



UNITED STATES DEPARTMENT OF ENERGY

OFFICE OF RIVER PROTECTION

Tank Farms Project

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Hanford's Greatest Challenge

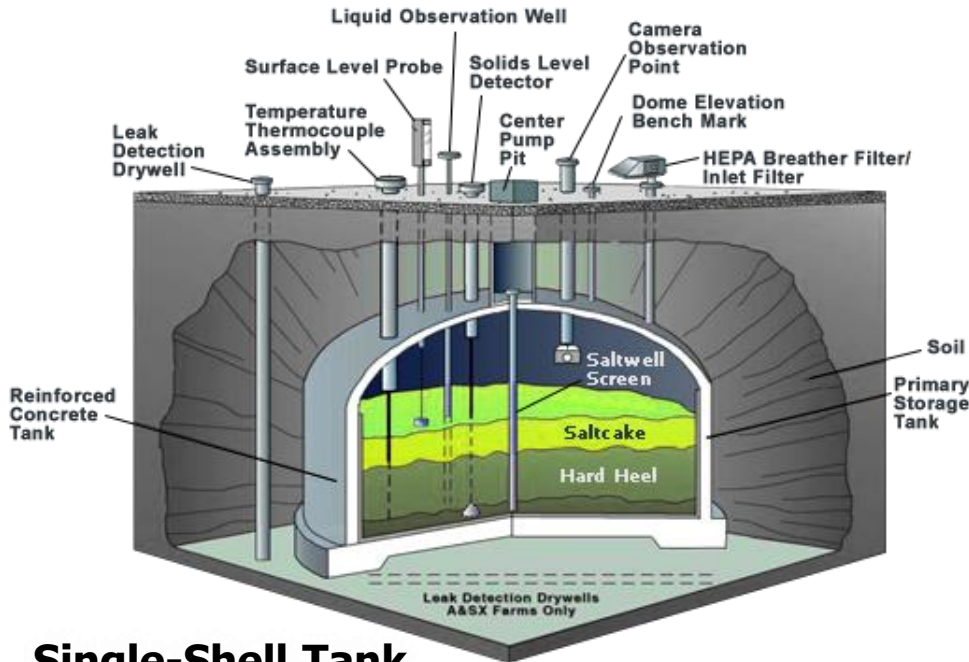
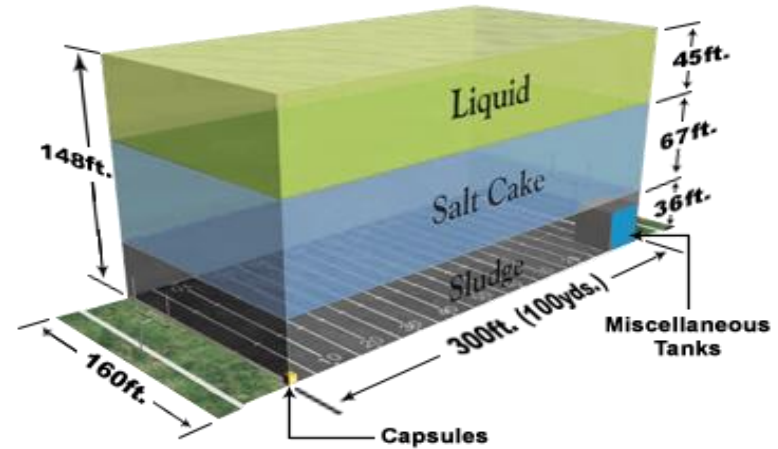
- 1943-1964: **149** single-shell tanks constructed
 - Up to 67 assumed to have leaked
 - Over 1 million gallons estimated to have leaked
- 1968-1986: **28** double-shell tanks constructed
 - 1 leaking, waste contained within annulus

