



DEPARTMENT OF  
**ECOLOGY**  
State of Washington



# **Regulatory Challenges and Innovations Related to US DOE Sites:**

## **Hanford, Washington**



**Suzanne Dahl**

Tank Waste Treatment Manager

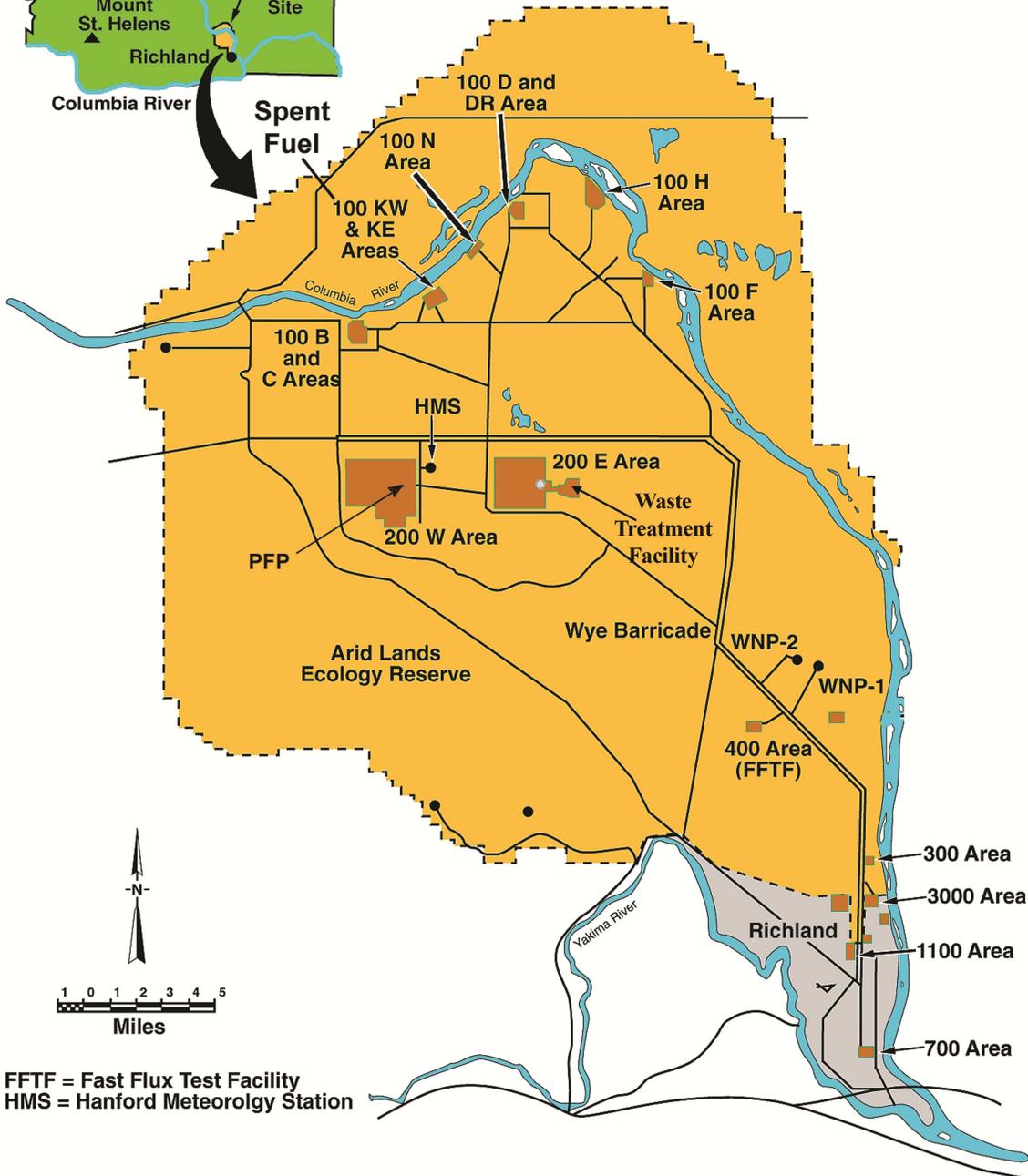
Washington State Department of Ecology

Nuclear Waste Program

February 27, 2013



# HANFORD SITE



FFTF = Fast Flux Test Facility  
 HMS = Hanford Meteorology Station

- 586-square-mile site
- 50 miles of Columbia River run through it
- 2,400 waste management units/areas of concern
- 72 square miles of groundwater contaminated above drinking water standards (remaining)
- 177 high-level waste tanks buried underground
- 9 plutonium production nuclear reactors (7 cocooned)
- 6 “canyon” processing buildings
- 2 sodium-cooled test nuclear reactors
- 72 radioactive landfills
- 43 miles of landfill trenches (remaining)



# Challenges: **Hanford**

## **Budget Shortcomings**

- Limit advancing cleanup to include plateau activities (cribs, trenches, canyon facilities, TRUM management and shipment)
- Limit Hanford's ability to achieve basic compliance with regulations (waste management units, single- and double-shell tanks)

## **Significant Additional Capital Projects Needed**

- 2<sup>nd</sup> Low-Activity Waste treatment capacity
- Upgrades to Effluent Treatment Facility
- Immobilized High-Level Waste Storage Facility



# Challenges: Tank Waste Storage

- Single-shell tank (SST) intrusion
- Double-shell tank leaking in annulus (AY-102)
- 6 SSTs leaking (B-203, B-204, T-111, T-203, T-204, TY-105)
- New, compliant tanks needed to support SST retrievals and vitrification plant operations





