6749 G-000-1005.96

AGENDA AND HANDOUTS FROM MARCH 14, 1995 COMMUNITY MEETING

03/14/95

DOE-FN/FERMCO PUBLIC
100
AGENDA

U.S. DEPARTMENT OF ENERGY
COMMUNITY MEETING

March 14, 1995

6:30 - 7:00 p.m. Availability Session

7:00 p.m. Opening

Welcome/Introductory Remarks . . . . . Gary Stegner
Budget/Funding . . . . . Pete Greenwalt
DOE-FN Cleanup Scenarios . . . . . Johnny Reising
U.S. EPA Remarks . . . . . Jim Saric
OEPA Remarks . . . . . Tom Schneider

7:40 - 8:20 Group Break-out Sessions

Cleanup Priorities/Feedback on Scenarios
. . . . . Johnny Reising
. . . . . Gary Stegner

Cleanup Priorities/Feedback on Scenarios
. . . . . Glenn Griffiths
. . . . . John Applegate

(10 minute break)

8:30 Agency Updates - FRESH Comments - Q&A

U.S. EPA Comments	Jim Saric
Ohio EPA Comments	Tom Schneider
Fernald Citizen Task Force	John Applegate
FRESH Comments	Lisa Crawford

QUESTION AND ANSWER SESSION

After the meeting, DOE/FERMCO staff will be available to talk with the public.

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DOE-FERNALD

TARGET BUDGET

CLEANUP SCENARIOS

Graphics #3317A.1 3/95

ALL DOLLARS IN MILLIONS

FERNALD

FISCAL YEAR	FY96	FY97	FY98
ADJUSTED BUDGET AUTHORITY	$234.790	$214.500	$171.559
Day Lawsuit	<$10.000>		
DOE-FN	<$15.000>	<$15.000>	<$15.000>
FERMCO Fee	<$20.000>	<$20.000>	<$20.000>
TARGET BUDGET	$198.790	$179.500	$136.559

Graphics #3317A. 2 3/95

FERNALD FUNDING
All Dollars in Millions

FERNALD

ADS	FY95 (Planned)	FY96 (Planned)	FY97 (Projected)
Program Management Activities	$53.489	$48.129	$40.281
Waste Management	26.300	20.000	15.000
Operable Unit 1	7.794	13.361	5.495
Operable Unit 2	7.687	15.300	19.291
Operable Unit 3	36.382	15.600	9.786
Operable Unit 4	17.524	17.300	33.139
Operable Unit 5	16.214	13.000	10.790
Landlord Activities	68.610	56.100	46.719
Totals	$234.000	$198.790	$179.500

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PROJECT MANAGEMENT ACTIVITIES

FERNALD

- Senior Management
- Public Affairs
- Legal Affairs
- Quality Assurance
- Strategic Programs Integration
- Information Resources Management
- Project Controls
- Contracts & Acquisitions
- Finance
- Administration
- Regulatory Programs
- Engineering Management
- Construction Management
- Environmental Management
- Technology Programs

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LANDLORD ACTIVITIES

FERNALD

- Environmental Safety and Health
- Remediation Support Operations
- Site Services
- Utilities
- Security
- Vehicle/Garage/Transportation
- Training
- Off-site Facilities
- Telecommunications
- Laboratory Services

Graphics #3317A. 16 3/95

DISTRIBUTION OF BUDGET
All Dollars in Millions

FERNALD

Fiscal Year	1995	1996	1997	1998-2000
Cleanup	$111.901 = 48%	$96.561 = 48%	$93.500 = 52%	
ES&H	$18.908 = 8%	$17.477 = 9%	$16.000 = 9%	
Site Operations	$47.702 = 21%	$38.623 = 19%	$30.719 = 17%	
Project Management	$53.489 = 23%	$48.129 = 24%	$40.281 = 22%	
Totals	$234.000 = 100%	$198.790 = 100%	$179.500 = 100%	$136.559

Graphics #3317A. 4 3/95

DEVELOPMENT OF COMPLIANCE CASE BASED ON FY96/97 TARGET FUNDING

FERNALD

DOE Priorities:

- Safety and Health Initiatives
- Consent Agreement/Consent Decree
- Operable Unit 4 Pilot Plant
- Thorium Overpacking/Disposition
- Waste Disposition
- Federal Facility Compliance Act (FFCA)
- Safe Shutdown Activities
- On-site Disposal Facility Planning

Graphics #3317A.5 3/95

DEVELOPMENT OF COMPLIANCE CASE BASED ON FY96/97 TARGET FUNDING

FERNALD

Challenges:

- Productivity Improvements
- Continued Reduction in Overhead/Indirect Dollars
- Reduction in Landlord Requirements
- Privatization
- Depleting Unnecessary Requirements
- Replanning Work for FY97 and Beyond (RD/RA Schedules)
- Workforce Restructuring

Graphics #3317A. 6 3/95

STAKEHOLDER INTERACTION

FERNALD

- Met with U.S. and Ohio EPA to Discuss FY96 Budget — 1/25/95
- Met with U.S. and Ohio EPA to Discuss Compliance Scenarios Based on Target FY96 Budget — 2/21/95
- Citizens Task Force Meeting Discussion on Budget and Priorities — 3/11/95

Graphics #3317A.7 3/95

WASTE MANAGEMENT

FERNALD

FY96	FY97
$20.000	$15.000

- Fully Fund Low Level Waste Disposition
- Thorium Overpack
- Thorium Material Disposition
- Federal Facility Compliance Act (FFCA)
  - Mixed Waste Disposition

Graphics #3317A. 8 3/95

OU4 -- SILOS

FERNALD

FY96	FY97
$17.300	$33.139

- Signed Record of Decision
- Fully Fund to Implement ROD
- Vitrification Pilot Plant
- Full Scale Vitrification Plant
- Processing

Graphics #3317A.9 3/95

OU2 -- OTHER WASTE UNITS

FERNALD

FY96	FY97
$15.300	$19.291

- Draft Record of Decision
- Initiate Remediation of Inactive/Active Flyash Piles, South Field Area
- Development of On-site Disposal Facility
- Defer Lime Sludge Ponds; Solid Waste Landfill
- Complete Surface Runoff Control and Hotspot Removal Action

Graphics #3317A.10 3/95

OU1 -- WASTE PIT AREA

FERNALD

FY96	FY97
$13.361	$5.494

- Signed Record of Decision (ROD)
- Scaled Down Remediation of Waste Pits
- Individual Pits (Pit 6)
- 10,000 cu. yd/yr

Graphics #3317A.11 3/95

OU3 -- PRODUCTION AREA

FERNALD

FY96	FY97
$15.600	$9.786

- Fully Fund Safe Shutdown
- D&D of Plant 4A
- Complete RI/FS/PP -- ROD
- Complete UNH, HF Tank Car
- No Additional D&D After FY96 (Plant 4A) Until 2001

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OU5 -- ENVIRONMENTAL MEDIA

FERNALD

FY96	FY97
$13.000	$10.790

- Continued Operation of Advanced Waste Water Treatment Plant
- Treat South Plume
- On-site Collection and Treatment of Waste Water and Storm Water
- Additional Extraction Wells in South Field Area

Graphics #3317A.13 3/95

ISSUES

FERNALD

- Funding Levels
- FY95 Rescission
- Compliance

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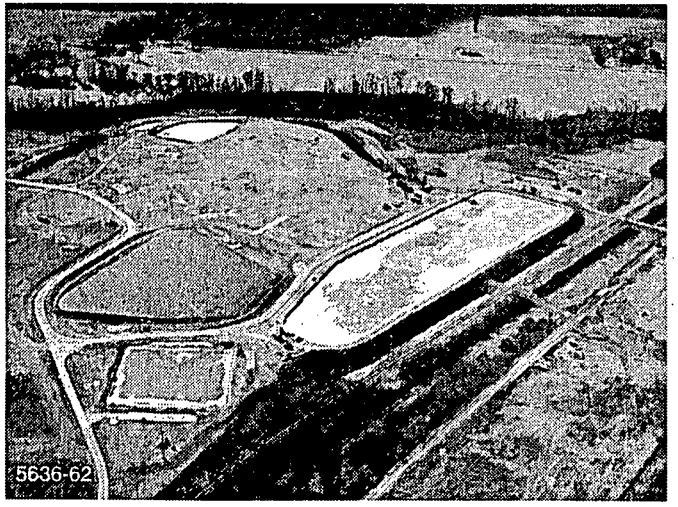
OPERABLE UNIT 1 - WASTE PITS



INCLUDES:

- Waste Pits 1 through 6
- Clearwell
- Burnpit
- Berms, Liners and Soils Within the OU Boundary

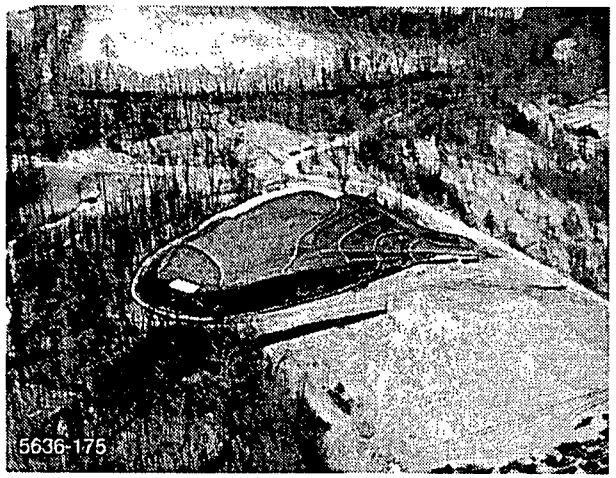
OBJECTIVE:

Remediate the Waste and Any Associated Soils to Prevent Further Release or Migration of Contaminants to the Environment.

SCHEDULE:

Proposed Plan Issued for Public Comment August 10, 1994
Public Comment Period Concluded September 8, 1994
Draft Record of Decision to U.S. EPA November 1994
Final Record of Decision Approved by U.S. EPA February 28, 1995

OPERABLE UNIT 2 - OTHER WASTE UNITS



INCLUDES:

- Flyash Piles
- Lime Sludge Ponds
- Solid Waste Landfill
- Other South Field Disposal Areas
- Berms, Liners and Soils Within the OU Boundary

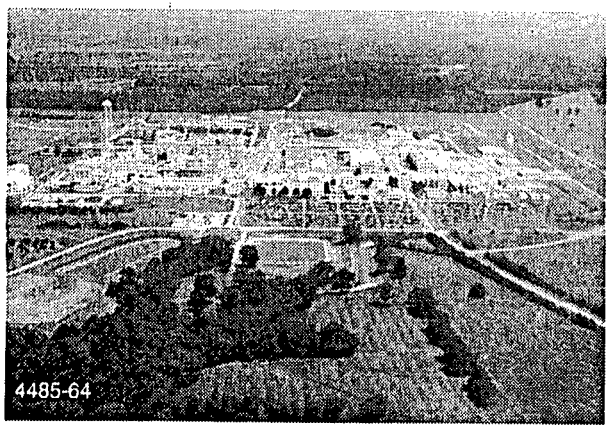
OBJECTIVE:

Mitigate a Potential Source of Contamination Resulting from Large Volumes of Waste Material that May Have Been Contaminated with Hazardous Chemical and Radioactive Materials During Fernald Operations.

SCHEDULE:

Submitted Draft Remedial Investigation Report to U.S. EPA February 1994
Submitted Draft Feasibility Report/Proposed Plan to U.S. EPA April 1994
Submitted Draft Record of Decision to U.S. EPA February 1995

OPERABLE UNIT 3 - FORMER PRODUCTION AREA



INCLUDES:

- All Man-Made Structures and Facilities at the Fernald, Above and Below Ground. Facilities Specifically Excluded from OU3 are:
  - K-65 Area (OU4)
  - Waste Storage Pits (OU1)
  - Fly Ash Piles (OU2)

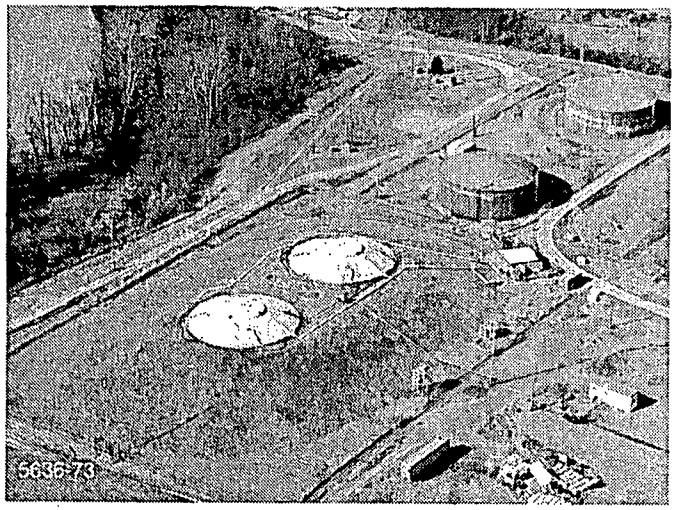
OBJECTIVE:

The Conduct of Environmental Investigations, Studies, Designs, Removal Actions, and Remedial Actions Necessary to Eliminate or Mitigate the Risks Posed to the Environment and Public Health by Contaminants Located Within OU3.

SCHEDULE:

U.S. EPA Approved Record of Decision for Interim Remedial Action on July 22, 1994
U.S. EPA Approved Remedial Design/Remedial Action Work Plan and First Imlementation Plan for Building 4A February 17, 1995
Submit Combined Draft Remedial Investigation and Feasibility Study/Proposed Plan to U.S. EPA by September 11, 1995
Submit Draft Final Record of Decision to U.S. EPA by July 25, 1996

OPERABLE UNIT 4 - SILOS



INCLUDES:

- Silos 1 and 2 (K-65 Silos)
- Silo 3 - Metal Oxides
- Silo 4 - Empty
- Decant Sump System
- Soils and any Buried Concrete
- Berm Surrounding Silos 1 and 2
- Perched Water (Encountered During Remediation)

OBJECTIVE:

Treat and Stabilize the Silo Contents, Structures and Affected Areas to Prevent Further Release or Migration of Contaminants to the Environment.

SCHEDULE:

Received Final U.S. EPA Approval and Acceptance on Remedial Investigation Report August 1994
Received Final U.S. EPA Approval of Feasibility Study/Proposed Plan August 1994
Record of Decision Conditional Approved by U.S. EPA September 1994
Final Record of Decision Approved by U.S. EPA December 7, 1994
Submitted Draft Remedial Design Work Plan to U.S. EPA January 26, 1995; Approval Anticipated May 1995
Submit Draft Remedial Action Work Plan to U.S. EPA October 1995

OPERABLE UNIT 5 - ENVIRONMENTAL MEDIA

INCLUDES:

- Groundwater (Great Miami Aquifer)
- Groundwater (Perched Water)
- Surface Water
- Soils (Not Associated with OU1 - OU4)
- Sediment
- Flora and Fauna

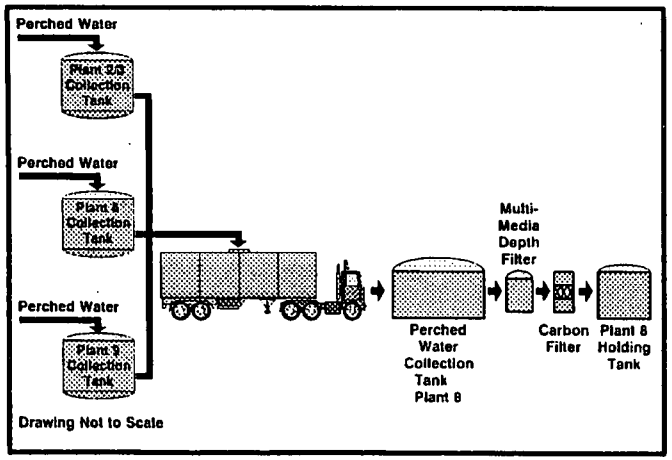
OBJECTIVE:

To Protect Human Health and the Environment by Preventing Exposure to Contaminated Soils or Water and to Prevent Further Contamination of Area Soils, Water, Flora and Fauna.

SCHEDULE:

Submitted Draft Remedial Investigation Report/Baseline Risk Assessment to U.S. EPA June 1994
Submitted Draft Feasibility Study Report/Proposed Plan to U.S. EPA November 1994
Submit Draft Record of Decision July 1995

REMOVAL ACTION #1
CONTAMINATED WATER BENEATH FERNALD BUILDINGS



OBJECTIVE/BENEFIT:

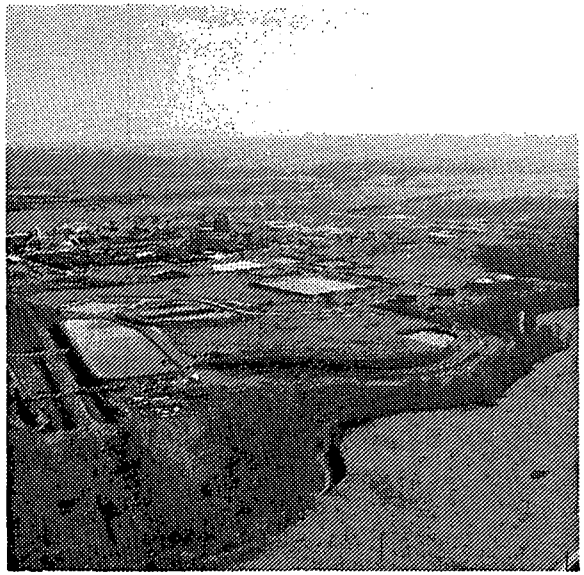
- Minimize the Potential for Uranium-Contaminated Groundwater to Infiltrate the Underlying Aquifer from Perched Water Zones Located Beneath Significantly Contaminated Portions of the Former Production Area.

ACTIVITIES:

- Extraction Facilities have been Installed.
- Treatment Removes Volatile Organic Compounds (VOCs) and Uranium Prior to Discharge to River.
- Addition of Plant 6 Motor Bay Sump Perched Water Collection Completed April 1994.

SCHEDULE:
Pumping Ongoing

REMOVAL ACTION #2
WASTE PIT AREA RUNOFF CONTROL



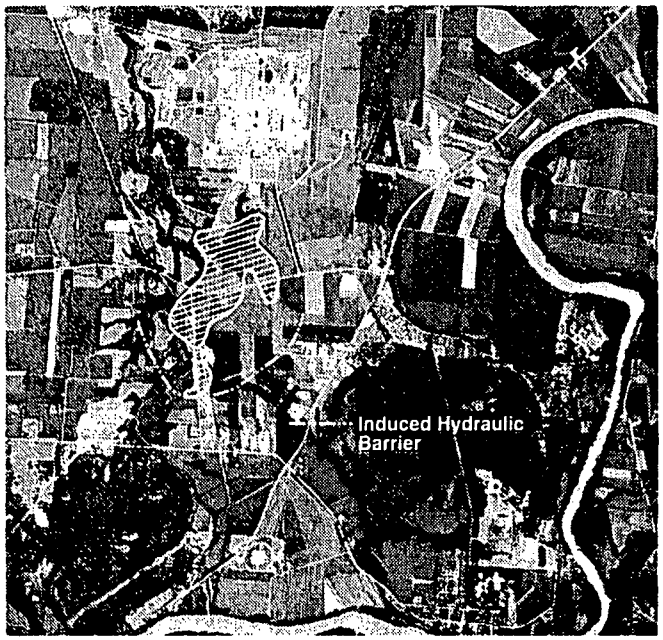
OBJECTIVE:
- Reduce Potential Groundwater Contamination from Contaminated Stormwater Runoff.

BENEFITS:
- Reduce or Mitigate the Release of Uranium and Other Contaminants to Paddys Run.
- Mitigate the Potential for Contaminants from Surface Water from Reaching the Underlying Aquifer.

ACTIVITIES:
- Collection of Runoff in the Waste Pit and Adjacent Areas Through the Installation of Trenches and Dikes.
- Treatment of Runoff in Existing Fernald Wastewater Treatment Facilities

SCHEDULE:
Project Completed July 30, 1992. System Operational

REMOVAL ACTION #3
SOUTH GROUNDWATER CONTAMINATION PLUME



OBJECTIVE:

- Protect Public Health by Limiting Access to the Use of Uranium-Contaminated Groundwater in an Area South of the Fernald Site. The Removal Action is Broken into Five Parts.

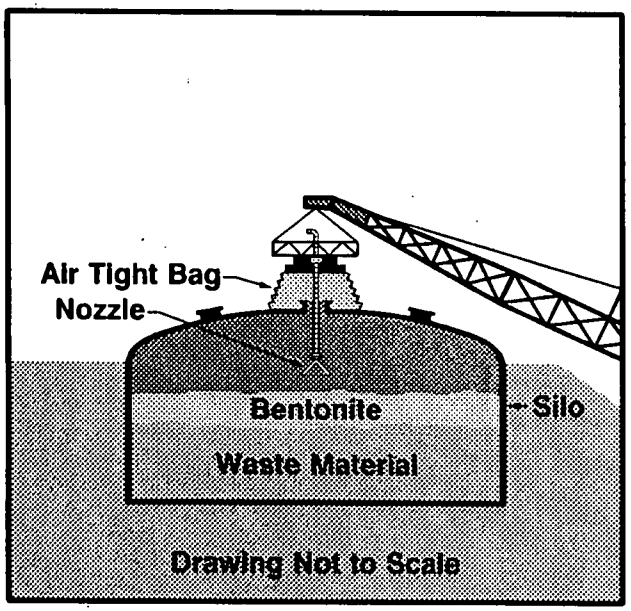
ACTIVITIES/BENEFITS:

- Part 1) Provide Alternate Water Supply to Affected Industry; Part 2) Extract and Pump Contaminated Groundwater Back to the Fernald Site for Monitoring, Future Treatment, and Discharge to the Great Miami River; 3) Construction and Operation of Interim Advanced Wastewater Treatment System; 4) Groundwater Modeling and Controls to Prevent the Use of Contaminated Groundwater, and 5) Additional Groundwater Investigations in the Vicinity of the South Plume.

