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**IMPLEMENTATION PLAN FOR THE REMEDIAL INVESTIGATION  
FEASIBILITY STUDY ENVIRONMENTAL IMPACT STATEMENT FOR  
REMEDIAL ACTIVITIES AT OPERABLE UNIT 2 AND OTHER  
OPERABLE UNITS - (USED AS A REFERENCE IN OU2 RI REPORT)**

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**IMPLEMENTATION PLAN  
FOR THE  
REMEDIAL INVESTIGATION/  
FEASIBILITY STUDY  
ENVIRONMENTAL IMPACT STATEMENT  
FOR REMEDIAL ACTIVITIES AT  
OPERABLE UNIT 2  
AND OTHER OPERABLE UNITS**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
CINCINNATI, OHIO**

**REMEDIAL INVESTIGATION AND FEASIBILITY STUDY-  
ENVIRONMENTAL IMPACT STATEMENT**

OU2RI  
Ref

**Volume 1 of 2**

**June 1992**

**U.S. DEPARTMENT OF ENERGY  
OFFICE OF ENVIRONMENTAL MANAGEMENT  
CINCINNATI, OHIO**

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**FINAL**

TABLE OF CONTENTS  
VOLUME 1

	<u>PAGE</u>
List of Tables	ii
List of Figures	ii
List of Acronyms	iii
1.0 Introduction	1-1
1.1 Site Background	1-1
1.2 NEPA/CERCLA Integration Approach	1-2
1.3 Purpose of Implementation Plan	1-3
2.0 Proposed Action and Remedial Alternatives	2-1
2.1 Operable Unit Approach	2-1
2.2 Proposed Actions for Operable Units 1, 2, 3, 4, and 5	2-1
2.2.1 Operable Unit 1	2-1
2.2.2 Operable Unit 2	2-1
2.2.3 Operable Unit 3	2-3
2.2.4 Operable Unit 4	2-3
2.2.5 Operable Unit 5	2-4
2.2.6 Site-wide Comprehensive Operable Unit	2-4
2.2.7 General Response Actions	2-5
3.0 Description of Scoping Process	3-1
3.1 Issues Included in the RI/FS-EIS NOI	3-1
3.2 Issues Resulting from Public Scoping	3-4
3.3 Related Scoping Process for the Programmatic Environmental Impact Statement for Environmental Restoration and Waste Management	3-4
4.0 Environmental Impact Statement Preparation	4-1
4.1 Outline for the Remedial Investigation Report	4-1
4.2 Outline for the Feasibility Study-Environmental Impact Statement	4-1
4.3 Schedule	4-2
4.4 Development Procedures	4-2
4.5 Disclosure Statement	4-4
4.6 Agency Consultation	4-4
Appendix A - Environmental Impact Statement Scoping Issues	
Appendix B - Scoping Meeting Transcripts and Written Comments	Vol. 2
Appendix C - Scoping Issue Categories Identified on Transcripts and Written Comments	Vol. 2

### LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
3-1	RI/FS-EIS Public Scoping Issue Categories	3-6

### LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
2-1	Operable Units Location Map	2-2
3-1	Fernald RI/FS-EIS Significant Issues	3-2
4-1	RI/FS-EIS Document Review Timeline	4-3

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## LIST OF ACRONYMS

ARAR	applicable or relevant and appropriate requirements
ASI	Advanced Sciences, Inc.
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EWMF	<i>engineered waste management facility</i>
EE/CA	engineering evaluation/cost analysis
EIS	environmental impact statement
EM	Environmental Restoration and Waste Management
EPA	U.S. Environmental Protection Agency
ETPSF	engineered treatment, packaging, and staging facility
FEMA	Federal Emergency Management Agency
FEMP	Fernald Environmental Management Project
FFCA	Federal Facility Compliance Agreement
FMPC	Feed Materials Production Center
FRESH	Fernald Residents for Environmental Safety and Health
FS	feasibility study
HSL	<i>Hazardous Substance List</i>
IT	International Technology Corporation
NEPA	National Environmental Policy Act
NOI	Notice of Intent
OSHA	Occupational Safety and Health
PCB	polychlorinated biphenyls
PEIS	Programmatic Environmental Impact Statement
PP	proposed plan
RA	risk assessment
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RI/FS-EIS	Remedial Investigation/Feasibility Study-Environmental Impact Statement
ROD	record of decision
VOC	volatile organic compounds
WEMCO	Westinghouse Environmental Management Company of Ohio

## 1.0 INTRODUCTION

### 1.1 SITE BACKGROUND

The Fernald Environmental Management Project (FEMP) (formerly called the Feed Materials Production Center [FMPC]) is a Department of Energy (DOE)-owned facility formerly utilized for the production of uranium metal used in U.S. defense programs. It is located on a 1050-acre site in a rural area about 18 miles northwest of Cincinnati, Ohio. The production facilities occupy approximately 136 acres near the center of the site. Most of the site, including all of the production and waste-management facilities, is located within Hamilton County, Ohio, with the exception of about 200 acres located in southern Butler County, Ohio. The villages of Fernald, New Baltimore, Ross, New Haven, and Shandon are all located within a few miles of the FEMP.

*Production activities at the FEMP involved the chemical processing of uranium that resulted in a product called a uranium derby. A portion of the derbies produced at the FEMP were sent directly to other DOE sites, while the remainder were remelted to form uranium ingots. Ingots varied in size, weight, and shape according to how they were used at the FEMP and at other DOE sites. Some Ingots were machined into uranium billets which were then shipped to other DOE sites, principally Savannah River and Hanford.*

*Production operations at the FEMP have resulted in 5 major areas of contamination (or Operable Units [OUs] under the Comprehensive Environmental Response, Compensation and Liability Act [CERCLA]) that must be addressed through CERCLA remedial action. The FEMP Operable Units include: OU1) Waste Pits 1 through 6, Burn Pit, and Clearwell; OU2) Other Waste Areas; OU3) Production Area and Suspect Areas; OU4) Silos 1, 2, 3, and 4; OU5) Environmental Media.*

Production activities at the site ceased in July 1989 and the overall mission of the FEMP has been directed to environmental restoration and cleanup. On February 19, 1991, DOE submitted a Closure Report and Training and Job Placement Services Plan to Congress. Following the 120 day congressional review, the site formally closed.

DOE is in the process of investigating the environmental effects of past and present activities at the FEMP in Fernald, Ohio. Remedial actions will be developed, assessed, and implemented to protect human health and the environment from releases or potential releases of hazardous or radioactive substances at or from the FEMP.

On July 18, 1986, a Federal Facility Compliance Agreement (FFCA) pertaining to environmental impacts associated with years of operation at the FEMP was signed by DOE and the U.S. Environmental Protection Agency (EPA). The FFCA was entered into pursuant to Executive Order 12088. On November 21, 1989, the FEMP was listed on EPA's National Priorities List. Since that time, DOE and the EPA have negotiated a CERCLA 120 and 106(a) Consent Agreement (Consent Agreement). An amended Consent Agreement was signed on September 20, 1991 following a dispute resolution between EPA and DOE.

Within the CERCLA framework, remedial investigations (RI) are being done to determine the nature and extent of any release, or threat of release of hazardous or radioactive substances, pollutants, or contaminants, and to gather all necessary data to support the feasibility studies (FS). The purpose of the FS is to develop and evaluate remedial action alternatives to protect human health and the environment from releases or threatened releases of hazardous or radioactive substances, pollutants, or contaminants at the FEMP.

|| *The NEPA process is being integrated with the CERCLA RI/FS process. Each OU will have integrated RI/FS-NEPA documentation that will evaluate alternatives consistent with those being considered in the CERCLA process. The integrated RI/FS-NEPA documentation will also assess a broader range of environmental impacts (e.g. socioeconomic and cumulative).*

## 1.2 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)/CERCLA INTEGRATION APPROACH

DOE policy on NEPA/CERCLA integration is set forth in DOE Order 5400.4. It incorporates policies established by a policy notice issued in August 1988 by the DOE Office of Assistant Secretary for Environment, Safety and Health. According to the order, integration is to be accomplished by conducting the NEPA and CERCLA environmental planning and review procedures concurrently. Integration is intended to (1) avoid duplicate effort and the larger commitment of resources that would be needed to implement both NEPA and CERCLA separately, (2) avoid conflicts in analysis and the choice of a remedial alternative, and (3) minimize the risk of delaying remedial actions on procedural grounds.

|| *The primary instrument for DOE's NEPA-CERCLA integration is to be the RI/FS process, supplemented as needed to meet the procedural and documentation requirements of NEPA. The final product will be a single, integrated set of documents; namely, an RI report and a combined FS/Environmental Impact Statement (EIS) report that satisfy the requirements of both NEPA and CERCLA.*

|| The NEPA/CERCLA integration approach published in the Notice of Intent (NOI) (55 Federal Register 20183, May 15, 1990) concluded that:

- An RI/FS-EIS is the appropriate level of NEPA documentation for the lead operable unit
- NEPA/CERCLA integration will also be provided in the remaining operable unit RI/FS-NEPA documents. These documents will be "tiered" to (or reference) the lead RI/FS-EIS and will present impacts specific to the operable units and update site-wide and cumulative impacts, as necessary.

|| *The ROD for OU4 was initially scheduled to be issued before the other OUs and it would have been the OU considered in the lead RI/FS-EIS. However, after submittal of the RI for OU4, EPA determined that the characterization effort to support the initial RI was incomplete and additional characterization activities were required. Therefore, the subsequent delays in the OU4 schedule resulted in OU2 becoming the lead operable unit.*

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|| The RI/FS-EIS for OU2 will evaluate the impacts of various site-wide alternatives (e.g. engineered waste management facility, packaging/treatment facility) that may be proposed for use in the handling/disposal of waste from some or all operable units. However, only existing information available at the completion of the first operable unit FS will be used for this assessment. This analysis will be updated in subsequent operable unit RI/FS-NEPA documentation.

