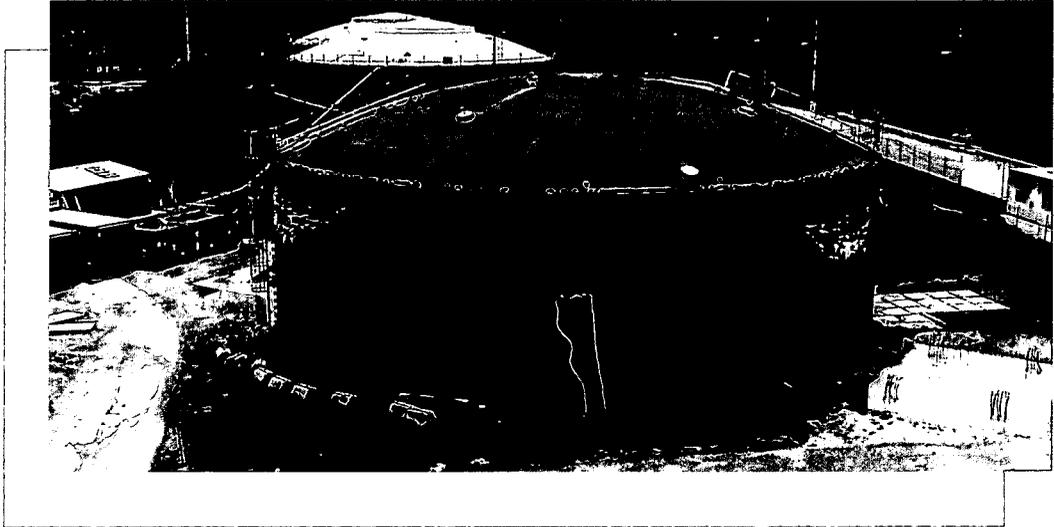


PROJECT  
SILOS



**From 1952 to 1989, the Fernald site produced 500 million pounds of pure uranium metal products for the nation's Cold War defense program. When the site ceased operations in 1989 because of declines in demand for Fernald's products and increasing environmental concerns, 31 million net pounds of nuclear product, 2.5 billion pounds of waste and 2.5 million cubic yards of contaminated soil and debris remained on site. Since then, Fernald workers have been dedicated to the remediation of the 1,050-acre site.**

**In 1986, Fernald began a 10-year environmental site investigation to determine contamination levels and develop cleanup plans. The investigation resulted in Records of Decision, or final cleanup plans, for five operable units. Operable Unit 4, located in the northwest quadrant of the site, includes four concrete waste silos. Two of the silos, known as the K-65 Silos, hold 8,900 cubic yards of low-level radium-bearing waste. The Fernald process that refined pitchblende ore from the Belgian Congo generated this waste. The third silo holds 5,100 cubic yards of cold metal oxides, a byproduct of the site's uranium processing operations, and the fourth silo is empty.**

**In 1994, the Department of Energy (DOE), Fluor Fernald, regulators and stakeholders agreed on a cleanup plan for Silos 1, 2 and 3. The plan involved removing the waste from the silos; using a process called vitrification to melt it into glass, thereby minimizing transportation risks; shipping the waste to the Nevada Test Site for disposal and demolishing the silos. To test the vitrification process, Fernald constructed an on-site Vitrification Pilot Plant. In 1997, while processing surrogate material through the plant, workers encountered problems in the glass manufacturing process. Concerns about the feasibility and increasing costs of vitrification prompted DOE and regulators to reevaluate the cleanup plan. The reevaluation process, called a Record of Decision (ROD) Amendment, involved screening potential stabilization technologies and selecting a new cleanup plan.**

*PHOTO: Silo 3 contains 5,100 cubic yards of cold metal oxides (7325-D0846).*

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At this point, DOE separated Silo 3 cleanup from Silos 1 and 2 to accelerate remediation. In 1999, Fluor Fernald awarded a contract for Silo 3 remediation facility design and construction; waste retrieval, treatment and packaging; shut down and plant dismantling. Workers initiated remediation facility construction in 2000, but Fluor Fernald released the subcontractor from the contract and explored a new path for the project.

