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CELEBRATING SUCCESS AT FERNALD

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## CELEBRATING SUCCESS AT FERNALD

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### ABSTRACT

Restoration of the Fernald Environmental Management Project is now moving from the environmental investigation stage to real, tangible remediation progress. Using a variety of programmatic innovations, DOE and FERMCO continue to strengthen an effective partnership that supports a mutually-developed mission of safe, least-cost, earliest final remediation of the Fernald Site while complying with all applicable DOE Orders, regulatory requirements and commitments and addressing the concerns of the many stakeholders who have an interest in how remediation at Fernald progresses. The progress that is occurring at Fernald is testimony to a productive DOE/FERMCO partnership that will continue to be an essential part of the difficult environmental restoration task at this site.

### DOE/FERMCO PARTNERSHIP KEY TO SUCCESS

The U. S. Department of Energy (DOE) and the Fernald Environmental Restoration Management Corporation (FERMCO) have developed an effective partnership that has resulted in real, tangible progress in the environmental restoration of the DOE's Fernald Environmental Management Project near Cincinnati, Ohio.

FERMCO, which is managing the remediation under a performance-based contract with DOE, assumed responsibility for the Fernald Site in December 1992. FERMCO was the first DOE Environmental Restoration Management Contractor (ERMC) in the DOE complex. Together, DOE and FERMCO established the Fernald mission as the safe, least-cost, earliest final remediation of the site. The mission also commits Fernald to compliance with all applicable DOE Orders, meeting all regulatory requirements and commitments, and -- most importantly -- addressing the concerns of the many stakeholders who have an interest in what happens at Fernald.

In July 1994, DOE and FERMCO successfully negotiated the first performance-based contract in support of DOE's new contract reform initiatives. The new contract includes more specific (and objective) criteria by which FERMCO's performance is assessed and fee is earned. The contract demonstrates the mutual trust and cooperation between DOE and FERMCO in planning and executing the environmental restoration effort at Fernald.

Since 1986, DOE has entered into several agreements with the U. S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA) that guide the environmental restoration effort at the Fernald Site. These agreements require DOE to conduct the remediation in compliance with a variety of environmental regulations, including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the

Resource Conservation and Recovery Act (RCRA). CERCLA regulations, in particular, require exhaustive environmental studies and development of remediation alternatives before final field remediation can begin. Today, much of that work has been completed. The Fernald skyline is changing as buildings are dismantled and new facilities are constructed in preparation for the final remediation work.

Originally called the Feed Materials Production Center (FMPC), the Fernald Site began producing highly-purified uranium metal products used as feed materials in U. S. defense programs in 1953. All production was suspended in July 1989 to allow concentration of resources on environmental restoration activities.

This paper discusses how DOE and FERMCO have used innovative approaches to make safe, least-cost, earliest remediation at Fernald a reality.

### ENVIRONMENTAL RESTORATION REQUIRES CAREFUL PLANNING

Much of the initial remediation effort at Fernald centered on CERCLA requirements for exhaustive environmental sampling and analysis of soil, water, and other media to determine the nature and extent of contamination at the site. Based on results of this Remedial Investigation (RI) work, a Feasibility Study (FS) carefully evaluated various alternatives for removing or containing the contamination. The RI/FS supported generation of Proposed Plans (PPs) for final remediation of the site. The CERCLA agreement established five Operable Units based on their location or the potential for similar response actions. This concept allows final remediation design to begin for each Operable Unit as soon as its individual RI/FS-PP phase is completed and a Record of Decision (ROD) is approved by the EPA.

During the course of the RI/FS process, DOE and FERMCO have built solid relationships with regulatory agencies overseeing the Fernald remediation. Fernald management recognized the need to partner with regulators during the development of environmental restoration plans to promote early resolution of issues and common understanding of approaches for remediation. Fernald worked with regulators to effectively integrate RCRA and CERCLA requirements, thereby reducing costs and eliminating duplicate requirements. This was done through technical exchanges to update OEPA on the status on the closure of various Hazardous Waste Management Units. Similar technical exchanges with EPA have resulted in steady progress toward reaching final remediation decisions.

Fernald management and the regulators have jointly developed innovative approaches that will speed the remediation effort significantly. For example, EPA has approved an Interim ROD for Operable Unit 3 -- the first of its kind in the DOE complex -- that will allow accelerated decommissioning and dismantling of some 125 production buildings and other structures located in the former uranium processing area. Thus, while the final ROD addressing treatment and disposition of soil and wastes from Operable Unit 3 is not scheduled until early 1997, work has already begun on the dismantling of the former uranium production facilities. In fact, the Interim ROD for Operable Unit 3 is expected to allow dismantling of the former production areas some 3-4 years ahead of schedule and at a savings of about \$300 million from the original cost estimates.