The lead RI/FS-EIS will consider only remedial alternatives that are being developed for the Fernald facility and not national DOE waste management strategies.

Environmental impacts of the RI/FS sampling program and removal actions are being addressed in separate NEPA documentation.

|| The strategy outlined in the Consent Agreement for the RI/FS will facilitate the analysis of cumulative impacts and the implementation of the tiering process.

1. DOE is performing a one-time Site-wide Characterization to summarize all site data available as of 12/01/91. This report will contain a Preliminary Baseline Risk Assessment (PBRA) that characterizes the current and potential threats to human health and the environment that may be posed by contaminants at the entire site if no further controls are applied. DOE will identify in the PBRA the Leading Remedial Alternative for each of the operable units 1 through 5, based on the data and best professional judgement.
2. Once a remedial action alternative has been selected for each of the operable units, DOE will develop a comprehensive response action risk evaluation. This risk evaluation will evaluate the residual risk associated with the proposed alternative and factor in the cumulative risk associated with the remedial action alternative for the other operable units. The purpose of this analysis is to evaluate the potential risk from each proposed alternative in the context of the risk posed by the site as a whole. The cumulative residual risk contribution from the other operable units will be estimated based upon the selected alternative (for OUs that have already reached a decision point), or the leading remedial alternative as presented in the PBRA.

### 1.3 PURPOSE OF IMPLEMENTATION PLAN

|| The main purpose of this RI/FS-EIS Implementation Plan is to: 1) record the results of the scoping process and 2) to provide DOE with guidance in the preparation of the RI/FS-EIS. A record of the scoping process is provided in the three appendices to the RI/FS-EIS Implementation Plan. Appendix A provides a summarization of the comments received during the scoping process and a summarization of DOE's responses to these comments. Appendix B provides the scoping meeting transcripts and the written comments. Appendix C provides the scoping issue categories identified on transcripts and written comments.

|| This Implementation Plan also provides a description of the proposed actions and remedial alternatives, a list of  
|| environmental issues to be considered in the RI/FS-EIS (including those identified during public scoping activities),  
|| a list of proposed agency consultations, the timing relationship between the NEPA compliance process and the  
|| CERCLA project planning and decision-making, and a detailed outline for the RI/FS-EIS.  
||

## 2.0 PROPOSED ACTION AND REMEDIAL ALTERNATIVES

### 2.1 OPERABLE UNIT APPROACH

DOE's approach at the FEMP is to expedite remediation through the use of the operable unit concept. Operable units are similar groupings of facilities and environmental media that will enable DOE to expedite the decision making on remedial actions for the highest priority operable units while awaiting necessary data and related analysis on other operable units. The FEMP operable units as defined in the 1991 amended Consent Agreement between EPA and DOE are: 1) Waste Pits 1 through 6, Clearwell, and Burn Pit; 2) Other Waste Areas; 3) Production Area and Suspect Areas; 4) Silos 1, 2, 3, and 4; 5) All Environmental Media. These operable units are identified in Figure 2-1.

### 2.2 PROPOSED ACTIONS FOR OPERABLE UNITS 1, 2, 3, 4, AND 5

#### 2.2.1 Operable Unit 1

Operable Unit 1 includes six waste pits, the burn pit, a collection and settling basin known as the Clearwell, berms, liners, and soil within the operable unit boundary which is located in the northwestern portion of the FEMP. The waste pits are no longer in use. Waste Pits 1, 2, 4, and 6 were mostly used for disposal of dry radioactive waste. Waste Pits 4 and 5 also contain hazardous constituents. The estimated volume of these four waste pits is 112,000 cubic yards. Waste Pits 3 and 5 were used for treatment of liquid wastes and contain uranium, thorium, and other constituents; the estimated volume is 329,500 cubic yards. The burn pit was used to burn waste materials, including pyrophoric and reactive chemicals, oils, and other combustible low-level radioactive material. Use of the burn pit was discontinued in 1986. The Clearwell was used as a collection and settling basin for liquid overflow from Pit 5 and for runoff from the waste storage area; since shutdown of the process flow to Pit 5 in early 1987, use of the Clearwell has been limited to collecting surface storm water runoff from the waste pit area. The intent of the remedial action is to stabilize, isolate or treat the waste and any associated contamination to prevent the release or migration of contaminants to the environment. During 1992, a removal action is being undertaken to mitigate the discharge of contaminated runoff into Paddy's Run.

#### 2.2.2 Operable Unit 2

Operable Unit 2, Other Waste Areas, includes the north and south lime sludge ponds, active flyash pile, inactive flyash disposal area, the South Field disposal area, the solid waste landfill, berms, liners, and soils within the operable unit boundary. The lime sludge ponds, located in the waste storage area, are settling/drying beds for alkaline sludges produced from the treatment of the raw water supply to FEMP. The ponds encompass an area of approximately two acres; the sludge volume is estimated at 11,500 cubic yards for each pond. The flyash piles contain flyash from the on-site coal-fired boiler plant and are located southwest of the production area. In the past, the inactive flyash disposal area was sprayed with oils (contaminated with uranium) to control dust. Approximately 1000 kg of uranium is estimated to have been present in these waste oils.

6382

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FIGURE 2-1

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The South Field, located at the northern edge of the inactive flyash disposal area, was used to dispose of uranium-contaminated construction rubble. The flyash disposal areas and the South Field encompass an estimated 16 acres. The solid waste landfill is located northeast of the waste storage area and served as the disposal site for waste paper, rags, and other types of solid sanitary wastes from the production facilities. The solid waste units are distinguished by the presence of large volumes of solid waste materials, but only small amounts of chemical or radioactive wastes, that were mixed with the solid wastes during the years of operation.

### 2.2.3 Operable Unit 3

|| *Operable Unit 3, Production and Production Associated Facilities within the former production area including, but not limited to, all above- and below-grade improvements, structures, equipment, utilities, drums, tanks, solid waste, waste, product, thorium, effluent lines, K-65 transfer line, wastewater treatment facilities, fire training facilities, scrap metal piles, feedstock, and the coal pile. The RI/FS work plan addendum to address the increase in the scope of OU3 to include decontamination and decommissioning (D&D) is currently under review at EPA.*

A removal action has been initiated to address uranium contaminated perched groundwater found under Plants 2/3, 6, 8, and 9. In each of the plants, potentially contaminated perched water will be pumped from the wells, sampled, stored in holding tanks, and transported by tanker truck to a central collection tank in Plant 8. All samples will be analyzed for *Hazardous Substance List (HSL)* constituents. An activated carbon filtration system will be installed in Plant 8 to treat the water stored in the collection tank. The filtration system will remove Volatile Organic Compounds (VOC) which have been determined to be in the perched water below each of the plants. The water will be sampled before and after treatment in the charcoal filter. The treated water will then be discharged to the existing Plant 8 treatment system.

### 2.2.4 Operable Unit 4

|| *Operable Unit 4 includes the K-65 Silos (Silos 1 and 2), the metal oxide silo (Silo 3), an unused silo (Silo 4), the decant tank system, berms, liners, and soils within the operable unit boundary. These are located south of the waste pit area in the northwestern portion of the FEMP. The domed waste storage silos measure 80 feet in diameter, 36 feet high to the center of the silo dome, and 27 feet to the top of the vertical walls. The walls are eight inch-thick concrete as are the outer part of the domes, which taper to four inches at the center. Silos 1 and 2 are surrounded by an earthen berm to a level of approximately 26 feet while the metal oxide silo and Silo 4 are free-standing. Silos 1 and 2 are used for the storage of radium-bearing residues formed as by-products of uranium ore processing. They received waste residues from 1952 to 1958. Waste raffinates were pumped into the silos where the solids would settle. The primary radioactive constituents of Silos 1 and 2 are radium (Ra-226), thorium (Th-230), and uranium. The majority of the waste material is silica and metallic compounds.*

|| *A Removal Action to apply a bentonite clay cap over the residues in Silos 1 and 2 and subsequently reduce radon emissions from the silos was completed on November 28, 1992. Sampling of the berms and soil beneath the silos was also completed on August 10, 1991.*

### 2.2.7 General Response Actions

Proposed general response actions are being considered for evaluation for appropriate waste units within Operable Units 1 - 5. The response actions include, but are not limited to the following:

- No action
- In-place stabilization/isolation of contaminated media
- Waste treatment
- On-site storage
- On-site disposal
- Off-site disposal
- Groundwater remediation

To implement some of the above technologies, an engineered disposal facility (EDF) and an engineered treatment, packaging, and staging facility (ETPSF) may be required to accept waste from more than one operable unit. Waste Acceptance criteria will be established for the EDF. Prior to placement in the EDF, waste may be processed in the ETPSF. The impacts of these site-wide facilities will be evaluated in the RI/FS-EIS.

was also completed on August 10, 1991.

