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WASTE PIT REMEDIAL ACTION PROJECT PUBLIC WORKSHOP, NOVEMBER 14, 1995 - HANDOUTS, OVERHEADS AND AGENDA

11/14/95

DOE-FN PUBLIC
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HAND OUTS

United States
Department of Energy
Fernald Environmental Management Project

Fernald Area Office
P.O. Box 538705
Cincinnati, OH
45253-8705

Fact Sheet:

Remedial Design Update for Operable Unit 1 Remedial Actions at Fernald - Preliminary Design

November 1995

INTRODUCTION

This fact sheet was prepared by the U.S. Department of Energy (DOE) to update the public on the remedial design activities relative to Operable Unit 1 remedial actions at the Fernald site. The Fernald site is a DOE-owned, contractor-operated federal facility that produced high purity uranium metal products for the DOE and its predecessor agencies from 1952 to 1989. This fact sheet provides key points on the various aspects of the planned Operable Unit 1 remediation process as they have been identified in the Preliminary Design packages for Operable Unit 1.

Operable Unit 1, which is one of five operable units at the Fernald site, is a well-defined, 37.7-acre area located in the northwest quadrant of the Fernald site (see Figure 1). Large quantities of liquid and solid wastes were generated by various chemical and metallurgical processing operations and these wastes were stored or disposed in six waste pits and the Clearwell, or burned in the Burn Pit. These waste pits are located in a portion of the Fernald site Waste Storage Area and are contained within the boundaries of Operable Unit 1. A detailed discussion of each waste pit's construction, contents, and volume of waste material is provided in the Remedial Investigation Report for Operable Unit 1. On March 1, 1995, the U. S. Environmental Protection Agency (U.S. EPA) signed the *Record of Decision (ROD) for Remedial Actions at Operable Unit 1*. The selected

Figure 1 Aerial Photo of Operable Unit 1 Area

remedy presented in the Operable Unit 1 ROD is excavation of the waste pit contents, waste processing and treatment by thermal drying (as necessary to remove free water), and off-site disposal at a permitted commercial disposal facility.

OPERABLE UNIT 1 REMEDIAL DESIGN

Upon selection of the remedy, the remedial design phase of the project was initiated. The purpose of the remedial design is to assess and develop technical requirements and direction, based on the selected remedy, to ensure the remedial action is implemented in a manner that meets the requirements of the ROD. Specifically, the remedial design consists of technical analyses and implementing engineering procedures in the development of design documents. The *Remedial Design Work Plan for Remedial Actions at Operable Unit 1* was developed to identify the deliverables and present the schedule for their submittal to U.S. EPA (in coordination with the Ohio Environmental Protection Agency). A Final Operable Unit 1 Remedial Design Work Plan was transmitted to the U.S. EPA and Ohio EPA on July 7, 1995.

The first of the design deliverables identified in the Operable Unit 1 Remedial Design Work Plan, the *Operable Unit 1 Remedial Design Preliminary Design Packages I and II*, were submitted to U.S. EPA and Ohio EPA on October 24, 1995 for their review. Comments are due from the U.S. EPA and Ohio EPA by December 26, 1995. These packages were simultaneously placed in the Public Environmental Information Center for public inspection. The Preliminary Design packages will not be revised and resubmitted based on comments received; rather, a Comment Response Package will be developed for the U.S. EPA and Ohio EPA, and any necessary changes will be made in the Pre-Final Design packages.

At the preliminary design stage, the pattern and direction for the design process has been formulated for the project; however, many details still need to be developed. Figure 2 provides a layout of the Operable Unit 1 remediation facilities as presented in the Preliminary Design packages. The following pages of this fact sheet provide a summary of the key elements of the design process as discussed in the Preliminary Design packages.

