Direct-Feed Low Activity Waste Update

Oregon Hanford Cleanup Board

Presented by: Wendell Wrzesinski, Direct-Feed Low Activity Waste Program Lead

September 26, 2016
One System integrating the Direct Feed Low-Activity Waste (DFLAW) program

WRPS, tank operations contractor
- Tank farm operations
- LAWPS
- Waste feed delivery
- Effluent retention and treatment

National laboratories
- Technical expertise
- Process improvements and issue resolution

The Office of River Protection
- Mission integration and accomplishment
- Delivering the DFLAW program

BNI, WTP contractor
- Design, construction, startup and commissioning
  - LAW vitrification facility
  - WTP Analytical Laboratory
  - WTP Balance of Facilities

WAI, 222-S laboratory contractor
- Analytical services in support of DFLAW

Richland Operations Office
- Hanford Site cleanup
- Waste disposal

MSA, Hanford sitewide services contractor
- Infrastructure and utilities services

CHPRC, environmental cleanup contractor
- ILAW container disposal services
- IDF operations
First step in sequential approach to tank waste treatment and disposal

- DFLAW facilities and infrastructure actively working to startup as early as 2022
- Provides earliest practicable tank waste disposition
20. Proposed waste feed delivery campaigns

1,000,000 Gallons per campaign

6.3 Million gallons of tank space generated*

9,600 Metric tons of sodium processed

15% of Tank Farm sodium inventory

12,000 Immobilized LAW containers produced
DFLAW Facility Overview

DFLAW
TARGET '22

INTEGRATED DISPOSAL FACILITY (IDF)
Accepts containers of vitrified low-activity waste for long-term disposal

TANK FARMS
Waste stored and maintained until ready for treatment at the Waste Treatment & Immobilization Plant
Complete Tank Farm upgrades and place new infrastructure to support waste load delivery to LWPS

LOW-PRETREATMENT SYSTEM (LWPS)
Suppresses high-level waste from low-activity waste for feeding to LAW

EFFLUENT MANAGEMENT FACILITY (EMF)
Treats the liquid effluent from the Low-Activity Waste Facility

DIRECT FEED LOW-ACTIVITY WASTE (DFLAW)
Process vitrifies low-activity waste into stable glass form for permanent disposition

TARGET DATES
CONSTRUCTION COMPLETE

LOW-ACTIVITY WASTE FACILITY
ANALYTICAL LABORATORY
EFFLUENT MANAGEMENT FACILITY
LOW-ACTIVITY WASTE PRETREATMENT SYSTEM
DFLAW

This graphic display is not to scale.
Containers of vitrified low-activity waste will be placed at **Integrated Disposal Facility** for long-term storage

**Status:** Construction substantially complete (2006); upgrades, permits needed

The **Analytical Laboratory** will analyze low-activity waste feed samples to determine appropriate glass-forming material-to-waste ratio for vitrification

**Status:** Construction substantially complete (2012); modifications ongoing
The **Balance of Facilities** consists of 21 infrastructure facilities and systems necessary to support WTP operations.

**Status:** Construction underway. On schedule to complete construction by FY2018 target date.

The **Low-Activity Waste Facility** is the largest and most complex of the WTP facilities supporting DFLAW.

**Status:** 56 percent complete overall. On schedule for construction complete by FY2018.
The **Effluent Management Facility** will concentrate and treat the liquid effluent from the LAW facility.

**Status:** In design. Target date for construction complete in FY2019.

The **Low-Activity Waste Pretreatment System** will remove solids and cesium from DSTs to provide low-activity waste feed to WTP.

**Status:** In design. Target date for construction complete by FY2021.
• Key components of the DFLAW program also include the following operating facilities:
  • 242-A Evaporator
  • 222-S Laboratory
  • Effluent Treatment Facility
• Upgrades to Double-Shell Tanks will be required to support waste feed to LAW Facility.
<table>
<thead>
<tr>
<th>Milestones</th>
<th>2010 Consent Decree</th>
<th>2016 Consent Decree (Amended)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAW Facility Construction Substantially Complete</td>
<td>12/31/2014</td>
<td>12/31/2020</td>
</tr>
<tr>
<td>Start LAW Facility Cold Commissioning</td>
<td>12/31/2018</td>
<td>12/31/2022</td>
</tr>
<tr>
<td>LAW Facility Hot Commissioning</td>
<td>12/31/2019</td>
<td>12/31/2023</td>
</tr>
<tr>
<td>Pretreatment Facility Hot Commissioning</td>
<td>12/31/2019</td>
<td>12/31/2033</td>
</tr>
<tr>
<td>HLW Facility Hot Commissioning</td>
<td>12/31/2019</td>
<td>12/31/2033</td>
</tr>
<tr>
<td>WTP Hot Start</td>
<td>12/31/2019</td>
<td>12/31/2033</td>
</tr>
<tr>
<td>WTP Begin Initial Operations</td>
<td>12/31/2022</td>
<td>12/31/2036</td>
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</tbody>
</table>
## DFLAW Program Status

<table>
<thead>
<tr>
<th>DFLAW Facilities</th>
<th>Status / Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Shell Tanks</td>
<td>Upgrades Required / DFLAW Waste Feed Delivery upgrades (AP &amp; AW-Farms), Air Permits</td>
</tr>
<tr>
<td>242-A Evaporator</td>
<td>Operating facility</td>
</tr>
<tr>
<td>LAW Pretreatment System</td>
<td>CD-1 Approved, in design / Long-lead procurements, LAWPS RCRA permit</td>
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<tr>
<td>WTP LAW Vitrification Facility</td>
<td>Construction underway / Start-up and commissioning, planning including readiness,</td>
</tr>
<tr>
<td></td>
<td>RCRA and air permits, LAW DSA</td>
</tr>
<tr>
<td>Integrated Disposal Facility</td>
<td>Construction complete / IDF Performance Assessment, upgrades, ORR, RCRA and air permits</td>
</tr>
<tr>
<td>LAW Effluent Management Facility</td>
<td>In design / Construction, RCRA and air permits</td>
</tr>
<tr>
<td>Effluent Treatment Facility</td>
<td>Operating facility</td>
</tr>
<tr>
<td>State-Approved Land Disposal Site</td>
<td>Operating facility</td>
</tr>
<tr>
<td>Consolidated Solid Waste Management</td>
<td>Decision complete / 90-Day Storage Pad, RCRA and air permits</td>
</tr>
<tr>
<td>222-S Laboratory</td>
<td>Operating facility</td>
</tr>
<tr>
<td>WTP Analytical Laboratory</td>
<td>Construction underway / start-up and commissioning, RCRA permit, Lab DSA</td>
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<tr>
<td>WTP Balance of Facilities</td>
<td>Construction underway / transitioning to start-up and commissioning, DFLAW upgrades</td>
</tr>
</tbody>
</table>

- Facility operating; no significant modifications required to support DFLAW
- Facility not operating, under construction or needs major modifications to support DFLAW
- DFLAW waste feed will consist of LAW supernatant (liquid waste)
- First feed expected to come from Tank AP-105
- AP Farm will account for ~45% of waste feed in first 10 years
- Waste from AW/AY/AZ tanks will account for ~15% of waste
- Some feed will come from recycling of DFLAW effluents
Original waste treatment approach sent all tank waste through the WTP Pretreatment Facility first, producing feed for high-level and low-activity waste facilities.
The DFLAW approach sends pretreated tank liquids to the Low-Activity Waste (LAW) Facility, enabling treatment operations as soon as practicable.