SCHEDULE:

Part 1 Completed on Schedule in December 1992; Continues to Operate
Part 2 Completed on Schedule in August 1993; Continues to Operate
Part 3 is Complete and Operational
Part 4 is Ongoing
Part 5 Completed

REMOVAL ACTION #4
SILOS 1 AND 2



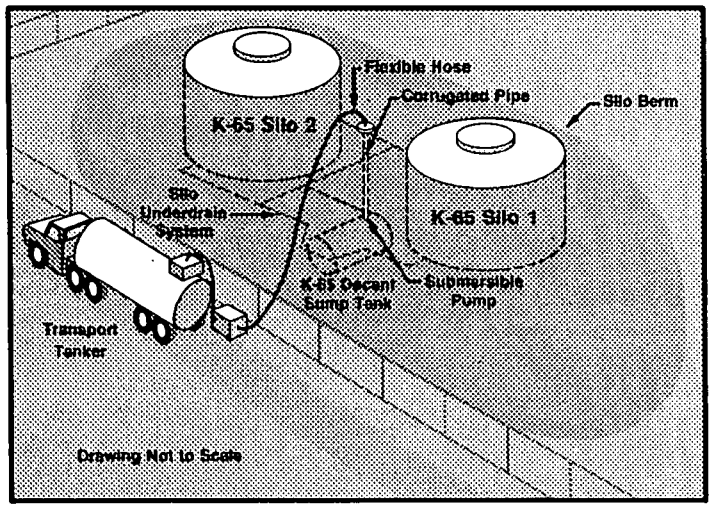
OBJECTIVE:
- Reduce Chronic Radon Emissions from Silos 1 and 2.

BENEFITS:
- Decrease, Mitigate, or Otherwise Control the Threat of a Release in the Event of a Silo Dome Collapse.
- Reduce Potential Radon Exposure of Both On-Site and Off-Site Personnel.

ACTIVITIES:
- This Removal Action Consisted of Placing Bentonite Clay Over the Top of the Residues Contained in Each Silo.

SCHEDULE:
This Removal Action was Completed in November 1991. DOE Continues to Monitor the Effectiveness of the Bentonite. This Data has Been Provided to the U.S. EPA. The Radon Head Space Concentration Post-Bentonite Installation has Been Reduced by Approximately 90 Percent.

REMOVAL ACTION #5
K-65 DECANT SUMP TANK



LOCATION OF K-65 DECANT SUMP TANK

OBJECTIVE:

- Reduce the Potential for Leakage of Contaminated Water into Surrounding Soils.

BENEFIT:

- Liquid was Analyzed at Off-Site Laboratory to Determine Proper Treatment and Disposition.

ACTIVITIES:

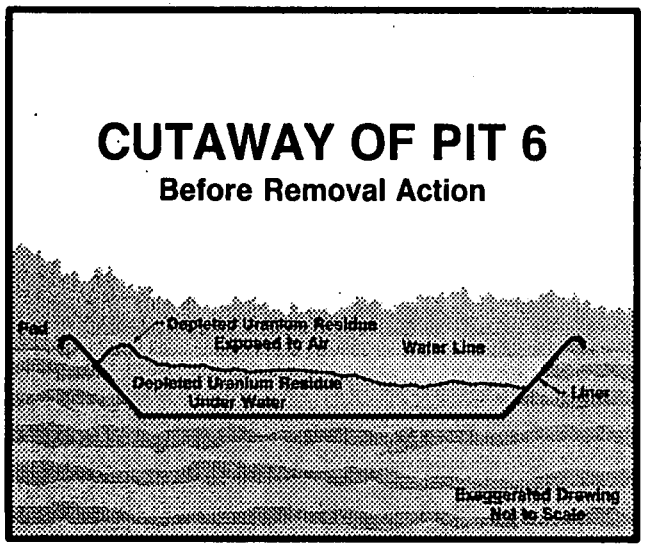
- Approximately 9,000 Gallons of Water was Removed, Analyzed, and Treated Through Existing Wastewater Treatment Systems at Fernald Prior to Discharge to the Great Miami River. The K-65 Decant Sump Tank was Used to Collect and Store Liquid that Drained from the K-65 Silos as the Slurried Material Settled.

SCHEDULE:

This Removal Action was Completed in April 1991.

Additionally During Late January and Early February 1993, Approximately 6,800 Gallons of Liquid Were Pumped from the Decant Sump Tank in a Maintenance Action and Transported to Holding Tanks at Plant 2/3. The Liquid will be Dispositioned Following Receipt of Analytical Data from Samples Collected from the Stored Liquid. Further Maintenance Actions Will be Performed as Required to Maintain the Liquid Level in the Tank at Less Than 75 Percent of Capacity.

REMOVAL ACTION #6
WASTE PIT 6 RESIDUES



OBJECTIVE:

- Eliminate the Potential for Airborne Emissions Due to Wind Erosion from the Fernald Site Waste Pit Area.

BENEFITS:

- Mitigate Source of Potential Airborne Fugitive Dust Emissions.

ACTIVITIES:

- A Mound of Approximately 4,800 Square Feet of Dried Radioactive Waste was Submerged Below the Water Line and Distributed Evenly Below the Surface of the Water. The Mound Contained Process Residues, Asbestos, Depleted Slag, Green Salt, and Filter Cake from Past Operations at the Fernald Site.

SCHEDULE:
This Removal Action was Completed in December 1990

REMOVAL ACTION #7
PLANT 1 PAD CONTINUING RELEASE

OBJECTIVE:

- Upgrade 440,000 Square Feet of the Existing Plant 1 Pad Plus Provide 80,000 Square Feet Additional Covered Storage Facilities.

BENEFIT:

- Control the Potential for Migration of Contaminants from Materials Stored on the Pad into Surrounding Environmental Media.

ACTIVITIES: Three Phase Approach:

- Phase I - Implement Run-on/off Control Measures.
- Phase II - Installation of 80,000 Square Feet of New Covered and Controlled Storage Facilities and Upgrade 100,000 Square Feet of the Existing Concrete Pad.
- Phase III - Upgrade 340,000 Square Feet of the Existing Plant 1 Storage Pad, Provide 22,500 Square Feet of Covered Storage Facility.

SCHEDULE:

Phase I and II are Complete
Phase III Construction Commenced August 13, 1993
Phase III Construction Completed September 30, 1994, with Exception of Minor Punchlist and Closeout Items
Completed Removal Action by February 1995

REMOVAL ACTION #8
INACTIVE FLYASH PILE CONTROL

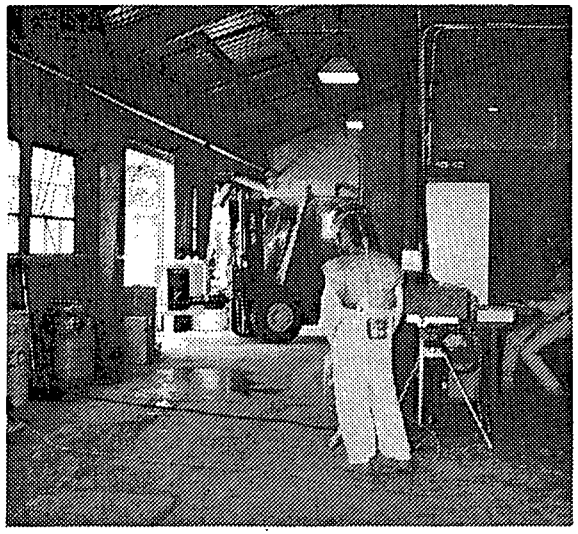
OBJECTIVE:
- Prevent Unauthorized Intrusion/Access into Radiological Surface Soil Contamination Area.

BENEFITS:
- Minimization of Potential Risk to Human Health.

ACTIVITIES:
- This Removal Action Consisted of Posting of Warning Signs and Installing a Chain Barrier Around the Perimeter of the Inactive Flyash Pile/Other South Field Disposal Areas.

SCHEDULE:
This Removal Action was Completed in December 1991
Ongoing Maintenance Required

REMOVAL ACTION #9
REMOVAL OF WASTE INVENTORIES
THORIUM AND PCB MANAGEMENT



OBJECTIVE:
- Off-Site Removal of Low-Level Radioactive Waste (LLRW) Inventories, Overpacked Thorium Materials, and Management of PCBs and PCB Items.

BENEFIT:
- Management and Disposal of Legacy and Targeted Priority Waste Materials to Reduce the Risk to Human Health, Safety, and the Environment at the Site and Surrounding Communities.

ACTIVITIES:
- Characterization, Packaging/Overpacking, and Disposition of LLR Materials
- Shipment of LLRW to the Nevada Test Site (NTS)
- Overpacking and Shipment of Thorium Material to NTS
- Management and Storage and/or Shipment of PCBs and PCB Materials

SCHEDULE:
- Disposal of 58,000 Drum Equivalents (DEs) of Legacy LLRW to NTS in Fiscal Year (FY) 1995
- Disposal of 22,000 Drum Equivalents of Currently Generated Project Waste in FY 1995
- Ship 4,450 DEs of Thorium Materials in FY 1995
- Develop the Required CERCLA Removal Documents

REMOVAL ACTION #10
ACTIVE FLYASH PILE CONTROLS

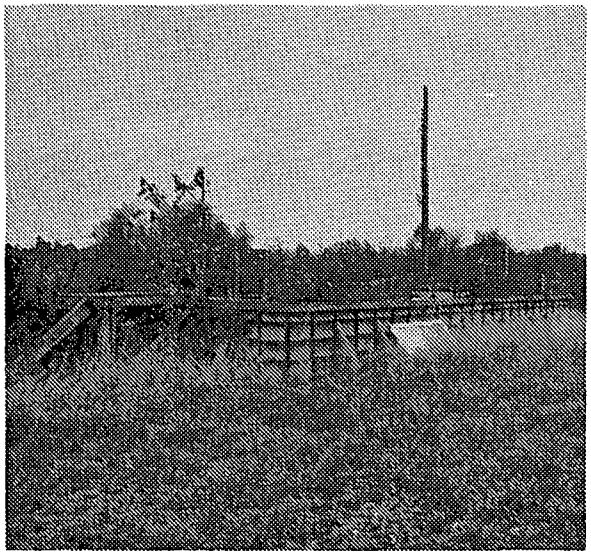
OBJECTIVE:
- Control Wind and Water Erosion of Active Flyash Pile.

BENEFITS:
- Minimize Wind and Surface Water Erosion.
- Reduce Fugitive Dust Emissions.
- Protective of Human Health and Safety.

ACTIVITIES:
- This Removal Action Consisted of a Combination of Control Measures to Minimize Fugitive Dust Emissions and Stormwater Runoff. A Silt Fence was Installed Around the Base of the Pile to Mitigate Stormwater Runoff and Wind Barriers were put in Place to Mitigate Wind Erosion. Minor Grading and Compaction were Conducted and a Chemical Spray was Applied to the Surface to Provide Stabilization.

SCHEDULE:
This Removal Action was Completed in June 1992
Ongoing Maintenance Required

REMOVAL ACTION #11
PIT 5 EXPERIMENTAL TREATMENT FACILITY



OBJECTIVE:

- Reduce the Spread of Contamination and Exposure of Personnel to ETF Wastes.

BENEFITS:

- Reduce or Mitigate the Release of Waste Materials Contained in the ETF to the Surrounding Area.
- Reduce or Mitigate the Potential for Exposure of Personnel through Removal of the ETF.

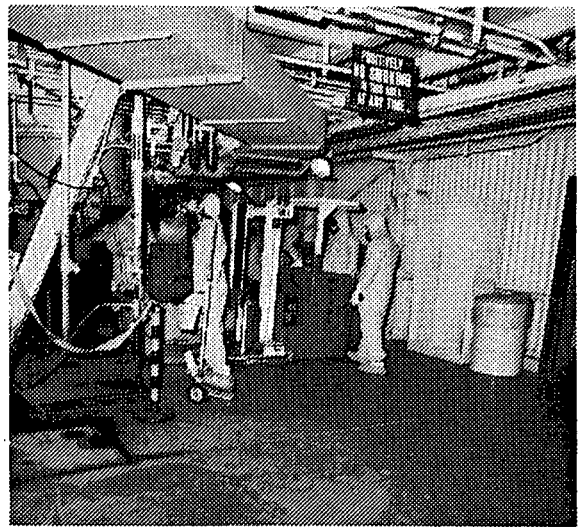
ACTIVITIES:

- Remove and Dispose of the Vegetation Surrounding the ETF.
- Collect, Containerize, and Store Waste Material Contained Within the ETF Structure.
- Collect, Containerize, and Store Filter Bed and ETF Wooden Structure.
- Sample and Analyze the Soil Affected by the ETF.

SCHEDULE:

This Removal Action was Completed in March 1992

REMOVAL ACTION #12
SAFE SHUTDOWN



OBJECTIVE:

- Removal and Disposition of Uranium and Process Materials from Fernald Site Buildings.

BENEFITS:

- Eliminates Source Term for Further Environmental Releases. Enhances ALARA Goals. Provides Necessary Preliminary Step for Preparation of the Systems for Subsequent Decontamination and Dismantling.

ACTIVITIES:

- Document Ongoing Shutdown Activity which will Remove Uranium and Other Process/Raw Materials from Equipment and Lines in Areas of Formerly Used Processing Equipment in Plants 1, 2/3, 4, 5, 6, 7, 8, 9 and the Pilot Plant. Systematic, Plant by Plant Implementation of Safe Shutdown.

SCHEDULE:

Plant 4 Process Equipment, Pipeline and Ductwork holdup Removal to be Complete by March 31, 1995

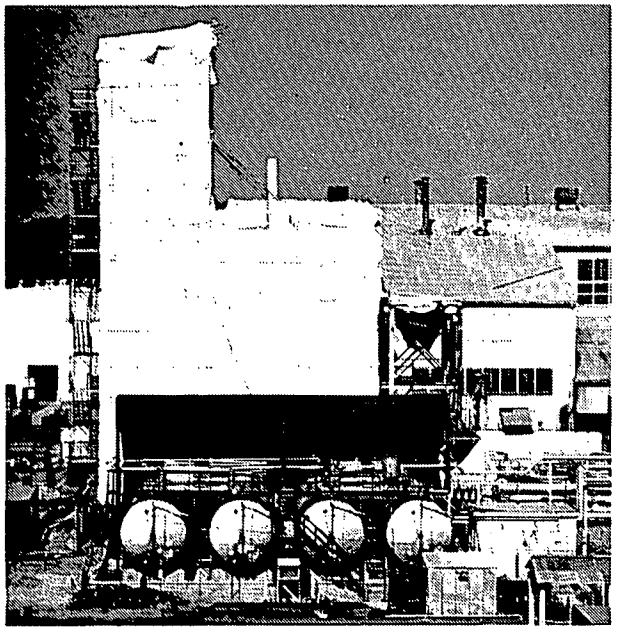
Plant 4 Turnover to Construction for Decommissioning Process by March 31, 1995.

Plant 1 Process Equipment, Pipelines, and Ductwork holdup Removal Accelerating for Completion by July 31, 1995

Annual Field Work Procedure Submittal to the EPA by June 30, 1995

Ongoing Safe Shutdown Implementation Period Through September 1997

REMOVAL ACTION #13
PLANT 1 ORE SILOS



OBJECTIVE:
- Dismantle the 14 Plant 1 Ore Silos and Support Structure.

BENEFITS:
- Eliminates Threat of Additional Material Releases.
- Eliminates Safety Hazard Due to Structural Deterioration of the Silos and Supporting Structure.

ACTIVITIES:
- Remove, Containerize, Characterize, and Dispose of the Material Identified to Exist in the Silos. All 14 Silos at Plant 1 will be dismantled Under this Removal Action.

SCHEDULE:
Submitted Final Work Plan to U.S. EPA July 1992
Awarded Contract October 1992
Initiated Field Activities February 1993
Completed Field Activities by November 1994
Completed Removal Action by December 1994

REMOVAL ACTION #14
CONTAMINATED SOILS ADJACENT TO SEWAGE TREATMENT PLANT INCINERATOR

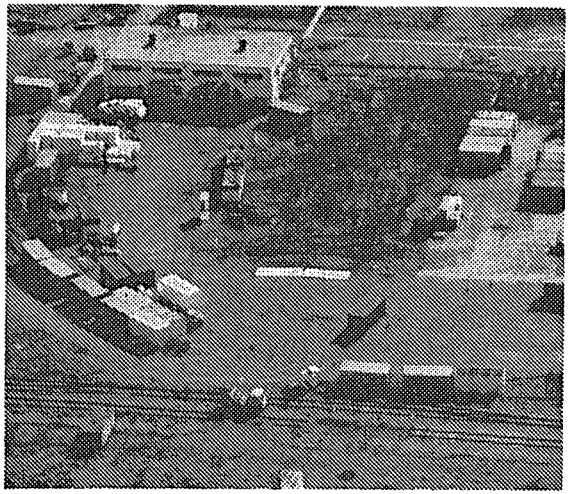
OBJECTIVE:
- To Address Contaminated Soils with Elevated Levels of Uranium.

BENEFIT:
- Mitigates the Potential for Migration of Contamination.

ACTIVITIES:
- Draft Final Report for U.S. EPA
- Continue Characterization of Excavated Soil

SCHEDULE:
Completed Phase I (Walkover Survey) August 1992
Completed Phase II (Excavation and Verification Sampling) October 1992
Completed Additional Off-Property (Walkover Survey) July 1993
Completed On-Site Excavations, Excluding Thorium 230 Hot Spots November 1993
Completed Off-Property Vegetation Removal December 1993
Completed Off-Property Soil Removal February 1994
Completed Additional Sampling Around Thorium 230 Hot Spots February 1994
Excavate Off-Property Pockets of Contamination June 1994
Submitted Final Report to U.S. EPA November 18, 1994

REMOVAL ACTION # 15
SCRAP METAL PILES



OBJECTIVE:

- Removal and Beneficial Reuse of Low-Level Radioactive Waste Scrap Metal Off-Site.

BENEFIT:

- Eliminate Potential Air Emission Source and Reduce Releases to Surge Lagoon and Great Miami River by Eliminating Source Contamination to Surface Water Runoff.

ACTIVITIES:

- Off-Site Removal, Treatment, and Disposition of 3,000 Tons of Recoverable Scrap Metal.
- Material Includes Approximately 1,300 Tons of Scrap Copper and Other Small Metal Piles.

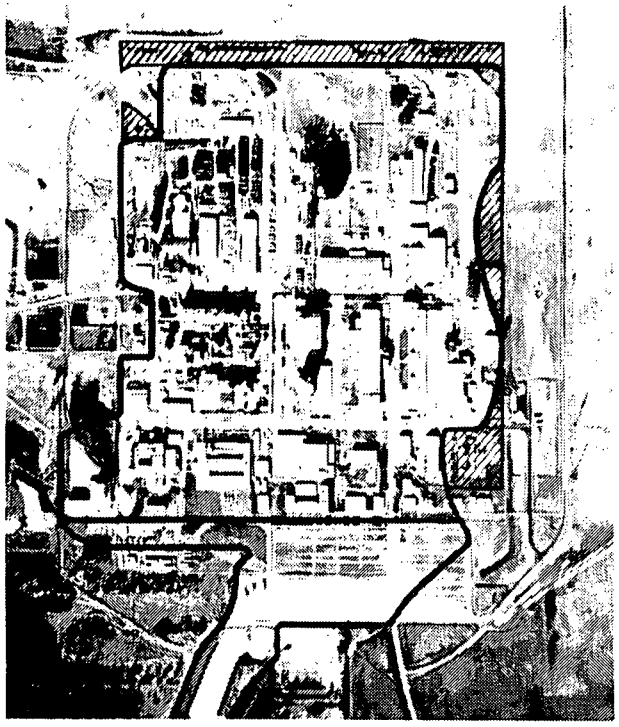
SCHEDULE:

Submitted Final Work Plan to U.S. EPA
Packaged and Shipped All Ferrous and Non-Ferrous Materials to Off-site Subcontractor September 1993
Completed Melting of Scrap Metal for Restricted Reuse March 1994
Submitted Final Report for Phase I September 1994
Disposition of Waste Streams

Graphics 3317b.15 3/95

Fernald Environmental Management Project

REMOVAL ACTION #16
COLLECT UNCONTROLLED PRODUCTION AREA RUNOFF



OBJECTIVE:
- Collect Uncontrolled Process Areas Runoff.

BENEFITS:
- Reduce or Mitigate the Release of Uranium and Other Contaminants to Paddys Run.
- Mitigate Flow of contaminants from Surface Water to Underlying Aquifer.

ACTIVITIES:
- Redirection of Subdrainage Areas and Collection of Runoff from Perimeter of Former Process Area to Site. Stormwater Retention Basin has been Completed.