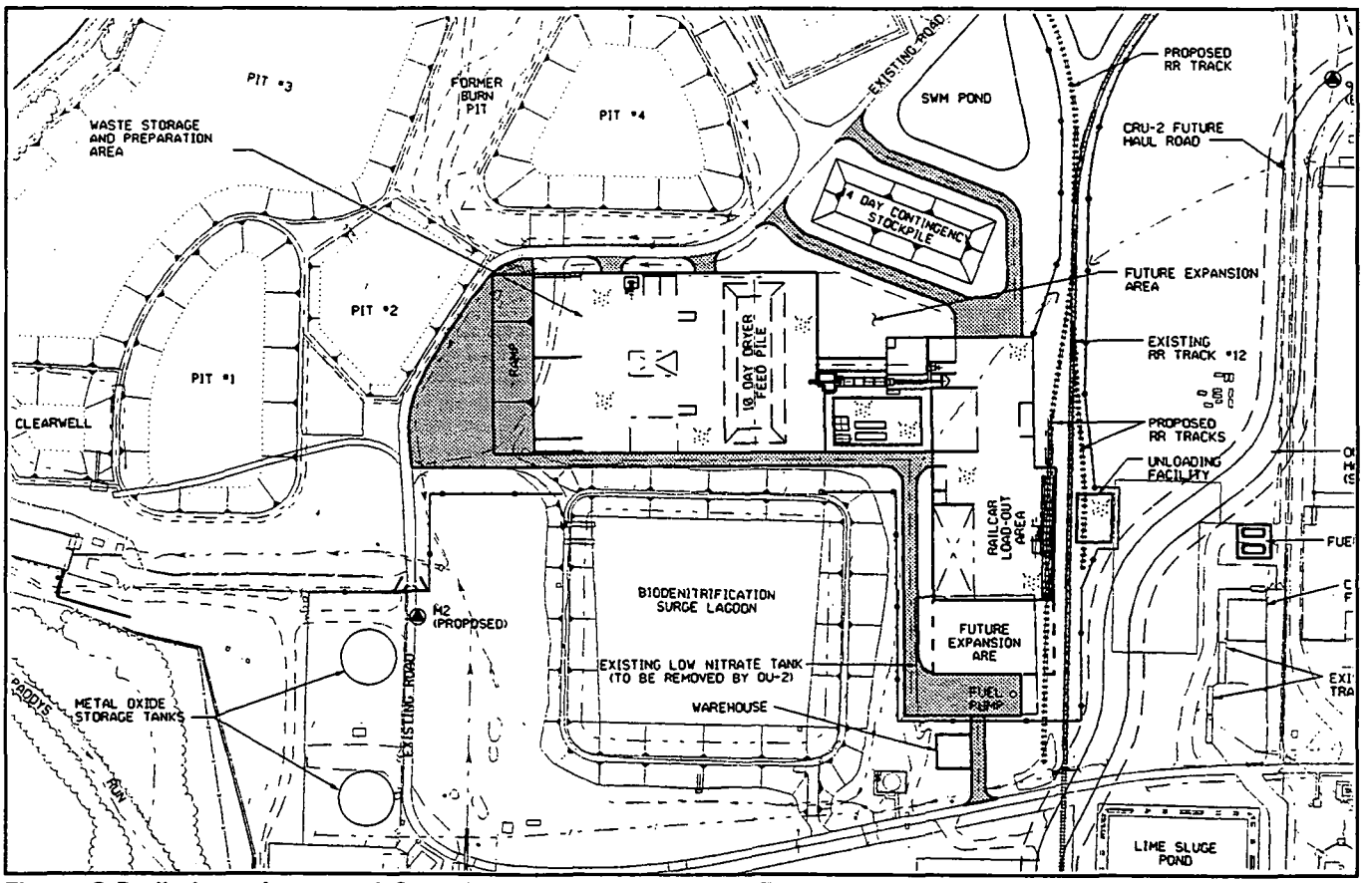

Figure 2 Preliminary Layout of Operable Unit 1 Remediation Facility

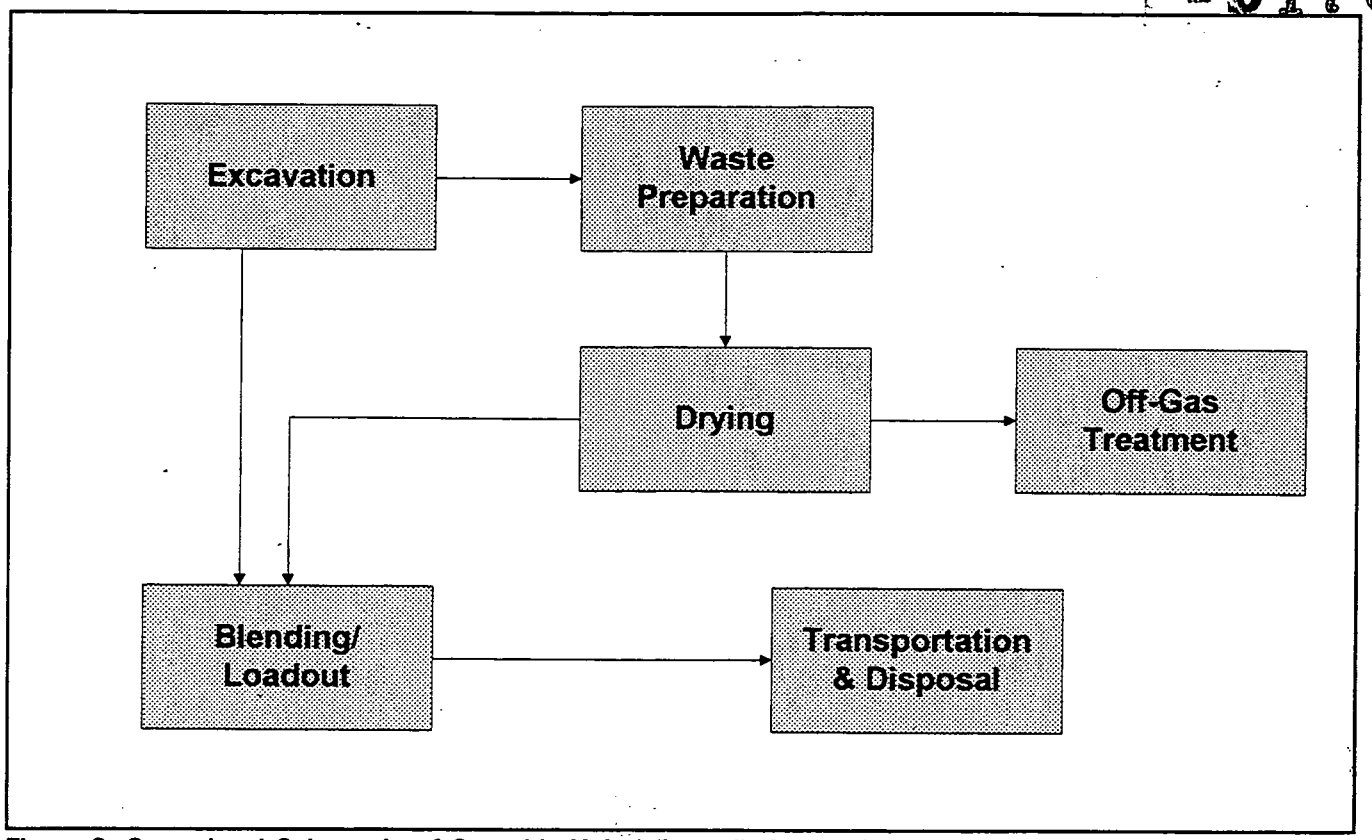

Figure 3 Operational Schematic of Operable Unit 1 Remediation Activities

General Process

- Key components of the Operable Unit 1 remediation process are shown in Figure 3.
- The proposed design is consistent with the Operable Unit 1 Record of Decision.
- Key aspects of the design are simplicity and flexibility.
  - **Simplicity** is evidenced through minimizing the use of automation for waste transfer operations, and instead focusing, where possible, on the transfer of waste with mobile earth-moving equipment.
  - **Flexibility** is evidenced through the ability to by-pass certain of the components within the overall process train, if that aspect of material handling is not necessary (e.g., by-passing the dryer if the material is already dry enough to meet the waste acceptance criteria of the disposal facility).
- **Experience** and **lessons learned** from other similar projects were evaluated and employed, as appropriate, in the design.
- The design reflects **integration** with other Fernald site operable units and **consistency** with the accelerated clean-up plan for the Fernald site (i.e., the 10-Year Plan).
- Most processing activities will be performed over a standard shift; with the exception of drying, which will be performed 24 hours per day.
- The decontamination and dismantlement of the Operable Unit 1 remediation facilities will be the responsibility of Operable Unit 3.
- The design will provide for the future need to modify the processing facilities to increase processing rates and/or to modify the process train to reflect enhancements to operations or equipment.

Figure 4 Photo of Excavation under the Dewatering Excavation Evaluation Program

Excavation

- The excavation, and transfer of waste to the process area, will be performed with **conventional** material handling equipment. Figure 4, which is a photo of excavation activities performed under the Dewatering Excavation Evaluation Program of Operable Unit 1, provides an illustration of such conventional material handling equipment.

- The preferred excavation method is a top and bottom approach wherein one set of equipment is located on top of the pit cap to strip the cap and waste, and a second operation simultaneously completes waste removal from the pit bottom.

- Airborne emissions will be **minimized, controlled**, and **monitored** during the excavation and subsequent transfer of the wastes, including those time periods when physical activities are not taking place.

- Stormwater controls will be provided to **control** water runoff, so as to **minimize** the spread of contamination.

- A key aspect of the planned excavation activities is the **flexibility** to adapt to field conditions which differ from what was expected (e.g., switching to hydraulic excavation if needed, instituting additional administrative and/or engineering controls to further reduce airborne emissions, etc.).

- **Safety** of equipment operators is a special consideration to be factored into the design and continuously evaluated during remediation.

- Details regarding soil excavation and management, cleanup level confirmation sampling, and site restoration will be developed through the Operable Unit 5 remedial design process.

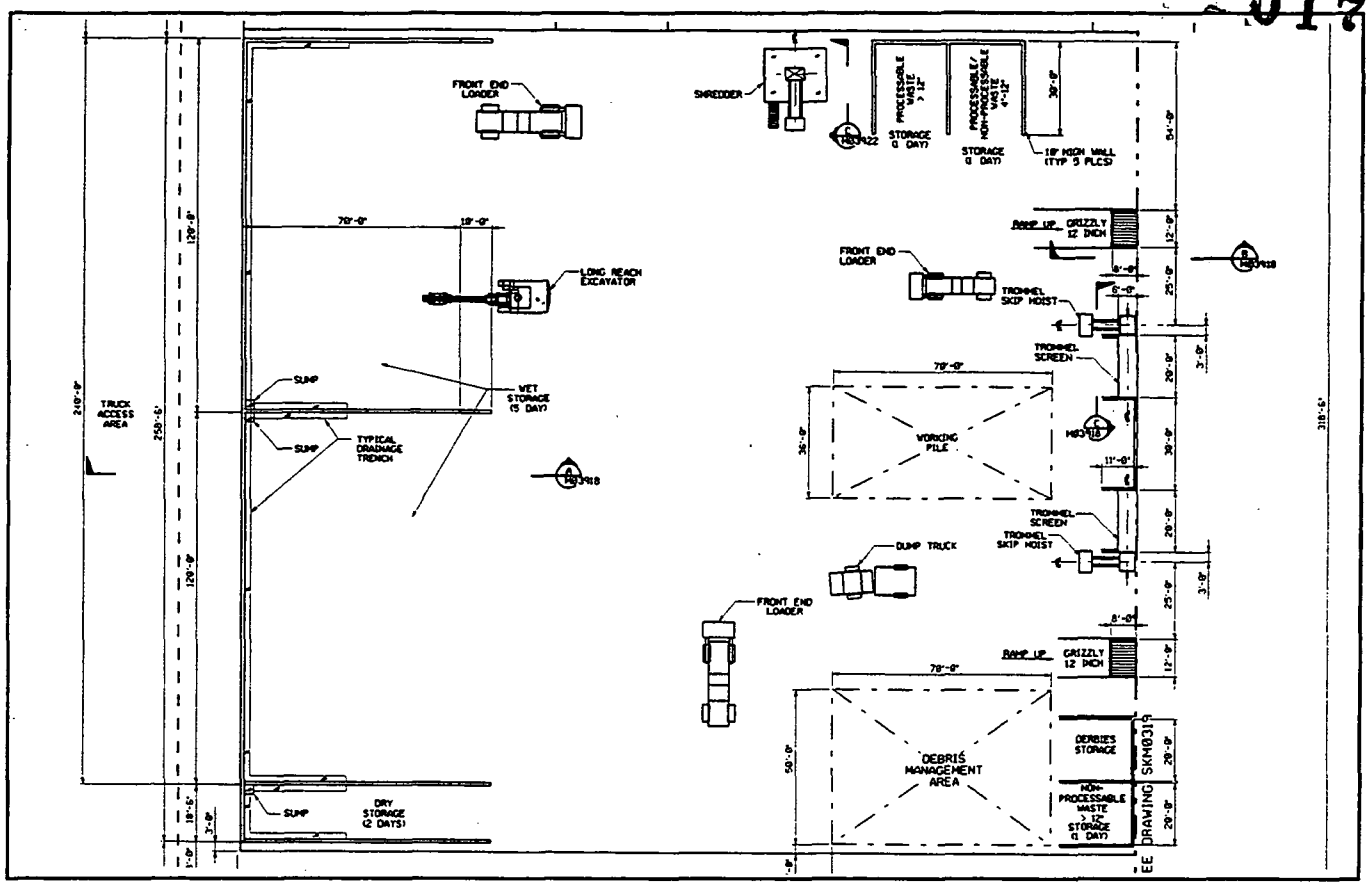

Figure 5 Preliminary Layout of the Waste Preparation Area

Waste Preparation

- The waste preparation activities will take place within a 250 ft by 250 ft structure with a roof, but no side walls.

