

## Tank Cleanup at Defence Sites Will Leave Radioactive Waste

*True but is that of concern to people who cannot even keep their yards clean?*

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High-level radioactive material will remain in nuclear waste the Department of Energy plans to dispose of at its Savannah River Site in South Carolina, warns a new report from the National Research Council on cleanup of waste in underground tanks at three defence sites. The committee-of-authors acknowledged that it is not practical to remove all of the waste from the tanks.

Saying that the U.S. Department of Energy's (DOE) overall plan for cleaning up the radioactive waste in 246 underground tanks at the three sites is "workable," the committee expressed concern about the "large volume of radioactive material" that DOE plans to place in salt-stone vaults at Savannah River, and other issues of safety and reliability at all three sites.

Fifty-one of the tanks are located at the Department of Energy (DOE) Savannah River Site in South Carolina. There are 177 tanks situated at the Hanford Site in Washington state, and 11 tanks and seven calcine vaults at the Idaho National Laboratory.

An example of the tank waste in the Hanford storage tanks. (Photo courtesy PNL)

In total, they contain more than 93 million of gallons of high-level radioactive waste from over 40 years of making plutonium for America's nuclear weapons.

The DOE plans to remove the waste from the tanks and separate out high-level radioactive waste, which will eventually be shipped to an off-site geological repository, such as the site at Yucca Mountain, Mountain, which is still in the pre-permitting stage.

The remaining radioactive waste will be disposed of on-site, and residual waste in the tanks will be covered by grout.

So far, only two of the 246 tanks have been cleaned out and backfilled with grout, and none has had a permanent cover installed.

The report assessing the DOE's plan of work and progress on tank cleanup was written by a panel of the Nuclear and Radiation Studies Board, Division of Earth and Life Sciences, of the National Research Council.

It is chaired by Dr. Frank Parker, distinguished professor of civil and environmental engineering at Tennessee's Vanderbilt University, and a former head of radioactive waste disposal research at the Oak Ridge National Laboratory.

The panel includes 18 other experts in nuclear and environmental engineering, concrete stability, computing, chemistry, geology, robotics and law.

Dr. Frank Parker, a member of the National Academy of Engineering, is an internationally recognized expert in nuclear remediation, has served on a number of advisory committees, including long-term membership on the Environmental Management Advisory Board to the U.S. Department of Energy. (Photo courtesy Vanderbilt University)

Their report points out that the DOE faces technical hurdles, such as retrieving waste from tanks with "significant obstructions" at the Savannah River Site and from tanks with leaks at the Hanford Site.

In addition, the committee expressed concern that more radioactive material than planned could remain in the waste to be disposed on-site of at the Savannah River Site after the waste-separation process.

To reduce the amount of radioactive material to be disposed of at the Savannah River Site, DOE should develop alternatives or enhancements to one of its planned interim waste-processing techniques, the panel advised.

The committee also had "serious reservations" about some of the assumptions the agency made regarding how much waste will remain in closed tanks at Savannah River after cleanup.

The safety and reliability of a proposal to immobilize large amounts of the Hanford Site's non-high-level radioactive waste in glass before on-site disposal were also of concern.

This process, known as bulk vitrification, needs to undergo a more detailed transparent and independent technical review of its likely performance and safety, the committee said.

The Idaho facility, on the other hand, is making good progress in tank cleanup and closure, the committee found, although there are fewer tanks at the site and they are simpler to clean.

Answering the question – how clean is clean enough? – is difficult, the panel admitted.

Construction began on the first high-level waste tanks at the Savannah River Site (SRS) in 1951, while the last waste tank was constructed in 1981. The waste tanks vary in size, from 750,000 gallons to 1.3 million gallons. (Photo courtesy LANL)

The DOE must consider the feasibility of technologies to retrieve and separate waste, the risk to workers, the potential risks posed by wastes left on-site, and costs.

Making these assessments would be easier if DOE pursued a more consistent risk-informed process with greater participation by other stakeholders, especially the public, the panel recommended. They applauded the increased transparency in some of DOE's recent waste assessments.

The final report repeated a finding from its interim report issued last year that DOE should "decouple" the schedules for cleaning tanks and permanently closing them, particularly for those tanks that still contain significant amounts of radioactive material after initial waste retrieval is completed.

This would allow more time for the development of technologies that could remove more wastes from those tanks, the panel said, adding that because the DOE is in the early stages of the tank cleanup process, there is time to pursue a research and development program to improve waste retrieval, tank stabilization, and immobilization of low-level radioactive waste.

The committee concluded that a 10 year program supported by \$10 million to \$50 million per year would be appropriate for generating improved knowledge about tank waste management and disposal.

In addition, DOE should begin planning now for how it will monitor tanks after they are closed so monitoring systems can be built in and around tanks before they are covered.

The report was requested by Congress and sponsored by the Department of Energy. The National Research Council is the principal operating arm of the National Academy of Sciences and the National Academy of Engineering. It is a private, nonprofit institution that provides science and technology advice under a congressional charter.