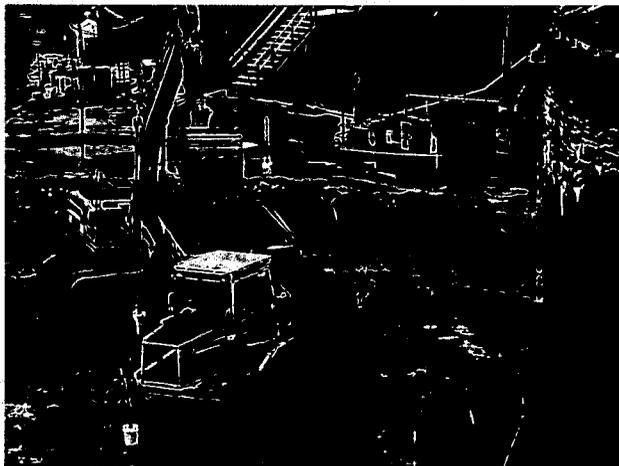
In 2002, the Silo 3 project team completed the design plan for waste removal, packaging and transportation. Workers will use vacuum and mechanical retrieval systems to remove the waste and package it in soft-sided containers for shipment to a licensed off-site disposal facility. Jacobs Engineering performed design and engineering for the project; Fluor Fernald will manage construction and guide operations, transportation and shipment.

Fernald continues to work with stakeholders to expedite startup of Silo 3 waste retrieval and disposal operations and is scheduled to complete cleanup of Silo 3 in 2005.



**"WORKERS WILL USE VACUUM AND MECHANICAL RETRIEVAL SYSTEMS TO REMOVE THE WASTE."**

**PHOTOS:**  
*Crews prepare the Silo 3 area before construction begins on waste processing facilities (TOP: 7325-D0881, BOTTOM: 7325-D0897).*



**For more information**

Visit the Public Environmental Information Center on site, open Tuesdays and Thursdays  
Contact Gary Stegner, DOE-Fernald Public Affairs, (513)648-3153, [gary.stegner@fernald.gov](mailto:gary.stegner@fernald.gov).  
View the Fernald website at <http://www.fernald.gov>

**SILOS COMPARISON CHART**

	<b>SILOS 1 &amp; 2</b>	<b>SILO 3</b>
<b>HAZARDS</b>	Radon gas, radium, gamma dose	Thorium-230 dust; alpha inhalation hazard
<b>RETRIEVAL</b>	Sluice material to AWR Transfer Tanks	Vacuum loose dry material and excavate compacted material
<b>TRANSFER</b>	To treatment facility	Directly to packaging
<b>TREAT</b>	Physically and chemically stabilize	Waste conditioning to reduce dispersability and mobility of metals
<b>DURATION OF OPERATIONS</b>	October 2004 — October 2005	April 2004 — November 2004
<b>PACKAGE</b>	Sealed cylindrical metal canisters	Sealed plastic liner inside IP2 certified lift liner bag inside cargo container; 7 bags to a container
<b>SHIP</b>	Two canisters on a shielded truck trailer; 3,800 trucks to NTS or alternate; 7 canisters to each shielded gondola car; dispatch as unit trains to intermodal site for truck transfer to NTS	One cargo container per truck; 273 trucks to NTS
<b>CURRENT MANDATES</b>	Record of Decision (ROD) calls for chemical stabilization and disposal at Nevada Test Site (NTS)	Explanation of Significant Differences (ESD) calls for chemical stabilization or encapsulation to meet RCRA limits and disposal facility Waste Acceptance Criteria (WAC). Disposal at either NTS or permitted offsite facility
<b>ROD AMENDMENTS</b>	Proposed ESD would allow treatment as required by disposal facility WAC; disposal at NTS or permitted off-site facility	Proposed amendment calls for waste conditioning to reduce dispersability and mobility of metals; removes TCLP requirement

## Silo 3 Proposed Plan Summary

In accordance with the Atomic Energy Act, the Department of Energy and Environmental Protection Agency designated the Silo 3 material as Section 11e.(2) by-product material. This regulatory classification identifies it as material produced during uranium extraction and concentration. Analysis of the Silo 3 material indicates that it contains levels of some regulated metals, such as arsenic, cadmium, chromium and selenium, above Resource Conservation and Recovery Act (RCRA) leachability limits. Due to its designation as 11e.(2) material, however, the Silo 3 residues are exempt from RCRA regulations. When Fernald engineers, regulators and stakeholders drew up the initial cleanup plan for all the silos, the Nevada Test Site's (NTS's) waste acceptance criteria required that all waste meet RCRA regulatory limits, regardless of its classification, so the 1994 Operable Unit 4 Record of Decision (ROD), which called for on-site vitrification and disposal at the NTS, included a quantitative waste treatment performance standard based upon the RCRA toxicity characteristic leaching procedure (TCLP) laboratory test. At the time, NTS was the only facility available for disposal of the material.

