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PROGRESS REPORT OPERABLE UNIT 3 PRODUCTION AREA FEBRUARY 1994

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FACT SHEET

FERNALD
Environmental Management Project

Remedial Investigation/ Feasibility Study

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Operable Unit 3
PRODUCTION AREA

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Introduction

The Remedial Investigation/Feasibility Study (RI/FS) is the blueprint for cleanup at the U.S. Department of Energy's Fernald Environmental Management Project. The nature and extent of contamination at the Fernald site and surrounding areas is being thoroughly investigated so that appropriate remedial actions can be formulated and implemented.

The Fernald site has been divided into five sections, known as Operable Units, for environmental investigation and cleanup. The Operable Units were defined based on their location or the potential for similar technologies to be used in the ultimate cleanup.

During the course of the RI/FS effort, certain conditions are occasionally identified which call for more immediate action. These actions are called "removal actions" and are initiated when there is a need to accelerate cleanup activities to address releases or potential releases of hazardous substances. Removal actions are coordinated with the U.S. EPA and the Ohio EPA.

Following is a progress report on Operable Unit 3 including its history, the current status of RI/FS activities, cleanup alternatives under consideration, and work that is being done to alleviate near-term concerns.

Background

Operable Unit 3, the former production area and production-associated facilities, is one of the largest and most complex of the Fernald site Operable Units, largely due to the wide variety of former processing and support facilities located within this 136-acre study area. When the mission at the Fernald site was production of high-purity uranium metal for U.S. defense programs and the processing of thorium to support other DOE programs, large quantities of radioactive materials and some hazardous chemicals were used in the various plants involved in the process. Operable Unit 3 focuses on cleanup of contamination in the former production area resulting from the 37-year production mission at the Fernald site. The primary contaminant is uranium, and the main focal points of cleanup are buildings, equipment, and support facilities.

RI/FS Activities

RI/FS Work Plan Addendum: Several tasks specified by the RI/FS Work Plan Addendum for Operable Unit 3 have been initiated, including sample plan preparation, field sampling, sample analysis, data validation, and treatability studies. The U.S. EPA-approved work plan recognizes the pursuit of a separate interim Record of Decision for the decontamination and dismantling of all Operable Unit 3 structures as an interim action concept.

Proposed Interim Action: Several significant activities have occurred regarding DOE's proposed interim remedial action for accelerating the decontamination and dismantling of Operable Unit 3 structures. In December 1993, both the U.S. EPA and Ohio EPA approved the Proposed Plan/Environmental Assessment for Interim Remedial Action. This document provides an evaluation of options available for interim action and selects a preferred alternative based on the results of the evaluation. Based on current planning assumptions and scenarios, the interim action approach could result in up to four years acceleration of the remediation process and result in over $300 million in project savings due to

avoided operations and maintenance costs.

A public comment period was held from December 8, 1993, to February 8, 1994, to provide a forum for evaluating community acceptance of the Proposed Plan and to gather and resolve public comments. Comments received from the public are being considered in the development of the draft Interim Record of Decision (IROD) which will be submitted to U.S. EPA and Ohio EPA for review and comment. The IROD will provide a consolidated source of information about Operable Unit 3 and the selected alternative, including the rationale behind the selection. The IROD will include a responsiveness summary of public concerns and demonstrate how these concerns are integrated into the decision-making process.

Remedial Investigation: Field investigation activities for characterization of Operable Unit 3 structures are progressing on schedule. More than half of the sampling plans have been prepared, and about one-third of the sampling has been completed through January 1994. The samples are being analyzed at off-site independent laboratories. Field sampling activities are expected to be completed by September 1994.

Analytical results will support the development of a baseline risk assessment for the former production area, and a determination of the scope of cleanup work in Operable Unit 3. Results of the field investigation program will be summarized in the Operable Unit 3 Remedial Investigation report.

Treatability Studies: Operable Unit 3 personnel are developing plans for the testing of potentially applicable innovative technologies to support the decontamination, dismantling, and treatment requirements of remedial actions. Technology alternatives will be tested for applicability, effectiveness, cost, waste minimization, secondary waste generation, and other key evaluation criteria. Screening of many technologies has been completed, revealing possible opportunities to reduce costs and minimize short- and long-term risks.

Technologies to be tested and the particular tests to be conducted are detailed in a Treatability Study Work Plan for Operable Unit 3, which was submitted to the U.S. EPA in December 1993 for review and comment. Planned studies include evaluation of vitrification for asbestos and mixed radiological/hazardous wastes, chemical destruction of asbestos fibers, and chemical leaching of contaminants from porous concrete, brick and other materials. Additional studies to be performed will be identified as planning continues for the effort.