SCHEDULE:
Completed Removal Action on August 20, 1993

REMOVAL ACTION #17
IMPROVED STORAGE OF SOIL AND DEBRIS

OBJECTIVE:

- Develop a Site Wide Management Concept and Implementation Strategy for the Improved Storage of Soil and Debris; Implement Management of Controlled Stockpiles.

BENEFIT:

- Minimize Potential Contaminant Migration from specific Storage Areas and Provide Safe and Environmentally - Sound Management and Interim Storage of Soil and Debris.

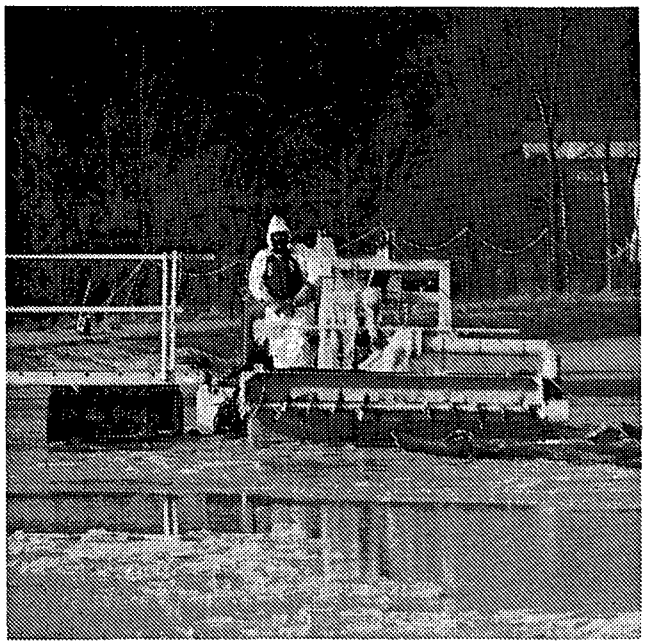
ACTIVITIES:

1. Revise Existing Procedures for Management and Control.
2. Identify Suitable Areas for Storage of Soil and Debris.
3. Establish Current and Future Policy and Engineering Approaches for Handling of Soil and Debris.
4. Evaluate the Engineering Approaches Considered with Respect to Applicable, Relevant and Appropriate Requirements (for ARARs).
5. Regrade and Seed One Large Existing Soil and Rubble Pile

SCHEDULE:

Submitted Final Work Plan to U.S. EPA August 1992
Provided Phase I Storage Upgrades for Existing Piles July 1992
Received U.S. EPA Approval and Ohio EPA Concurrence for Final Work Plan December 1992
Completed Regrading and Seeding of One Existing Soil and Rubble Pile August 1995; Other Planned Storage Facilities Deleted from Scope With EPA Concurrence January 4, 1995

REMOVAL ACTION #18
CONTROL EXPOSED MATERIALS IN PIT 5



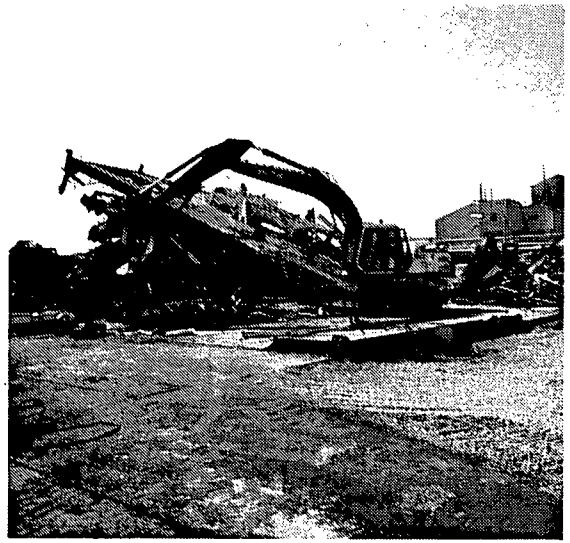
OBJECTIVE:
- Control Surface Emission of Radionuclide Contamination from Waste Pit 5.

BENEFITS:
- Reduce or Mitigate Worker Exposure and Exposure to Off-Site Residents Due to Airborne Radionuclide Contamination.

ACTIVITIES:
- Exposed Radioactive Waste was Submerged Below the Water Line and Distributed Evenly Below the Surface of the Water

SCHEDULE:
This Removal Action was Completed in December 1992

REMOVAL ACTION #19
DECONTAMINATION AND DISMANTLING OF PLANT 7

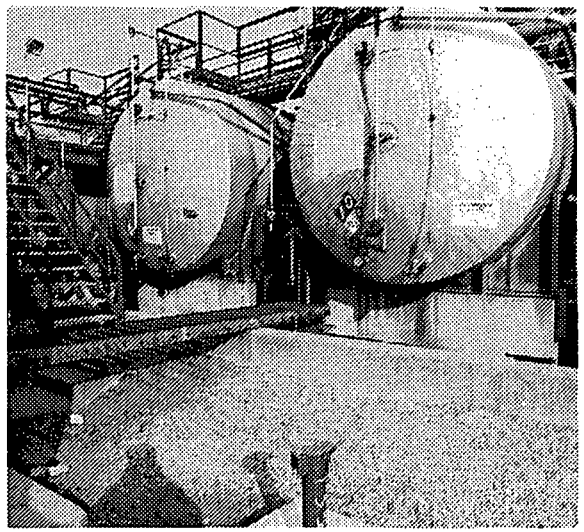


OBJECTIVE/BENEFIT:
Mitigate Potential Contaminant Releases and Support the DOE Integrated Technology Demonstration Program. D&D will also Serve as a Pilot Program for Future Remedy of the Site.

ACTIVITIES:
Remaining Decontaminating and Dismantling Operations
(1) Shearing Operation on Structural Steel
(2) Cutting Structural Steel and Loading in Containers
(3) Containerization of Transite Paneling, Piping, Ductwork, and Equipment for Shipment Off-site
(4) Encapsulation of Plant 7 Foundation Slab
(5) Demobilization

SCHEDULE:
Completed Relocation of Stored Drum Material and Debris August 1993
Completed Removal of Interior Asbestos Insulation October 1993
Completed Surface Decontamination of Interior Components November 1993
Awarded Subcontract to PDG, Inc. November 1993
Began Interior Dismantling Work February 1994
Began Exterior Dismantling Work June 1994
Imploded Structural Steel Framework September 1994
Completed D&D November 1994
Completed Shipment of Waste (D&D) to Nevada Test Site February 1995
Submitted Recycling Material Processing Schedule February 1995

REMOVAL ACTION #20
NEUTRALIZATION OF UNH INVENTORIES



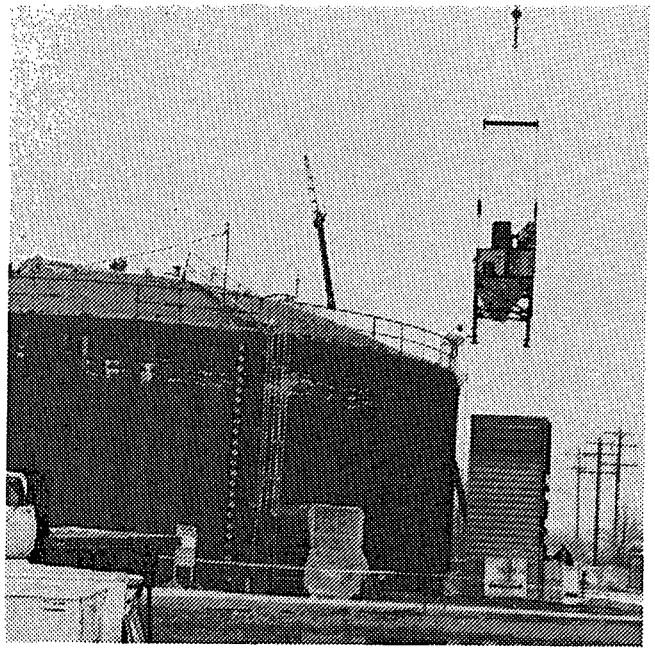
OBJECTIVE:
- Remove and Prepare for Shipment Approximately 200,000 Gallons of Acidic UNH Currently Stored in 19 Tanks in and Around Plant 2/3.

BENEFIT:
- Mitigate Potential Releases to Environment.

ACTIVITIES:
- Neutralize Solutions, Precipitate the Material, Filter the Precipitate, and Package the Resulting Filter Cake in Double Containment for Safe Storage.

SCHEDULE:
Completed Systems Integrity Testing February 1992
Completed Neutralization of First Batch of 21,000 Gallons November 1992
Restart Neutralization Process July 1995

REMOVAL ACTION #21
EXPEDITED SILO 3



OBJECTIVE:

- Eliminate the Potential for Release of Radioactive Material to the Environment from the Silo 3 Dust Collector and Hopper Assembly.

BENEFIT:

- All Pathways are Permanently Sealed to Prevent the Release of Silo 3 Contents to the Atmosphere. Eliminated the Source of Potential Airborne Emissions.

ACTIVITIES:

- The Three-Piece Assembly was Removed from Atop the Silo Dome and Lowered Directly into a Sea/Land Container for Disposal. Piping and Associated Equipment Originally Used to Place Waste in the Silo were also Removed and Prepared for Shipment.

SCHEDULE:

This Removal Action was Completed in January 1992
Shipment of the Assembly to the Nevada Test Site was Completed in October 1992

REMOVAL ACTION #22
WASTE PIT AREA CONTAINMENT IMPROVEMENT

OBJECTIVE:
- Minimize the Potential for Wind or Water Erosion of Contaminated Materials from Access Roads and Exposed Surfaces in the Waste Pit Area.

BENEFIT:
- Mitigate Sources of Potential Airborne Dust Emissions and Contaminated Surface Water Runoff.

ACTIVITIES:
- This Removal Action Included Revegetation (Seeding) of the Pit Area for Erosion Control, and Regrading of Some Existing Stormwater Ditches in the Pit Area to Promote Positive Drainage.

SCHEDULE:
Removal Action Completed August 1993

REMOVAL ACTION #23
INACTIVE FLYASH PILE

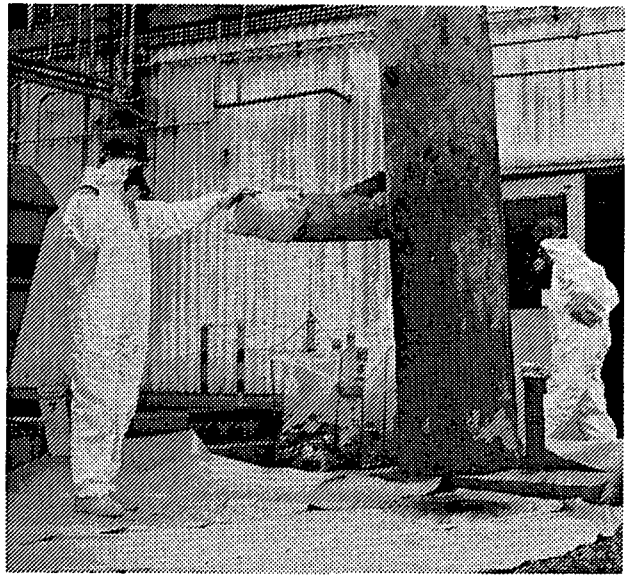
OBJECTIVE:
- Removal and Disposition of Isolated Areas of Radiological Surface Contamination in the Inactive Flyash Pile/Other South Field Disposal Areas.

BENEFIT:
- Mitigate Potential Migration of Contaminants.

ACTIVITIES:
- A Small Amount of Debris Including Soil and Transite Material was Removed from the Inactive Flyash Pile and Placed in Appropriate Containers for Storage Pending Final Disposition.

SCHEDULE:
This Removal Action was Completed in June 1992

REMOVAL ACTION #24
PILOT PLANT SUMP



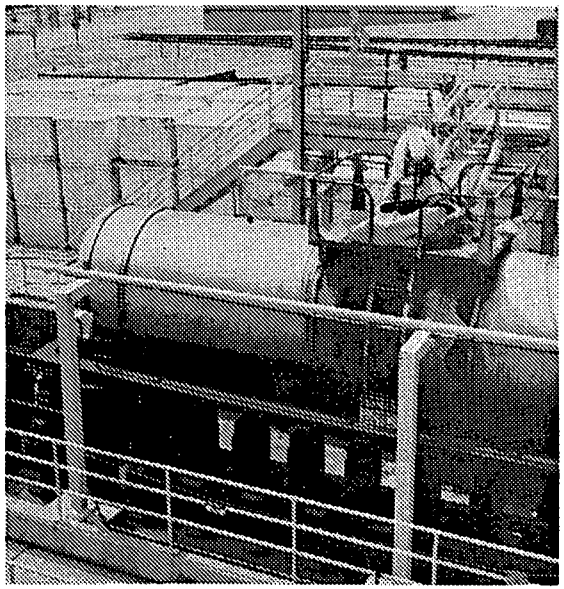
OBJECTIVE:
- Remove the Out-of-Service Sump and its Liquid and Sludge Containing High Concentrations of Metals, Thorium and Volatile Organic Compounds.

BENEFIT:
- Mitigate Source of Potential Environmental Releases.

ACTIVITIES:
- Pump-out Accumulated Liquid and Sludges, Removal of the Sump, and Identification of Contaminated Soils Resulting from its Operation. Sump was Removed September 17, 1993.

SCHEDULE:
Received Ohio EPA Work Plan Concurrence January 1993
Received U.S. EPA Work Plan Approval February 1993
Completed Removal Action October 1993
Received U.S. EPA Final Report Approval January 1994

REMOVAL ACTION #25
NITRIC ACID TANK CAR AND AREA



OBJECTIVE:

- Remove Residual Contents Followed by Decontamination and Disposition of the Tank Car, and Address Potentially Contaminated Surrounding Soils Related to the Tank Car

BENEFITS:

- Mitigate Source of Potential Contamination Releases to the Environment.
- Initiate RCRA Closure Activities for Designated (HWMU) Hazardous Waste Management Unit.

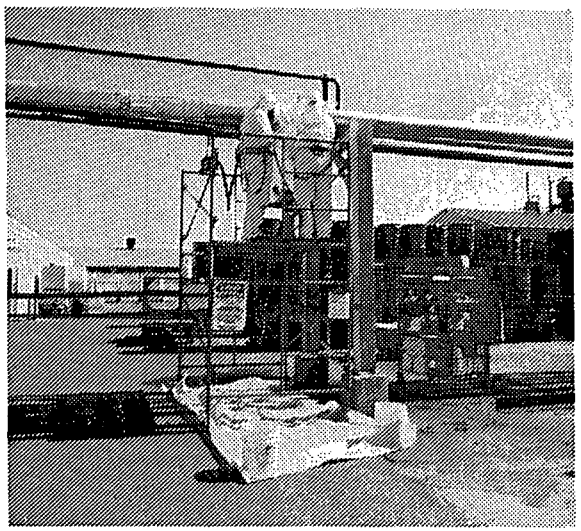
ACTIVITIES:

- Removed Residual Contents and Decontaminated Tank Car, Characterized Soils in the HWMU for Contaminants Related to the Tank Car, Soil Excavated in HWMU Completed to Depth of 12 Inches & Dismantled Tank Car.

SCHEDULE:

Received U.S. EPA Work Plan Approval March 1993
Received Ohio EPA Work Plan Concurrence May 1993
Completed Removal Action September 1993
Received U.S. EPA Final Report Approval December 1993
Submitted Certification of Closure to Ohio EPA October 1994

REMOVAL ACTION #26
ASBESTOS REMOVALS (ASBESTOS PROGRAMS)



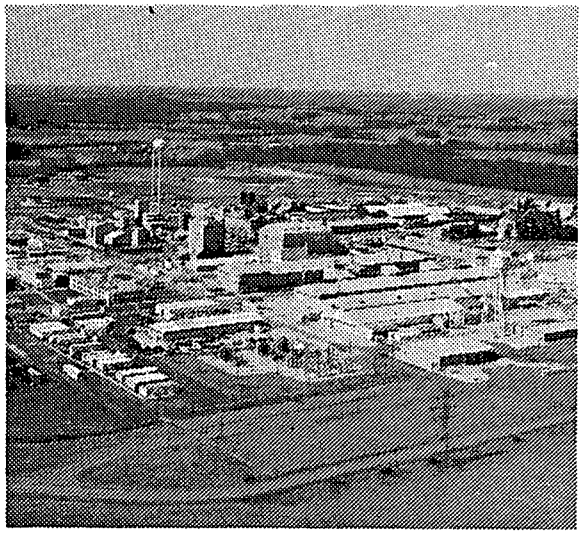
OBJECTIVE:
- Manage Ongoing Asbestos Abatement Activity at the Fernald Site.

BENEFIT:
- Mitigate the Potential for Contaminant Release and Migration.
- Reduce Potential for Worker Exposure to Respirable Asbestos.

ACTIVITIES:
- Document Existing Conditions.
  Ongoing Abatements Include:
  - Small-Scale In-Situ Repairs, Encapsulation, and Removals
- Large-Scale Abatements of 10 Buildings

SCHEDULE:
Submit Annual Work Procedures to EPA Each June

REMOVAL ACTION #27
MANAGEMENT OF CONTAMINATED STRUCTURES AT FERNALD



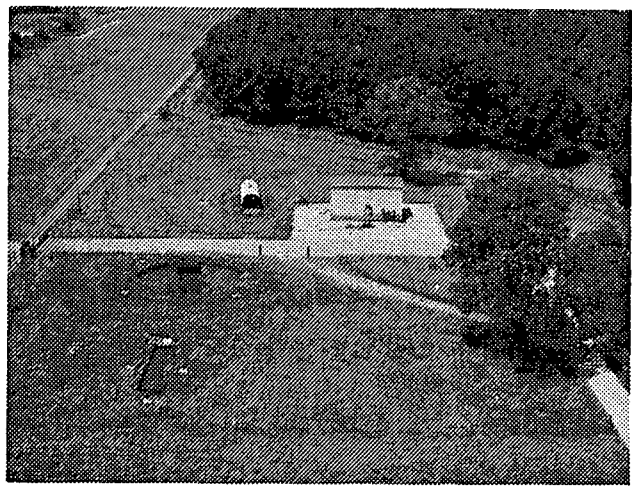
OBJECTIVE:
- Establish a Broad-based Removal Action to Support the Implementation of Cleanup Actions at Fernald's Contaminated Facilities.

BENEFIT:
- Mitigate the Potential Threat to Human Health and Environment.

ACTIVITIES:
- Submit Engineering Evaluation/Cost Analysis (EE/CA) to Support Proposed Removal Actions for Managing Contaminated Structures/Facilities.

SCHEDULE:
Submitted Draft EE/CA to U.S. EPA December 1992
Received U.S. EPA Conditional Approval January 1993
Submitted final EE/CA June 1993
EE/CA Superceded by Proposed Interim Remedial Action

REMOVAL ACTION #28
CONTAMINATION AT THE FIRE TRAINING FACILITY



OBJECTIVE:
- Removal of Soil Contamination and Contaminated Structures in the Fire Training Area

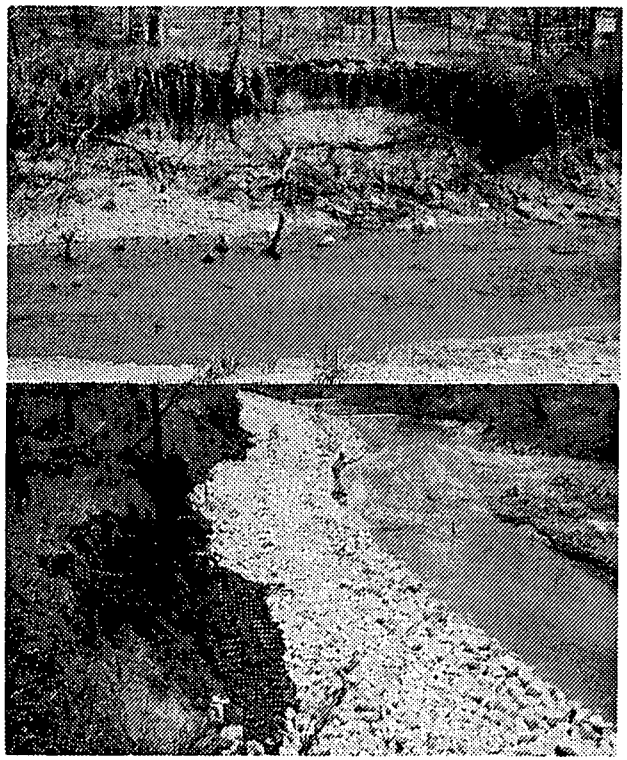
BENEFIT:
- Mitigate Source of Potential Contaminant Releases to the Environment.
- Initiate RCRA Closure Activities for Designated Hazardous Waste Management Unit

ACTIVITIES:
- Remove, Decontaminate, Treat, Dispose, and Store Contaminated Soil, Buildings, Tanks, Sump, and Pond; Obtain Additional Information on Contaminated Perched Water

SCHEDULE:

Submitted Draft Removal Action Work Plan/Closure Plan Information and Data (RAWP/CPID) to U.S. EPA and Ohio EPA June 1993
Received U.S. EPA Conditional Approval August 1993
Submitted Final RAWP/CPID U.S. & Ohio EPA October 1993
Received U.S. EPA Approval November 1993
Resubmitted RAWP/CPID to Ohio EPA February 1994
Demolished Building at the Fire Training Facility September 1994

REMOVAL ACTION #29
STABILIZATION OF PADDYS RUN BANK NEAR THE INACTIVE FLYASH PILE



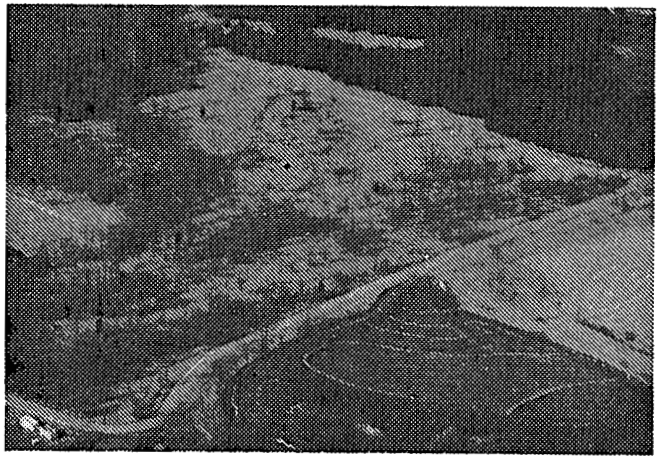
OBJECTIVE:
- Stabilize East Bank of Paddys Run Adjacent to Inactive Flyash Pile

BENEFIT:
- Prevent Potential Discharge of Flyash to Paddys Run

ACTIVITIES:
- First Phase of Removal Action was to Construct a Rock Berm as an Interim Protective Measure
- Second Phase of Removal Action was Detailed Engineering Evaluation Followed by Construction to Increase Berm Height and Improve Long-Term Protection

SCHEDULE:
Interim Protective Measure Completed May 1993
Final Protective Measure Completed September 1993
Ongoing Maintenance Required

REMOVAL ACTION #30
SEEPAGE CONTROL AT THE INACTIVE FLYASH PILE AND SOUTH FIELD



OBJECTIVE:
- Prevent the Transport of Contaminants to the Great Miami Aquifer

ACTIVITIES:
- Install a Seepage Collection System
- Pump Collected Water to the Advanced Wasterwater Treatment Facilty
- Remove Contaminated Sediment from the Southeast Corner of the South Field

SCHEDULE:
Begin Construction April 1995
Complete Construction August 1995
Ongoing Operation and Maintenance until Final Remediation of the Inactive Flyash Pile and South Field Area

REMEDIAL DESIGN

FERNALD
Environmental Management Project

Remedial Design

The U.S. Department of Energy's (DOE) Fernald Environmental Management Project is completing the study and characterization phase of remediation, which includes the selection of final remedies for each of the five site operable units, and has begun the transition to the remedial design phase.

