

# First full-scale test of bulk vitrification produces glass

Hanford officials have successfully melted a combination of soil and simulated Hanford tank waste into a large block of glass in the first full-scale field test of a potential treatment technology called bulk vitrification.

The method could potentially be used to turn millions of gallons of tank waste into sturdy glass at the Hanford Site, and it is one of three methods that contractor CH2M HILL Hanford Group is investigating for the Office of River Protection for use in treating selected tank waste for disposal on or off the Hanford Site.

The other methods are containerized cast stone and steam reforming. The methods are called supplemental technologies because they would be used to supplement Hanford's Waste Treatment Plant, which is currently under construction. An estimated 30 to 70 percent of Hanford's 42 million gallons of low-activity tank waste may be suitable for treatment using one or more of the supplemental technologies under evaluation.

"Evaluating and deploying one or more supplemental treatment technologies is critical to meeting our commitment under the Tri-Party Agreement to treat Hanford's 53 million gallons of radioactive and hazardous tank waste by 2028," said Billie Mauss of the Department of Energy's Office of River Protection.

Bulk vitrification allows for glassification of the tank waste inside a disposal container suitable for land disposal. Containers used in the full-scale testing are 20 feet long, 8 feet wide, and 8 feet high — about the same size as a large shipping container. Bulk vitrification would allow accelerated tank waste cleanup by reducing the mass of waste requiring vitrification in the Waste Treatment Plant.

A contract team led by AMEC Earth & Environmental, Inc. has conducted lab-scale tests using real Hanford tank waste and is conducting full-scale tests using simulated waste. AMEC will also provide conceptual engineering for a production facility. The first of three full-scale tests was completed earlier this month at a facility in Richland. The second and third tests will be conducted in July.

"The key to evaluating the bulk-vitrification method is to conduct the tests in as real an environment as possible," said Rick Raymond of CH2M HILL Hanford Group. "Through testing and careful evaluation, we will ensure the method or methods we recommend to the Department of Energy for treating Hanford tank waste are safe and effective."

After the full-scale tests are completed, an evaluation of bulk vitrification and other technologies by CH2M HILL will enable ORP to decide this fall on how to best move forward on building and operating facilities to provide supplemental treatment of Hanford tank waste. ■



**Dennis Hamilton of CH2M HILL Hanford Group (left) and Leo Thompson of AMEC Earth & Environmental examine pieces of a large block of glass that was made in the first full-scale test of bulk vitrification. CH2M HILL is investigating the treatment method, along with two other methods, for the Office of River Protection. Thirty to 70 percent of Hanford's low-activity tank waste could potentially be treated using a technology or technologies to supplement Hanford's Waste Treatment Plant.**