



Nuclear Materials Disposition



Normal uranium clad metal is overpacked in steel-banded wooden boxes which are then overpacked once again into metal shipping containers (7368-D97).

value to the private sector and disposal of some of the materials as waste.

Product Disposition

Efforts to sell or transfer product were initially successful in reducing inventory. By August 1998, the product inventory had been reduced to approximately 15.2 million pounds. At that time, the DOE Oak Ridge Operations Office agreed to assume stewardship of Fernald's nuclear product inventory to facilitate site remediation. The Portsmouth Gaseous Diffusion Plant was chosen as the storage site after completion of an Environmental Assessment. Approximately 8.4

million net pounds of product have been transferred to Portsmouth to date.

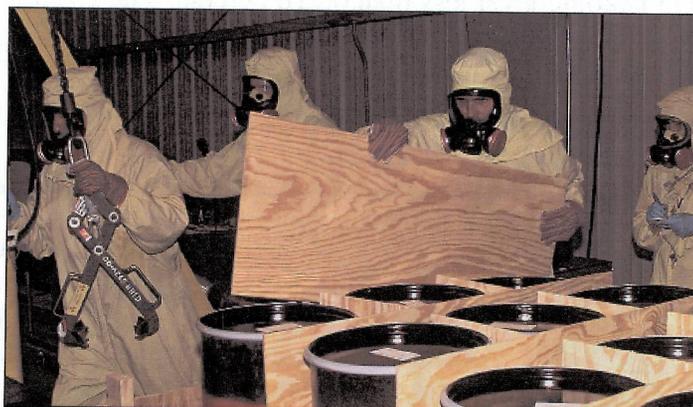
Transfer began in June 1999 and will be completed by June 2002. The Oak Ridge Operations Office will assume the marketing role for the DOE under the purview of the Uranium Management Division. The product will be marketed based upon its reuse

Description

The Nuclear Materials Disposition program at the Fernald Environmental Management Project is responsible for the removal of all nuclear materials from the site. The terminology "nuclear materials" refers to two different inventories at Fernald:

- Nuclear product materials, and
- Former nuclear product materials that have been declared waste.

"Feed materials" were uranium products that were supplied to other facilities within the Department of Energy (DOE) complex and to the Department of Defense. When feed materials production ceased at Fernald in 1989, and the mission changed to environmental restoration, the nuclear product inventory remaining at the site was approximately 31 million net pounds. Since that time, several options have been pursued to dispose of nuclear product and materials including: transfer to other DOE facilities for programmatic use, sale of product with market



Ten-gallon cans of depleted uranium tetrafluoride, commonly called green salt, are loaded into a wooden insert box and then overpacked prior to shipment (6731-D34).



The Drum Repackaging Station, installed in early 2001, will enable safe, efficient repackaging of enriched uranium compounds and oxides into acceptable quantities for shipment (7536-D17).

potential. Fernald's uranium inventory is divided into three broad categories: depleted, normal and enriched. Each category has its own potential applications as well as its own specific requirements for storage, packaging and transportation. Within each category, there are various physical forms including derbies, ingots, fuel cores, compounds and oxides stored in many different types of containers.

Uranium product categories at Fernald are as follows:

- **Normal Uranium** - Normal uranium has a U-235 isotopic level comparable to that found in nature in the form of ore, which is 0.711 percent; however, at Fernald, that level may have been obtained by isotopic blending of depleted and enriched uranium. Since the pedigree of Fernald's uranium in the 0.710 to 0.712 percent range cannot be traced to the natural feed, the inventory is called "normal," rather than natural. An example of a potential reuse of normal uranium is in blending with other nuclear product for commercial reactor fuel.
- **Depleted Uranium** — Depleted uranium has a U-235 isotopic level less than 0.710 percent. The U-235 level in depleted uranium varies depending upon how much of that isotope has been extracted for use in enriching other materials. An example of a potential

reuse for depleted uranium is in shielding applications.

- **Enriched Uranium** — Enriched uranium is a product in which the U-235 isotope has been increased above natural levels. Fernald's enriched nuclear product ranges from 0.713 to 19.9 percent U-235. Within this inventory, less than a ton has greater than five percent U-235. The bulk of the enriched nuclear product contains either 0.95 or 1.25 percent U-235. An example of a potential reuse of enriched uranium is in blending with other nuclear product for commercial reactor fuel.

All nuclear product is targeted for removal from the site by June 2002.

Materials Disposition

The Uranium Waste Disposition Project has the responsibility to characterize, package and plan disposition of nuclear product that has been declared waste. The project is also responsible for a small amount of other similar waste materials at the site. There are three general categories of these materials at Fernald:

- Materials characterized as low level waste that can be readily disposed of;
- Low-level waste which is above the Nevada Test Site disposal limits for fissile material, cannot be readily shipped in its present form per the applicable transportation guidelines and does not satisfy the NTS Waste Acceptance Criteria for disposition; and
- Materials containing mixed waste.

The uranium waste materials inventory is 994.4 metric tons uranium, which represents approximately 3.4 million net pounds. This effort is currently in the planning and characterization stages, but will eventually include packaging/repackaging of materials, processing as needed and shipment to an off-site location by December 31, 2005.

For more information . . .

- Visit** the Public Environmental Information Center at 10995 Hamilton-Cleves Highway (Delta Building);
- Attend** a Cleanup Progress Briefing (second Tuesday of every month at 6:30 p.m. on site);
- Contact** John Sattler, DOE-Fernald Waste Management team leader at 513-648-3145 or at john.sattler@fernald.gov;
- View** the Fernald Web site (<http://www.fernald.gov>).