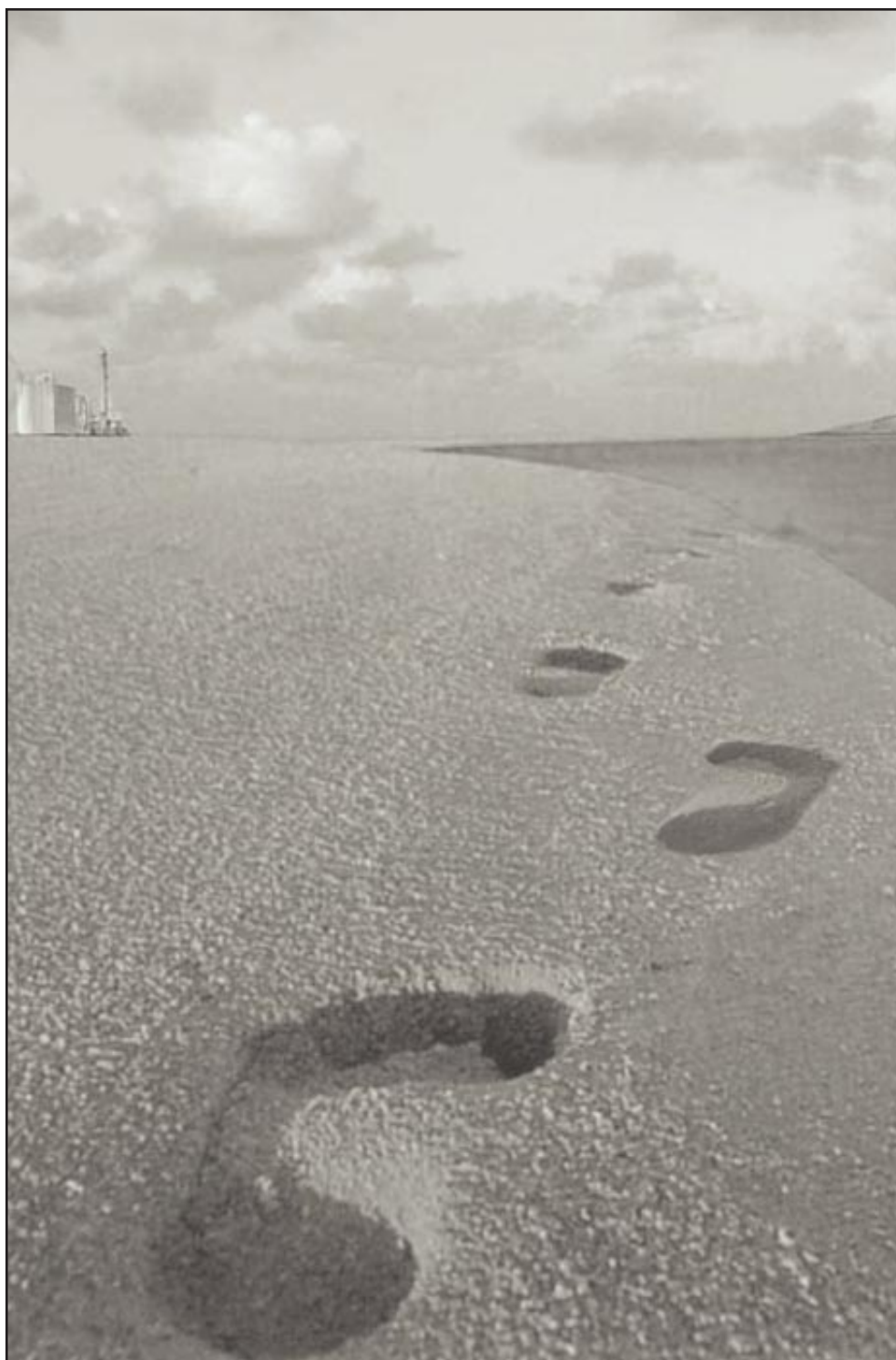


REDUCING THE NUCLEAR **Footprint**

One of the overall goals of Hanford cleanup is to reduce the nuclear footprint left by decades of nuclear production. In order to do that, as much of the waste materials as possible must be transferred to offsite storage facilities. What's left must be condensed into a small, manageable area away from the Columbia River.