Silo 3 contains uranium, radium (Ra-226), thorium (Th-230), silica, and other metal oxides. Silo 4 was never used and remains empty with the exception of some infiltrated rainwater.

#### 2.2.5 Operable Unit 5

Operable Unit 5, All Environmental Media, includes those environmental media that represent pathways and/or environmental receptors presently or potentially affected by the release of radionuclides or chemicals from the FEMP: all surface soils and sediments not included in other operable units; Great Miami Buried Valley Aquifer; Great Miami River; Paddy's Run; storm water outfall ditch; flora and fauna; and ambient air.

Leachate from the waste pits can potentially migrate vertically to the regionally important Great Miami Buried Valley Aquifer which underlies the site. This aquifer serves as a principal source of domestic, municipal, and industrial water throughout the region, and was designated as a sole source aquifer by EPA on July 8, 1990; this designation requires EPA review of federal financially assisted projects planned in sole source aquifer areas and recharge zones to determine that "no significant hazard to public health" exists due to the project.

Areas of the Great Miami Buried Valley Aquifer exhibit elevated levels of uranium both within and outside the FEMP boundary. Portions of a plume of contaminated groundwater extend south of the FEMP boundary and pose a potential threat to human health. To be consistent with commitments in the Consent Agreement, a removal action is scheduled for the "south plume" prior to the completion of the environmental media RI/FS and the implementation of a final remedial action for the regional aquifer. Operable Unit 5 will continue to assess groundwater contamination, the migration of the south plume, and the determination of the need for future actions for the south plume and any additional areas of groundwater contamination.

#### 2.2.6 Comprehensive Site-wide Operable Unit

Following the selection of a remedial action alternative for the last OU (currently OU3), DOE will undertake an evaluation of the remedies for Operable Units 1-5 (including removal actions) to ensure they are protective of human health and the environment on a site-wide basis, as required by CERCLA, the NCP and applicable U.S. EPA policy and guidance.

Proposed general response actions are being considered for evaluation for appropriate waste units within Operable Units 1 - 5. The response actions include, but are not limited to the following:

- No action
- In-place stabilization/isolation of contaminated media
- Waste treatment
- On-site storage
- On-site disposal
- Off-site disposal
- Groundwater remediation

To implement some of the above technologies, an engineered disposal facility (EDF) and an engineered treatment, packaging, and staging facility (ETPSF) may be required to accept waste from more than one operable unit. Waste Acceptance criteria will be established for the EDF. Prior to placement in the EDF, waste may be processed in the ETPSF. The impacts of these site-wide facilities will be evaluated in the RI/FS-EIS.

### 3.0 DESCRIPTION OF SCOPING PROCESS

|| *The Council on Environmental Quality (CEQ) and DOE NEPA Regulations (10 CFR 1021) require that DOE establish a scoping period so the public may identify issues to be analyzed in the EIS. For the RI/FS-EIS, significant issues have been identified from: 1) the issues listed in the RI/FS-EIS NOI; 2) issues identified during the RI/FS-EIS scoping period; 3) Related scoping process for the programmatic EIS for Environmental Restoration and Waste Management.*

According to NEPA Regulations, the issues are evaluated to determine those to be analyzed in the proposed EIS. The selection of issues is based on:

- level of concern expressed in the public scoping process
- the overall extent and intensity of the issue
- whether the issue is addressed in another NEPA program or document
- the relevance of the issue to the proposed action

The issues identified in the 1986 FEMP scoping period, those listed in the Notice of Intent, and issues identified in the 1990 RI/FS-EIS scoping period are categorized and discussed in the following text. A summarization of this process and the significant issues is shown in Figure 3-1.

#### 3.1 ISSUES INCLUDED IN THE RI/FS-EIS NOI

|| DOE began the scoping process to prepare an EIS to address *site renovation and environmental restoration* at the FEMP with the publication of a NOI in the Federal Register on August 19, 1986 (FR 29583 - 29587), amended on September 8, 1986 (to extend the comment period and hold a second scoping meeting).

Because DOE has made a decision to permanently cease production at the site, DOE withdrew its Notice of Intent to prepare an EIS for site renovation on December 10, 1991 (56 FR 64504).

|| Past DOE proposals (such as the FEMP Renovation and Environmental Restoration EIS) have helped identify a number of the potential issues related to the proposed FEMP remedial actions that are listed in the NOI for the RI/FS-EIS. *The NOI to prepare the RI/FS-EIS and hold public scoping meetings was published by the DOE in the Federal Register on May 15, 1990 (55 FR 20183-20188) and was amended on June 28, 1990 (to extend the comment period).* The following is a list of major issues that are identified in the NOI and may require analysis in the RI/FS-EIS:

- Potential radiological and chemical issues and health risks:
  - Related to human exposure, including exposure to workers and the public, individuals and the total population, children and adults, present and future generations
  - Along transportation routes and near other sites included in the alternatives

FIGURE 3-1

- Associated with various pathways to individuals, including surface waters and groundwater, soils and sediments, flora and fauna (including crops and livestock), and gases, dust, and particulates
  - Associated with both routine operations and accidents
  - Associated with human intrusion into the contaminated materials
  - Due to natural forces such as erosion and flooding
- Potential socioeconomic impacts:
    - Associated with land use
    - Related to local transportation systems
    - Related to economic activities near the site
  - Potential institutional issues:
    - Project-specific criteria for decontamination, effluent concentrations, and release of the property or portions thereof for unrestricted or restricted uses
    - Future institutional controls for monitoring and maintenance
    - Institutional issues related to the implementation of alternatives
    - Siting of any necessary treatment, storage or disposal facilities
  - Potential engineering and technical issues:
    - The most reasonable engineering options for each type of waste/residue
    - Probable duration of waste isolation or stabilization
    - Rates and magnitude of loss of containment
  - Potential ecological issues:
    - Related to terrestrial and aquatic habitats
    - Related to chemical contamination, as well as radiological impacts
    - Related to wetlands
    - Effects on the regional aquifer
    - Related to site-specific hydrology
  - Issues related to the CERCLA criteria for selection of a remedial action:
    - Compliance with applicable or relevant and appropriate requirements (ARAR);
    - Protection of human health and the environment
    - Short-term effectiveness
    - Long-term effectiveness and performance
    - Reduction of toxicity, mobility, and volume
    - Implementability
    - Cost
    - State acceptance
    - Community acceptance
    - Cumulative Impacts

### 3.2 ISSUES RESULTING FROM PUBLIC SCOPING

Two scoping meetings were held in the potentially affected communities located near the FEMP during June, 1990. The public, interested organizations, and federal, state, and local agencies were invited to provide oral comments at the scoping meetings and to submit written comments until the close of the EIS scoping period on June 29, 1990. Scoping comments were received from seven organizations, two government agencies, and four individuals. A total of 25 statements were received during the scoping period. Most of these scoping statements contained multiple scoping issues; each scoping issue was categorized and considered in the development of the RI/FS-EIS Implementation Plan.

A copy of scoping meeting transcripts and comment letters with identified issue brackets are available as separate appendices to this Plan, Appendices B and C. The manner in which these comments will be included in the RI/FS-EIS is addressed in Appendix A. Table 3-1 provides a listing of the issue categories and the number of commentors for each category. The following is a list of comments considered to be beyond the scope of the RI/FS-EIS:

- The content and schedule of the Renovation EIS
- The authority and availability of DOE at the FEMP
- Procedures for audits and hazardous waste inventories at the FEMP
- Impacts of continued uranium production
- Analysis of FEMP releases using a mass balance approach, as being done by the Center for Disease Control
- Provision of a public water supply for Crosby Township
- Provision of community service or assistance programs to benefit all residents

### 3.3 RELATED SCOPING PROCESS FOR THE PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

In November 1989, the Secretary of Energy established the DOE Office of Environmental Restoration and Waste Management (EM) for the purpose of consolidating the Department's environmental restoration and waste management activities. In January 1990, the Secretary determined that DOE will prepare a Programmatic Environmental Impact Statement (PEIS) on a newly proposed integrated environmental restoration and waste management program.

The Department is committed to ensuring that potential risks to human health and the environment from the cleanup of contamination resulting from past operations and from future waste management activities are at levels which ensure the protection of human health and the environment. DOE is further committed to full compliance with environmental regulations and to a goal of completing environmental restoration by 2019.

Historically, DOE environmental restoration and waste management operations have been conducted on a site-by-site basis. This practice has led to differing approaches to cleanup and waste management among DOE sites. The PEIS will assess broad programmatic issues and integrated approaches to DOE's environmental restoration and waste management activities. DOE aims, to the extent this is feasible, for the PEIS to provide the primary

environmental basis for selecting waste management methods and technologies and the locations at which they would be implemented.

