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**IMPLEMENTATION PLAN FOR THE NATIONAL ENVIRONMENTAL
POLICY ACT (NEPA) FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO, REMEDIAL INVESTIGATION AND FEASIBILITY
STUDY - ENVIRONMENTAL IMPACT STATEMENT - VOLUME 1 OF 2
- FINAL MARCH 1991**

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FOR THE
NATIONAL ENVIRONMENTAL
POLICY ACT (NEPA)**

**FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO**

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

Volume 1 of 2

March, 1991

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

FINAL

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ENVIRONMENTAL IMPACT STATEMENT**

Prepared for

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

**Volume 1 of 2
March, 1991**

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1.0 INTRODUCTION

1.1 SITE BACKGROUND

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 FMPC.

Production activities at the site ceased in July 1989 and the overall mission of the FMPC 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 will formally close.

DOE is in the process of investigating the environmental effects of past and present activities at the FMPC 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 FMPC.

On July 18, 1986, a Federal Facility Compliance Agreement (FFCA) pertaining to environmental impacts associated with years of operation at the FMPC 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 FMPC 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). It was signed on April 9, 1990, and became effective on June 28, 1990, following a public comment period.

Within the CERCLA framework, remedial investigations (RI) are being done to determine the nature and extent of any release, or threat 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 FMPC.

1.2 NEPA/CERCLA INTEGRATION APPROACH

In August, 1988, DOE issued DOE Order 5400.4 which provided guidance on the integration of the CERCLA and NEPA process. The goals of this policy are 1) to have NEPA and CERCLA RI/FS procedures run concurrently rather than consecutively to reduce the resources required and 2) to minimize the risk of having needed remedial actions delayed on procedural grounds.

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/EIS report that satisfy the requirements of both NEPA and CERCLA.

For the NEPA/CERCLA integration approach published in the Notice of Intent (NOI) (Federal Register, May 15, 1990) it was 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 reports. 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 NEPA/CERCLA integration approach, described above, will be implemented based on a number of key assumptions concerning the content of the RI/FS-EIS.

1. The lead RI/FS-EIS will evaluate the impacts of various site-wide alternatives (i.e. engineered disposal 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.
2. 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.
3. Environmental impacts of the RI/FS sampling program and removal activities are being addressed in separate NEPA documentation.

1.3 PURPOSE OF IMPLEMENTATION PLAN

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). Two scoping meetings were held in the potentially affected communities located near the FMPC 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.

The following RI/FS-EIS Implementation Plan includes 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 FMPC is to expedite remediation through the use of the operable unit concept. Operable units are distinctive groupings of facilities and environmental media that will enable DOE to expedite remedial actions on the highest priority operable units while awaiting necessary data and related analysis on other operable units. These operable units as currently defined 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. Negotiations are underway with EPA to redefine the scope of the operable units, especially Operable Unit 3.