The 200 Area Plateau is a 130-square-kilometer (50-square-mile) piece of land in the center of Hanford that is being converted to just such a place. Some waste from other parts of the 1,456-square-kilometer (560 square-mile) site is being brought to the 200 Area for long-term storage, thereby allowing those other areas to be decontaminated and converted to non-Hanford land. All of the waste that is not shipped offsite will be stored here.

NUCLEAR MATERIAL Stabilization

The Nuclear Material Stabilization Project is an important piece of the 200 Area conversion effort. The project's goal is to safely stabilize the plutonium inventory at the Plutonium Finishing Plant (PFP), and deactivate and dismantle the contaminated buildings.

- 150 items of oxides and sludge – 40 more than the FY 1999 target – were thermally treated. Three more furnaces were installed on schedule, greatly increasing the capacity for thermal stabilization.
- The first major milestone in the revised project plan to stabilize plutonium solutions at PFP was met with the August restart of the prototype Vertical Denitration Calciner. The calciner heats plutonium nitrate solutions, converting them to a more stable oxide powder. Of more than 400 containers of solutions, 16 have been stabilized.
- The design for a new, long-term technology for stabilizing solutions – Magnesium Hydroxide Precipitation – was

completed 10 days ahead of schedule. Testing confirmed that this process, which chemically separates the plutonium from solutions, will eliminate a step in stabilization. The prototype calciner will be used to stabilize solutions until the Magnesium system becomes operational in July 2000.

- All of the highly enriched uranium that was not contaminated with plutonium was shipped to Oak Ridge National Laboratory in Tennessee.
- Tank 241-Z-361, an old concrete settling tank once used for liquid containment at PFP, was successfully tested for structural integrity. Sampling confirmed there is low volatility and low potential for a criticality event. Two core samples were taken from the tank on schedule and delivered to the laboratory for analysis.



Small ovens, called muffle furnaces, dry small batches of plutonium-bearing materials, converting them to a more stable form. Hanford will use this thermal process to stabilize three-quarters of PFP's 4.3 metric tons of plutonium.



Items of Oxide & Sludge Processed at PFP

Waste MANAGEMENT PROJECT

Hanford's legacy from decades of defense production includes large volumes of waste that must be managed. The Waste Management Project safely treats, stores and disposes of solid wastes and provides analytical, generator, environmental, waste-minimization, transportation and packaging services.

- The first mixed-waste disposal trench in the Department of Energy (DOE) Complex opened and began receiving mixed low-level waste more than one-and-a-half years ahead of schedule. 182 cubic meters (6,440 cubic feet) of mixed low-level waste from the Central Waste Complex was disposed of in the trench.
- The Waste Management team began retrieving, testing and sorting transuranic waste from the Low-Level Burial Grounds 14 months ahead of schedule.

At the Waste Receiving and Processing facility, all waste drums are x-rayed to verify content. A percentage of the drums must also be inspected by opening and examining the contents remotely in shielded rooms at the WRAP facility.

The low-level wastes will remain in the burial grounds, while the transuranic waste will be transferred to storage, processed through the Waste Receiving and Processing facility (WRAP), and then prepared for shipping to the Waste Isolation Pilot Plant (WIPP) in New Mexico for disposal.