The FEMP will be considered within the PEIS. This is because the FEMP requires environmental restoration that will generate large volumes of radioactive, hazardous, and mixed waste. Thus, the PEIS may have an impact on disposal alternatives and planning for potential interim storage of these wastes at the FEMP.

**TABLE 3-1**  
**RI/FS-EIS PUBLIC SCOPING ISSUE CATEGORIES**  
**AND NUMBER OF COMMENTORS**

Category	No. of Commentors
1. FEMP NEPA Process	
Renovation and Site Evaluation EIS	3
FEMP RI/FS-EIS	8
Public Participation	6
Notification	6
Extended Comment Period	2
Cooperating Agency	5
2. DOE Authority/Responsibility	7
3. EIS Proposed Action and Alternatives	
Cost	4
Monitoring	5
Wastes	5
Cleanup	3
Cleanup Methods	7
Cleanup Standards	3
Separation of Cleanup and Production Alternatives	3
Disclosure of Alternatives	6
Evaluation of Alternatives	1
No Action	4
Testing, Sampling, and Analysis	1
4. Environmental Impact Issues	
General	5
Health and Safety	11
Impact to Nearby Residents	4
Protection of Groundwater	6
Public Water Supply	7
Surface Water Contamination	9
Transportation	2
Ecological Issues	4
Air Quality/Climate	4
Socioeconomic	2
Cumulative Impacts	3

#### 4.0 ENVIRONMENTAL IMPACT STATEMENT PREPARATION

The final product of this integration will be a single, integrated set of documents; namely, an RI report and a combined FS report and EIS that satisfy the requirements of both NEPA and CERCLA. The draft outlines for the RI and the FS-EIS follow.

##### 4.1 OUTLINE FOR THE REMEDIAL INVESTIGATION

- 1.0 Introduction
- 2.0 Operable Unit Investigations
- || 3.0 Site Setting (*NEPA - Description of the Affected Environment*)
- 4.0 Nature and Extent of Contamination
- 5.0 Contaminant Transport
- || 6.0 Baseline Risk Assessment (*NEPA - OU2 No-Action Alternative*)
- 7.0 Conclusions and Recommendations
- 8.0 List of References
- Appendix A Radiation Measurements
- Appendix B Soils Data
- Appendix C Surface Water and Sediments Data
- Appendix D Groundwater Data
- Appendix E Baseline Risk Assessment
- Appendix F Socioeconomic Data

##### 4.2 OUTLINE FOR THE FEASIBILITY STUDY-ENVIRONMENTAL IMPACT STATEMENT

- 1.0 Introduction
  - 1.1 Purpose and Organization of Report
  - 1.2 Background Information
- 2.0 Identification and Screening of Technologies and Process Options
  - 2.1 Introduction
  - 2.2 Remedial Action Objectives
  - 2.3 General Response Actions
  - 2.4 Identification and Screening of Technologies and Process Options
  - 2.5 Evaluation of Process Options
- 3.0 Development of Alternatives
  - 3.1 Introduction
  - 3.2 Screening of Alternatives - Operable Unit Sub-Area
  - 3.3 Screening of Alternatives - Operable Unit Sub-Area
  - 3.4 Screening of Alternatives - Operable Unit Sub-Area
  - 3.5 ARARs
- || 4.0 Detailed Analysis of Remedial Alternatives (*NEPA - Environmental Impact Analysis*)
  - 4.1 Introduction
  - 4.2 Individual Analysis of Alternatives - Operable Unit Sub-Area
  - 4.3 Individual Analysis of Alternatives - Operable Unit Sub-Area
  - 4.4 Individual Analysis of Alternatives - Operable Unit Sub-Area
  - 4.5 Comparative Analysis
  - 4.6 Overall Summary of the Detailed Analysis of the Alternatives

## 5.0 Summary of NEPA Compliance Analysis

## References

Appendix A	Analytical Data
Appendix B	Public Health Consideration
Appendix C	Detailed Cost Estimates
Appendix D	Applicable or Relevant and Appropriate Requirements
Appendix E	Packaging/Transportation
Appendix F	Solid/Liquid Separation Techniques
Appendix G	NEPA Compliance Analysis - Data and Methodologies ( <i>Appendix includes supplemental data and methods to support impact analysis [e.g. socioeconomic and wetland/floodplain]</i> )

4.3 SCHEDULE

The timing relationship between the NEPA compliance process and the CERCLA project planning is presented in Figure 4-1. The RI/FS-EIS review process will be in compliance with NEPA and CERCLA requirements. The public review dates for the Draft FS-EIS will be provided as an addendum to this Plan, when the operable unit scopes and schedules have been revised.

The following RI/FS-EIS requirements were completed on the dates specified:

NOI to prepare EIS published	May 15, 1990
Scoping Meetings Conducted	June 12, 13, 1990
RI/FS-EIS Scoping Period Closed	June 29, 1990

*The following are the Consent Agreement dates for the RI/FS-EIS documentation for OU2:*

<i>Initial Screening of Alternatives</i>	<i>April 18, 1992</i>
<i>RI Report/Baseline Risk Assessment</i>	<i>October 19, 1992</i>
<i>FS-EIS Report/Comprehensive Response Action Risk Evaluation</i>	<i>March 15, 1993</i>
<i>Proposed Plan</i>	<i>March 15, 1993</i>
<i>Draft Record of Decision</i>	<i>Dec.10, 1993</i>

*A 45-day public comment period will be provided for the draft RI/FS-EIS. This comment period has been extended from the 30-day comment period required by CERCLA due to the requirements of NEPA.*

4.4 DEVELOPMENT PROCEDURES

Advanced Sciences, Incorporated/International Technology Corporation (ASI/IT) have been selected to prepare the RI/FS, CERCLA documents, and the RI/FS-EIS. ASI/IT will develop the RI/FS-EIS and supporting documentation using RI/FS sampling and environmental research data, as well as information provided by DOE, other federal agencies, state agencies, and DOE contractors.

FIGURE 4-1

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DOE is responsible for the scope and content of the EIS and shall provide direction to the ASI/TT staff. Review of the draft RI/FS-EIS for NEPA compliance will be completed by DOE Fernald and DOE Headquarters staff.

#### 4.5 DISCLOSURE STATEMENT

ASI has no financial or other interest in the outcome of the remedial investigations and feasibility studies at the Feed Materials Production Center.

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John D. Wood  
ASI Project Director

#### 4.6 AGENCY CONSULTATION

Consultation with federal and state agencies is a necessary part of the NEPA process. Many federal and state agencies have responsibility for certain geographic areas, natural resources, or regulation for environmental protection that will be addressed in the RI/FS-EIS. DOE will request consultation with those and other interested agencies. The list of review agencies will include, but is not limited to:

- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency
- U.S. Corp of Engineers
- U.S. Soil Conservation Service
- U.S. Department of Interior
- U.S. Department of Transportation
- Ohio Historic Preservation Office
- Ohio Department of Natural Resources
- Ohio Environmental Protection Agency
- Ohio Department of Transportation

**APPENDIX A**  
**ENVIRONMENTAL IMPACT STATEMENT SCOPING ISSUES**

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FER/IMPLE/LJT.10-10/06/91

	<u>Page</u>
1.0 FEMP NEPA Process	A-1-1
1.1 Renovation and Site Evaluation EIS	A-1-1
1.2 FEMP RI/FS-EIS	A-1-1
1.3 Public Participation	A-1-2
1.4 Cooperating Agency	A-1-4
2.0 DOE Authority/Responsibility	A-2-1
3.0 EIS Proposed Action and Alternatives	A-3-1
3.1 Cost	A-3-1
3.2 Monitoring	A-3-1
3.3 Wastes	A-3-2
3.4 Cleanup	A-3-3
3.5 Cleanup Methods	A-3-3
3.6 Cleanup Standards	A-3-4
3.7 Separation of Cleanup and Production	A-3-4
3.8 Evaluation of Alternatives	A-3-4
3.9 Testing, Sampling, and Analysis	A-3-5
4.0 Environmental Impact Issues	A-4-1
4.1 General Issues	A-4-1
4.2 Health and Safety	A-4-1
4.3 Impact to Nearby Residents	A-4-3
4.4 Protection of Groundwater	A-4-4
4.5 Public Water Supply	A-4-5
4.6 Surface Water Contamination	A-4-6
4.7 Transportation	A-4-6
4.8 Ecological Issues	A-4-7
4.9 Air Quality/Climate	A-4-8
4.10 Socioeconomic	A-4-8
4.11 Cumulative Impacts	A-4-9

## 1.0 FEMP ISSUE PROCESS

### 1.1 RENOVATION EIS

#### Summary of Comments

The 1986 EIS was to cover renovation and cleanup of the FEMP, but within the past three and one-half years, the cleanup part of the EIS had been dropped. The new EIS now focuses entirely on cleanup activities at an estimated cost of \$1.0 million, and cleanup was supposed to be part of the 1986 EIS.

The 1986 draft EIS was to be public within one year and after four years, the 1986 EIS is still not published. DOE is asking for comments on a new EIS when the public has not seen the draft of the old one. A question was raised how DOE could consider a second EIS when the 1986 EIS was not complete.

