



U.S. DEPARTMENT OF  
**ENERGY**

**Nuclear Energy**

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# Sodium Bearing Waste Treatment Project

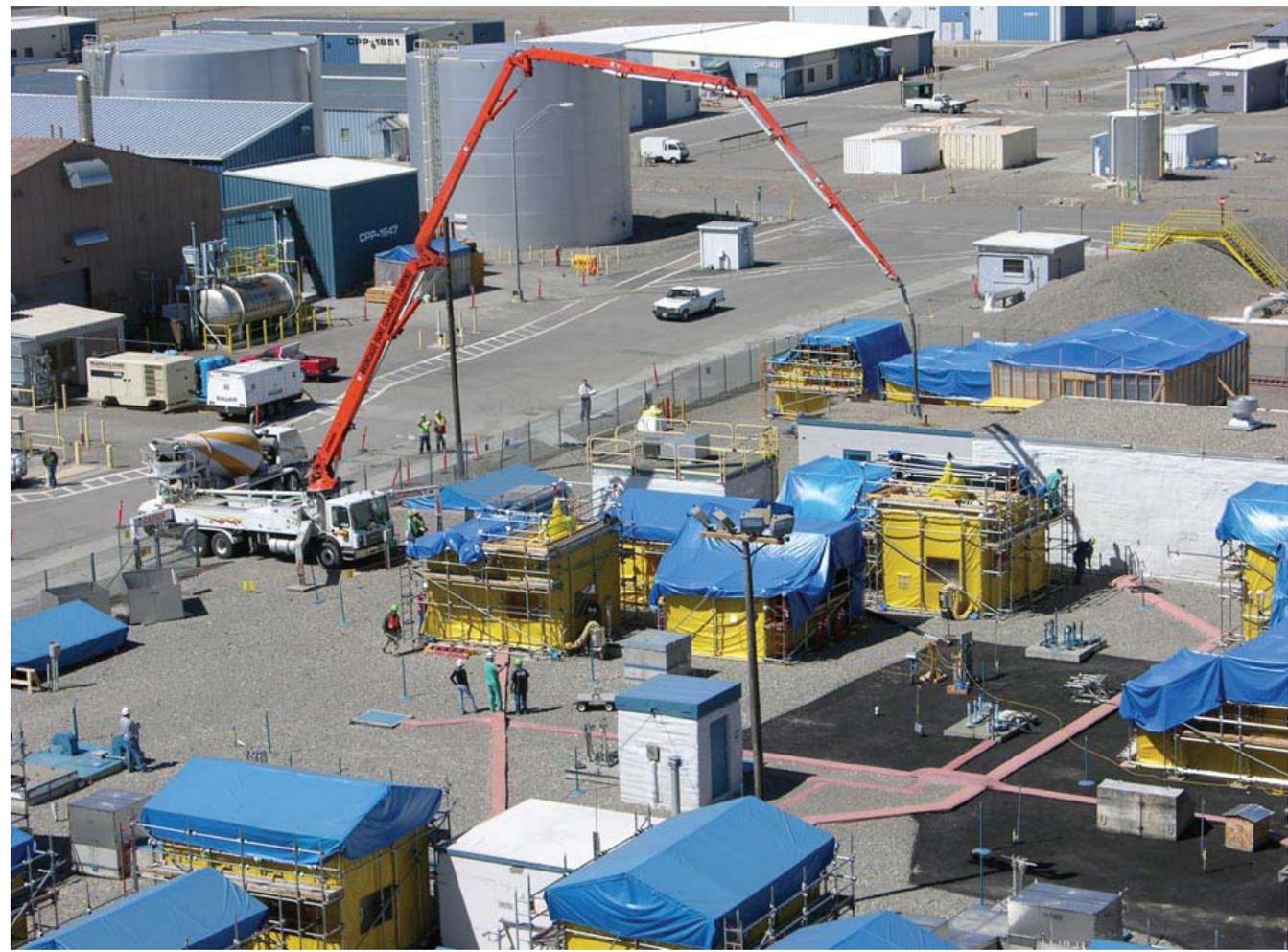
Nuclear Waste Technical Review Board  
June 2010

Shawn Hill, Deputy Federal Project Director

# Background Information

- Fuel Reprocessing: Processed Spent Nuclear Fuel from 1952 to 1991. Three-step solvent extraction process.
- Tank Farm: Eleven underground stainless steel storage tanks in concrete vaults. Storage facility for liquid waste from fuel reprocessing.
- Calciner/New Waste Calciner: Converted the majority of fuel reprocessing liquid waste into a solid calcine form (now stored in bin sets).
- Waste Management/Decon Activities: Decontamination solutions with high sodium content.
- Tank Farm – current status: Seven tanks closed and grouted; four tanks left: three with ~900,000 gallons of Sodium Bearing Waste, one empty.
- Settlement Agreement: DOE shall complete treatment of sodium bearing liquid high-level wastes by December 31, 2012.