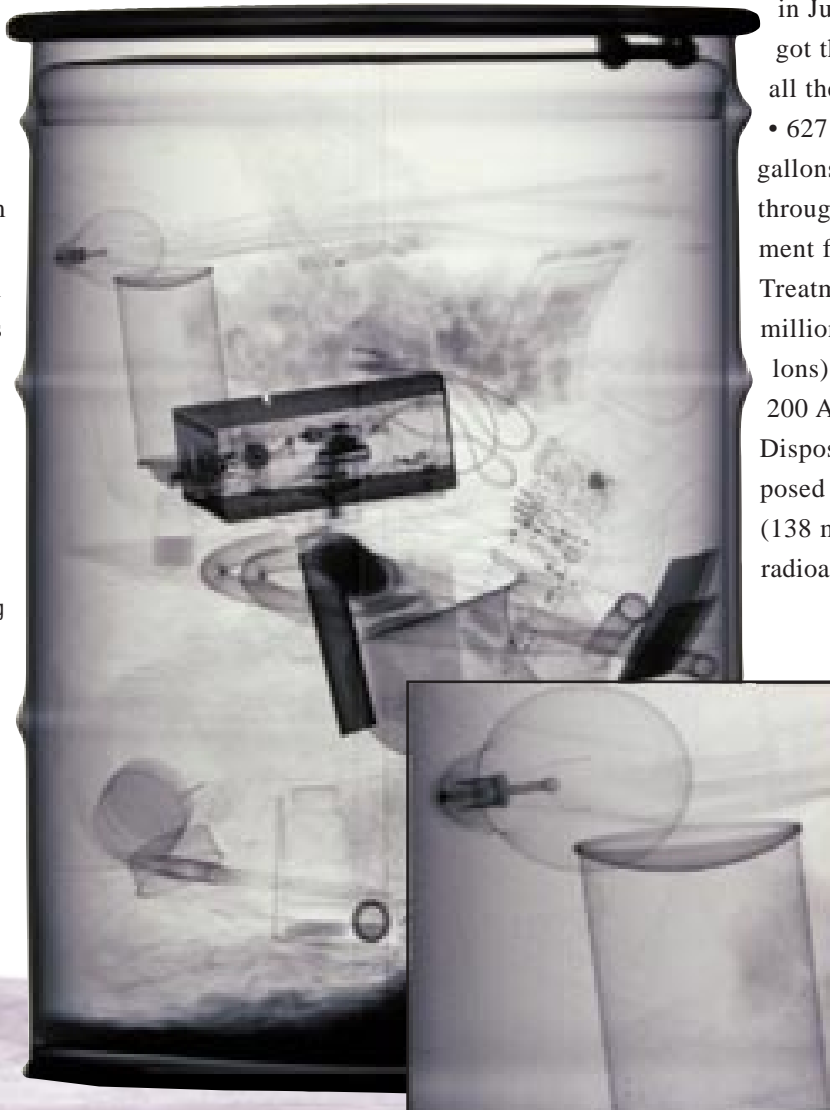
- Pollution prevention efforts were recognized in April with the *National Pollution Prevention Award* presented by Energy Secretary Bill Richardson. The team also received the White House

Closing the Circle Award for Waste Minimization and Pollution Prevention.

- The Waste Management Project's efficiencies saved \$10.5 million, which was then used to fund previously unfunded work and to accomplish work scheduled for FY 2000.
- DOE's Carlsbad Area Office assessed the Waste Management Project's Transuranic Waste Program to certify the program for shipping Hanford's transuranic waste to WIPP for disposal.

The first phase of the audit was completed in July, and Hanford's program got the highest initial marks of all the DOE sites.

- 627 million liters (165 million gallons) of wastewater passed through the 200 Area water treatment facilities. The Effluent Treatment Facility treated 95 million liters (25 million gallons) of wastewater, and the 200 Area Treated Effluent Disposal Facility treated and disposed of 524.4 million liters (138 million gallons) of radioactive wastewater.



- 228 million liters (60 million gallons) of industrial wastewater were treated in the 300 Area Treated Effluent Disposal Facility.
- The Waste Management team helped the Spent Nuclear Fuel team accelerate movement of K Basin sludge away from the river by proposing use of an existing facility (T Plant) for near-term treatment.
- Workers at the Waste Encapsulation Storage Facility successfully removed 1.8 metric tons (two tons) of low-level waste and .9 metric tons (one ton) of mixed waste from the facility without incident through careful strategy and daily pre-job safety planning sessions. Eliminating this contamination dramatically reduced the numbers of radiation areas, which significantly reduces the cost of daily work.



Uncovered drums of transuranic waste in this large trench are among the first to be retrieved more than a year early. The current schedule calls for retrieving 10,000 drums by 2004.

Tank WASTE REMEDIATION SYSTEM & RIVER PROTECTION PROJECT

By volume, 60% of the nation's high-level radioactive waste is stored at Hanford in aging and deteriorating tanks. Cleaning up that waste is the nation's number one environmental cleanup priority. If left alone, the tank waste is a threat to the Columbia River and the region.