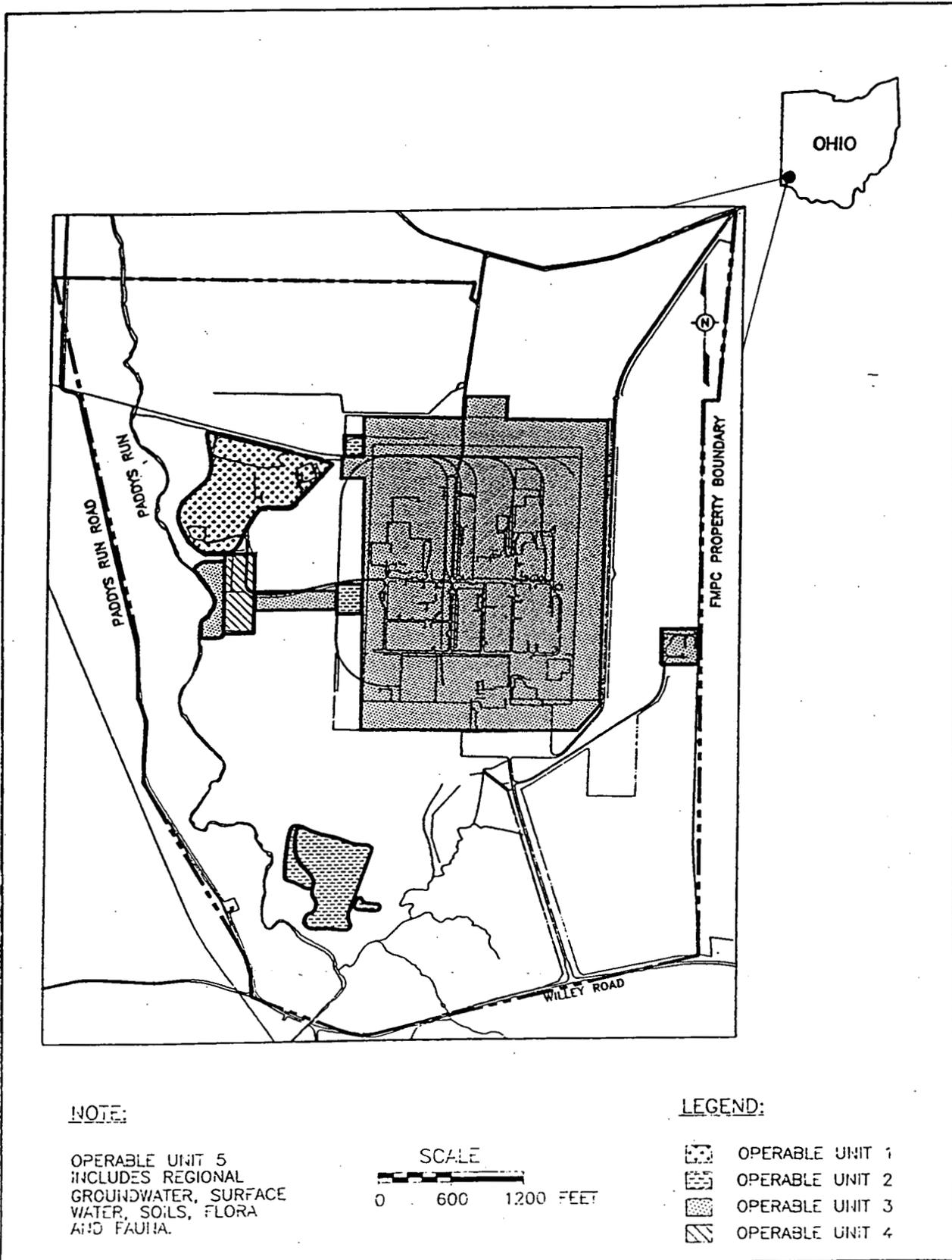
2.2 PROPOSED ACTIONS FOR OPERABLE UNITS 1, 2, 3, 4, AND 5

2.2.1 Operable Unit 1

Operable Unit 1 includes six waste pits, the burn pit, and the Clearwell, located in the northwestern portion of the FMPC. 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. In the interim, a removal action is being undertaken to mitigate the discharge of contaminated runoff into Paddys Run.

2.2.2 Operable Unit 2

Operable Unit 2, Other Waste Areas, includes the north and south lime sludge ponds, active fly ash pile, inactive fly ash disposal area and the Southfield, and the sanitary landfill. 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 FMPC. The ponds encompass an area of approximately two acres; the sludge volume is estimated at 11,500 cubic yards for each pond. The fly ash piles contain fly ash from the on-site coal-fired boiler plant and are located southwest of the production area. In the past, the inactive fly ash 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.



NOTE:

OPERABLE UNIT 5
INCLUDES REGIONAL
GROUNDWATER, SURFACE
WATER, SOILS, FLORA
AND FAUNA.

SCALE

0 600 1200 FEET

LEGEND:

-  OPERABLE UNIT 1
-  OPERABLE UNIT 2
-  OPERABLE UNIT 3
-  OPERABLE UNIT 4

FIGURE 2-1. OPERABLE UNITS LOCATION MAP

The Southfield, located at the northern edge of the inactive fly ash disposal area, was used to dispose of uranium-contaminated construction rubble. The fly ash disposal areas and the Southfield encompass an estimated 16 acres. The sanitary 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 Suspect Areas, includes specific areas within the production area. These areas represent past, current, or future sources of radionuclide or chemical releases to the environment. Additional suspect areas outside of the production area include: fire training area; incinerator area (east of the production area); area near the old flag pole; K-65 slurry line trench; several rubble mounds, and scrap metal piles. The scope of Operable Unit 3 is currently being negotiated with EPA and may be increased to include all waste, thorium, and decontamination and decommissioning (D&D) facilities. These activities may also be addressed under a new operable unit.

