USDOE readiness assessments.
- EC-02 was extended due to high river water temperature. River water is used for cooling the condenser. The campaign was also interrupted by a failed record air sampler in AP Tank Farm.
- EC-03 ran at 100% operating efficiency without any problems.

The additional campaigns planned for 2016 are:

- EC-04, feed source AP-104, slurry tank AP-103, estimated to begin third quarter of FY 2016.
- EC-05, feed source AP-104, slurry tank AP-103, estimated to begin third quarter of FY 2016.
- EC-06, feed source AY-101, slurry tank AP-104, estimated to begin fourth quarter FY 2016.

An integrity assessment of 242-A Evaporator by an independently qualified registered professional engineer (IQRPE) is planned during fiscal year 2016.

## Double-Shell Tanks (DSTs)

There are several DST Integrity Assessment Activities Planned for FY 2016.

Enhanced visual examinations of the annulus of the following 10 DSTs will be conducted in FY 2016:

AN-101, AN-103, AN-104, AN-105, AN-106, AW-103, AW-106, SY-101, SY-102, SY-103

Ultrasonic testing of DST primary walls and annulus floor will be performed for AN-105, AW-103

Corrosion probe data analysis and maintenance will be performed for:

AN-102, AN-107, AY-101, AY-102, AW-104, AW-105, SY-101

After these activities are completed, a complete Double-Shell Tank Integrity Assessment Report will be produced.

## AY-102 Recovery Project

A leak from the primary tank was discovered in August 2012. The leaked volume was initially estimated at 520 gallons. Moisture has since evaporated leaving about 60 gallons of dried residue in the annulus. Ecology reached a Settlement with USDOE in September 2014 to remove tank waste.

The Settlement Agreement requires:

- Isolation of AY-102.
- Submittal of Contingency Plan and Monitoring Plan.
- Periodic video monitoring for leaks.
- Begin supernatant retrieval by March 2016.
- Complete sludge removal by March 2017.

Current status:

Waste retrieval began on March 3, 2016.

*Composite image (below) of waste in the annulus of AY-102 taken in July 2015.*

*The area with visible waste has increased in size since first discovered in August 2012. However it is still assumed waste has not entered the environment outside the tank.*

**Learn More!**

Visit [www.ecy.wa.gov/programs/nwp](http://www.ecy.wa.gov/programs/nwp)



[www.facebook.com/HanfordEducation](https://www.facebook.com/HanfordEducation)



@ecyhanford

Email [Hanford@ecy.wa.gov](mailto:Hanford@ecy.wa.gov)

Or Call 1-509-372-7950



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

If you need this document in a format for the visually impaired, call the Nuclear Waste Program at 509-372-7950.

Persons with hearing loss can call 711 for Washington Relay Service.

Persons with a speech disability can call 877-833-6341.