The remedial design phase begins when the U.S. Environmental Protection Agency (U.S. EPA) approves and signs a Record of Decision (ROD), which identifies the selected cleanup remedy for a specific operable unit. The purpose of the remedial design is to assess and develop technical requirements and direction -- based on the selected remedy -- to ensure the remedial action is implemented in a manner that meets the requirements of the ROD. Specifically, the remedial design consists of technical analyses and procedures which result in the development of various design documents.

From project and regulatory perspectives, a series of stages and associated documents comprise the remedial design. These stages include planning the design, as documented in the remedial design work plan; preliminary design; intermediate design (if necessary); prefinal design; and final design. Once the design phase is complete, remedial action begins.

Remedial Design Work Plan

The fundamental objective of the remedial design work plan is to define the design delivery strategy and the associated schedule. At Fernald, the DOE develops a remedial design work plan for each of the site's five operable units as specified in the Amended Consent Agreement. Within 60 days after the ROD for an operable unit is signed by the U.S. EPA, DOE submits a work plan to the regulatory agencies for review.

Generally, the remedial design work plan:

- identifies the overall approach to the design and provides a strategy of how a project might be broken into manageable components (components may include an excavation plan, plans and specifications for a waste processing facility, a backfilling and grading plan, etc.);
- describes what the design documents for those components will consist of during the various phases of design development; and
- provides a schedule for developing and submitting design documents.

What is Remedial Design?

The remedial design establishes the scope of a project and develops the technical requirements for the remedial action. The primary goal of remedial design is to produce a detailed set of engineering plans and specifications which are consistent with the technical criteria established for the design.

Preliminary Design

At about the 30 percent stage of the remedial design process, the preliminary design package will have been developed. At this stage, the pattern and direction for the design process is set for either the entire project or for a component of the project. The preliminary design should provide information to assess the adequacy of the design with respect to all environmental and public health requirements, and the feasibility that the design will meet performance standards.

The preliminary remedial design submittal should include:

- remedial design criteria;
- project delivery strategy;
- results of treatability studies and additional field sampling, as appropriate;
- preliminary plans, drawings, and sketches;
- outline of required specifications;
- a preliminary construction schedule.

Typically, when DOE submits the preliminary design to U.S. EPA and Ohio EPA for review, the preliminary design will also be made available to the public for inspection. The timing of this design submittal, and of later design stages, relative to public inspection is represented in the figure below.

Comments on the design will be addressed and factored into future design submittals. However, the preliminary design documents will not be revised and resubmitted to the regulators until the 90 percent development stage of the prefinal draft.

Intermediate Design

The intermediate design submittal is expected only for complex designs. When the design is about 60 percent complete, the intermediate design will assess progress of the design, including how comments on the preliminary design have been incorporated into the design. The submittal process will be handled in the same manner as the preliminary design submittal.

Prefinal Design

When the design process is about 90 percent complete, the prefinal design package will have been developed. The prefinal design submittal includes detailed design plans and specifications, as well as any plans necessary to support implementation of the remedial action.

The prefinal design provides the technical direction necessary for implementing the selected remedy, or a component of the remedy, in compliance with all environmental and public health requirements and in a manner which can be readily implemented.

DOE will submit the prefinal design to U.S. EPA for review and approval, and to Ohio EPA for review and concurrence. It will also be made available to the public for inspection. Comments on the prefinal design will be addressed and factored into design documents. DOE will revise the prefinal design documents and submit them to U.S. EPA and Ohio EPA as the final design.

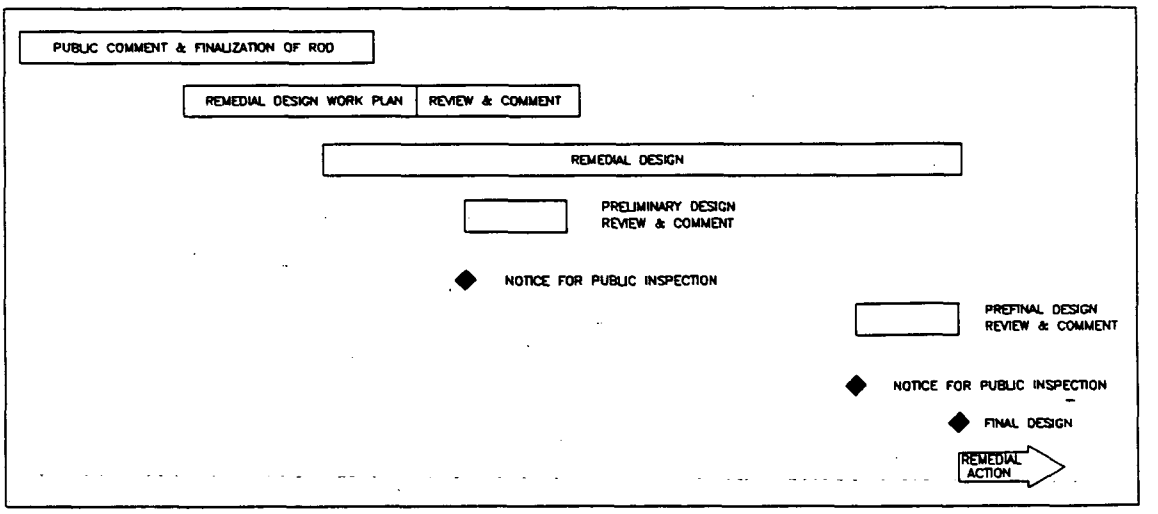
Variations

Based on unique features of a project or component, DOE may propose that the design steps be modified to allow more efficient utilization of time and resources, particularly with respect to document submittals. For example, in Operable Unit 3, which comprises the buildings and structures in the former production area, DOE, U.S. EPA, and Ohio EPA agreed that one design submittal per decontamination and dismantlement project would be sufficient. The submittal would be in the form of an *implementation plan* for each project. Modifications of this sort would be identified in the design delivery strategy within an operable unit's remedial design work plan.

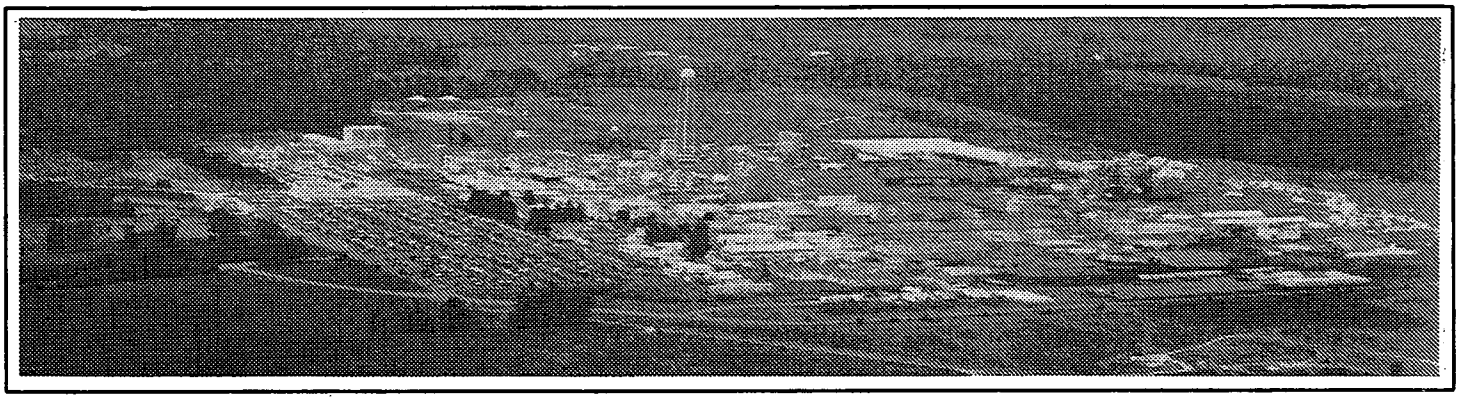
For more information about this topic or other Fernald site activities and issues, contact:

Gary Stegner, Public Information Director
Department of Energy
Fernald Area Office
P.O. Box 538705
Cincinnati, Ohio 45253-8705
513-648-3153

For an update on Fernald-related public meetings and documents available to the public, call the community access line at 513-648-6272.



FERNALD Environmental Management Project FACT SHEET



Background

The Fernald Environmental Management Project, formerly known as the Feed Materials Production Center, is located about 18 miles northwest of Cincinnati, Ohio. The facility produced uranium metal products for the nation's defense programs between 1953 and 1989. During those years the facility produced uranium products for use in production reactors to make plutonium and tritium at other U.S. Department of Energy (DOE) sites. Uranium metal production was suspended in July 1989 to focus resources on environmental restoration.

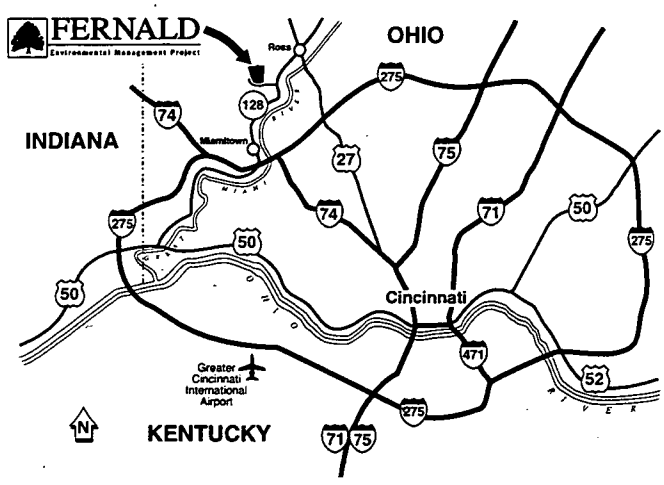
The Fernald Environmental Restoration Management Corporation (FERMCO) is managing all cleanup activities at Fernald under a contract with the U.S. Department of Energy. FERMCO is a wholly-owned subsidiary of Fluor Daniel, Inc., of Irvine, Ca. The FERMCO team is comprised of Fluor Daniel, Jacobs Engineering Group Inc., Halliburton NUS Environmental Services, and Nuclear Fuel Services. FERMCO assumed responsibility for the cleanup in December 1992. Prior to that, a subsidiary of Westinghouse Electric Corp. was the managing contractor at Fernald from January 1986 to November 1992. Westinghouse was preceded at Fernald by National Lead of Ohio, the original managing contractor from 1951 to 1985.

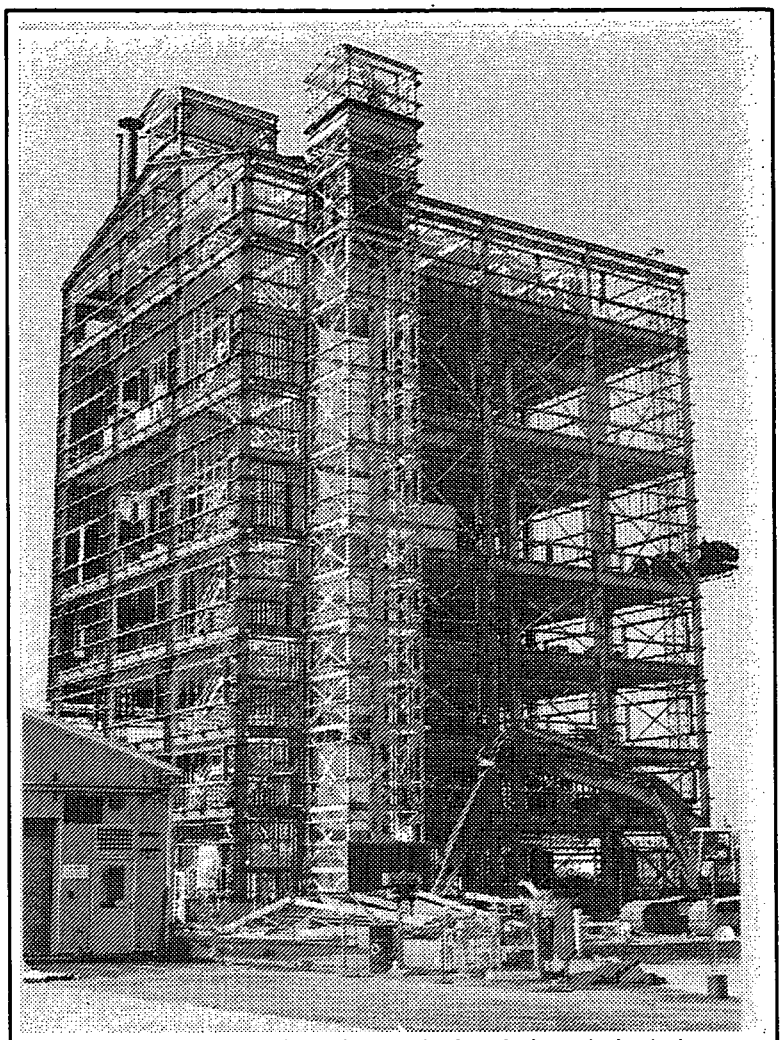
Cleanup Mission

Since production operations were discontinued in 1989, the Fernald workforce has been dedicated entirely to environmental restoration. In December 1989, the site was added to the U.S. Environmental Protection Agency's (EPA) National Priorities List of federal facilities in need of remediation. The DOE announced its intention to formally end the production mission in February 1991. That closure became effective in June 1991. In October 1991, program management responsibility within the DOE was transferred from Defense Programs to the Office of Environmental Restoration and Waste Management (now the Office of Environmental Management). The DOE Ohio Field Office located in Miamisburg oversees the DOE Fernald Area Office, which has responsibility for all aspects of Fernald's full-scale environmental restoration and waste management effort. The cleanup effort is expected to last several years.

Fernald Environmental Management Project

Fernald Site Vitals
Owner: United States Department of Energy
Managing Contractor: Fernald Environmental Restoration Management Corporation (FERMCO)
Historical Mission: Production of uranium metal forms (1953-1989)
Current Mission: Environmental Restoration
Total Area of Site: 1,050 acres
Former Production Area: 136 acres





Plant 7 was emptied, cleaned out, and stripped prior to the implosion.

Environmental Compliance

Many of the environmental, safety, and health regulations that are now applicable to the Fernald site did not exist in the 1950s and 1960s when the plant was in full production. It was not until the early 1970s that environmental consciousness was raised on a national scale, with particular focus on the environmental effects of the industrial revolution.

To address the releases and threats of releases of hazardous substances from containers and facilities at Fernald, the DOE and the U.S. EPA entered into a Consent Agreement in 1991 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). As part of CERCLA, a comprehensive Remedial Investigation/Feasibility Study (RI/FS) is being conducted in and around the Fernald site in conjunction with the U.S. EPA and the Ohio EPA to identify appropriate remedial actions. The RI/FS process involves thorough site characterization, evaluation of cleanup alternatives, public review and comment, and selection of preferred final remedial actions. Environmental restoration efforts under the RI/FS have been divided into five Operable Units, addressing specific areas or facilities at the site.

Operable Unit 1 includes Waste Pits 1-6, a burn pit and a clearwell. Operable Unit 2 includes a sanitary landfill, lime sludge ponds, inactive flyash disposal area, active flyash pile, and the South Field Area. Operable Unit 3 encompasses the former production area, including all former process buildings, structures and equipment, inventoried hazardous materials, scrap metal piles, and the fire training area. Operable Unit 4 includes K-65 silos 1 and 2, which contain radium-bearing wastes; Silo 3, which contains dried uranium-bearing wastes; and Silo 4, which is empty. Operable Unit 5 includes groundwater, surface water, soil, sediments, air, vegetation and wildlife throughout the Fernald site and surrounding areas.

Several key cleanup efforts have been completed or initiated recently at Fernald. Workers have completed the dismantling of Plant 7, the tallest and most visible former production building. The dismantling of the Plant 1 ore silos, formerly used to store waste residues from the processing of uranium ore, has been completed.

A facility for vitrification (transforming waste into glass) also is under construction to transform Operable Unit 4 silo wastes into a stable, durable glass-like substance to be shipped off site for disposal.

In addition, an Interim Record of Decision for Remedial Action for Operable Unit 3 has been approved by the EPA, allowing for early remediation of existing structures within the former production area. The plan calls for decontaminating and dismantling some 125 buildings and support facilities in advance of the final Record of Decision to be issued by EPA in 1997 for final cleanup of the former production area.

Waste Management

Waste at Fernald falls generally into three categories: low-level radioactive waste, hazardous waste, and mixed (radioactive and hazardous) waste. The waste is stored in six pits, three silos, and thousands of 55-gallon drums and other containers. The treatment, storage, and disposal of hazardous waste must meet requirements of the Resource

000056

Conservation and Recovery Act of 1976 (RCRA) and its subsequent amendments. Characterization and analysis of all waste material at Fernald is necessary to determine the precise nature, quantity, and location of each kind of waste, and how each should be handled under RCRA. Ongoing waste management activities include sampling of suspect RCRA materials, overpacking deteriorated drums to prevent escape of radioactive and hazardous materials into the environment, and proper storage and handling of RCRA regulated waste.

Waste material regulated under RCRA requires stringent storage and handling methods. Under its RCRA Implementation Plan, Fernald has established configured hazardous waste accumulation areas at several locations throughout the facility, and implemented procedures for regular and frequent inspections. RCRA storage warehouses are equipped with security, emergency response, and environmental protection capabilities. Other buildings on site also have been refurbished to allow safe storage of hazardous materials.

Fernald has an aggressive program in place to ship low-level radioactive waste, including currently generated waste from construction and restoration activities, characterized backlog waste, and scrap metal, off site for disposal.

Idle production buildings at Fernald are being used as indoor storage facilities for radioactive waste pending final disposition. Prior to being moved indoors for storage, all waste drums are inspected and repackaged as necessary to minimize drum deterioration and leakage.