# Challenges: Tank Waste Treatment

## Policy issues

- 2010: Vitrification plant start-up date delayed 8 years, after 3 false starts and 2 delays in the current plan – resulting in 21 years of delay in total
- Budget shortcomings and technical issues
- Now more delays may occur

## Technical issues

- Black cell design
- Erosion/corrosion
- Pulse jet mixers
- Particulate build-up
- Flammable gas



*Above: \$12.3-billion vitrification plant Bechtel National, Inc., is constructing at Hanford.*



# Innovations:

## Driving Forces in Clean Up



1989: Hanford Federal Facility Agreement and Consent Order signed by US DOE, US EPA, and Washington State.

- Outlines clean up
- Establishes partnerships
- Drives funding requests

2010: Consent Decree signed in court establishes new milestones for:

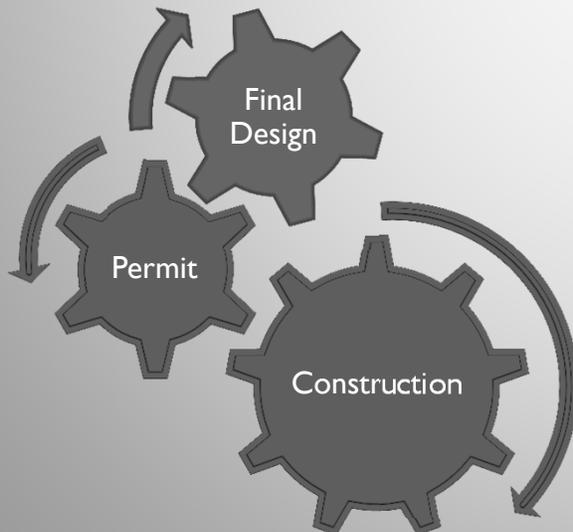
- Tank waste retrieval
- Vitrification plant startup and operations



# Innovations: Permit Approaches

## Pre-closure conditions for maintenance and storage until tank waste is retrieved

- Tanks are unfit for use, but will manage waste until 2040
- Closure Units use Omnibus Authority for key conditions



## Expediting the vitrification plant permit

- Phased permitting as each component's design is completed

# Innovations:

## Permit Approaches

### **TRU Retrieved from Trench Storage**

- Due to storage prohibition rules, the State could have forced waste characterization and designation.
- Would have been expensive and caused potential worker exposure.
- US DOE agreed to manage all waste as TRUM, and State agreed to have our designation requirements met later.