Removal Actions

Plant 1 Pad Continuing Release (Removal Action No. 7): The purpose of this removal action is to protect surface soils and regional groundwater from continuing releases of hazardous materials resulting from waste management activities on the eight-acre Plant 1 storage pad. This removal action is being conducted in three phases.

Phase I, the implementation of run-on and run-off control measures and the installation of underground utilities, is complete.

Phase II, the installation of a covered, 80,000 square foot concrete storage pad adjacent to the existing Plant 1 storage pad, also is complete.

Remaining drums of low-level radioactive waste in outdoor storage on the Plant 1 Pad are being moved into the two new covered storage structures, which are equipped with containment facilities for spill control, drainage, and stormwater runoff/run-on control.

Phase III involves activities to upgrade the existing Plant 1 storage pad, including the installation of a polyurethane and epoxy membrane coating over the pad surface to minimize contaminant migration to the environment. Drum movements to clear areas in preparation for Phase III construction were completed in July 1993. Construction began in August 1993. Phase III is on schedule for completion by February 19, 1995.

Removal of Waste Inventories (Removal Action No. 9) This removal action involves the characterization, overpacking, and disposition of low-level radioactive waste materials. The removal of waste inventories is ongoing at Fernald.

The Fernald site has approval from the DOE Nevada Field Office to dispose of general waste

streams at the Nevada Test Site (NTS), including: process area scrap wastes (scrap metal and wood); construction and Removal Action waste (demolition debris); uranium production residues; and baled trash. However, as the result of a DOE-Nevada audit conducted in July-August 1993, approval to ship baled trash has been temporarily suspended.

Deficiencies found during the audit gave rise to a 30-day grace period from the auditors in order to initiate necessary corrective actions to avoid a temporary suspension of all waste stream shipment activity. Corrective Action teams met weekly focusing on major subject areas where deficiencies were found, and many improvements were completed prior to the lead auditor's return on September 2, 1993.

With all of the planned improvements and controls completed in February 1994, it is anticipated that the suspension on baled trash will be lifted. Additional waste streams in the Fernald contract, such as U.S. Army-owned (AMCCOM) uranium metal and additional thorium waste, also will be approved.

The waste shipping goal for Fiscal Year 1994 was to dispose of 79,500 drum equivalents (DEs) of low-level radioactive waste to NTS, and 50,000 DEs of low-level radioactive waste through subcontractors. This goal includes waste from construction and restoration activities (8,600 DEs), characterized backlog waste (35,000 drums), 3,878 DEs AMCCOM metal, 5,651 DEs contaminated trash, and 8,420 DEs of thorium.

The overpacking of 5,600 drums of thorium compounds in Building 65 is expected to begin in mid-1994. Modifications to existing facilities in and adjacent to Buildings 64 and 65 are necessary prior to overpacking this material into strong, tight containers appropriate for shipment.

Safe Shutdown (Removal Action No. 12): This removal action was initiated to ensure the safe and permanent shutdown of production facilities, including the removal of uranium and other process/raw materials from equipment and lines in the former production area. Disposition of uranium products and recoverable residues is an integral part of Safe Shutdown activities.

Implementation plans for activities supporting safe shutdown of the Plant 4 Potassium Hydroxide Scrubber System, the Plant 4 Hydrogen Off-gas System, and the Plant 8 Box Furnace, are being reviewed. Field activities in those three areas are expected to begin in early 1994.

Assessments of equipment and materials also is ongoing. Field evaluations of Plants 1, 4, 7, 8, and 9 have been completed. The field evaluation of Plant 5 is in progress.

The first contract resulting from uranium sale efforts was signed with Manufacturing Sciences Corporation (MSC) of Oak Ridge, Tennessee, for the purchase of 973,651 net pounds of depleted uranium metal derbies. The first of 25 shipments to MSC was made January 25, 1994. The other shipments will be made at the rate of one per month until shipments are complete.

Approval to ship the 2.3 million pounds of U.S. Army-owned material to the Nevada Test Site is expected in February 1994. Removal of that material from the Fernald site is expected to begin in mid-1994.

Sales of other uranium products are being finalized. The total amount of uranium products shipped from Fernald since the production mission ended in July 1989 is 11.12 million pounds.