Perhaps the most visible evidence that full-scale remediation at Fernald has begun was the dismantling of Plant 7, the tallest building on the site and the first former production building to be removed. That dismantling effort included implosion of the building's steel superstructure in September 1994. The Plant 7 project was completed well ahead of schedule and at a cost of about \$11 million, compared with the \$33 million estimated in the FY 1993 budget baseline.

As old production structures at Fernald are being dismantled, new facilities are under construction to handle final remediation work. The recent EPA approval of a ROD for Operable Unit 4 calls for radium-bearing waste in two concrete silos and production waste from a third silo to be removed and vitrified (converted to a stable glass form) prior to its shipment off site for disposal. A vitrification pilot plant is under construction to house that operation. Fernald also has constructed an advanced waste water treatment facility to help reduce the uranium content of wastewater discharged from the site as the remediation work accelerates. The became operational in late January.

#### FINAL REMEDIATION DECISIONS NEAR

Fernald has received conditional EPA approval for Proposed Plans for two other Operable Units. DOE is currently reviewing a draft ROD for Operable Unit 1 that calls for the excavation and treatment of material stored in six waste pits at Fernald prior to its shipment off site for final disposition. Nearing completion is a draft ROD for Operable Unit 2 that proposes disposal of fly ash, lime sludge, slightly contaminated soil, and other material in an engineered cell on site. Work also is well under way toward a final Record of Decision for Operable Unit 5, which includes soil, water, and all other environmental media on and around the Fernald Site.

#### PLACE FIGURE 1 HERE

Concurrent with the detailed investigation and planning associated with the RI/FS process, Fernald is making steady progress on several interim risk reduction projects called Removal Actions. Removal Actions are initiated when there is a need to accelerate removal or containment of hazardous substances posing a significant potential threat to the environment or to the human population. Removal Actions are coordinated with both Ohio and U. S. EPA to ensure that they are consistent with the long-term remedial actions expected as a result of Records of Decision.

One of the more significant ongoing Removal Actions is the extraction of uranium-contaminated groundwater from an area south of the Fernald Site known as the South Plume. The years of production operations at Fernald and stormwater runoff from the site have contaminated the aquifer which underlies the area. Fernald also has completed a number of projects aimed at preventing any further introduction of contamination to the aquifer, including installing stormwater runoff controls and upgrading and sealing concrete pads where drummed wastes are stored.

Another continuing Removal Action is the off-site disposition of low-level radioactive and mixed wastes, including both residues from past production and construction rubble from remedial activities. In FY 1994 alone, Fernald shipped more than 577,000 cubic feet of low-level waste

and more than 3,500 cubic feet of mixed waste off site for disposal.

## **STAKEHOLDERS KEY TO DECISION-MAKING PROCESS**

Fernald's success in moving from the environmental restoration planning process to actual field remediation is due in large part to an innovative public involvement program that emphasizes person-to-person communication and early stakeholder involvement in the decision-making process.

A key public involvement activity at Fernald was the formation of the Fernald Citizens Task Force. The Task Force, the first Site Specific Advisory Board established as part of the DOE Environmental Management program, is an independent panel comprised of representatives from virtually all of the major stakeholder interests, including local government and the Fernald Residents for Environmental Safety and Health (FRESH). DOE commissioned the Task Force to develop a public consensus on specific aspects of the Fernald remediation, including potential future uses of the site, appropriate maximum risk levels, final disposition of waste, and development of environmental restoration priorities. The Task Force meetings are open to the public, thereby offering still another avenue for community involvement in the decision-making process at Fernald. The Task Force delivered its interim report on risk levels and general future land use decisions on November 30, 1994. The final report, scheduled for July 1995, will contain recommendations on waste disposition, environmental restoration priorities, and specific future land uses.

CERCLA regulations include requirements for holding meetings and providing information to help the public understand the environmental restoration process and to provide input into the selection of remedial action alternatives. While public comment periods are an integral part of the CERCLA community involvement requirements, complying with the letter of the law limits the public involvement aspect of the remediation planning to essentially one-way communication. Traditionally, public involvement has consisted of publishing newsletters and fact sheets and holding public hearings. These hearings too often focused on providing information and asking for public comment on what has already been done, rather than genuinely soliciting public input on what should be done.

Fernald recognized that a significant stakeholder audience remained unaware of or uninterested in the decision-making process. To reach those groups, Fernald developed an Envoy Program. Some 75 DOE and FERMCO employees have volunteered to serve as envoys to various governmental bodies, civic groups, service clubs, and other organizations. Envoys establish face-to-face contact with these groups by attending their meetings and listening to any ideas and opinions their members may have to offer. This input is relayed directly to Fernald management for consideration in the ongoing decision-making process.

