WASHINGTON STATE'S
DANGEROUS WASTE PERMIT
FOR HANFORD'S
SINGLE-SHELL TANKS

August 7, 2012

Hanford Tanks Background

Hanford's worst waste is stored in 177 large, underground tanks.

- 28 double-shell tanks (DST) (built 1968-1986)
- 149 single-shell tanks (SST) (built 1944-1964)

- Tanks are clustered together in tank farms.
- Tanks contain more than 56 million gallons of waste — enough to cover an entire football field to a depth of over 150 feet, or the height of a 15-story building.
Tank-Related Permit Units

New in Revision 9 of the Hanford site permit
- 149 single-shell tanks
- 28 double-shell tanks

Existing
- 242-A Evaporator
- Waste Treatment Plant (WTP)
- Effluent Treatment Facility (ETF)

Legal Requirements

1. TPA (originally signed in 1989, modified 2010)
   - Close C Farm tanks and associated equipment by 2019.
   - Close all Single Shell Tank Farms 2043.
   - Links to National Priorities List sites (regulated by EPA) for radiological contamination and AEA requirements.
   - "Operable Units" created to divide up the cleanup efforts, creating "stove pipes" within USDOE.
Status of Waste Retrieval in C Farm Large tanks

<table>
<thead>
<tr>
<th>Tank #</th>
<th>How much waste is left in tank? (gallons)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-104</td>
<td>5,000</td>
<td>Underway</td>
</tr>
<tr>
<td>C-107</td>
<td>253,000</td>
<td>Underway</td>
</tr>
<tr>
<td>C-109</td>
<td>9,000</td>
<td>Underway</td>
</tr>
<tr>
<td>C-101</td>
<td>88,000</td>
<td>To start October 2012</td>
</tr>
<tr>
<td>C-102</td>
<td>316,000</td>
<td>To start December 2012</td>
</tr>
<tr>
<td>C-111</td>
<td>35,000</td>
<td>To re-start August 2013</td>
</tr>
<tr>
<td>C-105</td>
<td>132,000</td>
<td>To start August 2013</td>
</tr>
<tr>
<td>C-110</td>
<td>17,000</td>
<td>To re-start February 2013</td>
</tr>
<tr>
<td>C-112</td>
<td>104,000</td>
<td>Re-start unknown</td>
</tr>
<tr>
<td>C-108</td>
<td>7,000</td>
<td>Retrieval halted</td>
</tr>
<tr>
<td>C-106</td>
<td>4,117</td>
<td>Retrieval complete but awaiting verification</td>
</tr>
<tr>
<td>C-103</td>
<td>2,641</td>
<td>Retrieval complete</td>
</tr>
</tbody>
</table>

Legal Requirements

3. Single Shell Tank Permit
   - Specify requirements and limitations for closing “unfit-for-use” tanks “in slow motion” (40-50 more years)
   - Assess integrity of degrading tanks and equipment
   - Incorporate TPA milestones
     - Closure compliance schedule
     - Soil cleanup
     - Groundwater monitoring and cleanup
   - Protect human health and the environment through
     - Tank Leak Detection and Response
     - Corrective Action
Tanks Are Aging

- DSTs are nearing their design life and capacity.
  - Receive waste retrieved from SSTs.
  - Need WTP to continue retrieving.
- SSTs were built from 1943-1964.
  - 40-60 years beyond their design life.
- Potential for SST catastrophic release to the air exists.
  - Potential for dome collapse increases with time.
- Both tank systems have integrity assessment programs.
  - SST System assessment is unique.
  - SSTs have released to the environment.

Associated Risk

- All 12 single-shell tank farms have impacted groundwater.
- Current plumes are 50 ft to 300 ft. deep which will be technically difficult to remediate.
- Best approach is to retrieve the waste while still in the tanks and immobilize it.
- One million gallons of the tank waste has leaked to the soil, causing extensive soil contamination.