Disposition of **56** million gallons of radioactive and chemical waste

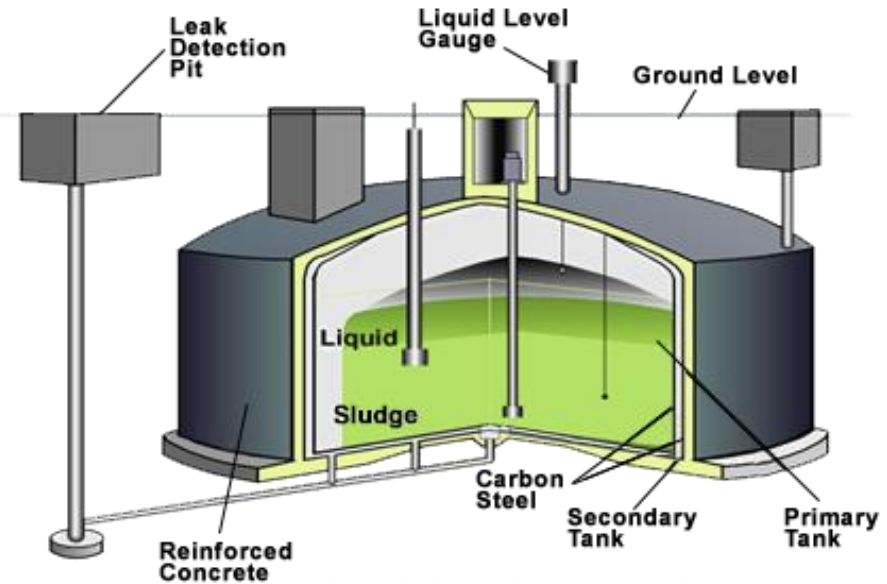


No Two Tanks are the Same

- Waste temperatures range from 60°F to 160°F
- Highly caustic
- Moderate-to-high radioactivity
- No two tanks have the same waste contents
- Most waste produces some hydrogen



Single-Shell Tank



Double-Shell Tank



Tank Farms – Complex, Accessible Only from the Surface





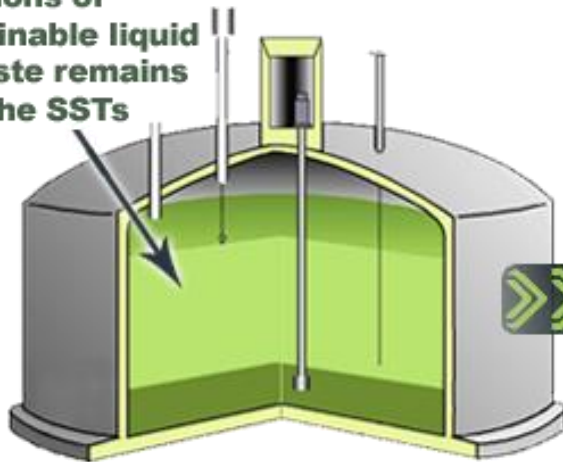
Interim Stabilization Completed

- Hanford's single-shell tanks first began leaking in 1959
- 28 double-shell tanks were constructed to address this problem
- Liquid waste was transferred to safer double-shell tanks from 1978-2005
- 2.7 million gallons of drainable liquid waste remains in Hanford's single-shell tanks

CRITERIA IS:

- < 50,000 gallons interstitial liquid
- < 5,000 gallons free liquid
- < 0.05 gallons/minute pump rate

About 2.7M gallons of drainable liquid waste remains in the SSTs

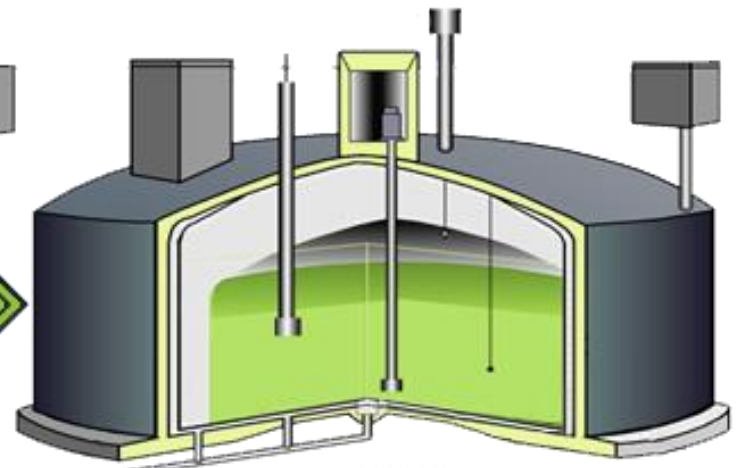


Single-Shell Tank

1978-2005



7.5M gallons of liquid waste moved to safer double shell tanks



Double-Shell Tank



Single-Shell Tank Waste Retrieval in C Farm

RETRIEVAL TECHNOLOGIES



Mobile Arm Retrieval System Sluicing (MARS-S)



Chemical Dissolution



Enhanced Reach Sluicing System (ERSS)