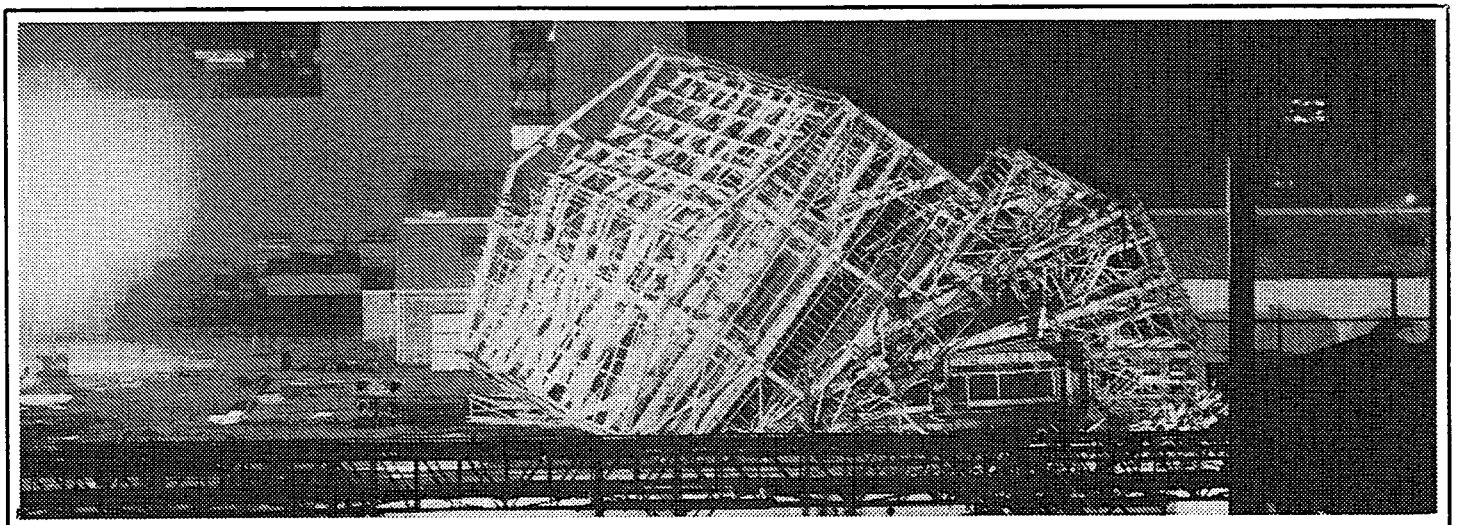
Fernald is nearing completion of improvements to an eight-acre concrete pad at Plant 1, where drummed waste is stored. The pad is being resealed and diked to contain drum leakage and control rainwater runoff. An 80,000 square foot extension to the pad has been completed. Large tent-like structures provide a cover for drummed waste, thereby eliminating drum deterioration due to weather exposure.

Fernald workers also have completed removal of an 1,800-ton outdoor stockpile of contaminated scrap metal, eliminating the potential threat of material releases to the environment due to wind or rain. The scrap metal was shipped offsite for recycling.

Emergency Preparedness

Fernald maintains an Emergency Operations Center (EOC) and a mobile communications unit on site to coordinate response efforts in the unlikely event of an incident that would pose a potential threat to public health and safety. An off-site Joint Information Center also provides a link to Emergency Management agencies in Hamilton and Butler counties, along with various other state, county, and local agencies, to coordinate emergency communications and disseminate important information to the media.

Eleven warning sirens are located within a two-mile radius of Fernald. Originally installed to provide warnings to nearby residents of potential hazardous releases from Fernald, the system can also be activated by the National Weather Service at the Greater Cincinnati Airport or by the Harrison (Ohio) Police Department to signal approaching severe weather.



Plant 7 after the implosion. The building has been cut up and packaged for recycling.

For More Information

Fernald's public participation programs keep Fernald area residents and other "stakeholders" informed of cleanup and other activities in progress, and provide opportunities for public input in key decision making processes. Fernald's envoy program is designed to improve decision making by using site employees to build closer relationships with stakeholder groups on a person-to-person basis.

The Fernald Citizens Task Force was created to help guide cleanup at Fernald. The task force is comprised of representatives of the constituencies affected by cleanup decisions, including Fernald area residents, labor organizations, local governments and local businesses. The objective of forming a task force is to seek consensus among these stakeholders concerning cleanup strategies, future uses of the Fernald site, and other environmental restoration issues.

Numerous publications are available about the Fernald Environmental Management Project. The Administrative Record, a compilation of detailed reports, records, and other documents related to the CERCLA cleanup effort at Fernald, is available for public viewing in the JAMTEK building located at 10845 Hamilton-Cleves Highway in Crosby Township.

For more information, please call (513) 648-3153 or write to: Fernald Environmental Management Project, Community Relations Department, Fernald Environmental Restoration Management Corporation, P.O. Box 538704, Cincinnati, Ohio, 45253-8704.

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FERNALD PROJECT
Cleanup
REPORT

February 1995

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Community meeting March 14

The next community meeting to discuss Fernald cleanup progress and other issues of public interest (including the budget and cleanup priorities) is scheduled for 7-9 p.m. Tuesday, March 14, 1995, at the Plantation, Dry Fork Road, Harrison, Ohio.

New treatment facility to reduce uranium discharges to river

DOE has completed construction and has begun operation of an advanced waste water treatment (AWWT) facility designed to reduce uranium discharges to the Great Miami River.

Jack Craig, director of the DOE Fernald Area Office, said "the construction of this groundwater and wastewater treatment facility meets an EPA milestone and is a major step forward in the environmental restoration of the Fernald Facility." The AWWT is expected to reduce current uranium discharges to the Great Miami River by more than 80 percent.

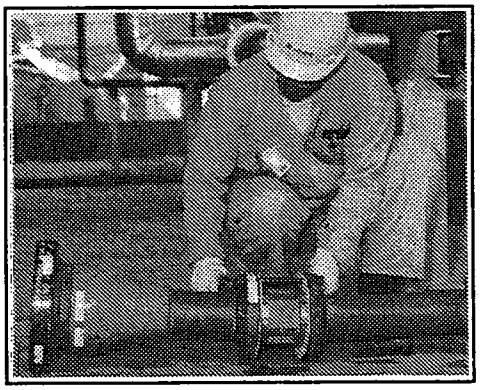
The AWWT consists of two parallel treatment systems. One system will treat 700 gallons per minute (gpm) of contaminated stormwater runoff from the Fernald stormwater retention basins. During periods when stormwater runoff processing is not necessary, the treatment system will treat uranium-contaminated groundwater extracted from the South Groundwater Contamination Plume prior to its discharge to the Great Miami River. The South Groundwater Contamination Plume is an area within the Great Miami Buried Valley Aquifer, extending beyond the southern borders of the Fernald Site, that is contaminated with uranium due to former production operations.

The second AWWT system will treat 400 gpm of wastewater generated during cleanup activities at the site. The system's design allows for expansion to address future site needs.

Water entering the plant is chemically pre-treated to remove suspended solids, then routed through carbon filters for organics removal. Finally, the water passes through ion exchange beds to remove uranium. Treatment residues generated by the new facility will be dried and the resulting sludge sent offsite for disposal.

In the process of constructing the AWWT system, Fernald saved about $100,000 by incorporating storage tanks and other equipment previously installed as part of a chemical tank farm renovation in the project. The tank farm renovation project was no longer needed after Fernald's production operations ended.

The AWWT system will remain in service throughout the remediation of the Fernald site.



A Fernald worker connects a pipeline at The Advanced Wastewater Treatment facility

The AWWT system will be one of the final site facilities to be decommissioned and dismantled. Current estimates are that the facility will operate for about 20 years.

Danis Industries of Dayton, Ohio, and Hydro-Pure Systems Company of Denville, New Jersey, constructed the facility under a contract with FERMCO. Total cost of the project was about $25 million.

Jack Craig named Fernald director

The U.S. Department of Energy has announced that Jack R. Craig, Jr. has been appointed Director of the Fernald Area Office. As the Department of Energy's top operating official at the Fernald site, Craig will be responsible for all environmental restoration and decontamination and decommissioning activities at the Fernald Environmental Management Project.

For the past seven years, he has held various technical and managerial positions for the Department of Energy at Fernald. Prior to joining the Department of Energy, Craig was responsible for managing facility improvements and environmental projects at Department of Defense facilities for General Dynamics Corporation. He was also employed by the Naval Sea Systems Command in Washington, D.C. where his responsibilities included ship design and shipyard inspections.

Craig holds a Bachelor of Science Degree in Civil Engineering from Ohio State University and has completed graduate studies at Virginia Polytechnic Institute.

Jack Craig

Plant 1 Ore Silos project completed

All 14 of the Plant 1 Ore Silos and their support structures have been dismantled and this project was completed on schedule.

Workers cut the final pieces of concrete, steel, and piping inside a size-reduction building equipped with high-efficiency particulate air filters to minimize the spread of potential contamination. The pieces have been packaged for waste disposal.

Deteriorated valves caused the silos to leak raffinate material onto an elevated concrete pad beneath them in 1991. Raffinate material is the waste residue from the processing of uranium ore after uranium is removed.

Call-in hotline established

The U.S. Department of Energy has established a call-in hotline for the Fernald Environmental Management Project. Fernald employees and interested stakeholders in the community may call **648-6272** and get up-to-date information on upcoming public meetings and other public involvement activities, documents available for public comment, and other events taking place at Fernald. The call-in hotline was placed in service in January 1995.

Archaeological Sites discovered near Fernald

The recent discovery of pre-historic human remains along the proposed route of a public water supply pipeline -- and the series of events that followed the archaeological finds -- has resulted in quite a success story for the Fernald Environmental Management Project and numerous other organizations.

The remains were discovered along the proposed route of a pipeline that will bring a public water supply to Crosby Township residents, including those whose drinking water wells have been affected by Fernald's South Groundwater Contamination Plume.

The U.S. Department of Energy (DOE) and the Fernald Environmental Restoration Management Corporation (FERMCO) have been working very closely with numerous parties to ensure that the project remains on schedule, while respecting the traditions and interests of Native American groups in Ohio and accommodating the research interests associated with the remains.

When the DOE agreed to fund the portion of the public water supply project servicing residences affected by the South Plume, a cultural resource survey focusing on potential archaeological sites was initiated for the portion of the pipeline funded by DOE.

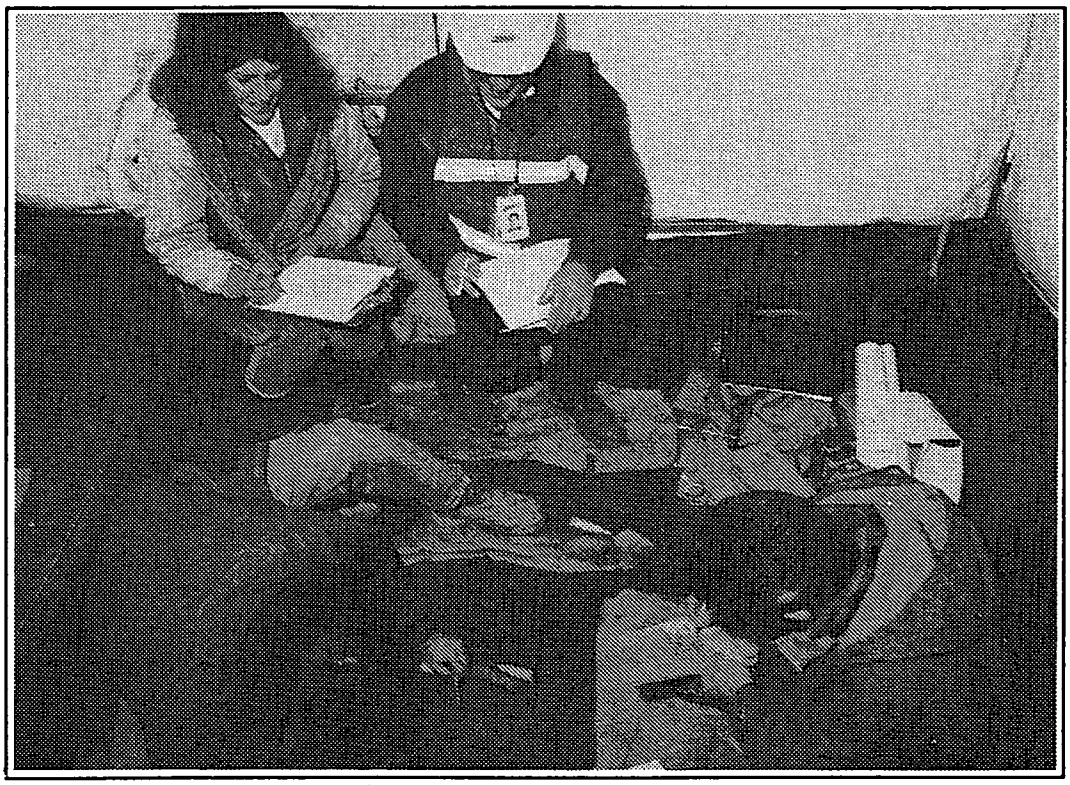
The National Historic Preservation Act (NHPA) requires that any project proposed or funded by a federal agency take into account the effects of the project on properties eligible for or included on the National Register of Historic Places. The Register is comprised of sites throughout the country that have played

Continued on page 3

Continued from page 2

a significant role in American history. These include historic buildings and structures, historic districts, as well as historic and prehistoric archaeological sites.

The archaeological survey, conducted by Gray & Pape, Inc., identified 11 sites containing various types of prehistoric and historic artifacts. Five of the sites were determined not to be eligible for the National Register of Historic Places. The remaining six sites required additional study. One site found along the route of the pipeline contained artifacts from as old as the Late Archaic Period dating back to 3,500 B.C. Of primary concern were intact remains of five humans from the Late Woodland period.



Field technicians carefully uncover Native American burials near Fernald

Upon discovery of the human remains, FERMCO notified the Ohio Historic Preservation Office, the Advisory Council on Historic Preservation, and DOE Headquarters. The consensus reached after consultation with these organizations was to avoid disturbing the remains if at all possible.

However, once it became clear there was no way to avoid the remains, DOE notified several Native American organizations about the discovery of the remains. Of all of the organizations contacted, only the Native American Alliance of Ohio (NAAO) indicated it wanted to work with DOE to determine the appropriate disposition of the remains.

The Cincinnati Museum of Natural History also expressed an interest in working with DOE to determine appropriate handling and disposition of the remains.

While planning was underway for Gray & Pape, Inc. to remove the human remains from the path of the pipeline, consultation between NAAO, DOE and FERMCO continued. NAAO representatives visited the site of the burials in September 1994 and met with DOE and FERMCO to express their concerns and wishes for the handling of the remains.

The NAAO was not opposed to removal of the human remains as long as the remains were handled in a respectful manner, and the NAAO was allowed to be present at various stages of the removal. The NAAO also agreed to a request by the Cincinnati Museum of Natural History to have the remains studied once they were removed from the ground if reasonable conditions were met, including limits on the amount of time they were studied.

The DOE and FERMCO are committed to ensuring that the remains are treated in a respectful manner. The NAAO has visited the site for a second and third time to perform Traditional Tribal Ceremonies. The NAAO also has provided expertise to ensure that appropriate handling and disposition occurs while accomplishing the goal of avoiding impacts to the remains from pipeline installation.

The removal of the human remains is expected to be completed soon, with possible reburial or curation of the remains occurring in the summer of 1995.

"This project provides an ideal example of a win-win situation for all parties involved," said FERMCO's Joe Schomaker, the Fernald Site's contact with the NAAO. Schomaker coordinated the surveys, the ceremonies, and the excavations.

"The DOE and FERMCO feel fortunate to be able to work with the Native American Alliance of Ohio and the Cincinnati Museum of Natural History on this effort, and we look forward to maintaining this excellent working relationship," Schomaker said.

UNH systems being checked prior to startup

DOE and FERMCO are evaluating a new date to commence operation of the uranyl nitrate hexahydrate (UNH) treatment system. DOE and FERMCO fully recognize the importance of removing and neutralizing the UNH currently stored at Fernald, and made a good faith commitment to meet the scheduled January 17, 1995, startup date. However, the target could not be met and still ensure the safety of the work force and the public.

Systems operability testing performed on the treatment system prior to the planned January startup date continued to identify minor problems with valves, pipes, and instrumentation which must be addressed before a safe startup of the system can be assured.

FERMCO has formed a special engineering design team to follow up on the problems identified in the systems operability testing to ensure that those problems are properly resolved prior to startup.

DOE and FERMCO believe that the startup will begin in July, but remain committed to start and complete the project quickly and in a manner that fully protects Fernald workers and the public.

An intermediate product during uranium production at Fernald, UNH is defined as any acidic uranyl nitrate solution having a pH of less than 2.0 and a uranium concentration greater than 10 grams per liter. About 200,000 gallons of UNH are stored in 18 tanks on site.

RI/FS update....

The final Record of Decision (ROD) for **Operable Unit 1 (Waste Pit Area)**, reflecting changes made in response to EPA comments, was forwarded to U.S. EPA and Ohio EPA on January 25, 1995, for final approval.

The draft ROD for **Operable Unit 2 (Other Waste Units)** was submitted to U.S. EPA and Ohio EPA on February 4, 1995, for review.

The draft final Remedial Design/Remedial Action (RD/RA) Work Plan for Interim Action at **Operable Unit 3 (Production Area)** is being reviewed by EPA. The first draft of the Remedial Design Prioritization and Sequencing Report is on schedule for submittal to U.S. EPA and Ohio EPA by March 17, 1995. This document contains a schedule for implementation of RD/RA tasks and submittal of RD/RA reports.

U.S. EPA has approved the final ROD for **Operable Unit 4 (Silos 1-4)**. The vitrification pilot plant is on schedule for completion in August 1995. DOE submitted the Draft Work Plan for Operable Unit 4 Remedial Design to U.S. EPA and Ohio EPA ahead of schedule on January 25, 1995, for review. This is the first document of its kind to be submitted for the Fernald Site.

The Feasibility Study/Proposed Plan for **Operable Unit 5 (Environmental Media)** is being reviewed by EPA. This document identifies remedial alternatives and presents the DOE's preferred alternative.

FERNALD PROJECT
CLEANUP REPORT
U.S. Department of Energy
Fernald Area Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705

The Fernald Project Cleanup Report is prepared by Fernald Environmental Restoration Management Corporation monthly for the U.S. Department of Energy, to inform the community about cleanup progress at the Fernald Environmental Management Project.
Address all inquiries regarding the Fernald Project Cleanup Report to:
Gary Stegner, Director
Public Information
U.S. Department of Energy
Fernald Area Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705
telephone: (513) 648-3153
Fernald Area Office.....Mr. Jack R. Craig, Director

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FERNALD
Environmental Management Project

Remedial Investigation/ Feasibility Study

PROGRESS REPORT MARCH 1995

Operable Unit 5
ENVIRONMENTAL MEDIA

Rob Janke
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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 5 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 5 encompasses the environmental media at the Fernald site and surrounding areas. While other Operable Units focus on specific waste facilities or defined areas, Operable Unit 5 is concerned with those environmental media that could be affected by the Fernald site. "Environmental media" includes the groundwater including perched water, surface water, soils, sediments, vegetation and wildlife throughout the Fernald site and surrounding areas. The groundwater includes the Great Miami Buried Valley Aquifer, a source of groundwater used for drinking water in the vicinity of the Fernald site. Surface waters include the Great Miami River, Paddy's Run, and the Fernald site's storm sewer outfall ditch. Sediments in Operable Unit 5 include solid materials carried in stormwater runoff or plant effluent discharges to surface waters or drainage ditches. Soils on and off the Fernald property boundaries also are being investigated for possible contamination due to past discharges or air emissions.

RI/FS Activities

Remedial Investigation Report: The Remedial Investigation (RI) report was approved by U.S. EPA and Ohio EPA in February 1995. The final RI report incorporating U.S. EPA and Ohio EPA comments was issued in mid-March 1995.

Feasibility Study/Proposed Plan Report: The draft Operable Unit 5 Feasibility Study/Proposed Plan for Remedial Action (FS/PP) report, including data generated from treatability studies, was submitted to U.S. EPA and Ohio EPA in November 1994, for review. DOE and FERMCO addressed EPA comments on the FS/PP report in December 1994 and January 1995. The draft final FS/PP report, reflecting changes made to incorporate EPA comments, will be resubmitted to U.S. EPA and

Ohio EPA in mid-March 1995, for final review.

Eleven remedial alternatives ranging from no action to full restoration of all affected environmental media are considered in the FS report. Each of the alternatives was subjected to detailed evaluation against a series of criteria including effectiveness, cost, and implementability. On the basis of these evaluations, the DOE identified a preferred remedy in the draft Proposed Plan. The DOE's preferred remedy is comprised of the following key elements:

* Excavation of contaminated soil and sediment that exceed proposed final remediation levels using conventional excavation equipment, and placement of the excavated materials in an on-property, above-ground disposal facility.

* Contaminated soil not meeting the waste acceptance criteria for the disposal facility would be shipped to an off-site disposal facility. Soil meeting the waste acceptance criteria would be placed in the on-site disposal facility.

* Extraction and treatment of Great Miami Aquifer groundwater containing concentrations of contaminants above established or proposed maximum concentration levels.

The final Proposed Plan will be issued for public comment following receipt of EPA approval.

DOE is scheduled to submit its proposed draft Record of Decision for Operable Unit 5 to U.S. EPA and Ohio EPA by July 3, 1995.

Removal Actions

Contaminated Water Beneath FEMP Buildings (Removal Action No. 1): This removal action was initiated to minimize the potential for uranium-contaminated groundwater to infiltrate the underlying aquifer from perched water zones located beneath some former production buildings. "Perched" water is present in isolated pockets within the layers of clay-rich glacial soils that exist above the Great Miami Buried Valley Aquifer in the Fernald area.

Perched water zones beneath Plants 2/3, 6, 8, and 9, are of concern due to the discovery of significant concentrations of uranium. In addition, it was determined that these waters also contained volatile organic compounds. To minimize the potential for the movement of contaminated water in these zones to the underlying aquifer, a series of pumping wells were installed to extract the perched groundwater.

A treatment system at Plant 8 comprised of activated carbon filters is being used to remove volatile organic compounds from the extracted water. Following treatment of the water to address the organics, the water is then processed through Fernald's new Advanced Wastewater Treatment system for the removal of uranium before discharge to the Great Miami River.

South Groundwater Contamination Plume (Removal Action No. 3): The purpose of this removal action is to protect public health by limiting access to the use of uranium-contaminated groundwater in an area south of the Fernald site. This removal action is broken into five parts.