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 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), and an unused silo (Silo 4). These are located south of the waste pit area in the northwestern portion of the FMPC. 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.

To mitigate radon release, a bentonite clay cap will be applied over the residues as a removal action for Silos 1 and 2 and is to be completed by December 1991 to reduce radon emissions. Sampling of the berms and soil beneath the silos is scheduled for completion in 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 FMPC: all surface soils and sediments not included in other operable units; Great Miami Buried Valley Aquifer; Great Miami River; Paddys 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 FMPC boundary. Portions of a plume of contaminated groundwater extend south of the FMPC 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 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.

3.0 DESCRIPTION OF SCOPING PROCESS

The CEQ and DOE NEPA guidelines require that a scoping period be designated to identify the significant issues to be analyzed in depth in the EIS. For the RI/FS-EIS, significant issues have been identified from: 1) the RI/FS-EIS scoping period; 2) issues listed in the Notice of Intent; and 3) issues submitted from a prior scoping period in 1986.

According to NEPA guidelines, the issues are evaluated to determine those to be analyzed in the proposed EIS (often referred to as in-scope and out-of-scope issues). 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 issues identified in the 1986 FMPC 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 IDENTIFIED IN PREVIOUS PUBLIC SCOPING MEETINGS

DOE began the scoping process to prepare an EIS to address renovation and waste cleanup at FMPC 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).

Some issues raised during the 1986 scoping period for the Renovation EIS are pertinent to the RI/FS-EIS. The public expressed concern that the cleanup issues from the 1986 scoping meetings be considered in the RI/FS-EIS. Therefore, these issues are summarized below and are considered as part of the input to significant issues for the RI/FS-EIS:

- Radiation doses to the general public
- Chemical exposure effects to the general public and ecological resources
- Source items and exposure pathways analyzed: surface water, groundwater, air, soil
- Socioeconomic impacts of expenditures/employment, cultural resources, transportation routes
- Environmental/occupational monitoring and mitigation
- Cumulative impacts from remedial actions

Because there is no future production mission at the site, the Renovation EIS will not be released.