- The function of the Waste Preparation Area is to take materials received from the waste pits and process it so as to produce a feed material amenable to the dryer, including:

  - **storage** to allow for 1) dry waste for blending with wet waste, 2) the ability for water to freely drain from wet waste (into a collection system), and 3) capacity to ensure continued operation in the event of inclement weather or other problems with excavation, or equipment downtime for maintenance/repair;

  - **segregation** of materials from the waste stream which are not amenable to the dryer (e.g., are too large for the dryer), and further segregation of those materials based on their ultimate disposition (e.g., derbies which would go to the Nevada Test Site, materials which can be size reduced in the shredder); and

  - **size-reduction** of materials which cannot go through the dryer through the use of a shredder.

- Nonprocessable materials (i.e., those which cannot be processed through the shredder or dryer, primarily because of size) are also removed from the main process stream, within this facility, for special handling.

- Many of the material transfer activities within this structure will be performed with **conventional** material handling equipment.

- Material will only be dried to meet the waste acceptance criteria of the permitted commercial disposal facility.

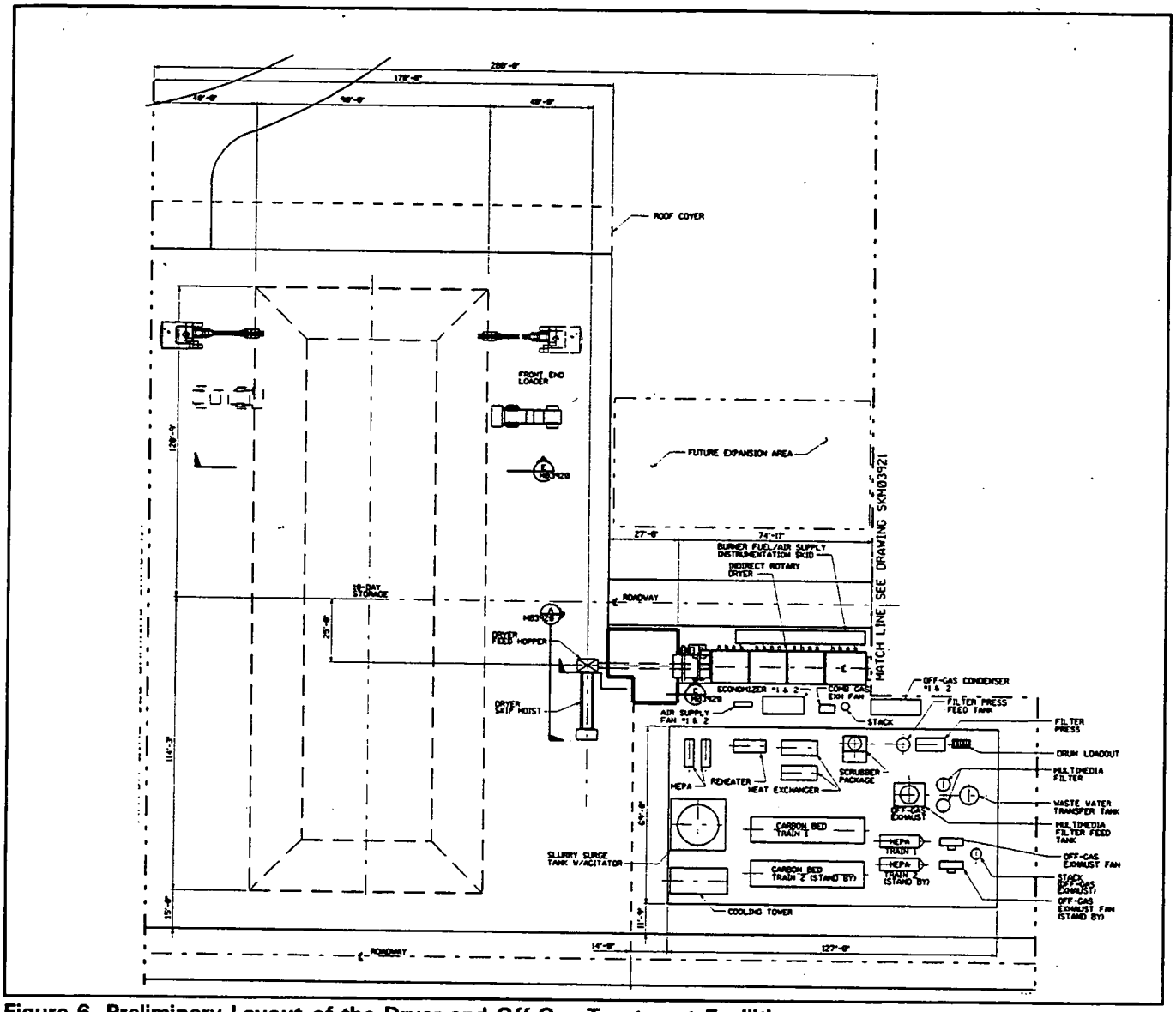

Figure 6 Preliminary Layout of the Dryer and Off-Gas Treatment Facilities

Thermal Drying

- The dryer is capable of accepting different types of feed (i.e., solid or slurry).
- The dryer will operate 24 hours per day.
- Enclosed structures will be provided at each end of the dryer.
- A feed pile of about 10 days is planned between the Waste Preparation Area and the dryer to ensure that sufficient feed is available to keep the dryer operational for 24 hours per day.

Off-Gas Treatment

- The off-gas treatment system will be designed to remove any constituents which might be present in emissions from the drying process, prior to discharging to the atmosphere.
- Emissions will be controlled using **Best Available Technology**.

