3.1.a. Increase the percent of completed tasks required for constructing and operating Hanford low activity tank waste treatment facilities from 0 to 100 percent by 2023

HEALTHY LANDS

Department of Ecology
Alexandra Smith
August 14, 2017
Background

Hanford:
The nation’s largest federal cleanup site

- 586 square miles
- 72 square miles contaminated groundwater

History and Risk from Underground Waste Tanks

- 56 Million Gallons of High Level Waste
- 177 Tanks
  - 149 single-shell
    - Over a million gallons has leaked to the soils and groundwater from the single-shell tanks.
  - 28 double-shell
    - One double-shell tank is now leaking into its outer shell.

Tank foundation under construction.

Tanks are grouped in tank “farms” of 6 to 12 tanks.

Tanks are underground to shield radiation.
The Solution – Vitrify Tank Waste

- Turning waste into glass immobilizes it.
- Immobilization reduces potential for environmental impact.

Waste Treatment Plant consists of five major facilities

1. **Pretreatment Facility (PT)** receives waste from double-shell tanks, divides into High Level Waste (HLW) and Low Activity Waste (LAW) for vitrification in separate facilities.


3. **High Level Waste (HLW) Melters** vitrify waste. Glass placed in canisters and stored on-site pending transport to national deep geologic repository.

4. **Analytical Laboratory** ensures that vitrified HLW and LAW waste meets regulatory requirements and standards.

5. **Balance of Facilities** support services and utilities: steam plant, electrical substation, back-up generators, warehousing, waste transfer pipelines.
Current DFLAW project: Beginning Tracking FY18 Q1

- Goal: 100% of DFLAW tasks completed by 2023.
- Current Status: First two tasks scheduled for FY18 Q1. Graph shows planned progress.
- Overall Hanford Tank Waste Treatment facility progress has been measured since 1999.
- Project construction delays over time due to management, budget, and technical issues.
- Reported to Goal Council in November 2018 that we would shift measure to DFLAW.
- State sued U.S. Department of Energy (USDOE) over missed deadlines. Revised federal court consent decree established new date for completion and new requirement for DFLAW by 2023.
Problem

Waste Treatment Plant completion schedule shifted from 2019 to 2033.

<table>
<thead>
<tr>
<th>Milestones Pushed Back</th>
<th>2010 Consent Decree</th>
<th>2016 Consent Decree</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAW construction substantially complete</td>
<td>2014</td>
<td>2020</td>
</tr>
<tr>
<td>LAW hot commissioning complete</td>
<td>2019</td>
<td>2020</td>
</tr>
<tr>
<td>HLW construction substantially complete</td>
<td>2016</td>
<td>2030</td>
</tr>
<tr>
<td>PT construction substantially complete</td>
<td>2017</td>
<td>2031</td>
</tr>
<tr>
<td>Hot start of Waste Treatment Plant</td>
<td>2019</td>
<td>2033</td>
</tr>
</tbody>
</table>

Opportunities

2. Resolve technical issues to allow high level waste treatment by 2033.
   - 3 of 8 Technical issues are at point of resolution.

Low activity waste is expected to fill 60,000-100,000 4’ x 7.5’ containers.

High level waste will fill an estimated 12,000 -16,000 2’ x 14.5’ canisters.
Direct Feed Low Activity Waste Treatment - Subset of Overall Tank Waste Mission

3.1.b Increase percentage of completed tasks for construction and operation of Hanford's direct feed low activity tank waste treatment facilities from 0% to 100% by 2023

Strategies

Ensure Direct Feed Low Activity Waste treatment by December 2023 by completing permitting for DFLAW facilities and continuing regulatory engagement with USDOE on design, engineering, construction, commissioning, and budget.

Challenges

Completing DFLAW by 2023

- Funding, design, permitting and construction of two new facilities – EMF and LAWPS.
- Completing construction of LAW and LAB facilities.
- Whether USDOE obtains sufficient funding to complete the project on time.

Completing High Level Waste Treatment Facility by 2033

- Resolution of technical issues.
- Redesign, permitting, and construction.
- Whether USDOE obtains sufficient funding to support the work.
Strategies

What Ecology is Doing

Direct Feed Law Activity Waste

- Interactive permitting and design oversight.
- Phased permitting - that permits the facility as design is available to allow construction to proceed.
- Construction oversight.
- Supporting USDOE’s requests for sufficient funding for the new facilities and completing project tasks.

High Level Waste Treatment Plant

- Participating in resolution of technical issues.
- Incorporating results of technical issues resolution into design.
- Phased permitting.
- Construction oversight.
- Supporting USDOE’s requests for sufficient funding to support the work.