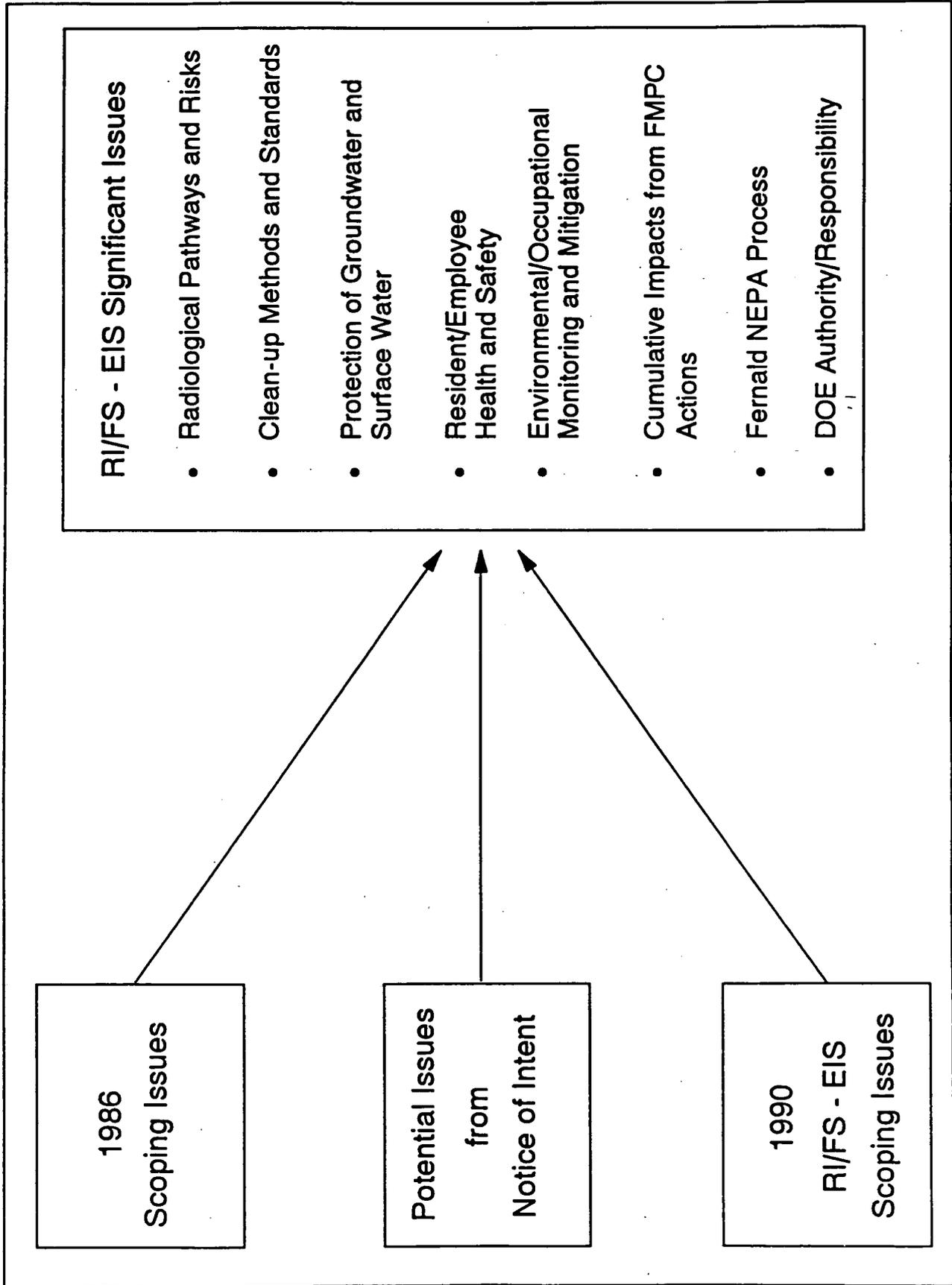


FIGURE 3-1. FERNALD RI/FS-EIS SIGNIFICANT ISSUES

More detailed information on the issues can be obtained from the Revised Implementation Plan for the Renovation EIS¹.

3.2 ISSUES IDENTIFIED IN THE RI/FS-EIS NOTICE OF INTENT

There are a number of potential issues related to the proposed remedial actions at the FMPC listed in the NOI for the RI/FS-EIS. Some deal with potential environmental impacts, including cumulative impacts, whereas others are factors that may include or be influenced by implementation of one or more of the alternatives. Major issues that may require analysis in the RI/FS-EIS are listed below. This list is based on DOE experience relative to other proposals of this nature. All topics identified in the NOI will be evaluated in the RI/FS reports and the accompanying EIS.

- Potential radiological 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
 - 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

¹ U.S. Dept. of Energy, Feb. 1989, "Revised Implementation Plan for the Environmental Impact Statement Addressing Renovation and Waste Cleanup at the Feed Materials Production Center Fernald, Ohio," U.S. DOE, Oak Ridge Operations Office, Oak Ridge, TN.

- 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

3.3 ISSUES RESULTING FROM PUBLIC SCOPING

The public, interested organizations, and federal, state, and local agencies were invited to provide oral comments at the RI/FS-EIS scoping meetings and to submit written comments until the close of the 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.

This section identifies the issues raised during the public scoping process and describes the relationship of these issues to the content of the RI/FS-EIS. Comments received by DOE during the scoping meetings or by correspondence are grouped below according to major issue categories. A computer system was used to record, identify, compile, and track each of the comments received.

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 FMPC
- Procedures for audits and hazardous waste inventories at the FMPC
- Impacts of continued uranium production
- Analysis of FMPC 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

3.4 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. DOE intends to complete the draft PEIS in early 1992. Comments on the draft PEIS will be considered in preparing the final PEIS, scheduled for 1993.

The FMPC will be considered within the PEIS. This is because the FMPC 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 FMPC.