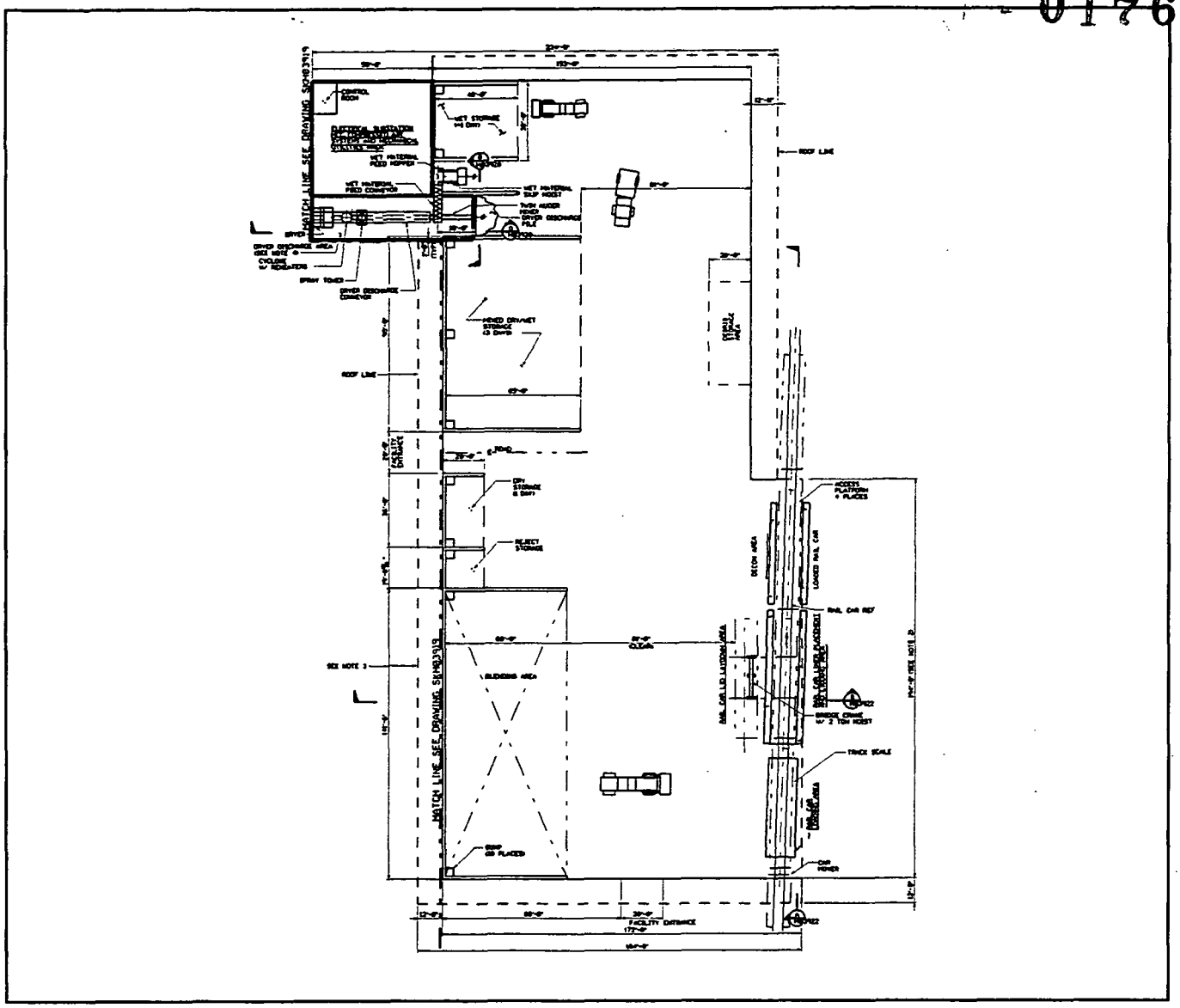

Figure 7 Preliminary Layout of the Blending/Loadout Facilities

Blending/Loadout

- Blending will be performed within this facility for the purpose of **optimizing** waste for attaining compliance with the disposal facility waste acceptance criteria.
- Wastes will be sampled within this facility to ascertain that it meets the waste acceptance criteria of the disposal facility.
- The loadout facilities will be designed with provisions for dust suppression so as to **minimize** the spread of contamination.
- Present plans call for a liner to be installed in each railcar prior to loading, and sealed after loading.
- Each railcar will be **surveyed, decontaminated** (if necessary), and **labelled** prior to leaving this facility.
- This facility is designed to accommodate the loading of containers, should this **contingency** be necessary (i.e., if it is necessary to ship waste to the Nevada Test Site or if rail problems prevent the shipment of materials to the permitted commercial disposal facility by rail).

Site Improvements

- This aspect of the project consists of **early improvements** to the site necessary to prepare it for the construction and operation of the Operable Unit 1 remediation facilities (e.g., clearing and grading, construction of access roads to the waste pits, installation of utilities needed to support remediation).

- Site improvements also include on-site rail improvements necessary to support Operable Unit 1 remediation activities, including additional rail to support the storage and movement of railcars within the boundaries of the site, and facilities needed to support such rail operations (e.g., for engine and railcar maintenance).

- Site improvements also include upgrades of trestles/bridges on the Branch Line between the Fernald site and Cottage Grove, Indiana.

- Many of these site improvements are expected to start in 1996.

Transportation

- Rail shipment is the planned transportation mode to the permitted commercial disposal facility.

- Shipment is planned via unit trains consisting of gondola cars where the load is contained by a disposable liner and a hard rail cover.

Disposal

- The permitted commercial disposal facility has yet to be selected. Until this selection is made, the design will reflect the use of Envirocare as the representative permitted commercial disposal facility.

- As a contingency, waste which cannot meet the waste acceptance criteria of the permitted commercial disposal facility, will be shipped to the Nevada Test Site for disposal.

- Operable Unit 1 residual contaminated soils and oversized materials will be disposed of consistent with the Operable Unit 5 and Operable Unit 3 RODs, respectively.

FUTURE ACTIVITIES

Additional Design Reviews

The next design deliverable identified in the Operable Unit 1 Remedial Design Work Plan, is the Pre-Final Design, which is scheduled for submittal to the U.S. EPA and Ohio EPA, for review, on March 21, 1996, at which time they will also be made available to the public for inspection. As with the Preliminary Design, DOE will formally address all comments submitted by the U.S. EPA and Ohio EPA on the Pre-Final design through the submittal of a Comment Response Document. All comments will then be addressed and incorporated, as required, into the Final design package.

Additional Public Involvement

Throughout the remedial design process, DOE will continue to make key decision-making documents available to the public for inspection. As these documents are issued, DOE will inform the public of their availability at the Public Environmental Information Center, JAMTEK Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio 45030, (513) 738-0165. DOE will also continue to update the public through briefings at township and citizens' group meetings, community roundtables, workshops, etc., on timely topics of interest. In addition, other mechanisms, such as this fact sheet, may be used to provide the public with information on key decision-making documents.

If you have any additional questions, you may contact Gary Stegner at (513) 648-3153. For information on Fernald-related public meetings and documents available to the public, you may call the community access line at (513) 648-6272.

U.S. DEPARTMENT OF ENERGY
WASTE PIT REMEDIAL ACTION PROJECT
PUBLIC WORKSHOP

Plantation
November 14, 1995

7:00 - 7:10 p.m.	*Introduction* - Where are we in process - Meeting objectives - Introductions	Dave Lojek
7:10 - 7:35 p.m.	*Updates on DEEP Project* - Types of materials to be processed - Handling of material - Conventional excavation	Willie Benson
7:35 - 8:05 p.m.	*Preliminary Design Process* - Contents of preliminary design package - Explanation of Fact Sheet	Bob Fellman
8:05 - 8:15 p.m.	*Break*	
8:15 - 8:25 p.m.	*Path Forward* - Project Schedule - Future Public Involvement Opportunities	Dave Lojek
8:25 - 9:00 p.m.	*Open Discussion*	Gary Stegner

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WASTE PITS REMEDIAL ACTION PROJECT

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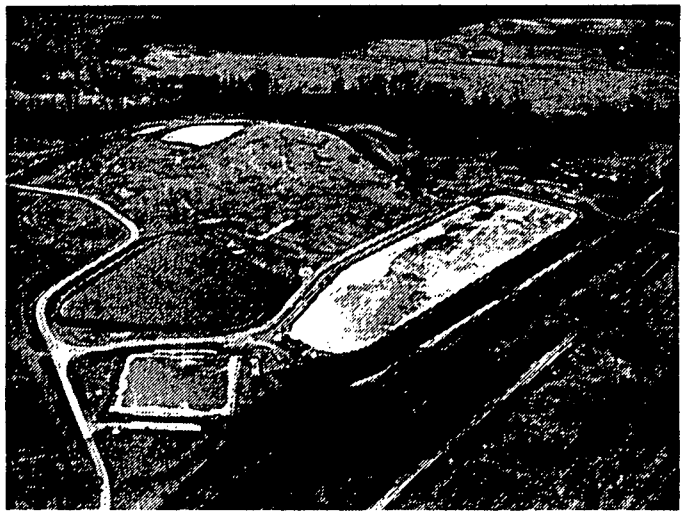

INCLUDES:

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

SELECTED CLEANUP ALTERNATIVE

Excavating the Waste Pits, Waste Processing and Treatment by Thermal Drying (as necessary to remove moisture), and Transporting Waste Material Off-Site by Rail to a Permitted Commercial Disposal Facility

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WASTE PITS REMEDIAL ACTION PROJECT

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Selected Remedial Alternative Activities

1) Construction of Facilities
2) Removal of Water from Open Pits
3) Removal of Pit Contents, Caps & Liners
4) Confirmation of Achievement of Remediation Levels
5) Pretreatment of Waste
6) Thermal Drying of Waste to Meet the WAC of the PCDF
7) Sampling & Analysis of Waste to Confirm Meeting the WAC
8) Off-Site Shipment of Waste for Disposal at a PCDF
9) Contingency: Shipment of Waste to NTS
10) Decommissioning and Removal of the Facilities