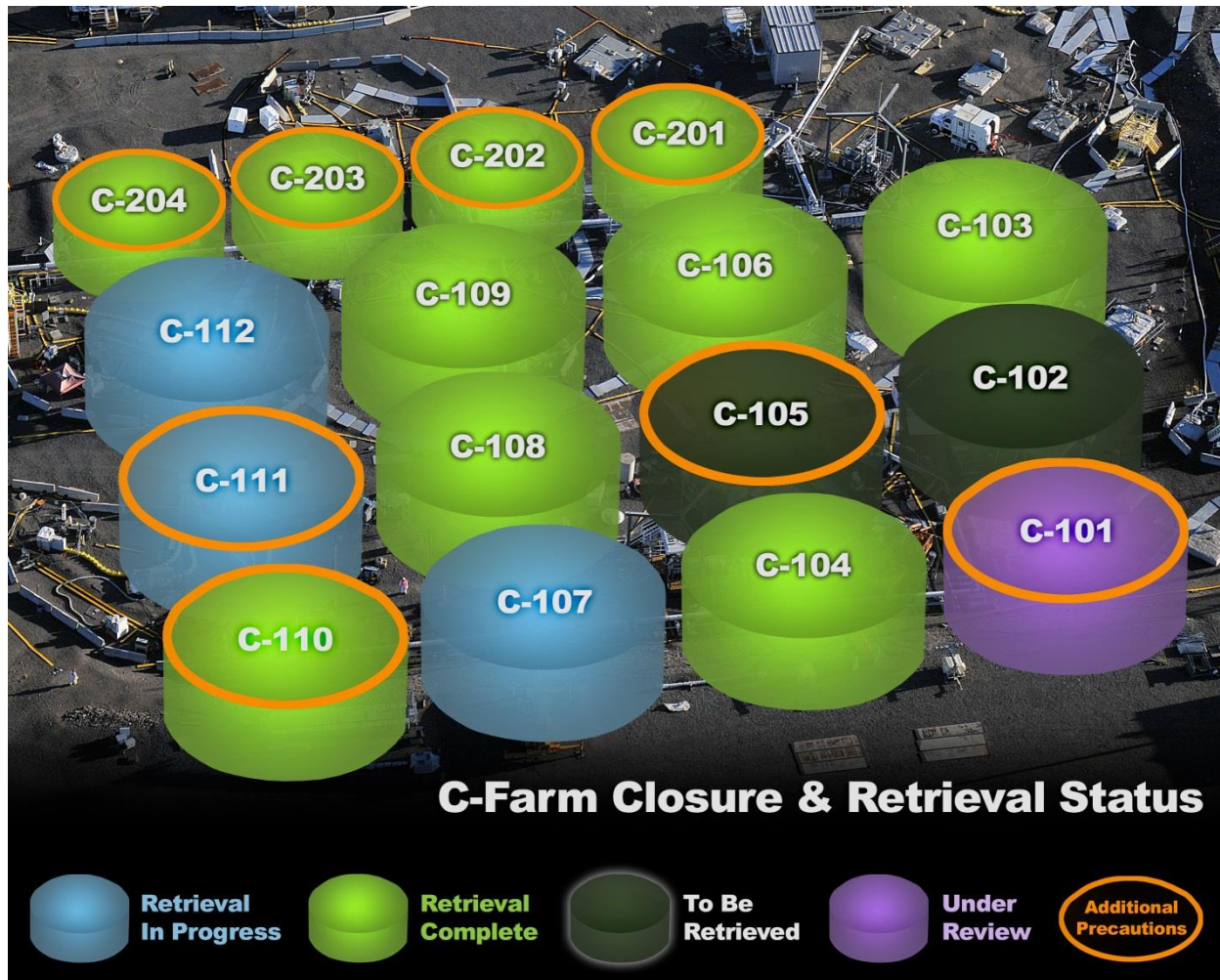
Modified Sluicing



In-Tank Vehicle (Foldtrack)



Mobile Arm Retrieval System Vacuum (MARS-V)



Aerial photograph of C-Farm with graphical overlay that depicts current status of each single-shell tank



Tank Farms Retrieval Progress – Inside Tank C-110



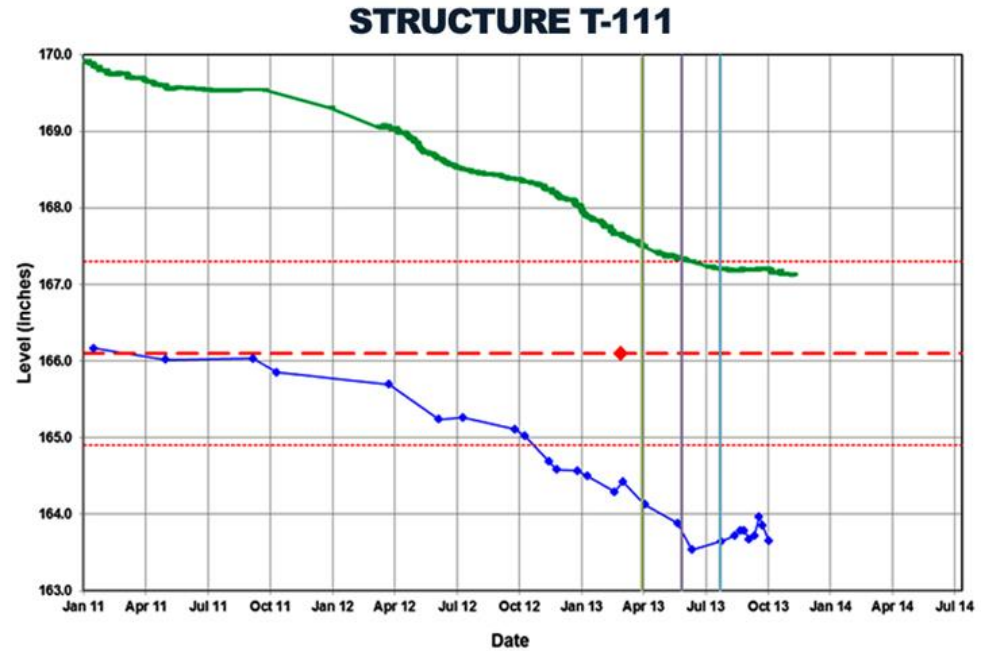
This composite image of dozens of individual-frame photos taken inside Tank C-110 provides a rare panoramic view of the tank interior