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

Category	No. of Commentors
1. FMPC NEPA Process	
Renovation and Site Evaluation EIS	3
FMPC 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	3
Alternatives	6
Disclosure of Alternatives	1
Evaluation of Alternatives	4
No Action	1
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
- 4.0 Nature and Extent of Contamination
- 5.0 Contaminant Transport
- 6.0 Baseline Risk Assessment
- 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 Environmental/Socioeconomic Data for NEPA Compliance Analysis

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
 - 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

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.

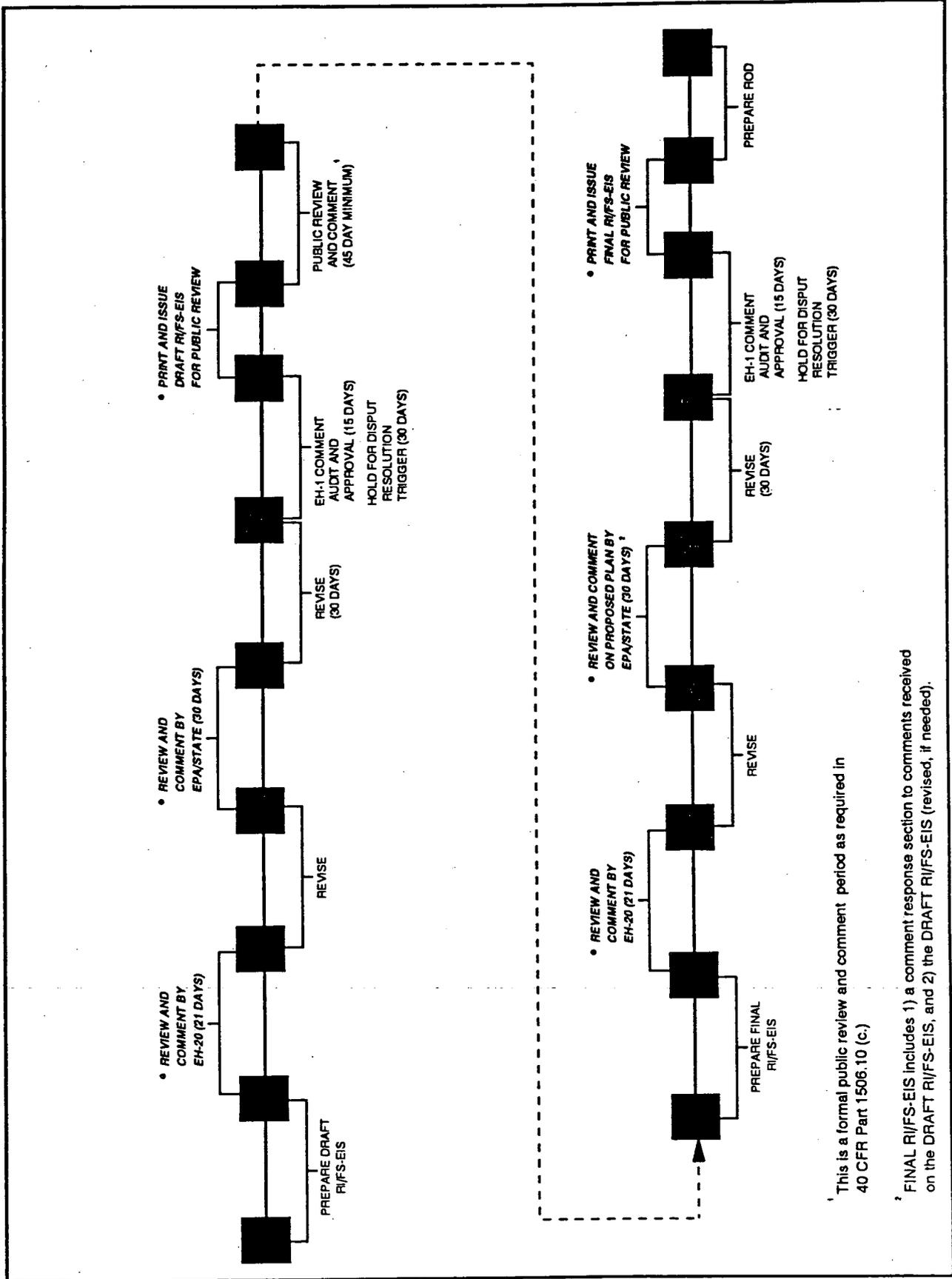
The following RI/FS-EIS requirements were completed on the dates specified:

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

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.

