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**PROGRESS REPORT OPERABLE UNIT 1 WASTE
PIT AREA FEBRUARY 1992**

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FACT SHEET**



Operable Unit 1 WASTE PIT 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 (FEMP). The nature and extent of contamination at the FEMP and surrounding areas is being thoroughly investigated so that appropriate remedial actions can be formulated and implemented.

The FEMP 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 where 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 1 including its history, the current status of RI/FS activities, cleanup alternatives under consideration, and work being done to alleviate near-term concerns.

Background

Operable Unit 1 includes the six waste pits, the burn pit and the clearwell. The six waste pits, built between 1952 and 1979, contain waste from past operations at the FEMP. No waste has been placed in any of the pits since the mid-1980s. Pits 1-3 are covered with soil. Pit 4 is covered with bentonite clay and a synthetic cover. Pits 5 and 6 are lined with synthetic membranes. The pits range in size from that of a football field to a baseball diamond and vary in depth from 13 to 30 feet. It is estimated that the six pits contain approximately 475,000 tons of waste, including uranium, thorium and other radioactive and chemical elements.

The burn pit, built in 1957, was used to burn laboratory chemicals and waste oils before it was taken out of service in 1970.

The clearwell was a settling basin for stormwater runoff from portions of the waste storage area including Pits 1-3 and Pit 5. Sediment in the base of the clearwell is estimated to be about 3.5 feet deep and contain concentrations of radionuclides and chemical constituents.

RI/FS Activities

Pit Berm Evaluation: Regular monitoring of soil continues in the berms around Pit 3, Pit 5, and the Clearwell, to ascertain their strength and consistency and to measure any movement or shifting of soils. Geotechnical analyses of soil samples taken from the berms around Pit 3, Pit 5, and the Clearwell, are being conducted to determine the structural integrity of the berms. A stability analysis was conducted on the pit berms which concluded that berm failure was unlikely.

Pit 5 Liner Repair: Repairs to the Pit 5 liner, a synthetic flexible membrane, are complete. Repairs to the liner were made by placing patches of the material over torn areas and sealing them with adhesives.

Waste Characterization and Treatability: Analyses of samples taken from materials in Waste Pits 1-4 and the burn pit are nearing completion. This information is required to complete the Operable Unit 1 Remedial Investigation Report and treatability studies. A number of shallow wells were installed in Waste Pits 1-4 and the burn pit to collect required samples.

The waste material samples are currently being analyzed at a U.S. EPA-approved laboratory to determine the concentration of radiological and chemical constituents in Operable Unit 1. Data generated from sample analyses will provide information about the chemical form and characteristics of the various materials in the waste pits, so predictions can be made about the potential for migration of contaminants into the environment.

Following receipt of analytical data expected in March 1992, the data will be subjected to a validation process to ensure the quality of data prior to its use in RI/FS documents.

Samples of materials in the pits are now being used to conduct tests and develop potential stabilization plans for waste treatment technologies currently under consideration, including cementation (stabilizing the waste with cement) and vitrification (transforming the waste into glass).

Waste stabilization studies are now in progress at the IT Environmental Technology Development Center in Oak Ridge, Tenn. These studies involve mixing quantities of waste pit materials with differing amounts of cement and cement additives. Each of the solidified waste forms from the treatability studies are subjected to a series of physical and chemical tests, including leaching the waste in acid, to arrive at the mix design which exhibits the optimal properties for retaining the physical form and stabilizing the waste materials. DOE is now in Stage I of a three-stage process with an expected completion date of July 1993.

Vitrification studies also have been initiated. Representative samples from each of the waste units are being mixed with a range of materials, including flyash, and placed into high-temperature furnaces with the intent of forming glass. The study is intended to establish the optimal mix design which supports vitrification. While vitrification typically represents an expensive technology to implement, it provides many benefits such as improved immobilization of hazardous contaminants within a glass matrix and a possible reduction in waste volume. DOE expects that vitrification studies on Operable Unit 1 wastes will be completed in July 1993.

Samples of additional waste materials from Pits 5 and 6 and the Clearwell are now being obtained to support treatability analysis. Up to eight 55-gallon drums of sludge from each waste unit are being collected with the use of a clamshell attachment suspended from a crane. This sampling activity, initiated in December 1991, is expected to be completed in February 1992. Some of the samples will be transported to an off-site laboratory for treatability analysis. Remaining sample volumes will be archived at the FEMP for the purpose of supporting further treatability analysis in support of remedial design.