Part 1 provides an alternate water source to an industry affected by the contamination plume. This portion of the project involved the installation of production wells outside the plume area and a water supply system to the affected industry. The system has been in operation since 1992.

Another affected industry, which uses a minimal amount of groundwater (currently using bottled water for drinking purposes), will be provided with an alternate water supply by being connected to the public water system which is now under construction.

Part 2 involves the installation of a hydraulic barrier to impede further migration of the off-property South Plume. This is accomplished via a groundwater recovery well system to extract and pump groundwater from the plume. The extracted water is transported through a force main pipeline back to the Fernald site for monitoring and subsequent discharge to the Great Miami River. The groundwater recovery well system has been operational since August 1993.

A new effluent outfall pipeline also was installed under Part 2. The new outfall pipeline parallels the original outfall pipeline to the Great Miami River. To address the low dissolved

oxygen content of the extracted groundwater, an aeration facility also was constructed under Part 2.

Part 3 involved construction of an Interim Advanced Wastewater Treatment (IAWWT) system which is now operational. The advanced treatment provided by the IAWWT system removes additional uranium from existing site wastewater streams.

Part 4 of the removal action involves groundwater monitoring and institutional controls to prevent the use of contaminated groundwater. This ongoing activity is being implemented through the Fernald site's existing Groundwater Monitoring Program, including frequent monitoring of private wells located near areas of known contamination.

Part 5 involved additional groundwater investigations in the vicinity of the South Plume to identify the location and extent of any remaining contamination attributable to Fernald in the groundwater south (downgradient) of the recovery wells installed under Part 2.

Results from the Part 5 sampling indicate that the South Plume Recovery System is effectively containing the leading edge of the plume (groundwater exceeding 20 ppb of total uranium). Additionally, continuous monitoring of these wells has indicated that the recovery well system is not adversely impacting the Paddy's Run Road Site contaminant plume.

Advanced Wastewater Treatment System: Construction of the Advanced Wastewater Treatment (AWWT) system was completed on schedule and the facility became operational in January 1995 as planned. The objective of the AWWT is to provide advanced treatment of stormwater runoff and wastewaters for the removal of radionuclides prior to discharge from the Fernald site.

In addition, preliminary engineering examining the viability of expanding the AWWT system to address groundwater removed as part of future remedial actions has been completed. These preliminary engineering efforts supported development of the Operable Unit 5 Feasibility Study. More detailed engineering on the expansion of the AWWT to address future groundwater remedial actions is now in progress.

Other Activities

Supplemental Environmental Project: DOE agreed to conduct a Supplemental Environmental Project with the objective of further reducing uranium discharges from the Fernald site to the Great Miami River. As part of this project, one additional Interim Advanced Wastewater Treatment unit was installed to treat 200 gallons per minute (gpm) of extracted South Plume groundwater. This system became operational in March 1994.

In addition, the lifespan of the existing IAWWT unit at the Stormwater Retention Basin will be extended and this unit will be converted to treat additional South Plume water. In March 1995, the treatment capacity of this unit will be increased from 300 gpm to 400 gpm. This effort is intended to further reduce uranium discharges.

Under the terms of the Supplemental Environmental Project agreement, Fernald also will utilize the AWWT for South Plume water treatment when excess capacity is available. This measure is expected to provide an additional average of 550 gpm of treatment capacity, and further reduce uranium discharges to the river.

For More Information

More information about Operable Unit 5 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.

FERNALD
Environmental Management Project

Remedial Investigation/ Feasibility Study

PROGRESS REPORT MARCH 1995

Operable Unit 4
SILOS 1-4

Randi Allen
DOE Manager,
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Introduction

The U.S. Department of Energy's (DOE) Fernald Environmental Management Project site is 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.

Located at the western periphery of the Fernald site, "Operable Unit 4" is defined as a geographic area that includes Silos 1 and 2 (K-65 Silos), Silo 3 (metal oxide silo), the unused Silo 4, and ancillary structures. Operable Unit 4 remediation will address each of these structures, any contaminated soils within the geographic boundary, and any contaminated perched water encountered during Operable Unit 4 remedial activities.

Background

Silos 1 and 2, commonly called the "K-65 Silos," contain radium-bearing, low-level radioactive wastes dating back to the 1950s. In 1964, the two silos were reinforced with an earthen berm, which was upgraded in 1983. Other improvements which have been made include a 30-foot cap installed on top of the silo domes for added protection, and a polyurethane foam coating that was applied over the domes for weather protection. In addition, a radon treatment system was constructed, and radon gas monitors were installed around the Fernald site boundary and in the immediate vicinity of Silos 1 and 2. Silo 3 contains dried uranium-bearing wastes, and Silo 4 is empty.

Remedial Investigation/Feasibility Study

The Remedial Investigation/Feasibility Study (RI/FS), a "blueprint" for Operable Unit 4 cleanup was completed with U.S. EPA approval and signing of a final Record of Decision (ROD), which outlines the selected cleanup remedy. During the RI/FS, the nature and extent of contamination within the Operable Unit 4 boundary was thoroughly investigated so appropriate remedial actions could be formulated and implemented.

Site Characterization

Data from the analyses of samples collected during site characterization activities associated with Operable Unit 4 are compiled in the U.S. EPA-approved Remedial Investigation report and the Feasibility Study/Proposed Plan-Draft Environmental Impact Statement for Operable Unit 4. Site characterization field activities included the completion of borings in the earthen berms surrounding the silos, the soils beneath the silos, and the contents of the concrete structures.

Above-background concentrations of radionuclides and other contaminants were identified in surface and subsurface soils, sediment and surface water, and groundwater within and adjacent to the Operable Unit 4 study area.

U.S. EPA approves final Record of Decision for Remedial Action

On December 7, 1994, U.S. EPA approved the final *Record of Decision for Remedial*

Action at Operable Unit 4. Major components of the selected remedy for Operable Unit 4 include:

Removal of the contents of Silos 1, 2, and 3 (K-65 residues and cold metal oxides) and the decant sump tank sludge.

Vitrification (glassification) to stabilize the residues and sludges removed from the silos and decant sump tank.

Shipment of the vitrified contents of Silos 1, 2, 3, and the decant sump tank for disposal at the Nevada Test Site (NTS), near Las Vegas.

Demolition of Silos 1, 2, 3 and 4, and decontamination -- to the extent practicable -- of concrete rubble, piping, and other construction debris generated.

Removal of the earthen berms and excavation of contaminated soils within the Operable Unit 4 boundary to achieve proposed remediation levels. Placement of clean backfill following excavation.

Segregation of non-contaminated soils and demolition of the vitrification treatment unit and associated facilities after use. Decontamination or recycling of debris prior to disposition.

On-property interim storage of excavated contaminated soils and remaining contaminated debris in a manner consistent with the approved work plan for Improved Storage of Soil and Debris (Removal Action No. 17).

Pumping and treatment of any contaminated perched water encountered during remedial activities.

The overall objective of Operable Unit 4 remedial actions is to safely remove a known source of contamination, which will reduce the potential for release of hazardous substances, including radionuclides, to the environment, thereby alleviating a potential risk to human health. Substantial risk reduction will be achieved by removing the sources of contamination, treating the material for which exposures result in the highest risk, shipping the treated residues off site for disposal, and managing remaining contaminated soils and debris consistent with a sitewide strategy. Vitrification (glassification) will reduce the mobility of hazardous constituents and will significantly reduce the volume of materials requiring disposal.

Operable Unit 4 remedial actions entail removing the materials from Silos 1, 2, and 3 and treating them in a vitrification facility to be constructed at the Fernald site. Sludge from the decant sump tank, which collects liquids from in and around the silos, will also be removed and treated in the vitrification facility. Following treatment, the vitrified residues will be containerized and transported and disposed at the NTS, near Las Vegas.

After the residues are removed from the silos, the concrete structures, radon treatment system and other structures within Operable Unit 4 will be demolished. Following completion of treatment, the vitrification facility will be disassembled. Surface scabbling, acid washing and other standard decontamination technologies will be applied, to the extent practical, to minimize the volume of waste requiring disposal. Opportunities for recycling materials will also be explored.

Contaminated soils within Operable Unit 4 will be excavated; it is anticipated that a minimum depth of 6 inches will be removed from the Operable Unit 4 area. Clean fill will be placed in excavated areas, which will then be seeded. Contaminated Operable Unit 4 soil and debris will be placed in an on-site storage facility. As required, the storage facility will be maintained and monitored.

Following application of available waste minimization processes, remaining Operable Unit 4 contaminated soil and debris will be disposed consistent with the selected remedies for Operable Units 3 and 5, respectively.

Operable Unit 4 remediation is anticipated to require approximately six years and $91.7 million, based on the assumptions in the *Final Record of Decision for Operable Unit 4*.

Remedial Design Activities

DOE submitted the *Work Plan for Operable Unit 4 Remedial Design* to U.S. EPA on January 26. On February 27, DOE received

conditional approval from Ohio EPA, pending satisfactory resolution of the agency's comments. U.S. EPA approval of the document is anticipated by May 10, 1995.

The remedial design work plan identifies and defines the activities required to develop final construction plans, specifications and bid documents for implementation of the selected remedial action for Operable Unit 4.

Other Activities

Vitrification Pilot Plant construction to be completed in August

Operable Unit 4 is about to begin conducting a pilot-scale treatability study consisting of removing and vitrifying K-65 materials and bentonite clay from Silo 2, as well as material from Silo 3. Previous bench- and laboratory-scale vitrification studies with K-65 and Silo 3 materials produced positive results. The pilot-scale test will result in development of final Operable Unit 4 vitrification processes and full-scale vitrification plant design. Construction of the pilot-scale vitrification facility began July 17, 1994, and is scheduled for completion in August 1995.

The Operable Unit 4 Vitrification Pilot Plant Treatability Study will be conducted in two phases to demonstrate continuous, 24-hour operation of the vitrification furnace. Other objectives are to verify that the formulations developed from the previous Operable Unit 4 bench-scale studies and glass-development program will produce a satisfactory glass product, and to ensure compliance with the acceptance criteria for disposal at the Nevada Test Site.

Phase I operations will verify the adequacy of the equipment, process and methodology of waste retrieval and the vitrification facility. Scheduled to begin in September, Phase I testing with non-radioactive, surrogate materials is expected to require approximately two months to complete.

During Phase I, bentonite and surrogate materials will be utilized in the vitrification facility to perform integrated system operability testing prior to operating with actual silo residues. Before entering the vitrification furnace, metallic compounds will be added to the surrogate material to more closely simulate K-65 material. No surrogate material will be used to demonstrate Silo 3 material. Phase I is estimated to require approximately 20-30 metric tons of surrogate material to adequately demonstrate vitrification.

Phase II: By March 1996, Phase II operations will begin with radioactive materials retrieved from Silos 2 and 3. Phase II is estimated to require approximately 20 metric tons of K-65 material and 10 metric tons of Silo 3 material.

From Silo 2, the material will be removed with a manually operated slurry pumping device suspended from a mobile crane over Silo 2. This device will be deployed through an existing manway using a glovebag to maintain the silo in a sealed condition and prevent radon escape into the atmosphere. Material from Silo 3 will be removed pneumatically. Also during Phase II, radon control for Silos 1 or 2 headspace atmosphere, and off-gas treatment for the vitrification facility will be demonstrated. Phase II will require approximately three months to complete. In the future, the Vitrification Pilot Plant may be modified to be utilized as a component of the remedial facility.

For More Information

More information about Operable Unit 4 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. For information regarding PEIC operating hours and services, please call (513) 738-0165.

FERNALD
Environmental Management Project

Remedial Investigation/ Feasibility Study

PROGRESS REPORT MARCH 1995

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. 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

Interim Remedial Action: A Record of Decision for Interim Remedial Action was approved by the U.S. EPA in July 1994, allowing for early remediation of existing structures within the former production area. The plan calls for decontaminating and dismantling buildings and support facilities several years in advance of the final Record of Decision for Operable Unit 3. The plan also provides for temporary on-site storage of the bulk rubble and debris from dismantlement activities as well as final off-site disposition of a limited portion of the debris. A determination on final disposition of rubble and debris from the interim remedial action will await the final Record of Decision for Operable Unit 3.

This interim remedial action with unconstrained funding could accelerate cleanup of the former production area by up to four years and result in a significant cost savings of approximately $300 million.

The interim cleanup action was pursued as a result of concerns with the increased potential for releases from deteriorating structures in the production area. The action will result in early reduction of potential human health and environmental risks from the deteriorating structures.

Design plans and specifications for performing the interim remedial action are in progress. U.S. EPA has approved the Operable Unit 3 Remedial Design/Remedial Action (RD/RA) Work Plan for Interim Remedial Action, and the implementation plan for the dismantling of Plant 4.

Remedial Investigation: Field investigation activities for characterization of Operable Unit 3 structures are complete. Analytical results from

collected samples are being validated to ensure data quality. The results will be used to characterize contamination in the former production area, and to support the development of remedial action alternatives for disposal of demolition debris from Operable Unit 3. Results of the field program will be summarized in the Operable Unit 3 Remedial Investigation/ Feasibility Study combined report.

Treatability Studies: Potentially applicable innovative technologies are being tested to support the decontamination, dismantling, and treatment requirements of remedial actions. Technology alternatives are being 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.

The technologies being tested and the particular tests being conducted are detailed in the Treatability Study Work Plan for Operable Unit 3.

Feasibility Study: The scope of the Operable Unit 3 FS report is limited to evaluating options for treatment and final disposition of wastes generated by the decontamination and dismantlement of Operable Unit 3 buildings and support structures. The FS scope has been limited based on the approved Operable Unit 3 Record of Decision for Interim Remedial Action.

The FS Report was initiated earlier than planned due to the early availability of resources required to develop the report. The limited scope of the document, combined with the early completion of the Operable Unit 3 field characterization project, the reduced scope of the RI Risk Assessments, and the opportunity to combine RI and FS activities in a parallel mode, will result in early completion of the effort. EPA has approved this accelerated and combined approach. The revised EPA submittal date is September 11, 1995, approximately 11 months in advance of the previously scheduled date of August 7, 1996.

The submittal date for the proposed draft Operable Unit 3 Final Action Record of Decision has been accelerated nine months, from April 2, 1997, to July 25, 1996.

Removal Actions

Plant 1 Pad Continuing Release (Removal Action No. 7): This removal action, completed in February 1995, protects surface soils and regional groundwater from continuing releases of hazardous materials resulting from waste management activities on the eight-acre Plant 1 storage pad. The removal action was conducted in three phases.

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

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

Remaining drums of low-level radioactive waste in outdoor storage on the Plant 1 Pad have been 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 involved activities to upgrade the existing Plant 1 storage pad, including the installation of a polyurethane and epoxy coating over the pad surface to minimize contaminant migration to the environment.

Removal of Waste Inventories (Removal Action No. 9) This removal action involves the characterization, overpacking, and disposition of low-level radioactive waste materials. Fernald continues to operate an aggressive waste shipping program which began in 1985.

The Fernald site has approval from the DOE Nevada Field Office to dispose of general waste streams at the Nevada Test Site (NTS). The wastes include: process area scrap wastes (scrap metal and wood); construction and Removal Action waste (demolition debris); uranium production residues; baled trash; processed metal waste; thorium wastes; and materials for the U.S. Army Depleted Uranium Armor and Munitions Program.

More than 33,000 drum equivalents (DEs) of waste has been shipped off site so far in Fiscal Year 1995 (October 1, 1994, through February 28, 1995). This includes 7,173 DEs of process area scrap; 776 DEs of thorium; 5,787 DEs of residues to NTS; 1,094 DEs of contaminated trash; 2,095 DEs of recyclable or reusable residues to Scientific Ecology Group, Inc., in Tennessee; 3,222 DEs of backlog construction waste; and 13,032 DEs of newly-generated construction waste.

Safe Shutdown (Removal Action No. 12): This removal action was initiated to ensure the safe and permanent shutdown of production facilities in the former production area. This includes the removal of uranium and other process/raw materials and waste materials from equipment, lines and ductwork. Mate-

rials removed are packaged for disposition.

Several Safe Shutdown programmatic responsibilities have been reassigned to Waste Programs Management. These include the programmatic responsibility for equipment location verification, relocation of excess production equipment within the DOE complex and the private sector, and the sale of depleted uranium metal derbies. The Safe Shutdown program works closely with Waste Programs Management to support them in this ongoing effort.

Plant 1 Ore Silos (Removal Action No. 13): This removal action was completed on schedule in December 1994. The removal action involved 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. Prior to the initiation of actual dismantling activities, the raffinate material that remained in the silos was removed, containerized and placed in safe storage pending final disposition. All 14 silos and support structures have been dismantled, cut up and packaged in containers for shipment as low-level radioactive waste to NTS.

Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (Removal Action No. 14): This removal action was completed in December 1994. The scope of the removal action included 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 was designed to mitigate the potential for contaminant migration. Activities included 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. The additional excavations were completed in accordance with the U.S. EPA-approved Work Plan Addendum.

An area of off-property soil was excavated and verification soil samples were collected and sent to a laboratory for analyses. The excavated soil was brought on site and stockpiled in accordance with Removal Action No. 17 (Improved Storage of Soil and Debris).

The final report, which included validated analytical data from verification soil sampling, was submitted to U.S. EPA and Ohio EPA on November 18, 1994. Comments were received on the final report from U.S. EPA on January 6, 1995. The revised final report was submitted to U.S. EPA on February 2, 1995.

Scrap Metal Piles (Removal Action No. 15): This removal action is addressing the stabilization and disposition of low-level radioactive waste scrap metal that was 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.

The recycling of the recoverable ferrous and nonferrous scrap metal has been completed under a contract that emphasized recycling or other beneficial reuse. Disposition of secondary waste from the recycling process is being negotiated with the subcontractor. The ferrous metal has been reprocessed for restricted reuse in DOE high-energy physics programs. A portion of the nonferrous metal has been recycled.

Plans are being finalized for the removal and off-site processing of the containerized scrap copper pile. This portion of the project is currently on hold until funding becomes available.

Non-recoverable scrap metal at Fernald has been 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 continued construction and maintenance projects, removal actions, and remedial actions at Fernald. Field implementation activities originally included four separate actions: the construction of three temporary interim storage structures (similar to those currently being used on Fernald's Plant 1 Pad), and the in-place containment of one existing large soil and rubble pile. These four field actions were to be implemented to improve interim storage and management of contaminated soils and debris to mitigate the potential spread of contamination until their final disposition is determined under the Operable Unit 3 and Operable Unit 5 Records of Decision.

Fernald requested and received EPA approval to cancel the planned construction of the three planned temporary covered storage structures and pursue more viable alternatives. These changes are the result of a re-evaluation of evolving waste and debris management methodologies and public concerns regarding the construction of additional storage structures at Fernald -- a Superfund site planned for total

remediation.

The U.S. EPA and Ohio EPA have approved the proposed plan to install an in-place vegetative cover (to serve as the in-place containment) over the existing large soil and rubble pile located north of Third Street within Fernald's former production area. Field activities in support of this regrading and seeding activity are on schedule for completion in the summer of 1995.

Visible scrap metal and wood was first removed from the Third Street soil and rubble pile and packaged for waste shipment.

The concrete from the soil and rubble pile north of Third Street has been segregated to the east side of the pile where it was size reduced to allow for more efficient stockpiling. Grading is essentially complete on the west side of the pile, including compaction of each lift to ensure slope stabilization.

Installation of a concrete curb and gutter, that will serve as the drainage trench around the perimeter base of the pile, began in February 1995.

Plant 7 Dismantling (Removal Action No. 19): This removal action was completed in November 1994. Activities under this removal action included characterization, decontamination, removal, containerization and disposal or reuse of materials in the building, and decontamination and dismantling of the building itself.

Steel, concrete and other materials including approximately 700 tons of structural steel have been packaged for recycling or other beneficial reuse.

Following the successful removal of interior contents, piping and equipment and all interior and exterior transite siding, the structural steel frame of Plant 7 was successfully imploded on September 17, 1994, on the second attempt using linear-shaped explosive charges. The final takedown completed an effort which began September 10, when explosive charges failed to take the building down completely. The first two floors of the building collapsed as planned on the first attempt. However, splice plates that had been pre-cut on the third and fifth floors did not separate as anticipated. The building dropped approximately 30-35 feet instead of the planned 60 feet.

The final takedown involved strategic placement and detonation of additional explosive charges at key structural supporting columns. The specialized steel-cutting charges were detonated sequentially to cut columns and to use the weight and configuration of the building to cause it to fall toward a pre-determined open area.

The dismantling process was completed by using track-mounted mechanical shears to cut the steel into sizes permitting shipment off site for recycling.

Neutralization of Uranyl Nitrate Inventories (Removal Action No. 20): DOE and FERMCO are evaluating a new date to begin neutralizing the inventory of uranyl nitrate hexahydrate (UNH), an intermediate product in the former uranium recovery process at Fernald.

Systems operability testing performed on the treatment system prior to the planned January 1995 startup date continued to identify minor problems with valves, pipes, and instrumentation which must be addressed before a safe startup of the system can be assured.

DOE and FERMCO believe that the startup will begin in July 1995, but remain committed to start and complete the project quickly and in a manner that fully protects workers and the public.

The purpose of this project is to safely neutralize and dispose of approximately 200,000 gallons of UNH, which essentially is uranium dissolved in nitric acid. The UNH is stored in 18 tanks in and around Plant 2/3. It will be diluted, neutralized, and filtered. There will be two by-products.