Fernald also recognized that stakeholder involvement will be necessary well beyond the RI/FS stage of the remediation effort. To ensure that established relationships continue, Fernald is revising and updating its Public Involvement Program to maintain a high level of stakeholder participation throughout the Remedial Design/Remedial Action phase of the environmental restoration.



An important element of Fernald's stakeholder involvement is reaching out to stakeholders of those facilities planning to receive remediation wastes from the Fernald clean-up—the Nevada Test Site (NTS) and Envirocare's facility at Clive, Utah. For over two years, Fernald has built and maintained open relationships with DOE's Nevada Operations Office, the NTS Community Advisory Board since its inception, and state regulators in Nevada and Utah. These relationships are based on candor, full disclosure of information and proposed plans, and a sincere desire to understand the needs and concerns of stakeholders at these sites of crucial importance to Fernald. This non-traditional outreach effort has been very successful.

## STRENGTHENING THE SAFETY CULTURE

While external stakeholder involvement is an extremely important element of the environmental restoration effort at Fernald, management has placed an equally high priority on the involvement of internal stakeholders -- the Fernald work force -- in strengthening the safety culture at the site and improving productivity. In another first for DOE sites, a broad-based Safety First Team formed in early 1994 has developed several initiatives to encourage Fernald workers to find safer and more effective work practices. A pilot work group concept successfully demonstrated that teams of employees can effectively identify potential safety hazards and develop work methods that both reduce those hazards and increase productivity. The success of this pilot program has led to the establishment of similar work groups throughout the Fernald organizations, with both DOE and FERMCO management playing an active role in nurturing the program.

Because the environmental restoration effort at Fernald is a complex program requiring careful balancing of regulatory requirements with available funding and other resources, Fernald management has placed strong emphasis on the area of project controls. FERMCO was the first DOE contractor to produce a project baseline containing thousands of schedule activities and hundreds of thousands of cost elements that serves as a yardstick for planning and measuring remediation progress. In March 1994, a DOE-HQ Cost Quality Management Assessment commended Fernald for putting a fully-integrated cost/scheduling system in place.

Fernald has established a formal, structured cost savings/cost avoidance procedure in support of cost savings goals established by DOE Headquarters. The procedure establishes criteria for measuring cost savings that require initiatives to be innovative, go beyond simply good business practices, and reduce the Fernald Performance Measurement Baseline.

During the second half of FY 1994, FERMCO achieved \$17,880,154 in cost savings. Major contributing components for those cost savings included: streamlining and accelerating certain Operable Unit 1 studies and expediting the remediation of Waste Pit No. 6 (a savings of \$1.5 million); acceleration of Remedial Action decommissioning and dismantling design packages in Operable Unit 3 (\$8.2 million savings); and changes in scope for a Removal Action for improved storage of soils and debris (\$2.4 million savings).

The Cost Savings Program is closely allied with the DOE-wide productivity improvement initiative, and Fernald management regularly shares productivity improvement ideas with other sites. Fernald also is developing a team to provide the additional productivity improvement focus required by the current climate of tightened federal budgets.

## TECHNOLOGY DEVELOPMENT PRODUCES EFFICIENCIES

DOE and FERMCO also place heavy emphasis on developing new technologies and adapting existing technologies for use at Fernald. The introduction of safer and faster technologies will produce efficiencies in both cost and schedule for the remediation work.

For example, Fernald has used a Solid Block Modeling technology -- developed by FERMCO's parent company Fluor Daniel for use in the mining industry -- to aid in the difficult process of site characterization. Solid Block Modeling uses three-dimensional computer images to show the location, types, and amounts of contamination in waste pits and other areas. The process has been particularly helpful in identifying "gaps" in existing characterization data at Fernald and in guiding subsequent sampling efforts.

Other technologies have also been adapted for use at Fernald. Micro-Purging, a groundwater sample collection method that eliminates the need for excessive well-water purging, both increases the accuracy of sampling by reducing water dilution effects and reduces the amount of contaminated water requiring disposal. Rotasonic (spoil-less) Drilling, a method which captures almost all of a soil sample within the core barrel, eliminates sample loss or cross contamination and reduces drill cuttings by 95-100 percent. Using this technology, a sample at 130 feet below the surface can be obtained in two days, as opposed to two-three weeks using other methods.

Fernald is hosting the DOE Office of Technology Development's Uranium in Soils Integrated Demonstrations (USID). The USID program continues to evaluate various technologies for the removal of uranium from soil using chemical and physical separation methods, as well as Real Time Characterization, Cone Penetrometer probes, and related technologies. Fernald also has applied innovative robotics in the management of wastes and the remediation operations.