### **Budget Shortfalls on Closure Plans**

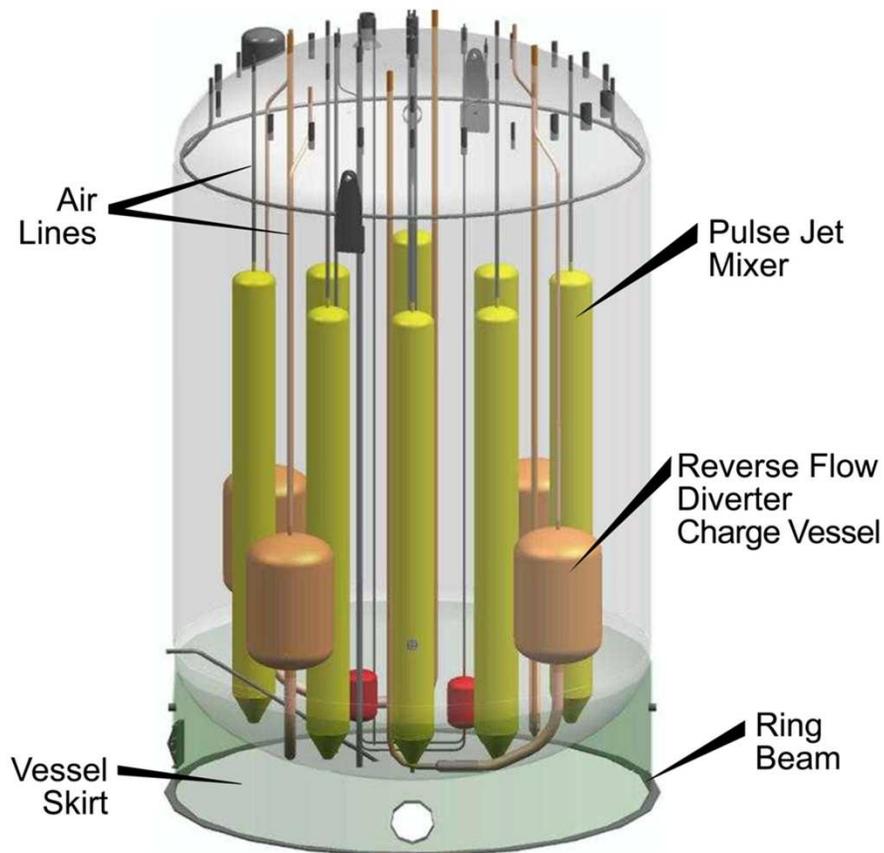
- US DOE requested delays.
- State offered to create a draft of the closure plans.
- As a result, the final documents will be submitted on time with significant cost savings.



# Innovations:

## Crossing Agency Boundaries to Solve Problems

Typical Process Vessel



- In late 2012, Secretary of Energy Chu and former Governor Gregoire formed a technical team to resolve vitrification challenges.
- In early 2013, Secretary Chu and Governor Inslee agreed to robust technical discussions about double-shell tank space and leaking tank solutions.

Nuclear Waste Program 3100 Port of Benton Blvd. Richland, WA  
Suzanne Dahl (509) 539-3489 [suzanne.dahl@ecy.wa.gov](mailto:suzanne.dahl@ecy.wa.gov)



**Thank you!**

# History of Hanford Tank Waste Treatment Project 1989-2010

- Plan 1 - 1989**  
Hanford Waste Vitrification Project for double-shell tank waste
- Plan 2 - 1993**  
New technical strategy to retrieve and vitrify all waste
- Plan 3 - 1996**  
Privatization concept adopted for tank waste treatment
- Plan 4 - 2000**  
Bechtel selected as new Waste Treatment Plant (WTP) contractor
- Plan 4 - delay**  
WTP construction schedule slip
- Plan 4 - delay**  
WTP construction schedule slip