The solid filter cake is expected to meet non-hazardous requirements of the Resource Conservation and Recovery Act (RCRA). The solid filter cake will be drummed and shipped to the Nevada Test Site for disposal as non-hazardous low-level radioactive waste.

The liquid filtrate will be tested to confirm its acceptability for discharge to the Great Miami River under Fernald's current National Pollutant Discharge Elimination System (NPDES) permit. Uranium will be removed from the liquid filtrate prior to treatment of the liquid filtrate through the site's normal wastewater treatment systems. Following treatment, the liquid waste will be sampled for uranium and other metals, acid content, etc., to ensure that it meets NPDES regulations for toxic pollutants prior to discharge to the river.

UNH became a RCRA issue due to its low pH (high acid content) when the material was declared waste by DOE in 1991. RCRA is a federal law designed to ensure safe handling, storage, treatment and disposal of hazardous waste.

Asbestos Removals (Removal Action No. 26): This removal action documents the ongoing asbestos abatement activities at Fernald to manage asbestos in-place and mitigate the potential for asbestos fiber release and migration. Abatement activities within the ongoing Asbestos Program

include repairs, encasement, encapsulation or removal of asbestos containing materials which exist in many buildings on the Fernald site. Abatements to date include small-scale in-situ repairs, encasement, encapsulation, removals, and the completion of the large-scale asbestos abatement. To date, asbestos abatement efforts have been completed in nine buildings. Encapsulation has been completed in two buildings. Field activities in support of asbestos abatement are continuing, including the removal of asbestos-bearing thermal insulation in pipes, tanks, 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 Acess Road. Work activities include the removal, decontamination, disposal, treatment or storage of all buildings, structures, tanks, and equipment in the area.

The concrete building was demolished last fall. The pressure vessel was removed and size reduced, the metal being used in the restricted use recycling program.

Waters and sludges were removed from the open top tand and containerized for disposal. The open top tank was removed from the shallow trench which held it.

Contaminated soils were excavated from the skid tank pond following removal, size reduction and containerization of the skid tank. Soils identified as being radiologically contaminated were removed and placed in covered, bermed soil piles.

Excavated areas have all been backfilled and environmental samples have been collected. Remaining activities consist of excavation and containerization of a portion of the asphalt pad and size reduction of the open top tank.

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.

FERNALD
Environmental Management Project

Remedial Investigation/ Feasibility Study

PROGRESS REPORT MARCH 1995

Operable Unit 2
OTHER WASTE UNITS

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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 2 including its history, the current status of activities, and the preferred cleanup alternative.

Background

Operable Unit 2 includes the Solid Waste Landfill, Lime Sludge Ponds, Inactive Flyash Pile, Active Flyash Pile, and the South Field area. These areas were used to dispose of flyash from the boiler plant, spent lime from water treatment activities, sanitary waste, and construction rubble from past operations at the Fernald site. While uranium is the primary contaminant, investigations have been completed to determine the status of other hazardous constituents which may be present within Operable Unit 2 facilities.

RI/FS Activities

Reports: U.S. EPA has approved the Remedial Investigation (RI) Report and the Feasibility Study/Proposed Plan (FS/PP) Report for Operable Unit 2. The DOE's proposed draft Record of Decision (ROD) was submitted to U.S. EPA on February 4, 1995 and included responses to public comments received during the public comment period.

The proposed final Record of Decision for Operable Unit 2 is scheduled to be submitted to the U.S. EPA by May 3, 1995.

Remedial Design

A pre-design field investigation is being performed to gather necessary information to determine the location and design parameters for an on-site disposal facility. The investigation includes soil studies and groundwater sampling. U.S. EPA and Ohio EPA approved the work plan for the investigation and field activities were initiated in December 1994. The pre-design field investigation is currently in progress.

Removal Action

Seepage Control at the South Field and Inactive Flyash Pile (Removal Action No. 31): Contaminated water is currently seeping from the South Field and Inactive Flyash Pile area. This

Removal Action is being initiated to cut off or capture the seepage and involves intercepting contaminated seepage from the drainage ditches along the Inactive Flyash Pile and South Field area, and pumping it to the Advanced Wastewater Treatment facility. Contaminated sediments will also be removed.

A revised work plan was submitted to U.S. EPA on January 20, 1995 for review. The project is scheduled for completion by October 1995.

Preferred Cleanup Alternative

A variety of cleanup options were evaluated during the Operable Unit 2 Feasibility Study. These include excavation of the waste material and off-site disposal, excavation and on-site disposal in a common disposal facility, and consolidation and capping of waste at each subunit. The preferred remedial alternative, as presented in the Operable Unit 2 Proposed Plan and Record of Decision, is excavation and on-site disposal of waste material.

For More Information

More information about Operable Unit 2 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.

FERNALD
Environmental Management Project

Remedial Investigation/ Feasibility Study

PROGRESS REPORT MARCH 1995

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. The objective of the Remedial Investigation is to develop a comprehensive understanding of the nature of stored waste materials, the extent to which the surrounding environment has been impacted, and the potential threat that the materials and contaminated media pose to human health and the environment.

The Feasibility Study utilizes the data provided in the Remedial Investigation report to develop and evaluate cleanup alternatives that are protective of human health and the environment.

To promote a structured and expeditious cleanup of the Fernald site, the facility and the environmental issues associated with it have been segmented into five operable units. Operable unit is a term used to logically group similar environmental issues at a cleanup site. Separate RI/FS documentation, including RI and FS reports and Records of Decision, will be issued for each of Fernald's five operable units.

A Record of Decision is issued by the U.S. EPA, and is the document that formally presents the selected remedial action for an operable unit and the basis for that selection.

Following is a progress report on Operable Unit 1 including its history, the current status of RI/FS activities, and the selected remedial action.

Background

Operable Unit 1 consists of Waste Pits 1, 2, 3, 4, 5, and 6; the Burn Pit (used for the disposal and burning of waste); the Clearwell (a settling basin for surface water runoff); miscellaneous structures and facilities such as berms, liners, concrete pads, underground piping, utilities, railroad tracks, fencing; and soil within the Operable Unit 1 boundary.

Operable Unit 1 is located in the northwest quadrant of the Fernald site (west of the former production area) and covers approximately 37 acres. Paddy's Run, an intermittent tributary of the Great Miami River, runs along the west side of Fernald property between Operable Unit 1 and the site boundary.

The six waste pits, built between 1952 and 1979, were used for storing wastes generated by the various chemical and metallurgical processes used at the facility for uranium production operations. Two types of disposal methods were generally used in placing wastes into the pits: (1) a "wet" system for slurries where the wastes were pumped to the pit, and (2) "dry" backfill-type operations. All pits have been closed and no waste has been placed in any of the pits since the mid-1980s.

Waste Pits 1, 2, and 3 are capped with soil and a vegetative cover. Waste Pit 4 is covered with a synthetic cap. Waste Pits 5, 6, and the Clearwell have a water cover. The pits range in size from that of a baseball diamond to a football field and vary in depth from 13 to 30 feet. It is estimated that in excess of 600,000 cubic yards of contaminated materials will be associated with the cleanup of the waste pits.

RI/FS Activities

The Remedial Investigation (RI) report, and the Feasibility Study/Proposed Plan (FS/PP) for Operable Unit 1 have been approved by U.S. EPA. Data obtained from the Remedial Investigation were used in the Feasibility Study to develop, screen, and evaluate remedial technologies and alternatives for potential implementation to address identified environmental concerns. The purpose of the Feasibility Study report is to evaluate a range of available remedial action alternatives for permanent disposition of the Operable Unit 1 waste pit materials and associated contaminated environmental media, and to provide a basis for selection of the remedy.

In August 1994, the Final Proposed Plan for

Operable Unit 1 was published. The Proposed Plan summarized information from the Remedial Investigation and Feasibility Study reports, and the Baseline Risk Assessment, and identified the preferred remedial alternative for Operable Unit 1 and the rationale for the preference. The purpose of the Proposed Plan was to facilitate public participation in the Operable Unit remedy selection process. DOE held a public meeting August 23, 1994, and a 30-day public comment period was held in August/September 1994.

The Final Record of Decision for Operable Unit 1 was signed by DOE on January 24, 1995, and by U.S. EPA on March 1, 1995. Ohio EPA concurrence on the selected remedy presented in the Operable Unit 1 Final Record of Decision was received February 24, 1995. A response to comments received during the 30-day public comment period is included in the Responsiveness Summary, which is part of the Final Record of Decision.

The Operable Unit 1 Remedial Design Work Plan is currently being developed for submittal to U.S. EPA by May 1, 1995.

Dewatering Excavation Evaluation Program (DEEP)

The Dewatering Excavation Evaluation Program (DEEP), is a short-term field program aimed at determining the best technique to excavate the waste pit material. The field work will involve digging trenches in Waste Pits 1, 2, and 3 to test various types of excavation equipment and methods. Several different techniques are available for excavating wastes like those found in Operable Unit 1, and the DEEP tests will help identify the most efficient method.

Phase I of DEEP, which involved taking samples via borings to obtain data on the engineering properties of the wastes in the pits, and soils in the area, was completed in November 1994.

Phase II of the field work for the DEEP project, which was initiated in February 1995, consists of wet excavation activities in Waste Pits 1, 2, and 3. Although they are covered with soil, these waste pits contain water saturated wastes. Because wet excavation presents special challenges, the field program will provide information on the best way to remove water from the excavation area and help identify the best methods and equipment for excavation. Four excavations were performed in February 1995, one in each of Waste Pits 1 and 2, and two in Waste Pit 3. Three additional excavations, for slurry tests, are scheduled to begin in March 1995, one in each of Waste Pits 1, 2, and 3.

Prior to any of the Phase II excavations, affected surfaces will have been graded to control water drainage. In addition, dust controls measures will have been put in place, and monitors are positioned to check for emissions. The integrity of the waste pit liners will not be affected by this program.

Selected Remedial Action

The primary components of the selected remedy for Operable Unit 1, as identified in the Final Record of Decision for Remedial Actions at Operable Unit 1, include the excavation of the waste pit contents, waste processing and treatment by thermal drying, and off-site disposal at a permitted commercial disposal facility.

For More Information

Additional 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. The hours are 9 a.m. to 7 p.m. Monday and Thursday; 9 a.m. to 4:30 p.m. Tuesday, Wednesday, and Friday, and 9 a.m. to 1 p.m. Saturday.

FERNALD CITIZENS TASK FORCE

RECOMMENDATION FOR AN ON-SITE DISPOSAL FACILITY AT FERNALD

The Fernald Citizens Task Force recommends the construction of an on-site disposal facility to accept, from the Fernald site only, materials solely with low levels of contamination meeting the site-specific waste acceptance criteria.

The Fernald Citizens Task Force does not make this recommendation lightly. It is the result of one and one-half years of study, discussion, and evaluation. Disposition of contaminated material is one of four key recommendations required of the Task Force by our August 1993 charter. In the December 1993 work plan, we scheduled this decision for 1995. This schedule was then further refined in a revised work plan approved in December 1994. The draft final recommendation was prepared as scheduled in February 1995, with discussion and a public workshop on the full range of issues having been conducted as scheduled in January 1995. It is important to the Task Force that all our recommendations be based on a thorough evaluation of the technical information available, and through discussion and feedback with our neighbors surrounding Fernald. To this end, all of our meetings are open to the public and widely publicized, and all agendas are mailed to an extensive list of local residents and government officials. Comments are received at Task Force meetings, other public meetings attended by Task Force members, by mail, and through the Task Force message line.

All members of the Task Force live and work in communities that are impacted by the decisions being made at Fernald, and eight of 14 live and work in the direct vicinity of the site. No member of the Task Force wishes to see contaminated materials from Fernald or any other location stored on the Fernald property indefinitely. As it adjoins residential and agricultural lands and is situated directly above a sole source aquifer, Fernald is far from an ideal location for disposal of contaminated materials. Nevertheless, we are aware of the many engineering, political, and financial challenges facing a project the size of the Fernald cleanup. Our primary goals are protecting human health and the Great Miami Aquifer. We believe that a balanced approach to cleanup, in which the most hazardous materials are disposed off the Fernald property and the least hazardous materials are stored safely on the property, is the most effective way to achieve prompt and enduring protection for the communities surrounding Fernald. We ultimately arrived at this recommendation in consideration of the following:

- The more quickly source materials are taken out of the environment, the better the aquifer is protected and the more quickly it can be restored. The Fernald Citizens Task Force believes that an on-site disposal facility is the quickest way to protect the aquifer and the overall environment.

- The hazard of the material to be placed in the on-site disposal facility is very low. The maximum level of contamination that will be allowed in the disposal facility would allow for a land use as a developed park under cleanup levels recommended by the Task Force. The material is to be contained in a disposal facility solely for the purpose of protecting the aquifer over the long-term, and failure of the disposal facility would not present any immediate or significant threat to human health.

- In the off-site option, the risk of transporting the expected 2.4 million cubic yards of low-level contaminated soil and debris from the Fernald site to Utah and/or Nevada includes an estimated six fatalities to the public along the transportation routes, while relatively little health and safety risk is incurred by the public under the on-site option. Both on and off-site options require similar levels of work in excavating, loading, unloading, and disposing of materials; therefore, the risk to remediation workers in both options is roughly equivalent. The Fernald Citizens Task Force believes the on-site option is the most responsible with regard to overall safety.

- The cost of off-site disposal is three times that of on-site disposal. The Fernald Citizens Task Force believes that under current and foreseeable budget conditions, an off-site decision would greatly delay cleanup and may prevent any progress at all. An on-site disposal facility is thus more viable under the current budget and political constraints.

- Both states of Utah and Nevada have written to Fernald encouraging a balanced approach to cleanup. The Fernald Citizens Task Force is concerned that if the decision were made to send all Fernald waste and contaminated materials off site, we would face the likelihood of reprisals from other states resulting in our not being able to send any waste off site. The Fernald Citizens Task Force believes that it is of paramount importance that the off-site shipment of the most hazardous materials be the first priority of cleanup, and carried out expeditiously.

- Because the entire Fernald property is situated over a sole-source aquifer, only the lowest level materials, as defined by the site specific waste acceptance criteria, will be allowed into an on-site disposal facility. The waste acceptance criteria for Fernald were established by modeling the proposed disposal facility over a thousand year period to prevent any contamination from reaching the aquifer at levels that would exceed the federal maximum levels of contamination for drinking water. This modeling assumed only natural materials in providing

protection of the aquifer and excluded consideration of man-made liners that are subject to failure over the 1,000 year period.

- The Fernald Citizens Task Force wants to prevent any waste or contaminated materials coming to Fernald from other sites for permanent disposal or long-term storage . Under the Federal Facilities Compliance Act of 1992, that potential exists. By managing the Fernald materials fairly and effectively, the Fernald Citizens Task Force believes we will be in a more equitable position to prevent a decision to send outside wastes to Fernald.

The above considerations have convinced us that an on-site disposal facility is the most prudent and effective solution to Fernald's waste problems. The Fernald Citizens Task Force recommends the construction of an on-site disposal facility to accept, from the Fernald site only, materials solely with low levels of contamination meeting the site-specific waste acceptance criteria. However, on-site storage of low-level materials at Fernald is acceptable only in the context of the above considerations and under the following conditions, such considerations and conditions being inseparable from the recommendation:

- The Fernald Citizens Task Force strongly and unanimously opposes the use of the Fernald site for the permanent disposal or long-term storage of any waste or contaminated materials originating from other locations.

- Any on-site disposal facility will be built for long-term performance using the best design, technology, and engineering available.

- Any on-site disposal facility at Fernald will be designed to make the least possible negative aesthetic impact. The Fernald Citizens Task Force and the public at large shall be explicitly involved in the process for determining the ultimate appearance of the disposal facility.

- Any on-site disposal facility at Fernald will provide an adequate buffer area to minimize negative impacts to neighboring properties and the future use of the Fernald property. The Fernald Citizens Task Force and the public at large shall be explicitly involved in the planning and design process for the disposal facility.

- The U.S. federal government will retain permanent ownership of any property containing the disposal facility.

- The U.S. federal government will continually monitor the disposal facility and report these findings in a timely manner to residents and interested parties.

- The U.S. federal government will commit to retrieve and treat or redispose of the material contained in the disposal facility if a new, proven, and economically justified technology to manage these materials should become available.

- The U.S. federal government shall have in place adequate procedures to identify and correct any and all failures in performance of the disposal facility before any increased risk to public health occurs.

- The U.S. Department of Energy commits to the above conditions.

U.S. Department of Energy budget adjustments in the short or long term will not adversely impact the substance of our recommendation.

The above recommendation was approved by the Fernald Citizens Task Force on February 18, 1995 by a vote of nine supporting, one opposing, and one abstaining. The supporting considerations and conditions were approved unanimously on March 11, 1995. The dissenting voter believes the arguments to recommend on-site storage of materials containing low level contamination are outweighed by the following:

- The contamination problems at Fernald did not evolve from local concerns or result in sufficient local benefit to warrant the long-term impact on local communities from a disposal facility.

- Facilities in the western U.S. are geologically better suited for the long-term management of this material than is Fernald.

- Local communities do not wish to incur the stigma associated with a disposal facility.

- A disposal facility on the Fernald property limits the land available for productive reuse by local communities.

NUMBER OF DRUM EQUIVALENTS (DEs) SHIPPED TO NTS THRU MARCH 3, 1995

YEAR	DEs
1985	319
1986	8,877
1987	39,163*
1988	57,395
1989	55,029
1990	24,846
1991	43,522
1992	100,596
1993	110,743*
1994	77,962*
thru 3/3/95	33,180*
TOTAL	**493,209**

* Includes shipments to other locations than NTS:

1987 -- 16,615 DEs to Scientific Ecology Group (SEG)
-- 181 DEs to Toxic Substance Control Act (TSCA)

1993 -- 36,953 DEs to SEG
-- 4,326 DEs to TSCA

1994 -- 480 DEs to Envirocare
-- 6,767 DEs to SEG

1995 -- 250 DEs to Envirocare
2,095 DEs to SEG

MATERIALS/PRODUCT SHIPPED:

148,314 pounds to Manufacturing Science Corp. for FY 1995

DOE NEWS

MEDIA CONTACTS:
Bill Wicker, 202/586-5827
Jeff Smith, 202/586-1169

FOR IMMEDIATE RELEASE
February 24, 1995

CUTS STRIKE AT HEART OF CRITICAL PROGRAMS

DOE RESPONDS TO PROPOSED RESCISSIONS TO '95 BUDGET

Secretary of Energy Hazel O'Leary reacted strongly to recent actions by House Appropriations subcommittees that threaten the funding of key programs in the Department of Energy's current 1995 budget. "We strongly oppose these cuts. They strike at the heart of programs critical to the nation." These programs include:

-- Protecting the health and safety of workers involved in nuclear waste cleanup throughout the country.

-- Reducing the country's dependence on foreign oil.

-- Maintaining the nation's scientific and technological leadership in the global marketplace.

Deputy Secretary Bill White added, "There will be a human cost to such cuts, in terms of safety, health and economic security. We have reduced the Department's budget and we will take it down further, but these are not the proper cuts to make."

White cited in particular the following proposed cuts and their impacts:

- A $145 million cut in the Environmental Management budget could severely hamper cleanup at 133 sites in dozens of states around the country. The waste sites whose funding could be affected include, for example: high-level radioactive waste treatment at the West Valley site in upstate New York; a former nuclear processing facility in Paducah, Kentucky; Brookhaven National Laboratory on Long Island; and the Oak Ridge National Laboratory in Tennessee.

- A $6 million cut threatens environmental, health and safety programs at DOE sites in Tennessee, Colorado, South Carolina, Florida and New Mexico.

R-95-025

- MORE-

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- A proposed rollback of $14.8 million in weatherization means that 7,000 fewer poor and elderly households will be weatherized in 1995.

- A $20 million cut in alternative fuel vehicle Federal fleet purchases jeopardizes urban air quality and Federal/local partnerships in 34 American cities, and threatens another tool to reduce our dependence on foreign oil.

- A $2.5 million cut in the Rebuild America program will cost building owners and taxpayers an additional $200 million annually in energy costs.

- A $13.7 million cut in an innovative steel industry collaboration will damage technological efforts to make U.S. steel globally competitive, ensuring employment for steelworkers across the country.

- Voluntary corporate efforts to reduce industry pollution will be discouraged by a $1.5 million cut in the Climate Challenge program.

- A $5 million cut in the Advanced Computational Technology Initiative will eliminate or curtail up to one-third of the public/private partnerships that apply supercomputing capabilities of our national laboratories to improve domestic production of oil and natural gas.

- A $21 million reduction in the Naval Petroleum and Oil Shale Reserves will jeopardize compliance with environmental and safety requirements of well abandonment at the Teapot Dome Field in Wyoming and could accelerate the decline of the field's remaining reserves.

- A $15 million cut would delay construction of the Environmental Molecular Sciences Laboratory and the Human Genome Laboratory, affecting environmental restoration as well as the nation's effort to catalogue the human genome, one of the building blocks of 21st century medicine.

- A $7.5 million cut will delay the ability of the United States to conduct world-class neutron research in the chemical, materials and biomedical fields.

- An $8 million cut will mean terminating valuable cooperative research and development agreements (CRADAs) with industry, many of which are small businesses in the fields of biotechnology, manufacturing, materials and environmental technology.