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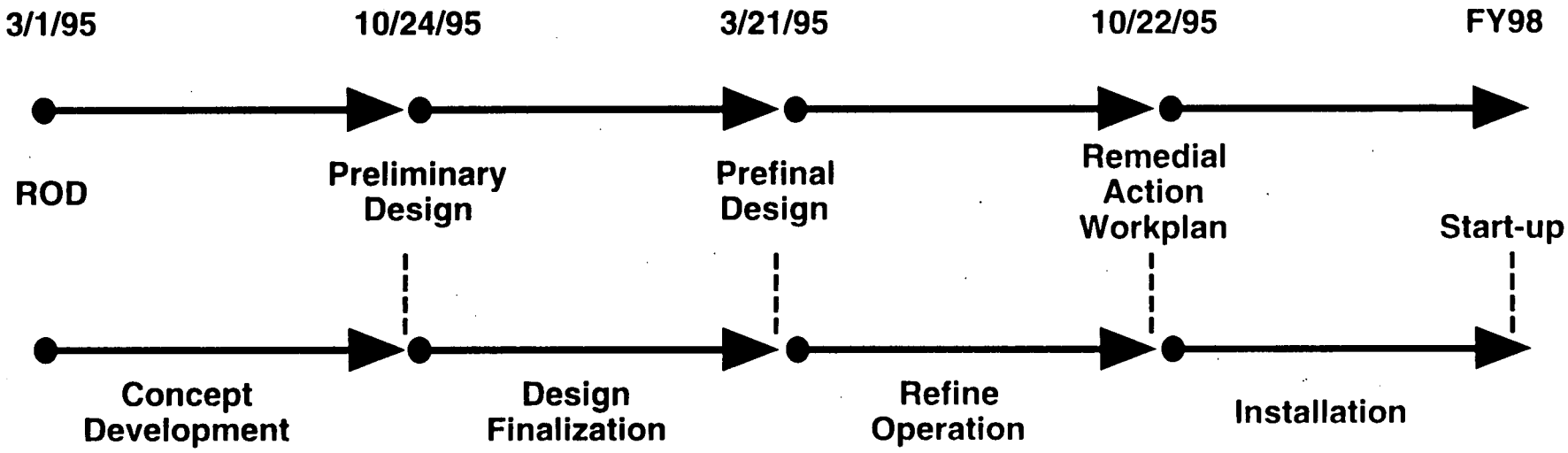
Progress of Remediation



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WASTE PITS REMEDIAL ACTION PROJECT

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DEEP

Purpose:

Obtain geotechnical information of the waste material to determine the most efficient excavation technique to be implemented during remediation of the waste pits.

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DEEP Phases

- Phase 1 - Geotechnical Testing
- Phase 2 - Wet Excavations
- Phase 3 - Dewatering
- Phase 4 - Dry Excavations

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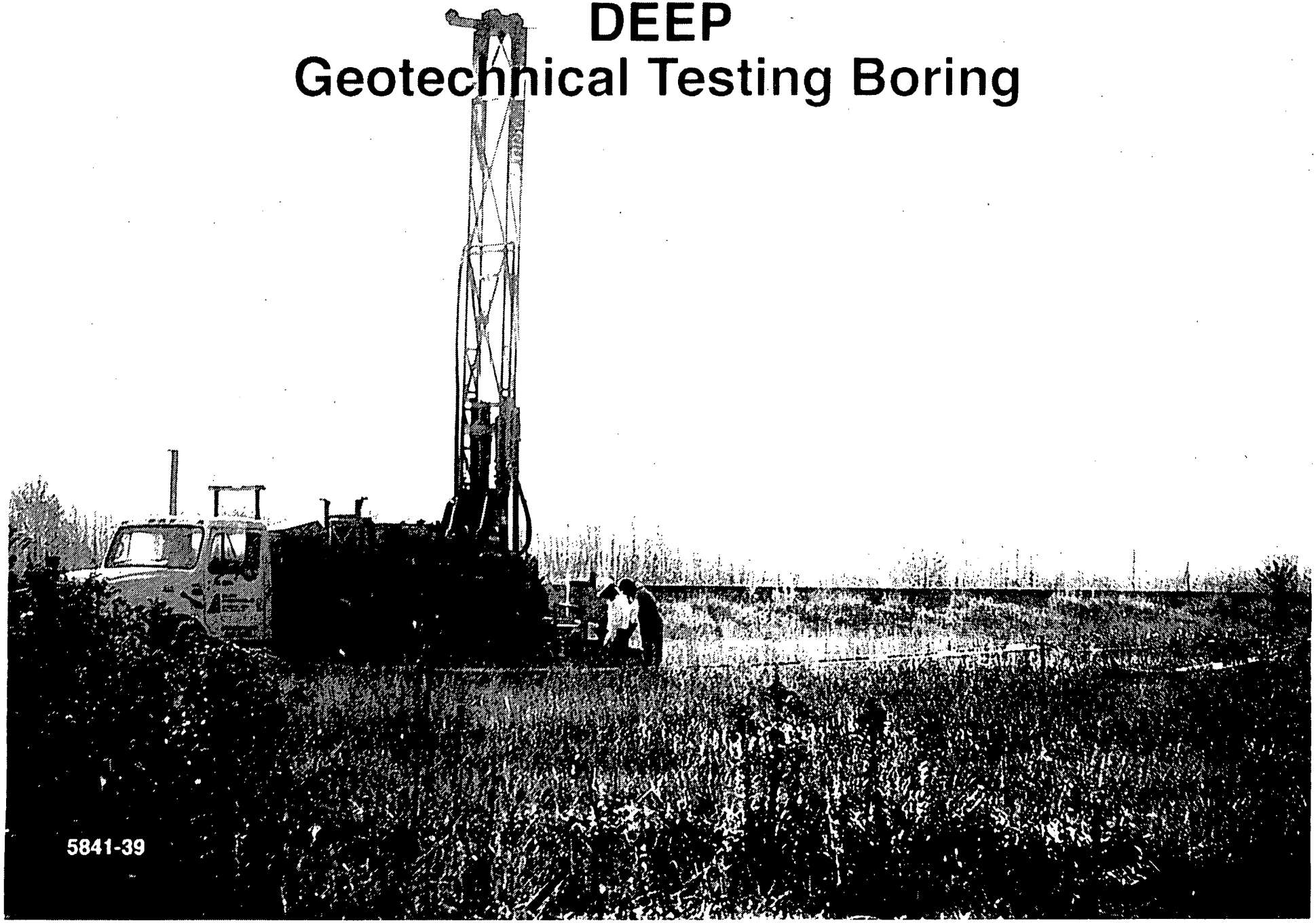
DEEP
Geotechnical Testing Boring



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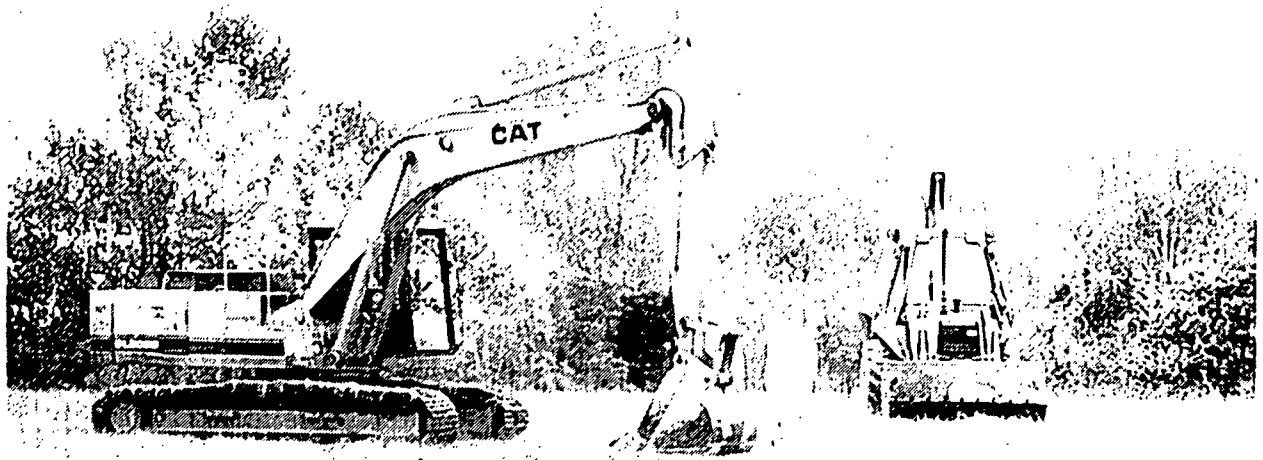
Geotechnical Testing CPT