Some on-property projects done over the past three and one-half years could be labeled as renovation activities, done without the input of the EIS. This observation raises a question about the usefulness of an EIS. No more funds should be spent on rehabilitation when cleanup funding is in question.

#### RI/FS-EIS Issue Response

The 1986 scoping meetings did request public comments on site renovation and cleanup actions. These comments are recorded in the revised EIS Implementation Plan for the Renovation EIS, February, 1989. Because of the extensive actions required and the initiation of the RI/FS process, a separate EIS to address cleanup alternatives was announced.

The cleanup of waste at the FEMP is considered to be a major federal action and separate from the renovation of the site. 1986 public scoping comments related to cleanup have been incorporated in the RI/FS-EIS Implementation Plan in Section 4.1.

|| *Because DOE has decided to permanently cease production at the site, DOE withdrew its Notice of Intent to*  
|| *prepare and EIS for renovation on December 10, 1991 (56 FR 64504). All required maintenance projects at*  
|| *FEMP will undergo appropriate environmental review in compliance with NEPA.*

### 1.2 FEMP RI/FS-EIS

#### Summary of Comments

Commentors noted that the RI/FS-EIS is an important first step to address Fernald's problems, and that the draft EIS should provide full disclosure and easy access to information on the FEMP.

There was concern regarding the relationship of the "new" RI/FS-EIS to the 1986 Renovation EIS; the legality of the proposed RI/FS-EIS; the efficiency of publishing a second document when the first one has not been completed. A commentator questioned the necessity for a full RI/FS-EIS for all five operable units.

000027

The RI/FS-EIS should consider the most recent scientific findings. Additionally, commentors urged that the RI/FS-EIS cover the following considerations: groundwater quality, subsurface hydrology, surface water hydrology and water quality, air quality, meteorological conditions, biotic environment, existing contamination, health effects, scenic and historical resources, socioeconomic impacts, and legal and institutional issues.

One commentor stated that the RI/FS-EIS contractor must assign qualified (PhD level) personnel to analyze the biological and ecological impacts.

#### RI/FS-EIS Issue Response

In terms of full disclosure, all RI/FS-EIS data will be completely referenced and all references will be provided as part of the Administrative Record. *The Administrative Record is located in the FEMP Public Information Center, 10845 Hamilton-Cleves Highway, Harrison, OH. 45030.* One of the goals of the NEPA regulations and the CEQ guidelines is to provide a document which clearly states and analyzes the issues. These goals will be followed in the preparation of the RI/FS-EIS.

The relationship between the Renovation EIS and the RI/FS-EIS is addressed under issue title - Renovation EIS. As described in the NOI (May 1990), the RI/FS-EIS will accompany the lead Feasibility Study. It will describe the regional and FEMP study area and will consider the cumulative impacts of all five operable unit actions. *DOE has not yet determined whether subsequent OUs after the lead OU warrant an EIS level of NEPA review.*

Every effort is being made to incorporate recent scientific findings and remedial action experience at other sites. This is being accomplished through literature reviews, scientific conferences, information exchange with other sites, and the involvement of a multi-disciplinary staff to prepare the RI/FS-EIS. This staff includes a qualified PhD biologist, as mentioned in the above comment. The RI/FS-EIS will consider all the technical issues stated in the above comments.

### 1.3 PUBLIC PARTICIPATION

#### Summary of Comments

Commentors noted they have not seen the results of their scoping comments for the Renovation EIS Implementation Plan and have repeatedly asked DOE over the past three years for progress information. A commentor noted positive changes occurring, including community input and increased availability of information through public libraries.

An oversight board was suggested to monitor the cleanup and be comprised of local citizens as well as DOE personnel. Another commentor questioned if the public's involvement would be limited to formal meetings. Commentors stated that public participation in the review and planning process should be allowed as well as citizen inclusion in the monitoring of remediation. While oversight by EPA was supported, commentors also called for an oversight team composed of independent experts, media, and local citizens; citizen involvement would improve the process credibility. DOE's adversarial relationship with the community must improve in order to provide the best solutions for cleanup.

Commentors said DOE refused to notify people of potential contamination danger from the FEMP and did not inform the public of the change to include cleanup in the new EIS, especially those who participated in the scoping process for the Renovation/Site Evaluation EIS. A question was raised whether DOE is in compliance with NEPA regulations. There was concern that DOE's NOI was made available less than 30 days before the hearings. Commentors asked about DOE's plan to issue interim progress reports to the public and how to keep the public informed about cleanup progress in non-technical, plain terms. A recommendation was made to broadcast the next series of public meetings on local radio stations and allow citizens to call in testimony.

It was requested that the RI/FS-EIS comment period be extended by one week.

#### RI/FS-EIS Issue Response

The Renovation EIS Implementation Plan was approved by DOE in October, 1987 and revised in February, 1989. The Implementation Plan is a public document. The RI/FS-EIS Implementation Plan will be available to the public and in the Administrative Record. The public will be notified of any change in scope and the Implementation Plan will be revised as required.

|| *The CERCLA statute and the National Contingency Plan (NCP) requires public participation in the planning and review process. EPA monitors this program to insure that public involvement goals are being achieved. In addition, an FEMP Health and Environmental Advisory Committee was formed in 1986 of technical experts and local residents. The functions of the Advisory Committee and public review can be addressed through the RI/FS public participation program. The RI/FS-EIS will provide an additional opportunity for public comment on alternative cleanup methods at the draft stage of analysis. The monitoring of impacts during remediation will be*  
|| *an administrative measure to be considered in the RI/FS-EIS. Any residual risks remaining after the remedial*  
|| *actions will be addressed in the Comprehensive FS Risk Evaluation.*

Information concerning the RI/FS-EIS was provided in various forms: the quarterly community meetings, presentation at Fernald Residents for Environmental Safety and Health (FRESH) meeting, Federal Notice of Intent, and materials sent to the FEMP mailing list. There was confusion about the content of the Renovation EIS and the RI/FS-EIS. This did require further clarification. The NOI for the RI/FS-EIS was published in the Federal Register on May 15, 1990, 28 days prior to the June 12 and 13, 1990 scoping meetings. A minimum of 20 days notice is required. The comment period was extended one week as requested. The recommendation to broadcast the public hearing for the Draft EIS on local radio will be considered.

#### 1.4 COOPERATING AGENCY

##### Summary of Comments

One commentor noted EPA thinks the RI/FS-EIS is unnecessary and duplicative. Another commentor wanted to know what steps DOE and EPA are taking to simplify and speed up the process.

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The U.S. Department of Interior, Fish and Wildlife Service, stated a willingness to become a cooperating agency in the project if it would enhance project quality. Their input would be limited to review and comment on project documents.

RI/FS-EIS Issue Response

|| *DOE is required to undertake the RI/FS, and complies with NEPA for remedial action as a matter of policy while*  
|| *the issue of the applicability of NEPA to CERCLA actions is under consideration by EPA, Department of Justice*  
|| *(DOJ), CEQ, and other federal agencies. The primary result is to enlarge the scope of the alternatives to*  
|| *consider cumulative impacts, socioeconomic impacts, and alternatives that may be beyond the scope of CERCLA*  
|| *alternatives. One analytical process will result in one environmental review document. This policy and the FEMP*  
|| *integration strategy is presented in Section 1.2 of this plan.*

Consultation with certain federal and state agencies is a necessary part of the NEPA process. The U.S. Department of Interior, Fish and Wildlife Service will be consulted on certain environmental regulations, such as wetlands and floodplain; and will be requested to review the Draft RI/FS-EIS. Other agency consultations are listed in Section 4.6 of the plan.

### 3.0 EIS PROPOSED ACTION AND ALTERNATIVES

#### 3.1 COST

##### Summary of Comments

It was noted that Congressional efforts to create a weapons plant cleanup trust fund is a positive step. A suggestion was made to have a Congressionally mandated fund, based on a percentage of the weapons budget, for plant cleanup. The cleanup program alternatives should not be determined by the funds that DOE has available.

##### RI/FS-EIS Issue Response

Mechanisms for funding DOE waste cleanup effort is a national policy issue and can not be addressed in the RI/FS-EIS. However, it should be noted that the "cost of cleanup alternatives" is part of the EPA CERCLA criteria for evaluating alternatives. Cost information will be provided in the FS for each operable unit.

DOE's Environmental Restoration and Waste Management Five-Year Plan for Fiscal Years 1992-1996 was released in June, 1990. It identifies environmental restoration and waste management projects and funds at DOE facilities.

#### 3.2 MONITORING

##### Summary of Comments

Comments regarding monitoring programs included that the number and placement of monitoring wells are inadequate to properly determine the impact to groundwater from specific disposal areas, which precludes effective and timely remedial action; consideration should be given to installing wells between Paddy's Run Road and Paddy's Run Creek; and further study of the pit area is needed to determine if there is permeation of water from the bottom.

Commentors stated that the current method of measuring radon emissions is misleading, since the measurements are taken from the areas of highest concentration of radon rather than in an area immediately outside the silos. If the radon emissions are measured outside the silos, the emissions should be examined in regard to compliance with the Clean Air Act. An installation of monitoring devices should be made to record the nature and extent of radon gas release due to dome failure or other catastrophe.