Single-Shell Tank Liquid Level Monitoring



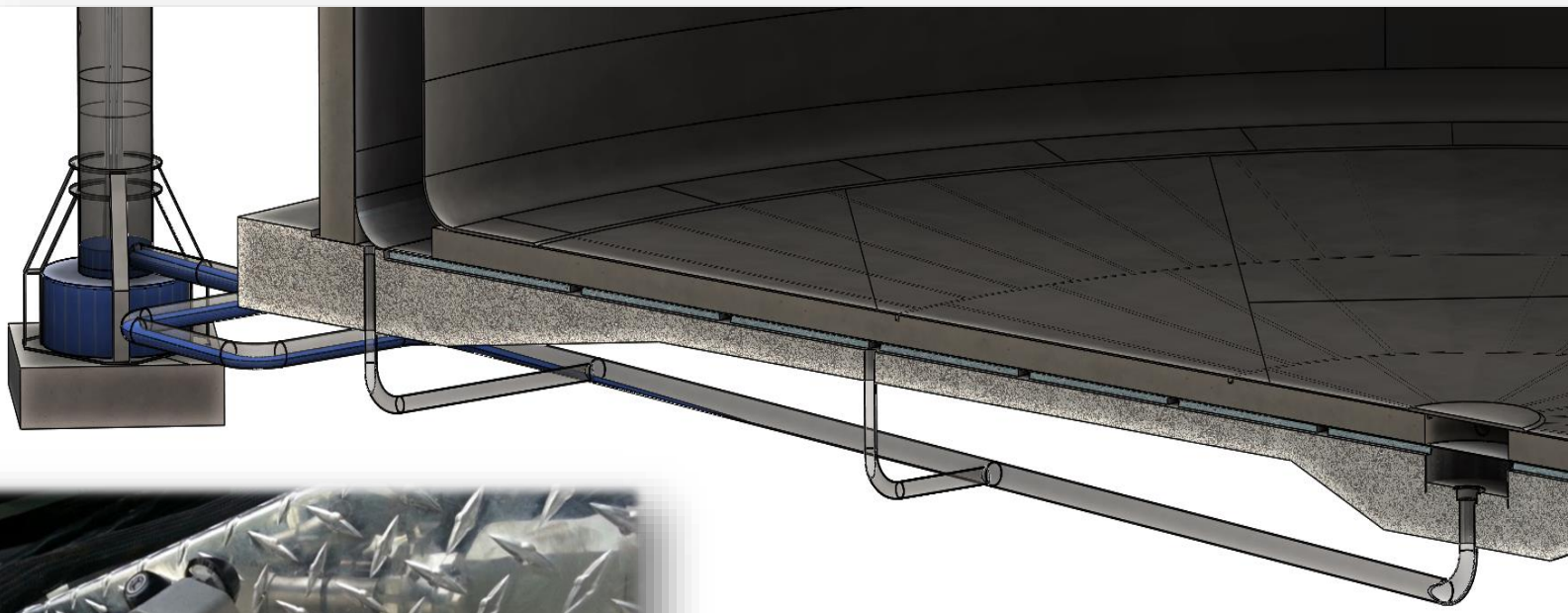
View inside tank T-111 with ENRAF tank level gauge visible



- ◆ Riser 7 LOW Neutron LOW
- Decrease Limit
- RPP-RPT-54964 Rev 0 released
- Baseline
- Enraf
- RPP-RPT-54964 Rev 1 released
- Increase Limit
- Cutoff date for data for RPP-RPT-54964



Tank AY-102 – Robotic Crawler



**Robotic crawler was
navigated through 60 feet of
six-inch drain line underneath
Tank AY-102**



Operational Challenges Being Addressed

- **Maximize DST storage space**
- **Improve Tank Farms infrastructure**
- **Complete C Farm retrieval**
- **Commence next SST retrievals**