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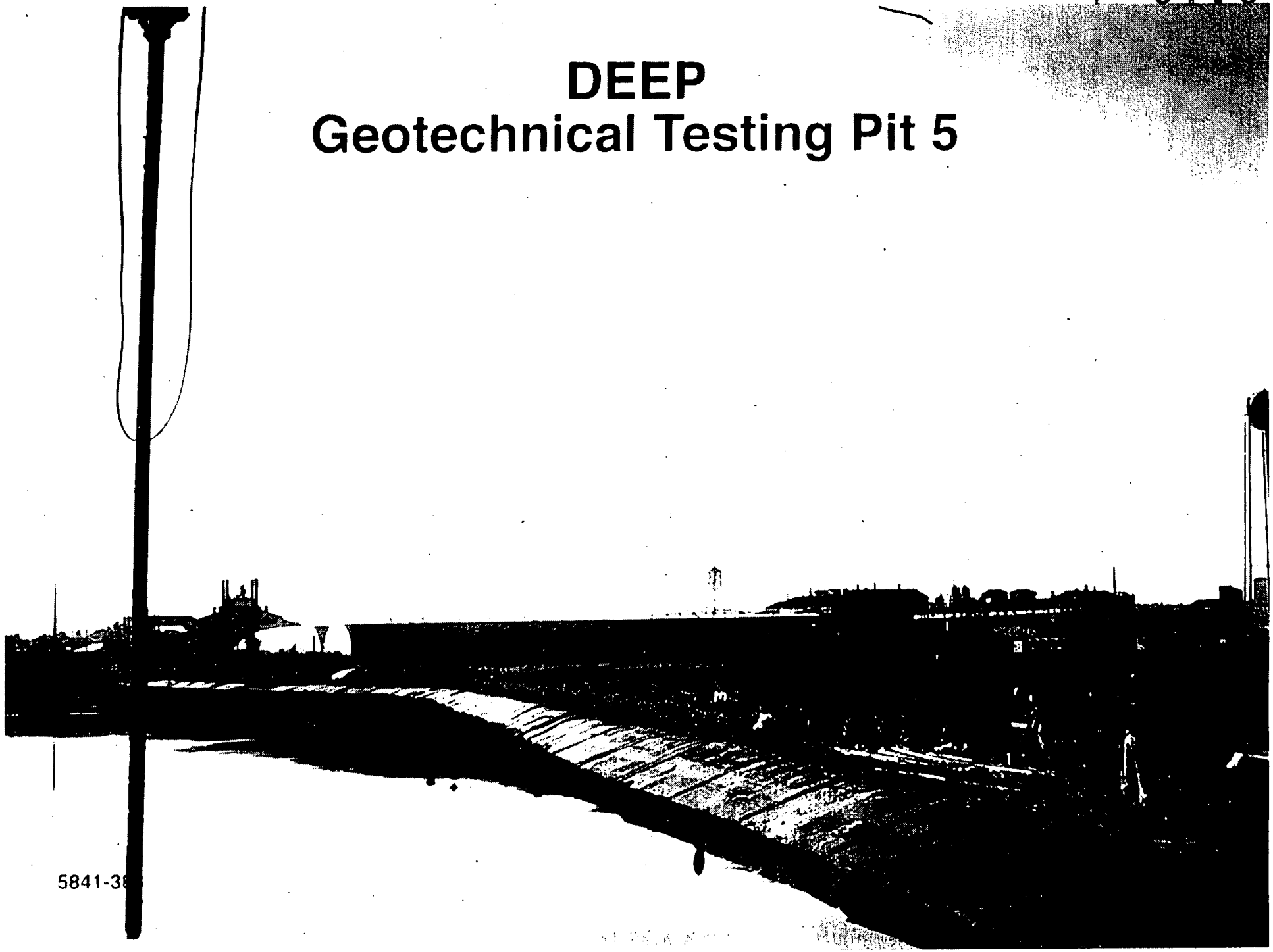
DEEP
Geotechnical Testing Pit 5



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DEEP
Wet Excavation Pit 2

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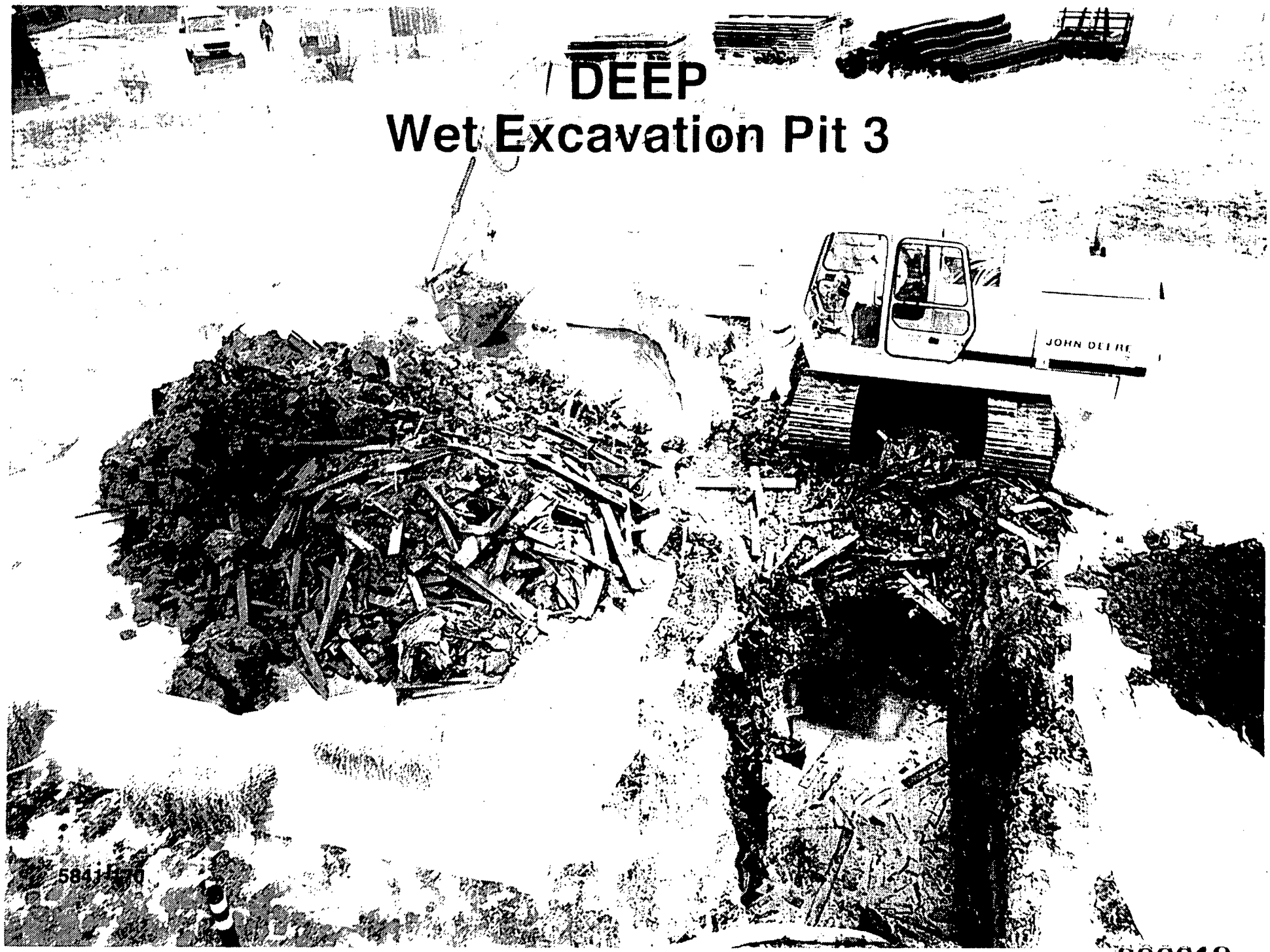
DEEP
Wet Excavation Pit 3



WASTE PITS REMEDIAL ACTION PROJECT

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DEEP Findings

Wet Excavations

- 7 Trenches
  - 3 in Pit 3, 2 in Pits 1 and 2

Learned (and Confirmed) to Date:
- Highly Heterogeneous
- Excavation Faces Vertical
- Cover Material Highly Permeable
- Water Infiltration Sporadic