A request was made to consider the adequacy of the monitoring evaluation program. The monitoring techniques and modeling should fulfill the requirements of NEPA and protect the public and the environment. Consideration should also be given to the placement and maintenance of ambient air measuring devices.

Commentors noted that periodic auditing of all cleanup activities, procedures for emergency preparedness, and an inventory system to monitor the amount and condition of storage containers for radioactive and hazardous waste is necessary.

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### RI/FS-EIS Approach

A sampling program has been developed for the RI/FS project to determine the extent of contamination on the FEMP property and the adjacent area. The Work Plan for the sampling program was approved by EPA in May, 1988. Specific information will be provided from this sampling work in the RI reports for each operable unit. In addition, yearly monitoring data collected by the plant operator, Westinghouse Environmental Management Company of Ohio (WEMCO), will be included in the RI/FS reports. The RI/FS-EIS will summarize available groundwater data from the FEMP, including the waste pit area. Environmental and human health impacts of radon emissions from the silos will be discussed in the RI/FS-EIS.

|| The RI/FS-EIS will provide site-wide characterization data, establish the appropriate remedial response actions, and will address potential environmental and human health effects of remedial actions at the FEMP. The need to monitor impacts or provide emergency preparedness procedures related to specific alternatives will be considered. However, procedures for audits and hazardous waste inventories are detailed in various FEMP hazardous materials and waste management documents. These subjects are not part of the scope of the RI/FS-EIS.

### 3.3 WASTE

#### Summary of Comments

The Radioactive Waste Campaign has estimated large amounts of radioactivity being released into the air and water from the FEMP. Since 1952, chemical and radioactive wastes have been disposed of in six waste pits. As a result, there is concern for the presence of uranium in the soil. Comments were made on the types of radioactive material and the storage sites. There is concern regarding the leakage of the waste pits and the structural condition of the K-65 silos and drums containing thorium. Other concerns include radioactive contaminated scrap and mixed wastes, such as polychlorinated biphenyls (PCBs) and asbestos contaminated by radioactive material.

Concerning the disposal of the waste, it was noted that diluting pollution by direct discharge to surface water is inadequate. One commentator was opposed to dumping any more radioactive heavy metals either in the air or on the ground. The dangers of the mixed waste contents of the K-65 silos were commented on.

#### RI/FS-EIS Issue Response

|| *The FEMP Remedial Investigations are being conducted to determine the nature and extent of contamination at the site. The RIs will establish the types of contamination in the soils, waste storage areas and evaluate the potential for continued releases from each of the OUs. This information will be used to establish the appropriate remedial response action for the particular source of contamination and/or release.*

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|| The management of waste on-site is an ongoing process at the FEMP. Waste management activities include the  
|| safe interim storage of waste, the appropriate packaging of waste, and the shipment of waste for disposal. The  
|| managemens of waste at the FEMP is driven by several Removal Actions in the 1991 Consent Agreement as well  
|| as requirements under the Ohio EPA. The best alternative for the final disposal of waste on-site as well as the  
|| Decontamination and Decommissioning of the waste storage facilities will be evaluated during the RI/FS-EIS  
|| process.

### 3.4 CLEANUP

#### Summary of Comments

Neighbors of the FEMP have the right to be informed of cleanup activities that are hazardous or potentially hazardous; the EIS must identify potential direct and indirect consequences of the five cleanup efforts; and, while DOE's preferred alternatives may comply with regulations, they do not represent optimal cleanup actions.

#### RI/FS-EIS Issue Response

|| The direct and indirect impacts of the cleanup alternatives for the five operable units is part of the EIS scope and  
|| will be addressed. CERCLA evaluation criteria and NEPA considerations (i.e. environmental impacts) will be  
|| used to select the most appropriate alternatives. In addition, both the CERCLA and NEPA processes provide  
|| opportunities for the public review of the remedial action alternatives and the submittal of comments to the DOE.

### 3.5 CLEANUP METHODS

#### Summary of Comments

Several comments were provided concerning the selection of cleanup methods for the FEMP. Some concerns were expressed regarding the evaluation of removal and remedial actions which only redirect contamination and the consideration of time-sensitive removal actions which are not permanent remedial action solutions.

Some commentators suggested cleanup methods for possible use at the FEMP, including: effluent controls, waste minimization, monitoring of waste stabilization and isolation activities, construction of isolation buildings around the K-65 silos, and monitored storage of treated waste on-property. One commentator expressed concern about the effect of excavated wastes on the surrounding environment and population.

#### RI/FS-EIS Issue Response

|| The cleanup methods being implemented as part of the CERCLA process at the FEMP include both interim  
|| removal actions and the final remedial actions being evaluated in the RI/FS reports. It is important to note that  
|| removal actions are interim actions that address a release or problem which cannot wait until the final remedial  
|| actions. The removal action implemented at the FEMP will be consistent with the final remedial actions; however,  
|| DOE does not considered them to be a substitute for final remedial actions. The potential impact of implementing  
|| these cleanup methods will be evaluated in the RI/FS-EIS. The effectiveness of all cleanup alternatives is  
|| considered as part of the CERCLA evaluation process.

### 3.6 CLEANUP STANDARDS

#### Summary of Comments

It would be difficult to select a cleanup alternative because standards for uranium and radioactive substances have not been established. Another commentator noted that remedial and removal actions should be in full compliance with applicable laws and statutes. One commentator stated that the concentration limit around the South Plume was based entirely on an adult population concentration limit and recommended that children should be taken into account in calculating the concentration limit. There was also concern that exposures from current and future FEMP production will contribute to health risks. The radiation exposure standards should take into consideration the latest scientific findings on the health effects of exposures to low-level ionizing radiation, e.g., BEIR V, Martin I. Gardner study, and latest announcement from the International Committee for Radiation Protection.

#### RI/FS-EIS Issue Response

Appropriate cleanup standards will be developed in consultation with EPA. Applicable laws will be identified in the RI/FS process. The adult population concentration limit generally will be used in the RI/FS reports; however, where appropriate, a child's concentration limit will be used. For example, the pathway for exposure to contaminated soils and sediments via ingestion uses a child's concentration limit, since children are more likely to ingest soil than are adults. This information will be summarized in the RI/FS-EIS.

### 3.7 SEPARATION OF CLEANUP AND PRODUCTION

#### Summary of Comments

Commentors stressed that planning and strategy for the FEMP must not separate cleanup from uranium production activities. A suggestion was made that the best approach is to eliminate waste-generating activity not essential to processing or removal of on-property waste inventories. Another commentator said there should not be repair or upgrading of production facilities and, where possible, production equipment and buildings should be dismantled.

#### RI/FS-EIS Approach

|| *The cumulative impacts of cleanup alternatives will be addressed in the RI/FS-EIS. The FEMP will have no future*  
|| *production activities. Production activities at the site ceased in July, 1989 and the overall mission of the FEMP*  
|| *has been directed to environmental restoration and waste management.*

### 3.8 EVALUATION OF ALTERNATIVES

#### Summary of Comments

Commentors asked DOE to identify clearly defined, permanent solutions and begin the cleanup process. A question was raised about why alternative new technologies for cleanup were not considered. A commentator offered guiding principles for alternatives: 1) where feasible, the preferred alternative should be that which reduces or eliminates environmental contamination; and 2) permanent risk containment is preferable over a time-sensitive alternative. Additionally, strategies and technologies that reduce existing waste and pollution, address

000035

the immediate danger to the public, and prevent future generation of waste, pollution, and contamination should be given top priority.

A second "no-action" alternative was proposed for parts of the facility that would be affected by resuming uranium production so that no further waste would be generated other than what is necessary to remove or process existing waste inventories. A recommendation was made that the RI/FS-EIS include activities to achieve compliance with other applicable laws. Specific comment regarding Operable Unit 5 and the EPA-DOE Consent Agreement suggested that the EIS include activities not specifically required by regulation, but that are important to achieve public safety and protection. Also, the EIS should identify potential direct and indirect consequences of each of the five operable unit cleanup efforts.

Commentors expressed concern regarding DOE's evaluation of alternatives in the EIS. Some viewpoints which were stated included support for no further production activities at the FEMP; endorsement of a removal action with permanent cleanup results; implementation of a remedial plan with the least possible delay involved; and preference for treatment of contaminated groundwater prior to disposal. Some commentors stated a reluctance to ship waste to other states, as this would only spread the problem by knowingly contaminating other areas.

#### RI/FS-EIS Approach

The evaluation of alternatives in the RI/FS process will include the principles mentioned in the comments. Pilot studies for new technologies may be considered for the FEMP. The RI/FS-EIS will evaluate direct and indirect impacts of cleanup actions. The NEPA and CERCLA processes both require an identification of applicable laws. The impacts of transporting waste to an off-property disposal location will be evaluated.

An alternative related to uranium production is not part of the scope of the RI/FS-EIS, which is to evaluate cleanup action.

### 3.9 TESTING, SAMPLING, AND ANALYSIS

#### Summary of Comments

The comment was made that thorough testing and analysis is needed for geology and geochemistry features, as well as for existing contamination. Specific comment was made that soil and sediment sampling is inadequate and there is insufficient documentation to ensure reliable data were collected. Lack of sampling from the main channel of the Great Miami River, where plant effluent discharge occurs, was noted as an example of inadequate sampling procedures.