Radon Sampling Program: Consistent with the terms of the 1991 Amended Consent Agreement, a sampling program was initiated in the waste pit area to measure the level of radon being released. The program involved a one-time measurement of radon release using Large Area Activated Charcoal Collectors (LAACC). Approximately 100 LAACCs were placed on Waste Pits 1, 2 and 3. The LAACCs were left on the pits for 24 hours, removed and then sent to an off-site laboratory for analysis. The collected samples are presently being analyzed. Analytical results are expected to be available by April 1992.

Reports: The U.S. EPA approved the Treatability Study Work Plan for Operable Unit 1 on November 25, 1991. The compilation of other Operable Unit 1 RI/FS reports, including the Remedial Investigation Report and the Feasibility Study Report, is proceeding consistent with the schedules set forth in the 1991 Amended Consent Agreement.

Removal Actions

Waste Pit Area Runoff Control (Removal No. 2): The first five of eight construction phases on the Waste Pit Area Runoff Control Removal Action are finished and this project was approximately 70 percent complete as of February 7, 1992. The objective of this Removal Action is to collect and treat potentially contaminated stormwater runoff from the waste pit area to prevent it from reaching Paddy's Run Creek.

An existing culvert has been upgraded and expanded to be capable of handling more water (Phase 1). A 30-inch storm sewer pipe 750 feet long has been installed (Phase 2). An existing 48-inch culvert has been plugged to reverse the flow of water to the upgraded culvert and the completed 30-inch storm sewer pipe (Phase 3). A new inlet control structure has been constructed on the east side of the waste pit area (Phase 4). A temporary access road has been provided northeast of the waste pit area (Phase 5).

Phase 6, which involves construction of a new sump station and underground piping, is nearing completion. Phase 7, the remainder of construction work including trench drains, storm sewers and a control structure on the north side of the waste pit area, is in progress. Phase 8 will involve construction of a new standpipe overflow.

This Removal Action will provide runoff control, as well as a collection system, designed to collect stormwater runoff from the waste pit area and allow it to pass through the site's Bionitrification Surge Lagoon and the effluent treatment system prior to discharge from the site to the Great Miami River.

Completion of this project and the continued operation of stormwater retention basins will result in the capturing of a significant amount of additional stormwater runoff from the FEMP, thus minimizing the potential for release of contaminants to the environment. Project construction is on schedule for completion by July 1992, when the system is expected to be placed into full operation.

Pit 5 Experimental Treatment Facility (Removal No. 11): On December 13, 1991, workers began dismantling the Experimental Treatment Facility which was built in 1984 to test the feasibility of thermal drying for sludge material from Waste Pit 5. The Removal Action involves dismantling the facility and packaging the building materials and sludge for storage pending final disposition.

The project also involves installation of berms, as

well as sampling and removal of surrounding soils as necessary to ensure against any potential spread of contamination beyond the immediate area. The original design included a sand and gravel filter bed installed over a plastic liner. Six-foot wooden walls surrounded the filter bed and the structure was covered with a greenhouse-type enclosure. The drying experiment entailed spreading the wet material on the filter bed to facilitate drainage and evaporation.

In February 1988, high winds removed the plastic roof from the facility and some of the sludge material was deposited on nearby surrounding soil. As an interim measure, water was applied to the remaining residues and a tarpaulin was placed over the filter bed to prevent further escape of the material. This project is scheduled for completion in April 1992.

Control Exposed Material in Pit 5 (Removal No. 18): Evaluation of alternatives is in progress. The objective of this Removal Action is to eliminate the possibility of airborne contamination resulting from exposed materials in the pit. Information obtained from Pit 5 liner repair activities, and the pit berm investigation which is addressing the pit's overall structural integrity, will be considered in developing the work plan. Preparation of the work plan for this Removal Action is on schedule for submittal to the U.S. EPA and Ohio EPA on or before March 30, 1992.

Cleanup Alternatives

Five alternatives to cleanup the waste pit area have been identified.

The first alternative would involve stabilizing the waste, removing and treating standing water, and construction of a slurry wall, subsurface drains and a groundwater extraction system. This alternative would leave the waste in place, but eliminate personal exposure and provide a system to prevent contamination from migrating into the groundwater.

The second alternative would involve removing the waste and contaminated materials from their current location, stabilizing or treating the waste, treating and discharging standing water, and permanent disposal of the stabilized/treated waste in an engineered structure at the Fernald Project.

The third alternative is identical to the second, but with permanent disposal at an off-site facility.

The fourth alternative is similar to the second alternative and would involve removing the waste from the pits, but leaving in place the contaminated materials that surround the pits and fit them with caps.

The fifth alternative is the same as the fourth alternative except the soils would be treated in place prior to capping.

More information about Operable Unit 1 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.