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



• REVIEW AND COMMENT BY EPA/STATE (30 DAYS)

• REVIEW AND COMMENT BY EPA/STATE (30 DAYS)

• REVIEW AND COMMENT BY EPA/STATE (30 DAYS)

PUBLIC REVIEW AND COMMENT (45 DAY MINIMUM)¹

EH-1 COMMENT AUDIT AND APPROVAL (15 DAYS)

REVIEW AND COMMENT ON PROPOSED PLAN BY EPA/STATE (30 DAYS)²

EH-1 COMMENT AUDIT AND APPROVAL (15 DAYS)

PREPARE FINAL RI/FS-EIS

PREPARE ROD

PRINT AND ISSUE FINAL RI/FS-EIS FOR PUBLIC REVIEW

¹ This is a formal public review and comment period as required in 40 CFR Part 1506.10 (c.)

² FINAL RI/FS-EIS includes 1) a comment response section to comments received on the DRAFT RI/FS-EIS, and 2) the DRAFT RI/FS-EIS (revised, if needed).

4-1. RI/FS-EIS DOCUMENT REVIEW TIMELINE

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.



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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1.0 FMPC ISSUE PROCESS

1.1 RENOVATION EIS

Summary of Comments

The 1986 EIS was to cover renovation and cleanup of the FMPC, 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 FMPC 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.

The Renovation EIS will not be released, because production has ceased at the FMPC. All required maintenance projects at the FMPC will be accompanied by the appropriate NEPA documentation.

1.2 FMPC 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 FMPC.

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 commentor questioned the necessity for a full RI/FS-EIS for all five operable units.

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. 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 FMPC study area and will consider the cumulative impacts of all five operable unit actions.

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 FMPC 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 EPA CERCLA guidelines require public participation in the planning and review process. EPA monitors this program to insure that public involvement goals are being achieved. In addition, an FMPC 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 a mitigation measure to be considered in the RI/FS-EIS.

Information concerning the RI/FS-EIS was provided in various forms: the quarterly community meetings, presentation at FRESH meeting, Federal Notice of Intent, and materials sent to the FMPC 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.

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

Because DOE is required to implement NEPA requirements, they have determined that a RI/FS-EIS will be required for remedial actions at the FMPC. This is consistent with NEPA and DOE actions at other sites. In order to meet these requirements in an efficient and timely manner, DOE has issued a NEPA/CERCLA integration policy. This policy and the FMPC 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.

2.0 DOE AUTHORITY AND RESPONSIBILITY

Summary of Comments

Concern was expressed that DOE should fund the EIS but not be the agency in charge of ensuring the EIS is in compliance with NEPA. Another commentator stated that DOE has a long history of neglect towards environmental health and safety problems from its nuclear weapons production activities and continues to place production goals ahead of environmental health and safety. Concern was expressed that DOE focuses too narrowly on compliance with the law, but not the spirit and intent of the law in the operation of its facilities. DOE was encouraged to develop and implement proactive strategies to avoid future problems. Also, commentators noted there is an ethical and moral responsibility to the community to do the best with the cleanup. A commentator stated that the cleanup controversy has created fear in the community that DOE will not do anything about the environment hazards. An observation was made that the public has waited over five years for short-term removal actions at the FMPC.

Some commentators accused DOE of giving misleading or inaccurate information; frequently changing proposed dates and figures; not answering questions or following up on promises to get answers to questions; and refusing to be accountable to the public.

RI/FS-EIS Issue Response

Because DOE is the agency responsible for implementing the proposed action, the agency is required to fund and prepare the EIS. However, compliance with NEPA regulations and other federal and state legislation will be determined by approximately six federal agencies, as well as the NEPA Compliance branch of DOE. (See Section 4.6 of this plan.)

DOE Secretary Watkins has stated in department orders, congressional hearings, and DOE Five-Year Environmental Restoration and Waste Management Plan (June 1990) that environmental health and safety is now the first priority at the weapons production facilities. The Consent Agreement with EPA establishes cleanup study areas and decision dates.