#### RI/FS-EIS Issue Response

A sampling program has been developed for the RI/FS project to determine the extent of contamination on the FEMP property and the adjacent areas. The Work Plan for this sampling program was approved by EPA in May, 1988. Also, a quality assurance/quality control plan has been prepared as part of the RI/FS Work Plan to assure that the samples collected are scientifically valid. Field and laboratory data is also validated by an independent

quality assurance staff. The geology and geochemistry of the FEMP will be described in the RI/FS-EIS, and available soil and sediment contamination data will be summarized and discussed.

RI/FS sediment sampling has been done in the main channel of the Great Miami River directly downstream from the effluent line.

000037

## 4.0 ENVIRONMENTAL NEPA PROCESS

### 4.1 GENERAL ISSUES

#### Summary of Comments

A commentator requested that the RI/FS-EIS consider impacts to wildlife and plant life including impacts from increased radiological and chemical emission; loss of habitat, impact to scenic and historic resources, and impacts to the physical environment. One commentator asked how environmental impacts could be determined from something not defined. Another commentator cited several incidents occurring at the FEMP and stated they have had terrible impacts to the environment.

#### RI/FS-EIS Issues Approach

|| *The extent of the contamination on and adjacent to the FEMP is part of the RI/FS studies. The RI/FS-EIS will*  
|| *address the potential impacts of the remedial alternatives to groundwater quality, subsurface hydrology, surface*  
|| *water hydrology and water quality, air quality, meteorological conditions, biotic environment, existing*  
|| *contamination, health effects, scenic and historical resources, socioeconomic impacts, and legal and institutional*  
|| *issues. Both the extent of the contamination and the cleanup alternatives will be defined.*

### 4.2 HEALTH AND SAFETY

#### Summary of Comments

Suggestions were made that the RI/FS-EIS discuss the existing health hazards as well as uranium's chemical toxicity to the plant workers and to neighbors. The commentators also wanted DOE to disclose records on health and safety problems, along with providing access to information on the FEMP in DOE computer tracking system. This system should be a chronological description of environment, safety, and health problems and should summarize remedial actions.

A comment was made that the old policy of diluting pollution is invalid and that there is no longer scientific pretense that some level of radiation exposure is safe. One commentator felt the community's health was hindered. Another concern was voiced over buckets full of water from the river used on the residents' gardens. In addition, medical monitoring of workers and of the community was suggested to be provided upon request, as well as a health study of the area.

It was pointed out that potential radiological and chemical exposures would impact the health of workers, visitors, and the surrounding population during the cleanup, and that health and safety is the number one issue. Several persons suggested medical monitoring be performed during the cleanup. Also, compliance with the Occupational Safety and Health Administration (OSHA) and additional applicable environmental laws should be required to achieve the greatest margin of public safety and protection.

There were concerns expressed that the transient worker may become over-exposed when moving waste between plants within the FEMP. A suggestion was made that the RI/FS-EIS consider the adequacy of public health notification procedures for hazardous and radioactive emissions from operations or accidents, and that the document also consider the activities and resources acquired from other federal, state, or local health and environment agencies.

The structure of the K-65 silos was also a concern, since a collapse could cause additional health and safety problems. A commentator suggested placing an airlock around the silos and a similar structure around the drummed waste to prevent accidental spills, which would create a worker health and safety hazard.

The RI/FS-EIS should describe FEMP site releases using the mass balance approach. The fate of these materials in the environment should be detailed. The specific activity of various media in contaminated areas should be presented along with the types of radiation emitted.

The risk assessment should consider not only human health but the risk to fish and wildlife species. Another commentator stated the earliest possible removal of threats to health and the environment should be a priority of the RI/FS-EIS.

#### RI/FS-EIS Approach

Secretary of Energy Watkins has stated that cleanup and health and safety are the *highest priority* issues facing DOE at present. It is the policy of DOE to make every effort to comply with all applicable laws. The RI/FS tasks undertaken at the FEMP include a site-wide Risk Assessment (RA). The RA will detail the hazards and evaluate the risks posed to workers and neighbors by the proposed remedial actions at the FEMP. The toxicity of a number of chemical and radioactive materials, including uranium, will be discussed. The issue of improved health and safety controls for workers will also be evaluated. To *avoid repetition*, this information will only be summarized in the RI/FS-EIS.

The issues regarding the priority removal of the most serious threats to the health and safety of workers and neighbors have been detailed in the various removal action documents called Engineering Evaluation and Cost Analysis (EE/CAs) and will also be summarized in the RI/FS-EIS. One such removal action document, the K-65 EE/CA, describes the structural stability of the silos. *The K-65 EE/CA and the integrated OU4 RI/FS-NEPA documentation will discuss the alternatives for controlling the releases from the silos. Safe handling and storage practices for the drums accumulated on-property will also be discussed.*

The possible impacts to surface water of discharging untreated effluent will be discussed. The concern about uptake of radionuclides by vegetation will be detailed in the RI/FS-EIS. An environmental risk assessment will be developed for the RI/FS-EIS and for each operable unit RI report.

An analysis of FEMP site releases using a mass balance approach is being prepared by the Centers for Disease Control and is not part of the RI/FS-EIS scope. The extent of contamination on and adjacent to the FEMP will be characterized.

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#### 4.3 IMPACT TO NEARBY RESIDENTS

##### Summary of Comments

The comment was made that large amounts of radioactivity have been released into the air and water from FEMP. It was further stated that it is not known how far this material has traveled or what impact it has had on the health of the nearby residents.

The RI/FS-EIS should consider how the exposures to radioactivity and toxic material at FEMP have contributed to health risks of members of the community. The commentator indicated a thorough dose reconstruction effort to assess the cumulative dose has not yet been completed.

Throughout the cleanup, it has been suggested that the process be extensively sampled, tested, and analyzed for radioactive and hazardous substances. The residents should also be informed. Comments were made to discuss the health effects to the neighbors including existing health hazards, uranium's chemical toxicity, yearly radiation dose limits, and all known and suspected health effects from FEMP operations. An emergency notification system with an emergency plan was suggested for the residents.

During the cleanup and possible emergencies, various concerns for the impacts to residents were enumerated. In addition to radiological and chemical exposures, there would be impacts on education, utility, industry, municipal, scenic, and recreational resources. Also, an impact would be felt on existing and proposed land uses, as well as on property values and on the tax base. It was stated that there would be transportation impacts due to increased road traffic and potential spills from vehicular accidents.

A commentator stated that neighbors should be compensated for lost property values.

##### RI/FS-EIS Issue Response

The amounts and extent of radioactive and hazardous materials released to the environment and health hazards and related risks from the FEMP will be detailed in other RI/FS project documents and summarized in the RI/FS-EIS. Specific needs for monitoring remedial activities at the FEMP will be considered in the RI/FS-EIS. These methods will also be contained within the work plans for remedial actions as part of the engineering design process. As stated above, the risk assessment will discuss the hazards and evaluate the risks posed to workers and neighbors by the remedial actions and other activities of the FEMP, including specific chemical toxicities and annual exposure limits.

There is an emergency response plan, complete with notification procedures and emergency notification system, for the FEMP. Additional emergency response needs will be addressed if required for remedial action alternatives.

The issue of a dose reconstruction study to evaluate the possible health effects to neighbors is beyond the scope of the RI/FS-EIS. Dose reconstruction information is currently being reported separately by DOE. The calculation considerations used in this dose reconstruction will be reviewed and applied where appropriate in evaluating

current and future health risk assessments.

Local property values and existing land use patterns will be included in the RI/FS-EIS. The impacts to local property values and proposed land uses associated with the remedial action alternatives will be addressed. The possible impacts to the local community and possible road degradation and noise associated with transportation of wastes off-property and construction materials on-property will be addressed. The RI/FS-EIS will also identify potential socioeconomic impacts to education, industry, public utilities, and community resources.

#### 4.4 PROTECTION OF GROUNDWATER

##### Summary of Comments

A number of commentors voiced concern that DOE take steps to clean up contaminated groundwater as well as to prevent further groundwater contamination. At least one commentor stated that cleanup and protection of the Great Miami Buried Valley Aquifer was a major priority.

In regard to DOE's evaluation of groundwater remediation alternatives, commentors sought assurance that thorough subsurface hydrology and groundwater quality studies would be performed for the RI/FS-EIS. One commentor stated that, through studies of this nature, sources of groundwater contamination could be more accurately determined.

Some commentors expressed preference for further investigation of the waste pit area, in order to ascertain whether contaminated runoff is entering the Great Miami Valley Buried Aquifer through the waste pit.

##### RI/FS-EIS Approach

Thorough subsurface hydrology and groundwater quality studies are being conducted under the CERCLA RI/FS process and will be summarized and referenced in the RI/FS-EIS. These studies include investigations of potential sources of contamination such as the waste pit area.

|| *Cleanup of contaminated groundwater is being addressed by the South Plume Removal Action and the OUS*  
|| *Remedial Action. The RI/FS-EIS will summarize these actions and will also address any potential*  
|| *impacts of remedial actions on groundwater.*

#### 4.5 PUBLIC WATER SUPPLY

##### Summary of Comments

Commentors stated that the RI/FS-EIS should address the impacts to the public and private water supply from radioactive and hazardous material emissions. There was also concern that DOE has made no offers to relocate or provide alternative water sources.