In 1998, after the site encountered difficulties with the vitrification process, Fernald engineers, regulators and stakeholders developed an Explanation of Significant Differences (ESD) that replaced vitrification with a chemical stabilization and solidification or polymer encapsulation alternative. Since the NTS waste acceptance criteria still required that all waste meet RCRA limits, the ESD maintained the TCLP-based performance standard. The ESD also allowed disposal at an appropriately-permitted commercial facility in addition to disposal at the NTS.

Since 1998, DOE and EPA have received new information concerning changes to the NTS waste acceptance criteria. In February 2002, NTS and its regulators revised the criteria to specify that only waste subject to RCRA regulations must meet RCRA limits. Since Fernald's Silo 3 material is excluded from RCRA regulation, NTS can dispose of it without treatment to meet TCLP limits so long as it is disposed "in a manner that is protective of human health and the environment." In June 2002, NTS issued a formal letter to Fernald stating that untreated Silo 3 material is eligible for disposal there. In addition, DOE has identified potential commercial options for disposal of untreated Silo 3 material.

The Proposed Plan explains DOE's and EPA's recommended change to the Silo 3 cleanup plan as it was described in the 1994 ROD and the 1998 ESD. The Proposed Plan aligns the Silo 3 cleanup plan with current disposal facility waste acceptance criteria. Also, DOE and EPA are proposing to remove the TCLP performance standard from the cleanup plan since it is no longer necessary to maintain long-term protectiveness and regulatory compliance with disposal facility waste acceptance criteria. The recommended revised cleanup plan simplifies design and operations, reduces worker risk, and saves money while maintaining the same level of long-term protection for human health and the environment.

Members of the public have expressed concerns about controlling dispersability of Silo 3 material if DOE and EPA remove the primary requirement for treatment. The Department of Energy and EPA have addressed these concerns in the Proposed Plan by specifying that the project will condition the Silo 3 material by adding binders to reduce dispersability and a beneficial stabilization reagent during the packaging process. This is a best management approach. If the addition of liquid during packaging proves technically infeasible, the Proposed Plan includes a contingency which involves double packaging the material to maintain protectiveness during transportation to the disposal facility. This contingency plan is subject to EPA approval.

The Department of Energy and EPA will adopt a final plan for Silo 3 after they review and consider all information submitted during the public comment period, which is April 30 through May 30, 2003. This hearing is a required part of the public review process.

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**For More Information**

Additional information or related cleanup documents are available to the public at the following location:

Public Environmental Information Center  
Fernald Closure Project  
7400 Willey Road  
Hamilton, OH 45013-9402

513-648-3153

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**COMMENT FORM**

Your input on the Proposed Plan for amending the Operable Unit 4 ROD to accommodate the revised cleanup plan for Silo 3 is important. Public comments assist DOE and EPA in selecting the final cleanup plan.

You may use the space below to write your comments about both of the alternatives described in this Proposed Plan. After making your comments, please fold, tape (no staples), and mail this prepaid form. We must receive your comments on or before the close of the public comment period on May 30, 2003. If you have questions about the comment period or the upcoming public meeting, contact Gary Stegner in DOE's Public Information Office at (513) 648-3153. Those with electronic capabilities may submit their comments to DOE via E-mail to: gary.stegner@fernald.gov.

Lined area for writing comments.

**(BELOW INFORMATION IS OPTIONAL)**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Phone: \_\_\_\_\_

**MAILING LIST ADDITIONS**

Please add my name to the Fernald Mailing List to receive additional information on the cleanup progress at the Fernald Environmental Management Project.

Yes \_\_\_\_\_ No \_\_\_\_\_

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