Plant 1 Ore Silos (Removal Action No. 13): This removal action involves the dismantling of the Plant 1 Ore Silos and their support structures. Due to deteriorated valves, materials leaked from the silos onto an elevated concrete pad in February 1991. The material, known as cold raffinate, is the waste residue from the processing of uranium ore after uranium is removed. Remaining material in the silos has been removed, containerized and placed in safe storage pending final disposition. All 14 silos and support structures will be dismantled under this removal action.

Demolition of the concrete silos began in October 1993. As of December 1993, two of the six concrete silos have been dismantled. Due to unsatisfactory schedule performance, the subcontractor performing this work was terminated in December 1993. Options are being evaluated to replace the subcontractor and resume demolition activities as soon as possible. Despite the setback, the removal action remains on schedule for completion by December 18, 1994.

Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (Removal Action No. 14): The scope of this removal action includes the isolation or removal and disposition of contaminated soils with elevated levels of uranium in the vicinity of an out-of-service solid waste incinerator at the sewage treatment plant. The project is designed to mitigate the potential for contaminant migration. Current activities include characterization, removal, storage and disposal of materials.

The first phase of the removal action (characterization) discovered a larger area of contamination than previous sampling had indicated. A Work Plan Addendum detailing the need for additional excavations based on analytical results from the initial sampling was approved by the U.S. EPA and Ohio EPA in August 1993. Additional excavations are scheduled for completion by the end of March 1994. The final report for this removal action is scheduled to be submitted to the U.S. EPA and Ohio EPA by September 24, 1994.

Scrap Metal Piles (Removal Action No. 15): This removal action is addressing the stabilization and disposition of low-level radioactive waste scrap metal currently stockpiled outdoors at Fernald. The project is designed to eliminate the potential threat of material releases to the environment due to wind or rain from 1,300 tons of scrap copper and about 2,210 tons of recoverable ferrous and nonferrous scrap metal.

As of February 1994, 105 tons of nonferrous metal and 2,278 tons of ferrous metal have been shipped off site under a contract that emphasizes recycling or other beneficial reuse. The ferrous metal has been reprocessed for restricted reuse in DOE high-energy physics programs; the nonferrous metal has been recycled.

Plans are being finalized for the removal and off-site processing of the containerized scrap copper pile. Bids have been evaluated and the contract is expected to be awarded by April 1994. The copper will be shipped in mid-1994, and at that time this removal action will be complete.

Non-recoverable scrap metal at Fernald is presently being packaged into appropriate containers and shipped off site for disposal under Removal Action No. 9 (Removal of Waste Inventories).

Improved Storage of Soil and Debris (Removal Action No. 17): This removal action was initiated to address contaminated soil and debris generated as a result of performing cleanup at Fernald. Activities include the construction of three interim storage structures and the in-place containment of an existing soil and rubble pile, to improve interim storage and management of contaminated soils and debris until their final disposition is determined under the Operable Unit 3 and Operable Unit 5 Records of Decision.

Construction of the three above-ground structures is expected to begin in the spring of 1994. Covered storage structures similar to those currently being used to provide indoor storage for drummed waste on Fernald's Plant 1 Pad will be constructed to provide improved storage of soil and debris and to mitigate the potential spread of contamination.

The U.S. EPA and Ohio EPA are reviewing a proposed plan to install an in-place cover over the large soil and rubble pile located north of Third Street within Fernald's former production area.

Plant 7 Dismantling (Removal Action No. 19): Activities under this removal action include characterization, decontamination, removal, containerization and disposal or reuse of materials in the building, and decontamination and dismantling of the building itself. Characterization and gross decontamination are complete. A contract has been awarded for the dismantling and removal of all structural steel and concrete from Plant 7, the tallest and most visible production building at Fernald. Steel, concrete and other materials including approximately 700 tons of structural steel will be recycled for beneficial reuse. Workers are scheduled to begin removing interior walls in February 1994, and the exterior asbestos-bearing transite siding in June 1994. Actual dismantling of the steel structure is expected to begin in August 1994.

Stabilization of Uranyl Nitrate Inventories (Removal Action No. 20): Fernald's inventory of uranyl nitrate hexahydrate (UNH) material will be neutralized on site due to transportation safety concerns and overall cost factors. After the

materials are neutralized, they will be converted to a solid form which can be drummed and properly stored in warehouses pending final disposition. Due to additional engineering requirements and based on the level of approvals required to proceed with this removal action, the completion date has been extended to late 1995.