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Specifically, commentors said DOE should pay for a public water supply for area residents and the Crosby Township community and study the feasibility of a safe public water system for Crosby Township.

Specific comment was also directed to concern for the Great Miami River; Butler County relies on the Great Miami Buried Valley Aquifer for its total drinking water source; the Great Miami Buried Valley Aquifer has been designated as a "sole source aquifer," and that the Great Miami River should be safe and usable for recreation and the future potential drinking water source.

#### RI/FS-EIS Approach

The RI/FS-EIS will detail the impacts to local surface and groundwater associated with releases of hazardous and radioactive materials by the proposed remedial actions at the FEMP. If the risk assessment determines that an alternate water supply is recommended for specific areas, it will be considered in the RI/FS-EIS. An alternate supply is currently being provided to one resident and is part of the South Plume removal action for businesses along Paddy's Run Road.

The possible impacts to local and regional land uses such as recreation on the Great Miami River and the use of the Great Miami Buried Valley Aquifer as a source of industrial and drinking water will be detailed in the RI/FS-EIS, including the status of the aquifer as a "sole source" of drinking water.

|| *The extent of the public water supply for Crosby Township and other ancillary issues are currently under*  
|| *negotiation and is not yet within the scope of the RI/FS-EIS.*

#### 4.6 SURFACE WATER CONTAMINATION

##### Summary of Comments

Commentors made a variety of recommendations regarding surface water, most commonly requesting additional study of areas such as Paddy's Run and the Great Miami River. Several persons noted that pumping and disposing of contaminated groundwater into the Great Miami River was unacceptable as a cleanup alternative. Other commentors felt the storm water runoff through Paddy's Run (possibly ending up in the Great Miami Buried Valley Aquifer) should be stopped.

Concern was also expressed that there was a lack of information available regarding the migration of contaminants as well as its potential impact on local ecology and human health. Related to this issue was a comment that additional local water supplies could become contaminated via contaminants' migration from the South Plume.

##### RI/FS-EIS Approach

Surface water contamination in Paddy's Run and the Great Miami River is being investigated under the RI/FS program, and control of storm water runoff into Paddy's Run is being addressed by the Waste Pit Area Storm Water Runoff Control Removal Action. The RI/FS-EIS will summarize these investigations and will discuss potential impacts of remedial actions on surface water quality, including disposal of contaminated water in the Great Miami River if that is considered as a remedial action. The RI/FS-EIS will address migration of

contaminants from the FEMP and potential impacts on local ecology and human health. Impacts of the South Plume are being addressed in the South Plume EE/CA and will be summarized in the RI/FS-EIS.

#### 4.7 TRANSPORTATION

##### Summary of Comments

Comments regarding transportation included that the RI/FS-EIS should consider a Federal Emergency Management Agency (FEMA)-approved emergency plan which contains transportation and roadway improvement plans to accommodate emergency evacuations and impacts from accident spills. Also, the RI/FS-EIS should include potential dangers associated with remedial actions related to transport plans. It was also stated that DOE could not be trusted to transport waste across the country considering the past leakage during transport from the hopper. A commentator noted that problems with transport would only be magnified given the quantity involved.

##### RI/FS-EIS Issue Response

The possibility of a FEMA-approved emergency plan for evacuations due to accidents and spills is beyond the scope of the RI/FS-EIS. There is in place an approved Contingency Plan, coordinated with area fire and disaster response agencies and EPA. There is also an emergency response plan complete with notification procedures and an emergency notification system for the FEMP.

The RI/FS-EIS will reference U.S. Department of Transportation (DOT) reports on potential transportation accidents while moving construction materials on-property and wastes off-property during implementation of remedial action alternatives. The volume of materials and wastes involved will be considered in the statistical analysis of accident potential. All transportation actions will be done in compliance with the U.S. Department of Transportation and the Nuclear Regulatory Commission requirements.

#### 4.8 ECOLOGICAL ISSUES

##### Summary of Comments

Comment was made that indices of environmental quality should include regular testing of birds, small mammals, dairy cows, and milk. Also, consideration should be given to loss of habitat and biotic environment. Another commentator stated that DOE's past management failures raise questions about DOE's claim that the FEMP has had only negligible effects on the local ecology. Comment was also made that local flora and fauna should not be destroyed unless they pose an extreme danger to the local environment or health of residents or pose further serious contamination to the ecosystem. One commentator also requested that the cleanup alternative return the area to a near natural environmental state.

The RI/FS-EIS should describe and map the vegetation on site and in surrounding areas subject to site releases. Site and vicinity fish and wildlife, vegetation and soils should be sampled and appropriate tissues examined for radionuclides. The movement of radionuclides released from the site in aquatic and terrestrial ecosystems, should be modeled and points of concentration noted.

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RI/FS-EIS Issue Response

The RI/FS-EIS will describe and map aquatic and terrestrial communities at the FEMP and will describe the regional biotic environment. RI/FS data and Environmental Monitoring Reports describing contaminant levels in aquatic and terrestrial organisms, vegetation, and soils will be summarized, as will data on the general effects of the FEMP on local ecology. The RI/FS-EIS will discuss potential impacts of remedial actions on individual organisms and local habitats, including recommendations for mitigation of impacts and monitoring to be conducted during remediation. Movement of radionuclides from the FEMP into aquatic and terrestrial ecosystems is being modelled as part of health and ecological risk assessments for the RI/FS and will be summarized in the RI/FS-EIS. Criteria for selection of remedial actions include minimal impact on the environment consistent with protection of human health and local ecology..

4.9 AIR QUALITY/CLIMATE

Summary of Comments

Comment was made that there are approximately 430 emission sources throughout the FEMP and the major sources originate from uranium production operations. A request was made that the EIS consider the following air quality factors: temperature variations, wind data, precipitation data, identification of air quality standards and non-compliance with these standards, impacts to air quality from radioactive and hazardous material emissions during cleanup, and excavation activities and other remedial actions.

Commentor noted the current method for storing hazardous waste could not withstand natural occurrences such as tornadoes and that storage containers should be constructed to withstand tornadoes so that the waste will not come into contact with the weather elements.

RI/FS-EIS Issue Response

The air quality analysis for the RI/FS-EIS will provide a description of the existing air quality environment, including meteorological factors such as wind data, precipitation data, temperature variations, and severe storm data. This information will be used to evaluate the current compliance or noncompliance status at FEMP with respect to ambient standards for priority pollutants, radionuclides, and air toxics. Additional air quality analyses will include the evaluation of unmonitored emission sources, cleanup activities, fugitive dust emissions, and the entrainment of hazardous materials during remedial actions. Severe storm data from the National Climatic Data Center will be used to determine the potential for severe thunderstorm and tornado impacts.

4.10 SOCIOECONOMICS

Summary of Comments

Commentors stated that the EIS should include the following socioeconomic factors: demography, business profiles, government structure and finances, local land use patterns, transportation networks and increased road

traffic, municipal and utility services, local industry impact, impacts to schools, impacts to Miami-Whitewater Forest and the Great Miami River, impacts to local hunting and fishing areas, impacts to local parks and recreation areas, and impacts to land conservation. Commentors also asked that impact to property values, compensation for lost property values, impact to tax base and transportation impacts from accidents be included in the EIS.

#### RI/FS-EIS Approach

The RI/FS-EIS will address a number of socioeconomic factors such as demographics and related impacts to schools and local employment. Local and regional economies will be examined with respect to potential impacts to business and industry resulting from remedial activities at the FEMP. The socioeconomic analysis will also review land use patterns, including recreational areas, and land conservation efforts with particular attention paid to special area resources such as the Miami-Whitewater Forest. Potential impacts to the existing transportation network and public utilities will be discussed. A depiction of local government structures, the tax base, and property values will also be included. The impacts to local property values and proposed land uses associated with the remedial action alternatives will be addressed. *However, DOE compensation for the decline in property values is a policy issue not within the scope of selecting a remedial alternative.*

#### 4.11 CUMULATIVE IMPACTS

##### Summary of Comments

Cumulative impacts from a range of factors are being requested for consideration in the document, including: the extent of pollution around the FEMP, DOE's claim of negligible effects on the local ecology, the need for responsible and informed decision making, and consideration of past faults with the FEMP monitoring program. Additionally, health and safety issues, socioeconomic impacts, institutional issues, engineering and technical issues, and ecological issues should be addressed for all five operable units. An assessment of the cumulative effects of the various projects should be considered as well as impacts on education, scenic and recreational resources, socioeconomics, transportation, and impact of waste on other locations, if disposed of off-site.

##### RI/FS-EIS Issue Response

The RI/FS-EIS will evaluate the cumulative impacts of CERCLA remedial actions at five operable units, other RCRA corrective actions, and other plant activities that would enhance the potential for cumulative impacts. The potential impacts mentioned by the commentors will be analyzed in the RI/FS-EIS.

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