ANALYTICAL LABORATORY

Waste Treatment Plant Project

www.hanfordvitplant.com

BACKGROUND

The Hanford Site, located in southeastern Washington state, was the largest of three defense production sites in the U.S. Over the span of 40 years, it was used to produce 64 metric tons of plutonium, helping bring an end to World War II and playing a major role in military defense efforts during the Cold War. However, as a result, 53 million gallons of radioactive and chemical wastes are now stored in 177 underground tanks on the Hanford Site.

To address this challenge, the U.S. Department of Energy contracted Bechtel National, Inc., to design and build the world's largest radioactive waste treatment plant. The Hanford Waste Treatment and Immobilization Plant (WTP), also known as the "Vit Plant," will use vitrification to immobilize most of Hanford's dangerous waste. Vitrification involves blending the waste with molten glass, heating it to high temperatures, then pouring it into stainless steel canisters. In this glass form, the waste is stable and impervious to the environment, and its radioactivity will dissipate over hundreds to thousands of years.

Construction of the WTP began in 2002. The plant will be operational in 2019.

CONSTRUCTION FACTS

- **Building volume:** 2,592,000 cubic feet
- **Concrete:** 12,000 cubic yards
- **Structural steel:** 1,800 tons
- **Heating and ventilation ductwork:** 314,500 pounds
- **Piping:** 35,000 feet
- **Electrical cable:** 172,000 feet
- **Craft hours to build:** 635,000 hours

Lab in July 2010

The Hanford Waste Treatment and Immobilization Plant (WTP) will cover 65 acres with four nuclear facilities – Pretreatment, Low-Activity Waste Vitrification, High-Level Waste Vitrification and Analytical Laboratory – as well as operations and maintenance buildings, utilities and office space.

The Analytical Laboratory, also known as the Lab, will serve as a process link between the Pretreatment, High-Level Waste Vitrification and Low-Activity Waste Vitrification facilities. The Lab is 320 feet long and 180 feet wide, approximately the size of a football field, and 45 feet, or four stories, high.

The Lab's key function is to ensure that all glass produced by the Low-Activity and High-Level Waste Vitrification facilities meets all regulatory requirements and standards. Each year, when the WTP is operational, the Lab will analyze approximately 10,000 waste samples.

Samples will be used initially to confirm the correct glass-former "recipe" that will produce a consistent glass form. Once the recipe is identified, the glass-forming materials and the waste will be transferred to the Low-Activity or High-Level Waste facility, as appropriate, for further processing. Samples will also be taken throughout the vitrification process to ensure a high-quality glass product and good process controls.

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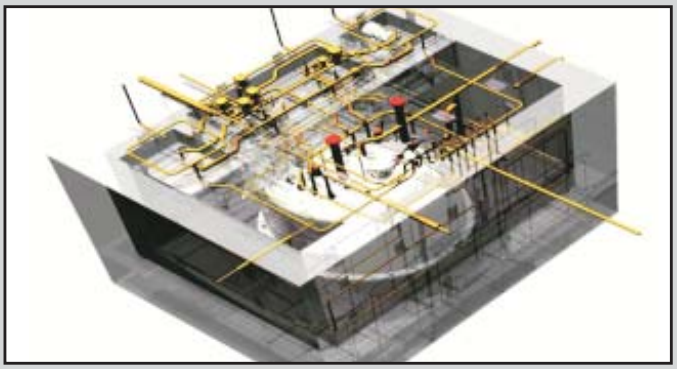
A CLOSER LOOK INSIDE THE ANALYTICAL LABORATORY

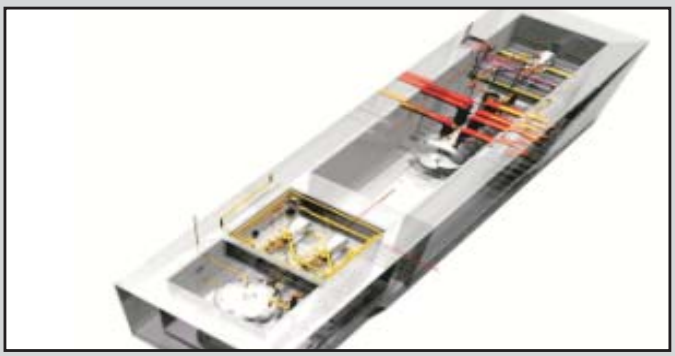
ENVIRONMENTAL EMISSIONS STACK ASSEMBLY

The 68-foot stack assembly will exhaust emissions from the Lab's ventilation systems, filtering radioactive and chemical contaminants from the air to ensure it meets strict regulations. Made of structural steel, the assembly contains three emission stacks and weighs approximately 140,000 pounds. The assembly sits atop the Lab, making it more than 119 feet tall.



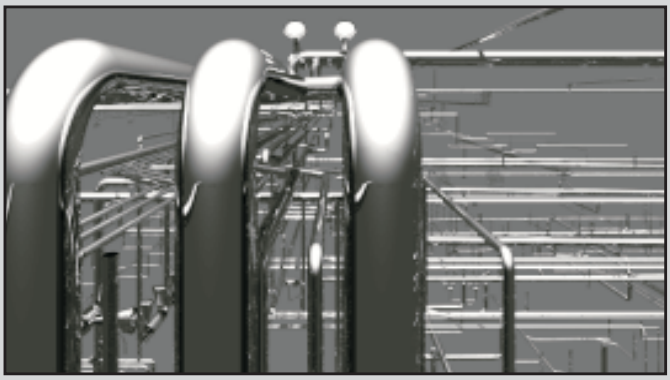
HOT CELL DRAIN COLLECTION VESSEL

The underground hot cell collection vessel is a collection, containment, staging, transfer and secondary containment area for waste streams from the analytical services. The vessel contents are recycled to the Pretreatment Facility.



DRAIN COLLECTION VESSELS CELL AND FIRE WATER VAULT

The floor and sink drain collection vessel also collects water overflow in the event of a fire. The area includes radioactive liquid discharge pumps, ventilation systems and specialized exhaust systems to prevent potential cross contamination among areas.



ABOVE GROUND AND EMBEDDED FOUNDATION PIPING

The Lab contains piping for drainage and waste transfer. Piping may be above ground; within underground cells and vaults; or embedded in the thick concrete foundation. All process piping is nuclear-grade stainless steel or Hastelloy and is installed to exacting specifications using the most advanced welding and installation techniques.