R-95-025 - DOE -

DOE NEWS

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Jayne Brady, 202-586-5806

FOR IMMEDIATE RELEASE
February 23, 1995

PROPOSED CUTS TO ENERGY DEPARTMENT ENVIRONMENTAL AND SAFETY BUDGETS THREATEN SITES IN 26 STATES

Prospective Congressional budget cuts threaten environmental cleanup at Department of Energy (DOE) sites throughout the country. A proposed loss of $151 million from the 1995 environmental and safety budgets has the potential to severely hamper cleanup at more than 130 sites throughout the country. The department today released a list of 90 sites that would likely be affected by the most recent $51,000,000 cut proposed by the House Appropriations Subcommittee on Energy and Water Development. (Attached) Yesterday, the full House voted to rescind another $100 million in FY 1995 site cleanup funding at Department of Energy facilities.

Deputy Secretary of Energy William White, acting on behalf of Secretary Hazel O'Leary who is on a trade mission to China and India said, "We believe that the budget as enacted is necessary for meeting our legal and moral obligations."

"Congress cannot continue to cut away at this program without real consequences. We have already taken productivity improvement cuts of more than $2 billion between 1993 and 1996, and are in the midst of laying off 18,000 contractors employees," warned Thomas P. Grumbly Assistant Secretary for Environmental Management.

(MORE)

R-95-024

"If the Congress believes that there are unlimited efficiencies that can be gained by cutting this budget, they are wrong. We are dealing with some of the highest environmental risks in the world today, such as potentially explosive underground radioactive waste tanks and unstable weapons-usable plutonium. We have a duty and a moral obligation to protect the safety of the workers at these dangerous facilities and the communities that surround them," added Grumbly.

The waste sites whose funding could be affected by the cuts include: the high level radioactive waste treatment operations at the West Valley site in upstate New York; Brookhaven National Laboratory on Long Island, New York; the Oak Ridge National Laboratory in Tennessee.

- DOE -

R-95-024

Fernald Environmental Glossary

This fact sheet has been prepared as part of the effort to familiarize the public with the specific vocabulary used in discussions about environmental restoration and waste management at Fernald.

ALARA - As Low As Reasonably Achievable, or keeping radiation emissions and exposures to levels set as far below regulatory limits as is reasonably possible in order to protect public health and the environment.

alpha radiation - The most energetic but least penetrating form of radiation. It can be stopped by a sheet of paper and cannot penetrate human skin. However, if an alpha-emitting isotope is inhaled or ingested, it will cause highly concentrated local damage.

aquifer - A permeable body of rock capable of yielding quantities of groundwater to wells and springs.

AR - Administrative Record, a required, comprehensive file of documents that forms the basis of decisions made regarding cleanup at Fernald. It is available for public review and comment. (See **PEIC**).

ARARs - Applicable or relevant and appropriate requirements, a comprehensive set of laws and regulations that are relevant to guide the selection of cleanup activity at a particular site.

asbestos - A strong and incombustible fiber widely used in the past for fireproofing and insulation. The small, buoyant fibers are easily inhaled or swallowed, causing a number of serious diseases including: asbestosis, a chronic disease of the lungs that makes breathing more and more difficult; cancer; and mesothelioma, a cancer (specific to asbestos exposure) of the membranes that line the chest and abdomen.

atom - The smallest particle of an element having the chemical properties of that element; the fundamental building block of matter.

AWWT - Advanced waste water treatment

background radiation - The natural radioactivity in the environment. Natural radiation consists of cosmic rays, filtered through the atmosphere from outer space, and radiation from the naturally radioactive elements in the earth (primarily uranium, thorium, radium and potassium). Also known as natural radiation.

baseline risk assessment - (See **BRA**).

BDN - Biodenitrification, the process of breaking down nitrates into harmless elements through the use of living bacteria.

beta radiation - High-energy electrons (beta particles) emitted from certain radioactive material. Can pass through 1 to 2 centimeters of water or human flesh and can be shielded by a thin sheet of aluminum. Beta particles are more deeply penetrating than alpha particles but, because of their smaller size, cause less localized damage.

biological effects - The early or delayed results of biological damager caused by nuclear radiation (alpha, beta gamma).

biosphere - The part of the earth and its atmosphere in which living things exist.

BRA - Baseline risk assessment, the study and estimation of risk from taking no activity. Involves estimates of probability and consequence.

carcinogen - A cancer-causing agent.

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act (also known as Superfund), the federal law that guides cleanup of hazardous waste sites.

CFR - Code of Federal Regulations

characterization - Facility or site sampling, monitoring and analysis activities to determine the extent and nature of a release. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

CIS - Characterization investigation study

cleanup - The general term for environmental restoration, the process designed to ensure that risks to the environment and to human health and safety from waste sites either are eliminated or reduced to prescribed, safe levels.

closure plan - Documentation prepared to guide the deactivation, stabilization and surveillance of a waste management unit or facility under the Resource Conservation and Recovery Act.

conservation - The preservation of resources through efficient and careful use.

contamination - The presence of foreign materials, chemicals or radioactive substances in the environment (soil, sediment, water or air) in significant concentrations.

CRARE - Comprehensive Response Action Risk Evaluation.

CRU - CERCLA/RCRA unit, another term for the operable units at Fernald.

cubic meters - A volume equal to the volume of a cube measuring one meter in each dimension.

comment period - Time provided for the public to review and comment formally on a proposed action or decision.

community relations - The effort to establish two-way communication with the public to ensure public input into the decision-making process related to Superfund.

curie - A unit of radioactivity that represents the amount of radioactivity associated with one gram of radium. To say that a sample of radioactive material exhibits one curie of radioactivity means that the element is emitting radiation at the rate of 3.7 million times a second. Named after Marie Curie, an early nuclear scientist.

consent decree - Signed agreement between DOE and OEPA that mandate specific environmental improvements at Fernald

daughter product - An element formed by the radioactive decay of another element; often daughter products are radioactive themselves

DEs - Drum equivalents

decay - The process whereby radioactive particles undergo a change from one form, or isotope, to another, releasing radioactive particles and/or energy.

decontamination - The removal of unwanted material (typically radioactive material) from facilities, soils, or equipment by washing, chemical action, mechanical cleansing or other techniques.

defense wastes - Radioactive wastes resulting from weapons research and development, the operation of naval reactors, the production of weapons materials, the reprocessing of defense spent fuel, and the decommissioning of nuclear-powered ships and submarines.

disposal - Waste emplacement designed to ensure isolation of waste from the biosphere, with no intention of retrieval for the foreseeable future.

dioxin - One of the most hazardous of all chemicals, can cause both acute and long-term effects ranging from chloracne, a skin disease, to cancer, reproductive failures, and reduced resistance to infectious disease.

DOE - U.S. Department of Energy

DOE-FN - U.S. Department of Energy Fernald Field Office

dose - Quantity of radiation or energy absorbed; measured in rads. (See **rad**).

dose equivalent - A term used to express the amount of effective radiation received by an individual. A dose equivalent considers the type of radiation, the amount of body exposed, and the risk of exposure. Measured in rems. (See **rem**).

dosimeter - An instrument that measures exposure to radiation.

EA - A written environmental analysis that is prepared under the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require preparation of a more detailed environmental impact statement.

effluent - A waste discharged as a liquid.

electron - An elementary particle with a unit negative charge and a mass 1/1837 that of the proton. Electrons surround the positively charged nucleus and determine the chemical properties of

the atom.

EE/CA - Engineering evaluation and cost analysis

EIS - Environmental impact statement, required by the National Environmental Policy Act. (See **NEPA**).

element - Any of the 109 substances that cannot be broken down further without changing its chemical properties. Singly or in combination, the elements constitute all matter.

EMR - Environmental monitoring report also called the Annual Site Environmental Report

environmental restoration - The process of environmental cleanup designed to ensure that risks to the environment and to human health and safety from waste sites either are eliminated or reduced to prescribed, safe levels.

ERMC - Environmental restoration and management contractor

erosion control - Methods to control land surface features to prevent erosion by surface water or precipitation runoff.

EWMF - An engineered waste management facility, designed to store low-level radioactive wastes.

exposure - A measurement of the displacement of electrons from atoms caused by x-rays or by gamma radiation. Acute exposure generally refers to a high level of exposure of short duration; chronic exposure is lower-level exposure of long duration.

FEMP - Fernald Environmental Management Project, the name given Fernald when its missions was transferred from weapons production to environmental restoration

FERMCO - Fernald Environmental Restoration Management Corporation, the contractor selected in August 1992 to clean up Fernald

FFCA - Federal Facility Compliance Agreement, an agreement signed in 1986 between DOE and U.S. EPA; predates the Consent Agreement and the Amended Consent Agreement.

final disposition - Methods for permanent disposal of waste or contaminated media residuals following excavation/treatment.

fission - The splitting of a heavy nucleus into two or more radioactive nuclei, accompanied by the emission of gamma rays, neutrons and a significant amount of energy. Fission usually is initiated by the heavy nucleus absorbing a neutron, but it also can occur spontaneously.

FMPC - Feed Materials Production Center, the name of Fernald until 1991

FR - Federal Register

FRESH - Fernald Residents for Environmental Safety and Health

friable asbestos - Asbestos insulation that is loose and capable of becoming airborne.

FS - Feasibility study, the Superfund study following a remedial investigation which identifies, develops, evaluates and selects remedial action alternatives.

gamma rays - Penetrating electromagnetic waves or rays emitted from nuclei during radioactive decay, similar to x-rays. Dense materials such as concrete and lead are used to provide shielding against gamma radiation.

geohydrologic - Pertaining to groundwater and its movements through the geologic environment.

geohydrology - The science dealing with underground water, often referred to as hydrogeology.

groundwater - Waste beneath the earth's surface that fills pores between materials such as sand, soil or gravel. Groundwater is a major source of water for agricultural and industrial purposes and is an important source of drinking water for about half of all Americans.

half-life - The time required for a radioactive substance to lose 50 percent of its activity by decay. The half-life of the radioisotope plutonium-239, for example, is about 24,000 years. Starting with a pound of plutonium-239, in 24,000 years there will be one-half pound of plutonium-239, in another 24,000 years there will be one-fourth pound, and so on. (A pound of material remains, but it gradually becomes a stable element.)

hazardous waste - A solid waste or combination of solid wastes that, because of quantity, concentration or physical, chemical or infectious characteristics, may cause or significantly contribute to an increase

in mortality or an increase in serious, irreversible, or incapacitating reversible illness or pose a substantial hazard to human health or the environment when improperly treated, stored, transported, disposed or otherwise managed. About 290 million tons of hazardous wastes are generated in the United States each year. A small percentage (about 4 percent) is recycled. The rest is treated, stored or disposed. Of the hazardous wastes disposed, most are injected as a liquid into the ground in specially designed injection wells. A large quantity is placed in surface impoundments (pits, ponds and lagoons). A small portion is placed directly on the land or buried.

heavy metals - Metals that are dense. Examples include mercury, lead, silver, gold and uranium.

HEPA - High-efficiency particulate air

high-level radioactive wastes - Highly radioactive material, containing fission products, traces of uranium and plutonium, and other transuranic elements, that results from chemical reprocessing of spent fuel. Originally produced in liquid form, high-level waste must be solidified before disposal.

ion - Atomic particle, atom or chemical radical bearing an electric charge, either negative or positive.

ionization - Removal of electrons from an atom, for example, by means of radiation, so that the atom becomes charged.

ionizing radiation - Radiation that has enough energy to remove electrons from substances it pass through, forming ions.

isotopes - Atoms of the same element that have equal numbers of protons, but different numbers of neutrons. Isotopes of an element have the same atomic number by different atomic mass. For example, uranium-238 and uranium-235.

leachate - The solution formed when soluble components have been removed from a material.

leaching - To remove a soluble substance from a material by dissolving it in a liquid, and then removing the liquid from what is left.

LLW - Low-level waste, discarded radioactive material such as rags, construction rubble, glass, etc., that is only slightly or moderately contaminated. This waste usually is disposed of by land burial.

MCL - maximum contaminant level

millirem - A unit of radiation dosage equal to one-thousandth of a rem. A member of the public can safely receive up to 500 millirems per year, according to federal standards, but the U.S. EPA ordinarily limits public exposure to 25 to 100 mrem/year.

mixed waste - Contains both radioactive and hazardous components.

mobility - The ability of radionuclides to move through food chains in the environment.

monitoring well - A hole drilled into the ground with a pipe inserted to allow for the collection of groundwater samples.

natural radiation - Radiation that is always present in the environment from such sources as cosmic rays and radioactive materials in rocks and soils. Also known as background radiation.

NCP - National Oil and Hazardous Substances Pollution Contingency Plan

NEPA - National Environmental Policy Act, requires a study of the impacts of activities at federal facilities.

neutron - A particle that appears in the nucleus of all atoms except hydrogen. Neutrons are one of three basic particles that make up the atom. Neutrons have no electrical charge.

NLO - National Lead of Ohio, Inc., the company that operated Fernald from 1951 until 1986

NOA - Notice of availability, published when a document on some aspect of Fernald cleanup is issued. Documents are available in the administrative record and public reading room.

NOV - Notice of violation

NPDES - National Pollutant Discharge Elimination System

NPL - National Priorities List, the list of the nation's worst Superfund sites. Fernald was added in 1989.

NRC - Nuclear Regulatory Commission

NTS - Nevada Test Site, a repository for radioactive wastes.

nuclear radiation - Ionizing radiation originating in the nuclei of atoms; alpha, beta, and gamma radiation.

nucleus - The central part of an atom that contains protons, neutrons and other particles.

OEPA - Ohio Environmental Protection Agency

OSHA - Occupational Health & Safety Act

OU - Operable unit, or area of study that contains similar characteristics or problems. There are five operable units at Fernald.

pathways - The means by which contaminants move. Possible pathways include air, surface water, groundwater, plants and animals.

PCB - Polychlorinated biphenyl, a synthetic, organic chemical once widely used in electrical equipment, specialized hydraulic systems, heat transfer systems, and other industrial products. Highly toxic and a potent carcinogen. Any hazardous wastes that contain more than 50 parts per million of PCBs are subject to regulation under the Toxic Substances Control Act.

PEIC - Public Environmental Information Center, 10845 Hamilton-Cleves Highway, Harrison, Ohio 45030, which houses the administrative record and the public reading room. The phone number is 513-738-0165.

PEIS - Programmatic environmental impact statement, being conducted nationally by DOE.

picocuries - Measurement of radioactivity. A picocurie is one million millionth, or a trillionth, of a curie, and represents about 2.2 radioactive particle disintegrations per minute.

plume - A defined area of groundwater containing contamination that originates from a particular source such as a waste unit.

plutonium - An artificially produced element that is fissile and radioactive. It is created when an atom of uranium-238 captures a slow neutron in its nucleus.

PP - Proposed plan, a CERCLA document on which the public comments that summarizes what cleanup remedy has been selected, and why.

RA - Risk assessment, the study and estimation of risk from a current or proposed activity. Involves estimates of the probability and consequence of an action.

rad - Radiation absorbed dose, a measurement of ionizing radiation absorbed by any material. A rad measures the absorption of a specific amount of work (100 ergs) in a gram of matter.

radiation - Fast particles and electromagnetic waves emitted from the nucleus of an atom during radioactive disintegration.

radioactive - Giving off, or capable of giving off, radiant energy in the form of particles (alpha or beta radiation) or rays (gamma radiation) by the spontaneous disintegration of the nuclei of atoms. Radioisotopes of elements lose particles and energy through the process of radioactive decay. Elements may decay into different atoms or a different state of the same atom.

radioactive waste - A solid, liquid or gaseous material of negligible economic value that contains radionuclides in excess of threshold quantities except for radioactive material form post-weapons-test activities.

radioisotope - An unstable isotope of an element that eventually will undergo radioactive decay (i.e., disintegration). Radioisotopes with special properties are produced routinely for use in medical treatment and diagnosis, industrial tracers, and for general research.

radionuclide - A radioactive species of an atom.

radon - A radioactive gas produced by the decay of one of the daughters of radium. Radon is hazardous in unventilated areas because it can build up to high concentrations and, if inhaled for long periods of time, may cause lung cancer.

RCRA - Resource Conservation and Recovery Act, the federal environmental law designed to account for and ensure proper management of hazardous wastes, from creation to disposition

rem - Roentgen equivalent man, a unit used in radiation protection to measure the amount of damage to human tissue from a dose of ionizing radiation. Incorporates the health risks from radiation.

remedial action - Long-term cleanup activities

remedial design - A phase of remedial action that follows that remedial investigation/feasibility study

and includes development of engineering drawings and specifications for a site cleanup.

remediation - Those activities performed to remove or treat hazardous waste sites or to relieve their effects.

removal action - Interim cleanup activities that are identified as needed to protect public health and the environment

restoration - (See **environmental restoration**)

RI - Remedial investigation, the CERCLA process of determining the extent of hazardous substance contamination and, as appropriate, conducting treatability investigations.

RI/FS - Two distinct, but related studies, the remedial investigation and feasibility study. Together, they characterize environmental problems and outline remedial actions to solve those problems.

Risk assessment - (See **RA**)

risk communication - The exchange of information about health or environmental risks between risk assessors, risk managers, the general public, news media, interest groups, etc.

risk management - The process of evaluating alternative regulatory and non-regulatory responses to risk and selecting among them. The selection process necessarily requires the consideration of legal, economic and social factors.

ROD - Record of decision, a written decision that identifies the selected method for long-term cleanup of contamination at a site

SARA - Superfund Amendments and Reauthorization Act

scoping - In CERCLA, scoping is the initial planning phase of the cleanup process, when requirements are discussed and the projects defined. In the NEPA process, scoping relates to public involvement to help identify significant issues early so that efforts can be focused on those areas requiring resolution and to present a balanced environmental impact statement.

sludge - A semi-solid residue from any of a number of air or water treatment processes. Sludge can be a hazardous waste.

slurry - A watery mixture of insoluble matter that results from some pollution control techniques.

Superfund - The program operated under the legislative authority of CERCLA and SARA that funds and carries out the EPA solid waste emergency and long-term removal remedial activities. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority level on the list, and conducting and/or supervising the ultimately determined cleanup and other remedial actions.

solidification - The conversion of either liquid or loose hazardous waste into a solid.

solubility - A measure of how much of a given substance will dissolve in a liquid. Usually measured in weight per unit volume.

somatic effects - Effects of radiation limited to the exposed individual, as distinguished from genetic effects, which also affect subsequent, unexposed generations.

stable isotope - An isotope of an element that is not radioactive.

SWCR - Site-wide characterization report

thorium - A naturally-occurring radioactive element

threshold dose - The minimum dose of radiation that will produce a detectable effect.

toxic - Relating to a harmful effect by a poisonous substance on the human body by physical contact, ingestion or inhalation.

toxicology - The science that deals with poisons and their effects on plant, animal and human life.

transuranic wastes - Waste materials contaminated with isotopes above uranium in the periodic table. Transuranic waste is long-lived, but only moderately radioactive.

treatment - Any activity that alters the chemical or physical nature of a waste to reduce its toxicity or prepare it for disposal.

uranium - The heaviest element found in nature. Approximately 997 out of every 1000 uranium atoms are uranium-238. The remaining 3 atoms are the fissile uranium-235. The uranium-235 atom splits, or fissions, into lighter elements when its

nucleus is struck by a neutron.

U.S. EPA - United States Environmental Protection Agency, sometimes referred to as EPA.

UST - Any underground storage tank or associated piping containing hazardous materials.

vitrification - A method of immobilizing waste that produces a glass-like solid that permanently captures the radioactive materials.

VOCs - Volatile organic compounds, chemicals that contain carbon and commonly also contain hydrogen, oxygen and other elements. The prefix "volatile" means that the compound evaporates rapidly. Most industrial solvents are volatile. Found in some liquid and air waste releases.

WAC - Waste Acceptance Criteria

waste minimization - Employing new techniques to reduce the amount of hazardous and radioactive wastes generated to as low a level as possible.

WEMCO - Westinghouse Environmental Management Company of Ohio, the contractor who ran Fernald from 1986 until December 1, 1992. Formerly WMCO, for Westinghouse Materials Company of Ohio.

x-rays - Electromagnetic radiations used in medical diagnosis; a penetrating electromagnetic radiation, usually generated by accelerating atoms to high velocity and suddenly stopping them by collision with a solid body.

Concentration Comparisons

Parts per million:

- One automobile in bumper-to-bumper traffic from Cleveland to San Francisco
- One drop of gasoline in a full-size car's tankful of gas
- One facial tissue in a stack taller than the Empire State Building
- One pancake in a stack four miles high

Parts per billion:

- One silver dollar in a roll of silver dollars stretching from Detroit to Salt Lake City
- One kernel of corn in enough corn to fill a 45-foot-silo, 16 feet in diameter
- One sheet in a roll of toilet paper stretching from New York to London

Parts per trillion:

- One square foot of floor tile on a kitchen floor the size of Indiana
- One drop of detergent in enough dishwater to fill a train load of railroad tank cars 10 miles long
- One mile on a two-month journey at the speed of light

Parts per quadrillion:

- One postage stamp on a letter the size of California and Oregon combined
- The palm of one's hand resting on a table the size of the United States
- One human hair out of all the hair on all the heads of all the people in the world
- One mile in a journey of 170 light years

Sources:

- *Glossary of Environmental Restoration Terms and Acronym List* (EPA/OPA-87-017, August 1988)
- *Glossary of Environmental Restoration* (DOE, Office of Environmental Restorations and Waste Management, Oak Ridge Operations, October 1990 and October 1991)

Revised: October 1994