

## Advances in Soil Contamination Monitoring at Hanford

RICHLAND, Wash., February 20, 1996 -- The U.S. Department of Energy (DOE), Richland Operations Office (RL), in partnership with its regulators, Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) and its stakeholders, has moved forward in Hanford's cleanup effort by improving Hanford's underground contamination monitoring program.

This four-year effort by DOE to improve monitoring and gain a better understanding of contaminated soil beneath Hanford's 177 underground radioactive waste storage tanks on the Hanford Site is beginning to yield more definitive results.

"We are now obtaining data which will greatly improve our understanding of the contamination that may have come from surface cribs or ponds or from single shell tanks that are known or suspected to have leaked over the past several decades," stated Hanford Manager, John Wagoner. "This will lead to better management of the waste and is consistent with one of our highest priorities of protecting the river and the environment."

"The data provided from this monitoring will also be useful in the consideration of the recommendations from the National Academy of Sciences' National Research Council for the potential role of containment-in-place technology in dealing with Hanford's tank wastes," added Ami Sidpara, Director of Tank Farm Operations for RL.

Of Hanford's 149 single-shell storage tanks, 67 are known to or suspected to have leaked radioactive hazardous waste into the surrounding soil. "In order to minimize the risk to the environment, DOE has an ongoing aggressive program to remove the pumpable liquids from these tanks by the year 2000 in accordance with the Tri-Party Agreement," Wagoner stated. To date, 114 of the single shell tanks have been stabilized on or ahead of schedule. Only 35 of Hanford's 149 single-shell tanks still hold pumpable liquids. One of these tanks, C-106, will be stabilized through the ongoing retrieval demonstration project. The total volume remaining to be pumped from all single-shell tanks is estimated at about 5 million gallons.

"In the early 1990's we recognized the need to obtain more definitive information about the waste that leaked to the soil either from surface discharges to cribs and ponds or from the tanks to determine if the contamination is moving toward groundwater," said Sidpara.

To do this, improved techniques were employed. Specialized monitoring equipment and instrumentation were developed by Westinghouse Hanford Company which could not only detect the radioactivity, but could identify which radioactive isotopes are present and their concentrations.

Once the equipment was ready, DOE selected Rust Geotech because of its expertise in this field, to begin the Tank Farms Vadose Zone Characterization Project. The vadose zone is defined as the soil from the surface of the ground down to the groundwater. Rust Geotech began measurement logging in the tank farms in April 1995 with a process called spectra gamma analysis. To date, Rust Geotech has logged approximately 250 drywells around the tanks, which represents measurements for 50 of 149 single shell tanks. When the project is completed in 1998 at a total cost of approximately \$10 Million, data from up to 750 monitoring wells will have been obtained and analyzed. This information will provide a baseline for future monitoring.

Preliminary data from some of the wells in the SX tank Farm in the 200 West Area show at least one radioactive isotope...cesium...may be deeper in the soil than predicted. "We had expected to find the

cesium much closer to the bottom of a tank if it had leaked," said Sidpara. Readings from several of the monitoring drywells indicate cesium has been detected down at the bottom of the shafts, which are up to 125 feet deep. However, regular groundwater monitoring over the past decades has detected no significant levels of cesium in the groundwater. The groundwater below this tank farm is approximately 210 feet below the surface.

Another contaminant, Technetium-99, has also been identified in the groundwater beneath the tanks and cribs. However, as far back as the mid- 1980's, Hanford has been detecting and reporting Technetium-99 in the groundwater to both Ecology and EPA (Region 10). The source of the Technetium is believed to be from the past practice of surface discharges to cribs and ponds that was stopped many years ago. However, further monitoring and evaluation must be performed to confirm the source of this contamination.

"We are in the process of establishing a team of experts to further evaluate this new data and develop a path forward." added Sidpara.

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