DOE has heard and recorded public concern for accurate information and accelerated action. The RI/FS program itself has been placed on a "fast-track" to speed-up final actions. DOE and EPA are committed to a timely cleanup of the FMPC area. This will be done in compliance with all federal and state regulations. Issues concerning the authority and credibility of DOE are not within the scope of the RI/FS-EIS, which is to focus on an analysis of the environmental impacts of the proposed remedial actions.

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 Paddys Run Road and Paddys 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.

RI/FS-EIS Approach

A sampling program has been developed for the RI/FS project to determine the extent of contamination on the FMPC 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 Materials Company of Ohio (WMCO), will be included in the RI/FS reports. The RI/FS-EIS will summarize available groundwater data from the FMPC, 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 baseline conditions to determine the need for CERCLA actions and will address potential environmental and human health effects of remedial actions at the FMPC. The need for potential mitigation measures 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 FMPC 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 FMPC. 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 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 commentor 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

Within the EPA CERCLA framework, RIs are being done to determine the nature and extent of any releases of hazardous or radioactive materials, pollutants, or contaminants, and to gather the necessary data to develop cleanup alternatives. These investigations will be reported in the operable unit RI reports and summarized in the RI/FS-EIS. All of the types of pollutants and areas of contamination commented on are being investigated. Each operable unit characterization will include information regarding specific contaminants, estimated volumes, and ecological and human health risk assessments.

3.4 CLEANUP

Summary of Comments

Neighbors of the FMPC 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 will be used to select the most appropriate alternatives.

3.5 CLEANUP METHODS

Summary of Comments

Several comments were provided concerning the selection of cleanup methods for the FMPC. 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 commentors suggested cleanup methods for possible use at the FMPC, 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 commentor expressed concern about the effect of excavated wastes on the surrounding environment and population.

RI/FS-EIS Issue Response

The cleanup methods being evaluated in the RI/FS reports include those mentioned in the above comments. 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 FMPC 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 ICRP.

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 FMPC 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 and production activities will be addressed in the RI/FS-EIS. Production activities at the site ceased in July, 1989 and the overall mission of the FMPC has been directed to environmental restoration and cleanup.

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 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 FMPC; 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 FMPC. 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. Such an alternative could be part of the Renovation EIS.

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 FMPC 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 FMPC 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.

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 FMPC 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 FMPC is part of the RI/FS studies. The RI/FS-EIS will address the potential impacts of the remedial alternatives to wildlife, plant life, historic resources, etc. (as reflected in the RI/FS-EIS outline). 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 FMPC 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 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 FMPC. 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 commentor 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 FMPC 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 commentor 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 number one 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 FMPC 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 FMPC. 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 minimize duplication of effort, 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 Operable Unit 4 RI/FS also discuss the alternatives for controlling the releases from the silos. The pertinent information from these documents will be incorporated into the RI/FS-EIS. 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 FMPC 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 FMPC will be characterized.

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 FMPC. 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 FMPC 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 FMPC 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 FMPC will be detailed in other RI/FS project documents and summarized in the RI/FS-EIS. Specific needs for monitoring remedial activities at the FMPC 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 FMPC, including specific chemical toxicities and annual exposure limits.

There is an emergency response plan, complete with notification procedures and emergency notification system, for the FMPC. 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 also being addressed by the South Plume EE/CA and in the Operable Unit 5 RI/FS reports. The RI/FS-EIS will summarize these investigations 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.

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 FMPC. 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 Paddys 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 possible provision of a public water supply for Crosby Township by DOE is considered beyond 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 Paddys 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 Paddys 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 Paddys Run and the Great Miami River is being investigated under the RI/FS program, and control of storm water runoff into Paddys 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 FMPC 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 commentor 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 on emergency notification system for the FMPC.

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 DOT and NRC 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 FMPC 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.

RI/FS-EIS Issue Response

The RI/FS-EIS will describe and map aquatic and terrestrial communities at the FMPC 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 FMPC 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 FMPC 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 FMPC 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 FMPC 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 FMPC. 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.

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 FMPC, 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 FMPC 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, production activities on-property (if production is planned), 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.