

Capital improvements to move, store millions of gallons of radioactive waste

CH2M HILL Hanford Group is on a challenging schedule to complete construction upgrades to Hanford's tank farms by 2007; that's when a treatment facility is scheduled to begin converting into glass a portion of the 54 million gallons of radioactive waste currently contained in 177 behemoth underground tanks.

The upgrades are currently estimated at more than \$1 billion. They include clearing the vitrification facility construction site and running utilities to the facility, preparing the tank farms to supply waste to the treatment facility, and upgrading or constructing interim storage facilities and transportation systems for the glass treatment products.

CH2M HILL is counting as early successes construction site preparation activities and waterline placement. Both were completed ahead of schedule and under budget. Project managers say they will build on these successes, but they recognize the challenges ahead.

"To meet funding challenges, we're focusing on identifying project needs early and completing projects safely, on time and under cost," said Garry Cusack, project delivery vice president. "Another big challenge is working around the existing equipment, some of which dates back to the 1940s."

A new network of pipes and diversion systems is needed to transfer the waste from the tank farms to the treatment facility. Many of the complications come from working around highly radioactive pipes and other equipment already in place. Workers often must stand behind thick lead shielding, using tools attached to poles or other mechanical devices to reach into pipe trenches and diversion vaults.

Design changes may be needed when existing drawings don't match

CH2M HILL Hanford background

In December 1999, CH2M HILL acquired Lockheed Martin Hanford Group.

CH2M HILL Hanford Group includes 1,200 employees who have the challenging tasks of operating, characterizing and retrieving high-level nuclear waste from the Hanford tank farm.

Hanford, a U.S. Department of Energy site, is located in south-central Washington and was a plutonium production facility for more than 50 years.

60 percent of the nation's nuclear waste is stored at Hanford.

what's actually under the surface or to avoid areas where crews find high radiation levels.

"We check old drawings and other records before we do any digging, but what's actually in the ground can be entirely different," said Kitty Bryan, projects director.

Despite the challenges, CH2M HILL has demonstrated it can meet deadlines to support future vitrification and temporary storage operations.

A new double-contained cross-site transfer pipeline was first used in March 1999. It has moved more than 1.1 million gallons of waste. The line carries waste six miles from the 86 tanks in the 200 West Area to where the vitrification facility will treat the waste.

Ventilation upgrades to the AZ and AY tank farms involved the most complex and extensive ventilation upgrades in the history of Hanford's tank farms. The upgraded ventilation system is essential for staging high-heat wastes for the future vitrification mission, including waste from Tank C-106, long known as Hanford's high-heat tank.

"With continued funding and close management of our aging equipment, we can stay on budget and on schedule," Cusack said. ♦

A billion dollars of river protection

The estimated billion dollars of River Protection Project capital upgrades include the following major projects:

- **Vitrification facility infrastructure**
Includes clearing the facility construction site, building roads, installing a 62.5 mega-watt substation, running power lines, and laying pipes for plant water and waste discharge to secondary processing facilities.
- **Initial tank retrieval systems**
Create or upgrade systems for retrieving waste from nine double-shell tanks, including new mixer pumps and upgrades to existing tank sensors, pumps, monitors, utilities and control systems.
- **Tank farm restoration and safe operation**
Upgrade tank farm transfer systems, including installing new transfer lines and making improvements to pumps, instrumentation, ventilation and electrical support systems.
- **Waste feed delivery systems**
Create waste delivery systems between selected double-shell tanks and the vitrification facility by installing retrieval equipment and transfer lines.
- **Immobilized high-level waste interim storage facility**
Create transportation and interim storage capabilities for immobilized high level waste produced by the BNFL vitrification plant. Vaults in the Spent Nuclear Fuels Storage Building will be used to store the glassified waste.