The processing of uranyl nitrate inventories was initiated in September 1992. In November 1992, after an initial 20,000 gallon batch had been processed as part of a systems operability test, the system was placed on hold to allow for an evaluation of systems. Processing resumed April 13, 1993, but was stopped April 20, 1993, to complete a commitment requiring an operational readiness review. Processing remains on hold until an investigation into a check valve leak that occurred in April 1993, has been completed and necessary improvements are made.

Uranyl nitrate is an intermediate product in the former uranium recovery process at Fernald. There are approximately 210,000 gallons of acidic uranyl nitrate (not including the 20,000 gallons already processed) stored in 18 tanks in or near the Plant 2/3 Refinery.

This Removal Action is designed to process the uranyl nitrate to a stable form. The uranyl nitrate inventory will be neutralized and converted to a solid form which can be drummed and properly stored in warehouses pending final disposition.

Pilot Plant Sump (Removal Action No. 24): This removal action was initiated to address contaminated liquids and sludges remaining in an out-of-service sump at the Pilot Plant. The below-grade sump is a stainless steel cylinder approximately two feet in diameter and 10 feet deep. The sump was installed to remove liquids from the floor drains of the Pilot Plant during the renovation of the Pilot Plant in 1969.

Analyses of the sludges and liquids from the sump indicated high concentrations of metals (lead, copper, chromium, and nickel), as well as thorium and volatile organic compounds.

Accumulated liquids were pumped out of the tank on a monthly basis prior to removal of the sump. Under this removal action, the stainless steel sump was removed and its associated piping disconnected. The drain system was plugged in September 1993. Adjacent contaminated soils were cleaned up as required.

This removal action was completed in October 1993. The Final Report was submitted to the U.S. EPA and Ohio EPA in December 1993.

Nitric Acid Tank Car and Area (Removal Action No. 25): This removal action was initiated to remove the residual contents of a Nitric Acid Railroad Tank Car, decontaminate and dispose of the tank car itself, and address potentially contaminated surrounding soils related to the tank car. The high-grade stainless steel tank car stored nitric acid from 1952 until 1989 for use in the former production process at Fernald. The tank car has a capacity of 100,000 gallons and contained approximately 100 gallons of dilute nitric acid before it was emptied.

After the tank car contents were removed, a series of rinses were performed in September 1993. Contaminated soils were cleaned up as required. This removal action was completed in September 1993. The Final Report was issued to the U.S. EPA and Ohio EPA in October 1993.

Asbestos Removals (Asbestos Program) (Removal Action No. 26): This removal action documents ongoing asbestos abatement activities at Fernald to mitigate the potential for contaminant release and migration. Abatement activities within the existing Asbestos Program include repairs, encasement, encapsulation or removal of asbestos-bearing materials which exist in many buildings on the Fernald site. Abatements to date include small-scale in-situ repairs, encasement, encapsulation, and removals, and the initiation of large-scale asbestos abatement within Plant 7. Field activities in support of asbestos abatement are continuing, including removal of asbestos-bearing thermal insulation in pipes and valves throughout the Fernald site.

Fire Training Facility (Removal Action No. 28): This removal action was initiated to address an area historically used to simulate fire and emergency response conditions for training purposes. The Fire Training Facility is located just north of the former production area on the old North Access Road. Work will include removal, decontamination, and disposal, treatment or storage of all buildings, structures, tanks,

and equipment.

The draft work plan was submitted to the U.S. EPA and Ohio EPA on June 29, 1993. Comments received from both agencies have been addressed and the work plan has been revised accordingly. The revised plan was submitted to the agencies October 5, 1993, for final review. Final approval of the work plan was received from U.S. EPA in November 1993. DOE and FERMCO are responding to Ohio EPA comments and revising the work plan accordingly. Initial preparatory and field work is expected to begin in early 1994.

Cleanup Alternatives

Several cleanup alternatives have been identified for Operable Unit 3. All of these options include regular maintenance and monitoring. Much of the cleanup work involves the disposal of inventoried waste materials in either an on-site or an off-site disposal facility, removal and decontamination of buildings and equipment, and disposal of remaining contaminated materials in approved, engineered facilities either at the Fernald site or off site. Implicit within all Operable Unit 3 alternatives is an emphasis on the recycling and recovery of building materials and equipment to minimize waste disposal requirements. More definitive descriptions of alternatives will be provided in RI/FS documents.

For More Information

More information about Operable Unit 3 is available in the Public Environmental Information Center (PEIC), where Fernald Project cleanup documents are kept in the Administrative Record. The PEIC is located in the JAMTEK building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030. The telephone number is (513) 738-0164.