The 200 Area's complex of 177 underground tanks is known as the Tank Farms. 149 of those tanks are single-shell tanks. The waste from those single-shell tanks must be pumped into more environmentally sound double-shell tanks for safe storage.

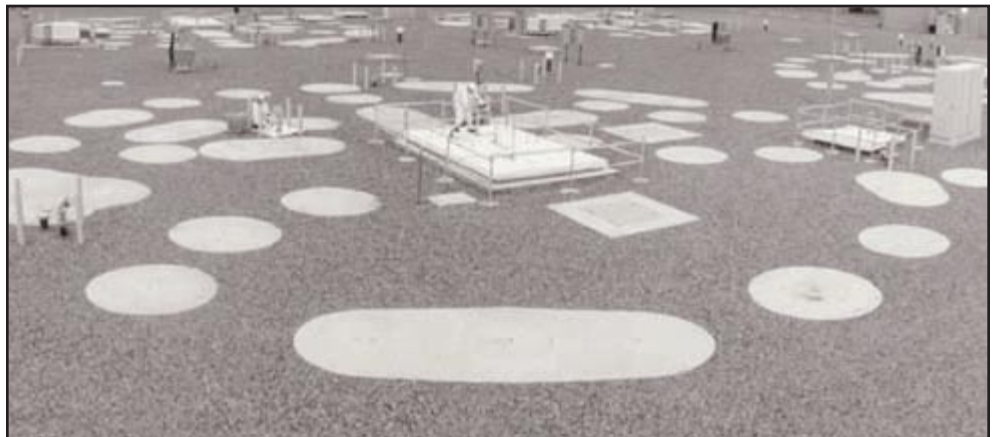
The Tri-Party Agreement agencies (Department of Energy (DOE), Environmental Protection Agency and Washington State Department of Ecology) reached agreement on a plan to remove 22.8 million liters (6 million gallons) of remaining pumpable liquid waste from the single-shell tanks by the end of FY 2004.

Hanford's Interim Stabilization Project is responsible for:

- *Identifying the contents of the underground waste tanks*
- *Determining necessary actions for continued safe management of the tank waste*
- *Stabilizing the waste for transfer from the single-shell tanks to double-shell tanks*
- *Storing the stabilized waste until permanent facilities are available*
- *Reducing life-cycle cost by applying enhanced characterization, monitoring and leak-detection technologies*
- The first transfer of waste to a double-shell tank using the new cross-site transfer line occurred in March 1999. The cross-site transfer line is a 9.92 kilometer- (6.2-mile) long, double-walled pipeline

that carries liquid waste from the single-shell tanks in the 200 West Area to double-shell tanks in the 200 East Area.

- Nearly 1.9 million liters (500,000 gallons) of radioactive waste was pumped from aging single-shell tanks into safer double-shell tanks – 190,000 liters (50,000 gallons) beyond the FY 1999 Consent Decree total set for the Interim Stabilization Project. This action minimizes the potential for discharge to the environment.
- There were seven single-shell tanks being pumped simultaneously by the end of FY 1999. By early 2000, more tanks will be pumping than have ever been pumped at one time in the site's history.
- The long-standing high-heat safety issue in Tank 241-C-106 was effectively



All that is visible of the underground storage tanks in a typical Hanford

Tank Farm are the monitoring and access areas on top of the tanks.

resolved this year with the successful sluicing of 173.74 centimeters (68.4 inches) – 95 percent – of the tank’s sludge. That’s 50.8 centimeters (20 inches) more than originally targeted. The work was completed two-and-a-half months ahead of schedule and \$1.8 million under budget.

- During FY 1999, Lockheed Martin Hanford Corp. (LHMC) managed cleanup of the Tank Farms as a subcontractor to Fluor Hanford. At the beginning of FY 2000, work at the Tank Farms was transferred to DOE’s newly created Office of River Protection (ORP) as the next step in the evolution of tank-waste cleanup. LHMC will continue to manage the River Protection Project cleanup as a contractor to DOE-ORP.



Workers install the pump for S-103, one of the most recent single-shell tanks to enter the pumping phase.