Finally, Fernald pioneered Minimum Additive Waste Stabilization (MAWS), a process which converts optimum mixtures of waste to a much safer glass form using specially-designed furnaces. The MAWS developments led directly to the construction of a vitrification plant now under way at Fernald to remediate wastes from the K-65 silos.

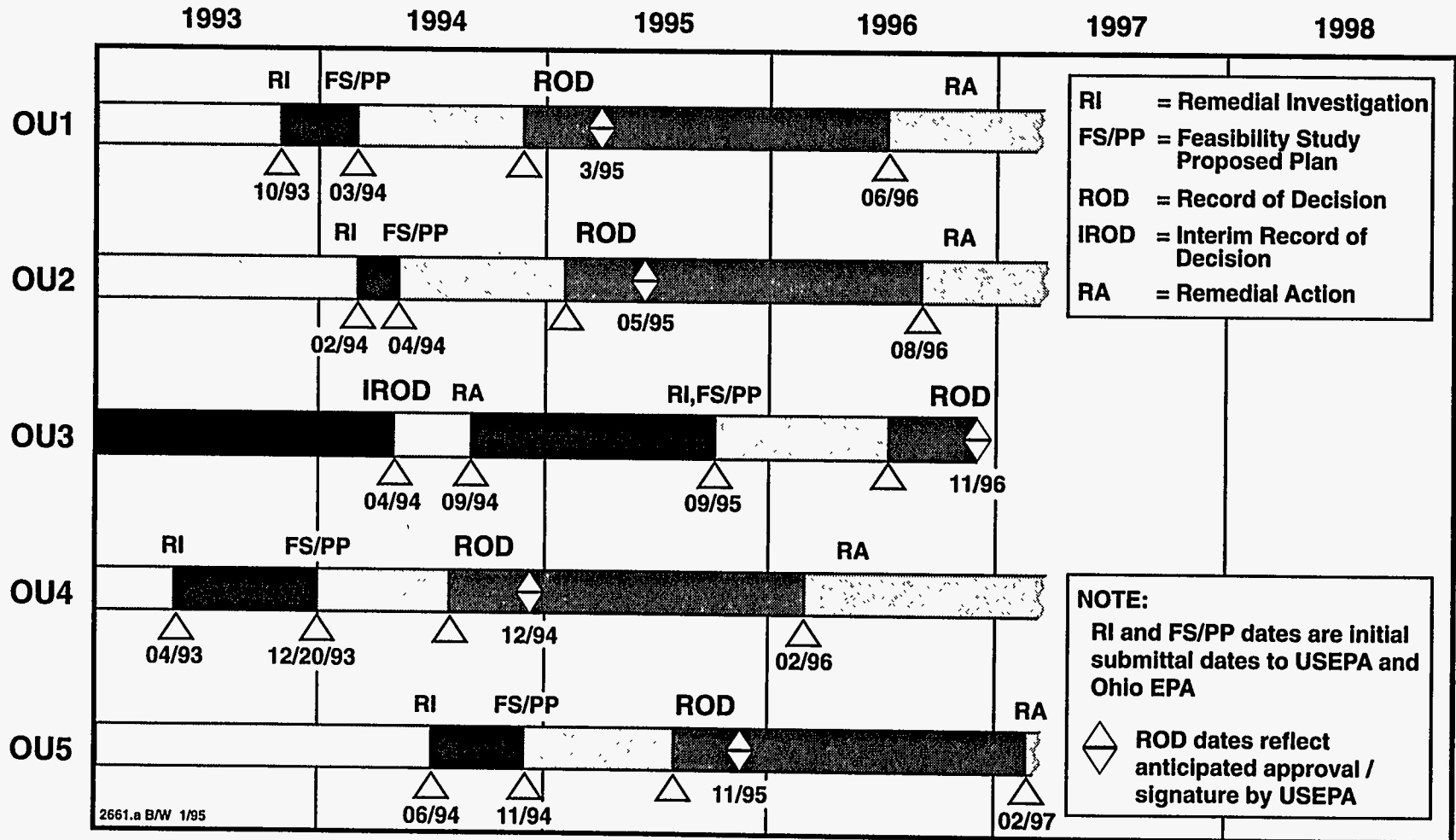
## REMEDiation NOW A REALITY

The environmental restoration effort at Fernald has, by necessity, required an enormous investment in preliminary activities related to characterization, analysis, and planning. It also continues to require significant effort in the development of stakeholder consensus on the appropriate level of restoration and the most desirable remediation alternatives. Fernald is demonstrating that it is among the leaders in the DOE environmental restoration effort and is achieving tangible success in the environmental restoration that all who have an interest in the site have been anticipating. Together, DOE and FERMCO have developed an effective partnership that is successfully melding the interests . . . and the ideas . . . of both internal and external stakeholders in the common goal of environmental restoration at Fernald.



# FEMP PATH FORWARD

FERNALD



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