# Tank Farm Grouting



# Integrated Waste Treatment Unit



# Integrated Waste Treatment Unit

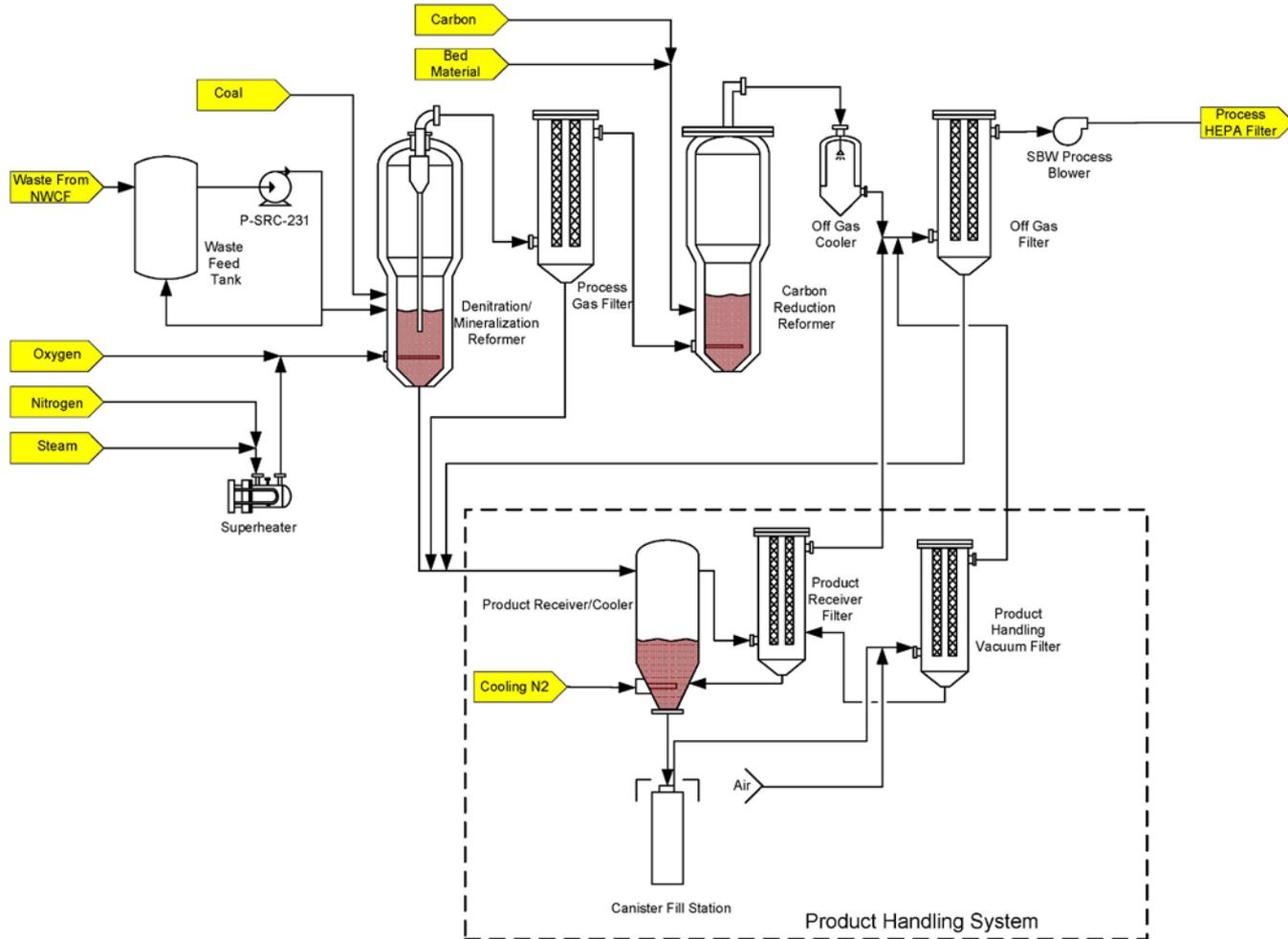


# Sodium Bearing Waste Treatment Project

- **Fluidized Bed Steam Reforming:** process destroys nitric acid, nitrates, and organic materials present in the SBW, and produces a dry, solid mineral product
- **Waste Flow:** Tank Farm jetted to Blend and Hold Tanks at New Waste Calcining Facility then pumped to Waste Feed Tank at Sodium Bearing Waste Treatment Project
- **Process Overview:** Waste Feed Tank provides feed to Denitration/Mineralization Reformer (DMR); solids transferred to the product receiver cooler then loaded into canisters. Gases/vapors from DMR pass through process gas filter then to Carbon Reduction Reformer (CRR), off gas cooler, and off gas filter. Off gas is processed through HEPA filters and mercury adsorber beds.



# SBWTP Steam Reforming System



# Sodium Bearing Waste Treatment Project

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- **Canisters:** Two feet in diameter by 10 feet tall. Similar in construction to removable lid canisters used to transport RH-Tru waste to WIPP. (650 – 700 canisters)
- **Vaults:** Concrete storage container capable of holding 16 canisters (4 X 4 array, 41 - 44 vaults)
- **Product Storage Building:** Controlled environment facility for the storage of the vaults.

# Product Storage Building



# Future Disposition

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- WIPP
- Blue Ribbon Commission on America's Nuclear Future