

# Three supplemental treatment methods in the running

The evaluation of methods for treating selected tank waste is gaining momentum with additional equipment and process testing both inside and outside the laboratory.

Tank cleanup contractor CH2M HILL Hanford Group and its contractor teams are testing three methods of treating selected low-activity tank waste to supplement the Waste Treatment Plant, which is being constructed by Bechtel National. The potential methods would accelerate Hanford cleanup by reducing the amount of waste to be glassified in the new facility.

In September, CH2M HILL will make a recommendation to the Department of Energy Office of River Protection on the use of one, more than one or none of the three methods being considered. An evaluation of the methods will allow ORP to decide on the best way to move forward on building and operating supplemental treatment facilities to treat all of Hanford's tank waste by 2028.

## Treatment methods

Three treatment methods are being considered:

- **Containerized cast stone:** This method involves mixing waste with ash, blast furnace-slag, Portland cement and chemical binders to form a material that is comparable in density and permeability to marble. The material would be cast in large steel containers suitable for land disposal. Cast stone is significantly denser and less porous than previous grout treatment methods considered at Hanford. A Fluor Federal Services contractor team is casting stone samples at the 222-S Laboratory using *real* tank waste. Fluor personnel at the Center for Laboratory Science on the Columbia Basin College campus are conducting leachability testing this year on samples cast with *simulated* waste. This summer, the Fluor team will also provide pre-conceptual engineering for a full-scale production system.
- **Steam reforming:** The steam reforming process uses heat and chemicals to immobilize waste in pebble-sized, insoluble ceramic crystals. The final waste form would have leachability characteristics comparable to glass. The commercial nuclear industry currently uses this process to treat radioactive waste.
- **Bulk vitrification:** This method uses electrodes inserted into a mixture of Hanford's sandy soil and low-activity tank waste to form glass inside a large steel container. Electrical power is applied and the mixture is converted to glass. After an off-gas hood is removed, the container — which is about the same size as a large sport utility vehicle — is suitable for burial in a disposal facility. Personnel from the contractor team of AMEC Earth and Environmental conducted lab-scale test melts with real and simulated tank waste earlier this spring at Pacific Northwest National Laboratory's Radiochemical Processing Facility. Earlier this month, the AMEC contractor team produced the first batch of bulk-vitrification glass in an actual disposal container at a facility near HAMMER. ■



With bulk vitrification, waste is glassified in a container suitable for final disposal.

## Open house will feature treatment methods

To give the community a closer look at the supplemental treatment methods under evaluation, CH2M HILL is sponsoring an open house on Friday, June 20, from 11 a.m. to 3 p.m. at the Richland Community Center Activity Room.

Hanford employees and their families are welcome to look at the various samples of the proposed treatment methods and talk with representatives of CH2M HILL and the contractor teams conducting the treatment testing.