TASK TIMELINE

<table>
<thead>
<tr>
<th>Task Lead</th>
<th>ECY Role</th>
<th>Description</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>Aggregate % Complete (approx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 USDOE</td>
<td>Monitor</td>
<td>Low Activity Waste Pretreatment System (LAWPS): submit Critical Decision-3A package</td>
<td>Jul</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.5</td>
</tr>
<tr>
<td>2 USDOE</td>
<td>Monitor</td>
<td>Immobilized Low Activity Waste (ILAW) container transport vehicle: complete design</td>
<td>Sep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>3 USDOE</td>
<td>Monitor</td>
<td>Low Activity Waste (LAW): complete construction</td>
<td>Nov</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.5</td>
</tr>
<tr>
<td>4 USDOE</td>
<td>Monitor</td>
<td>Site infrastructure upgrades to support Direct Feed Low Activity Waste (DFLAW) operations: complete</td>
<td>Dec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>5 USDOE</td>
<td>Monitor</td>
<td>Submit final phase 2 Waste Incidental to Reprocessing (WIR)</td>
<td>Jan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27.5</td>
</tr>
<tr>
<td>6 USDOE</td>
<td>Monitor</td>
<td>Low Activity Waste Pretreatment System: submit CD-2/3 package</td>
<td>Feb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>7 USDOE</td>
<td>Monitor</td>
<td>LAWPS: initiate site prep construction</td>
<td>Feb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38.5</td>
</tr>
<tr>
<td>8 USDOE</td>
<td>Monitor</td>
<td>ILAW transporter: first transporter delivered</td>
<td>Sep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>44</td>
</tr>
<tr>
<td>9 USDOE</td>
<td>Monitor</td>
<td>LAWPS: full construction start</td>
<td>Nov</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>49.5</td>
</tr>
<tr>
<td>10 USDOE</td>
<td>Monitor</td>
<td>Effluent Management Facility (EMF): construction readiness for startup</td>
<td>Sep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55</td>
</tr>
<tr>
<td>11 USDOE</td>
<td>Monitor</td>
<td>Immobilized Low Activity Waste transporter: ready for cold commissioning</td>
<td>Dec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60.5</td>
</tr>
<tr>
<td>12 ECY</td>
<td>Action</td>
<td>Low Activity Waste Pretreatment System: issuance of final permit</td>
<td>Jan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>13 ECY</td>
<td>Action</td>
<td>LAW: Operations permit complete</td>
<td>Sep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>71.5</td>
</tr>
<tr>
<td>14 USDOE</td>
<td>Monitor</td>
<td>LAW: start cold commissioning</td>
<td>Oct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>15 USDOE</td>
<td>Monitor</td>
<td>Integrated Disposal Facility (IDF): complete contractor ORR</td>
<td>Feb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>82.5</td>
</tr>
<tr>
<td>16 USDOE</td>
<td>Monitor</td>
<td>Low Activity Waste Pretreatment System clear double-shell tank AP-107 for startup/start feed batch prep complete</td>
<td>Oct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>17 USDOE</td>
<td>Monitor</td>
<td>LAW: start hot commissioning</td>
<td>Oct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>93.5</td>
</tr>
<tr>
<td>18 USDOE</td>
<td>Monitor</td>
<td>LAW: complete hot commissioning</td>
<td>Dec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Detailed Action Plan:

<table>
<thead>
<tr>
<th>Task</th>
<th>Task Lead</th>
<th>Expected Outcome</th>
<th>Status</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Activity Waste Pretreatment System: submit CD-3A package</td>
<td>USDOE</td>
<td>LAWPS submit Critical Decision-3A design package (design of long lead time equipment)</td>
<td>On Schedule</td>
<td>July 2017</td>
</tr>
<tr>
<td>Immobilized Low Activity Waste transporter: complete design</td>
<td>USDOE</td>
<td>Immobilized Low Activity Waste container transport vehicle complete design</td>
<td>On Schedule</td>
<td>September 2017</td>
</tr>
<tr>
<td>Low Activity Waste: complete construction</td>
<td>USDOE</td>
<td>Low Activity Waste vitrification facility construction is complete</td>
<td>Currently anticipate a one month project slip to Dec 2017.</td>
<td>November 2017</td>
</tr>
<tr>
<td>Site infrastructure upgrades complete</td>
<td>USDOE</td>
<td>Site infrastructure upgrades complete to water, power, and waste transfer piping to support DFLAW operations.</td>
<td>Currently anticipate a two month project slip to Feb 2018.</td>
<td>December 2017</td>
</tr>
</tbody>
</table>

Assistance Needed:

How can Goal Council or Governor Help?

- Monitor progress on DFLAW; insist on continued emphasis and progress on Waste Treatment Plant.

- Governor’s office meet with new Secretary of Energy to emphasize the critical need to keep Hanford tank waste treatment a high priority, to reinstitute a transparent and robust project management approach, and to request necessary funding to complete the project by 2023.

- Communicate to Congressional delegation the importance of DFLAW, of continued funding for Waste Treatment Plant, and of support for retrieval of aging tanks.

- Assist with communication to stakeholders and residents about the importance of Hanford cleanup.