- Slurry Testing
  - 1 in Pits 1 and 2

Learned to Date:
- Unsuccessful Due to Cohesiveness
- Waste Inability to Flow

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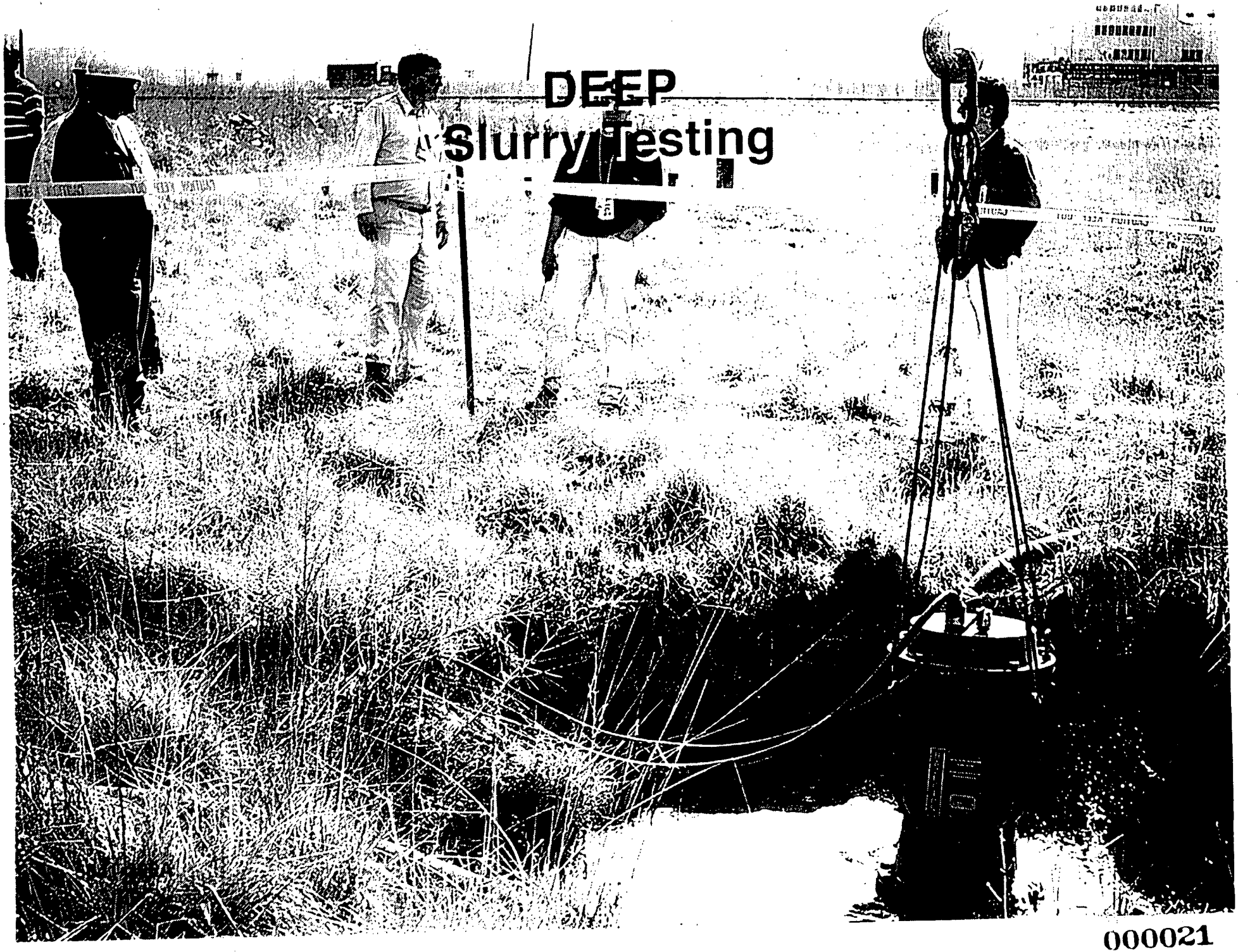
DEEP
Slurry Testing

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DEEP Findings

Dewatering Testing

- 4 Dewatering Well in Pits 1 and 3
- 1 Hour Pump Tests for Well Types
- 4 Hour Pump Tests for Best Yielding Wells

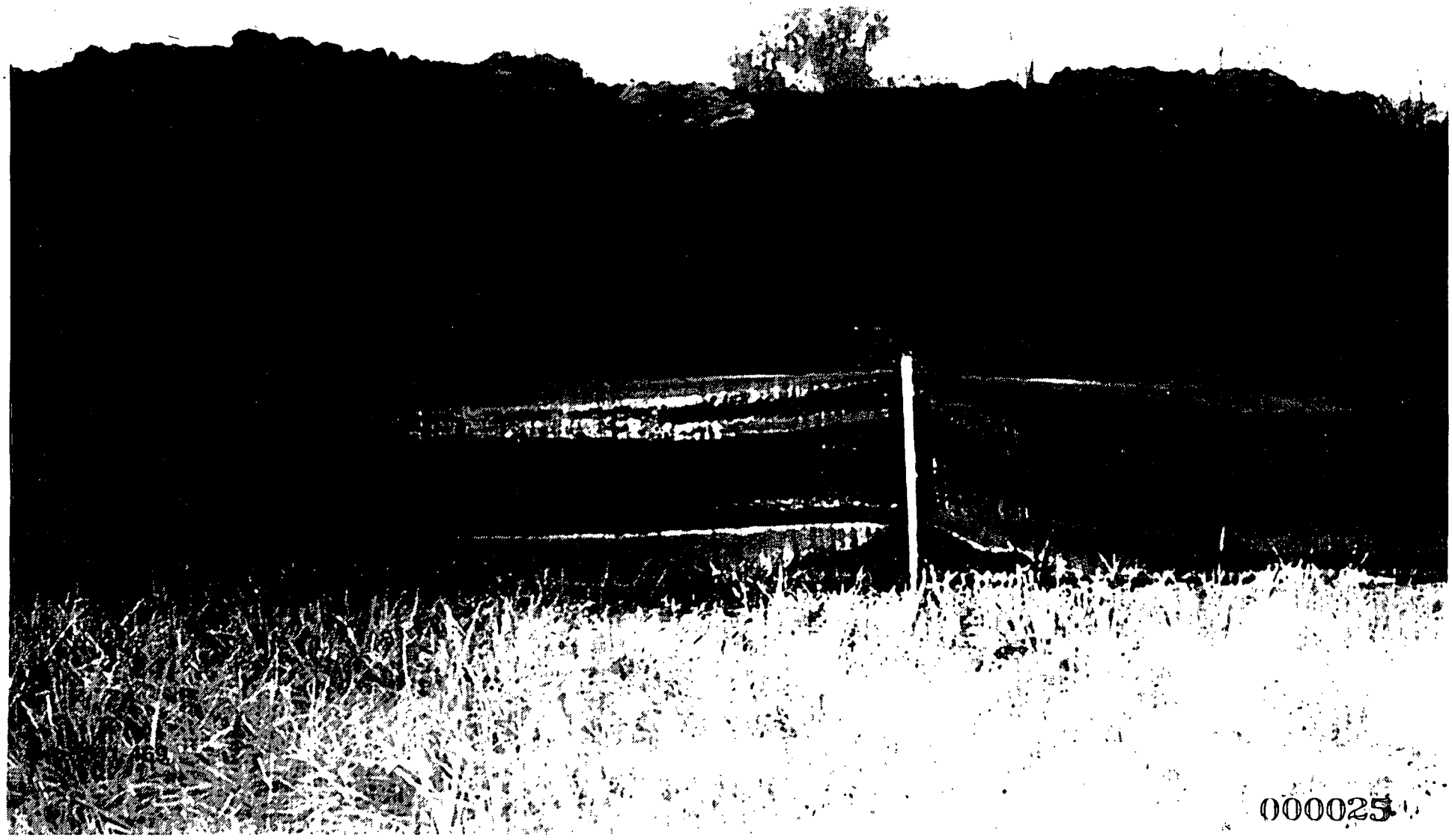
Learned to Date:

- 0 - 1 GMP Well Yields
- Not Feasible Due to Heterogeneity

DEEP
Dry Excavation Pit 1

DEEP
Dry Excavation Pit 1

DEEP
Dry Excavation Pit 3



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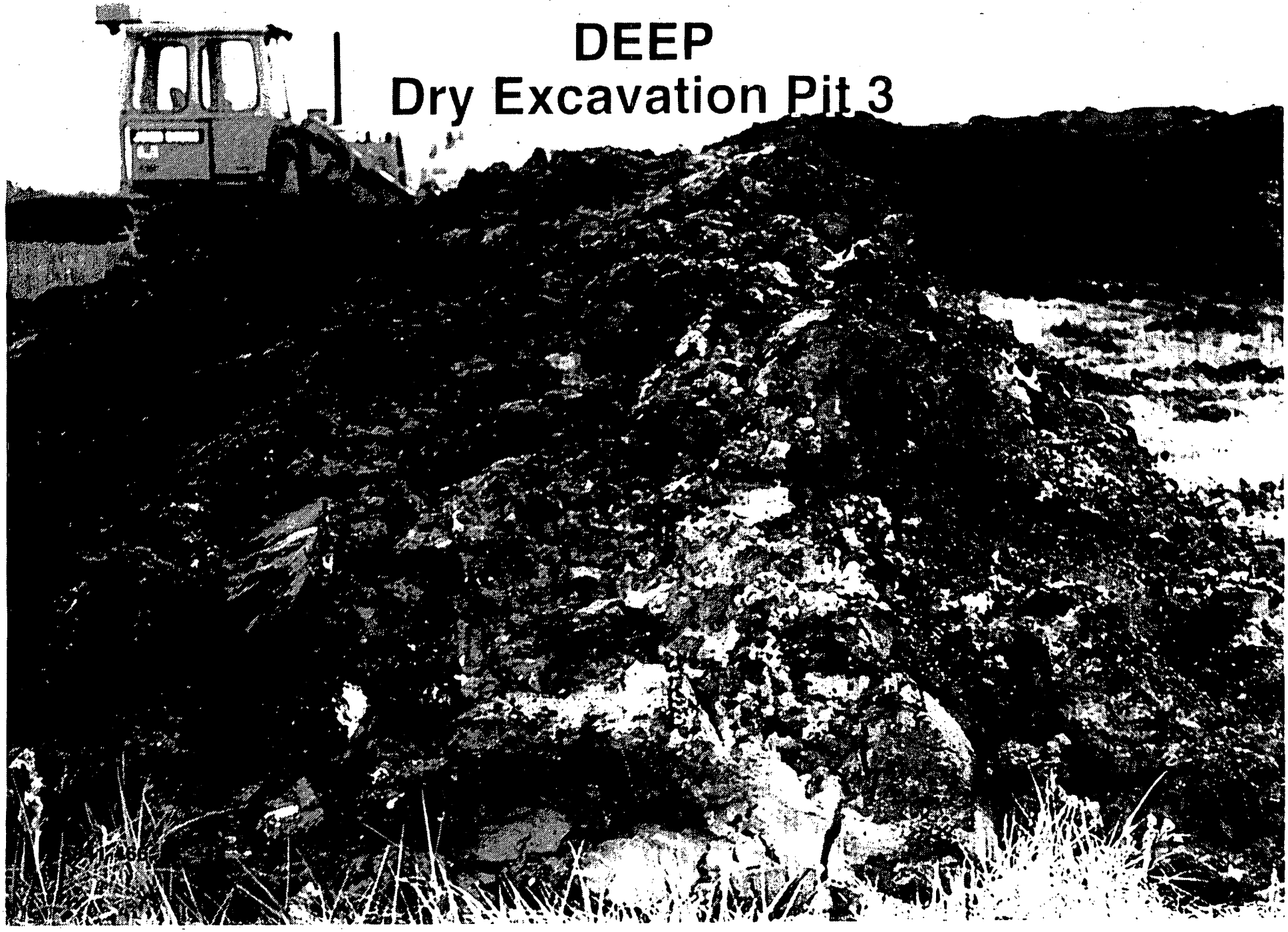
Dry Excavation Pit 3



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DEEP Results

- Conventional Excavation Implementation represents a safe, low cost excavation technique to be implemented during remediation of the waste pits

WASTE PITS REMEDIAL ACTION PROJECT

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Preliminary Design Overview

Status:

RDWP Implementation
Preliminary Design Submitted to EPA -- 10/24/95
EPA/OEPA Comments Anticipated - 12/26/95

Purpose of Presentation:

Review the Overall Concept
Identify the Components of the Preliminary Design Package
Solicit Comments

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WASTE PITS REMEDIAL ACTION PROJECT

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Selected Remedial Alternative Activities

1) Construction of Facilities
2) Removal of Water from Open Pits
3) Removal of Pit Contents, Caps & Liners
4) Confirmation of Achievement of Radiation Levels
5) Pretreatment of Waste
6) Thermal Drying of Waste to Meet the WAC of the PCDF
7) Sampling & Analysis of Waste to Confirm Meeting the WAC
8) Off-Site Shipment of Waste for Disposal at a PCDF
9) Contingency: Shipment of Waste to NTs
10) Decommissioning and Removal of the Facilities

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Aerial of Waste Pits

WASTE PITS REMEDIAL ACTION PROJECT

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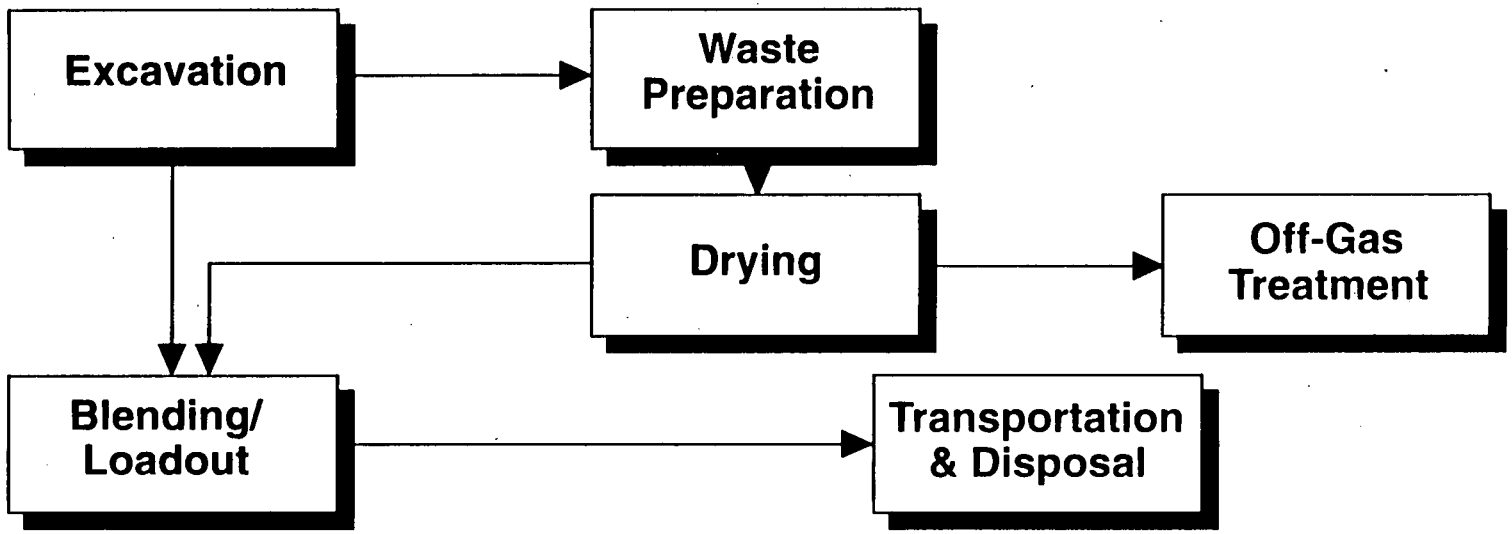
Operational Schematic of Remediation Activities



- Simplicity of Concept
  - Focus is on conventional earth moving equipment
- Flexibility of Operation
  - Process only to degree need to meet WAC
- Standard Shift Operation Except for 24 Hour Dryer Operation

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Waste Pit Excavation

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WASTE PITS REMEDIAL ACTION PROJECT

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Preliminary Design Package Contents

- Design Criteria Document
  - ARAR's & TBC Requirements (Cross Walk)
  - Results of Studies & Tests
- Plant Facilities Engineering
  - Process Description
  - Control Philosophy
  - Mass & Energy Balances
  - Process Flow Diagrams
  - General Arrangement Drawings
- Equipment Specifications
  - Shredder
  - Dryer
  - Off-gas Control System
  - Load Out Facilities

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Preliminary Design Package Contents

- Site Improvements Plan
  - Site Plans and Details
  - Site Grading Plan and Details
  - Utility Plan and Details
  - Civil Specifications
  - Utility Summary
  - Description of Site Preparation Activities
  - Description of On-Site Rail Improvements
  - Description of Off-Site Rail Improvements

- Construction Schedule

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WASTE PITS REMEDIAL ACTION PROJECT

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Preliminary Design Package Contents

- Excavation Plan
  - Excavation Plan
  - Materials Management Plan
  - Conceptual
  - DEEP Test Data Results

- Transportation and Disposal Plan

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WASTE PITS REMEDIAL ACTION PROJECT

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Schedule Major Features

- Enforceable Dates:
  - Preliminary Design Submittal — October 24, 1995
  - Pre-Final Design Submittal — March 21, 1996
  - RAWP Submittal Date — October 22, 1996
- 15 Month Criterion - June 1, 1996
- Substantive Commitment(s):
  - Award of Crusher/Shredder Contract
  - Award of Dryer/Offgas System Contract
  - Award of Material Handling Equipment Contract
  - Award and Start of Site Prep./Onsite Rail Infrastructure Contract
- Continuous Remedial Action:
  - Site Prep./Onsite Rail Infrastructure
  - Offsite Rail Upgrades
  - Plant Construction
  - Operation

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WASTE PITS REMEDIAL ACTION PROJECT

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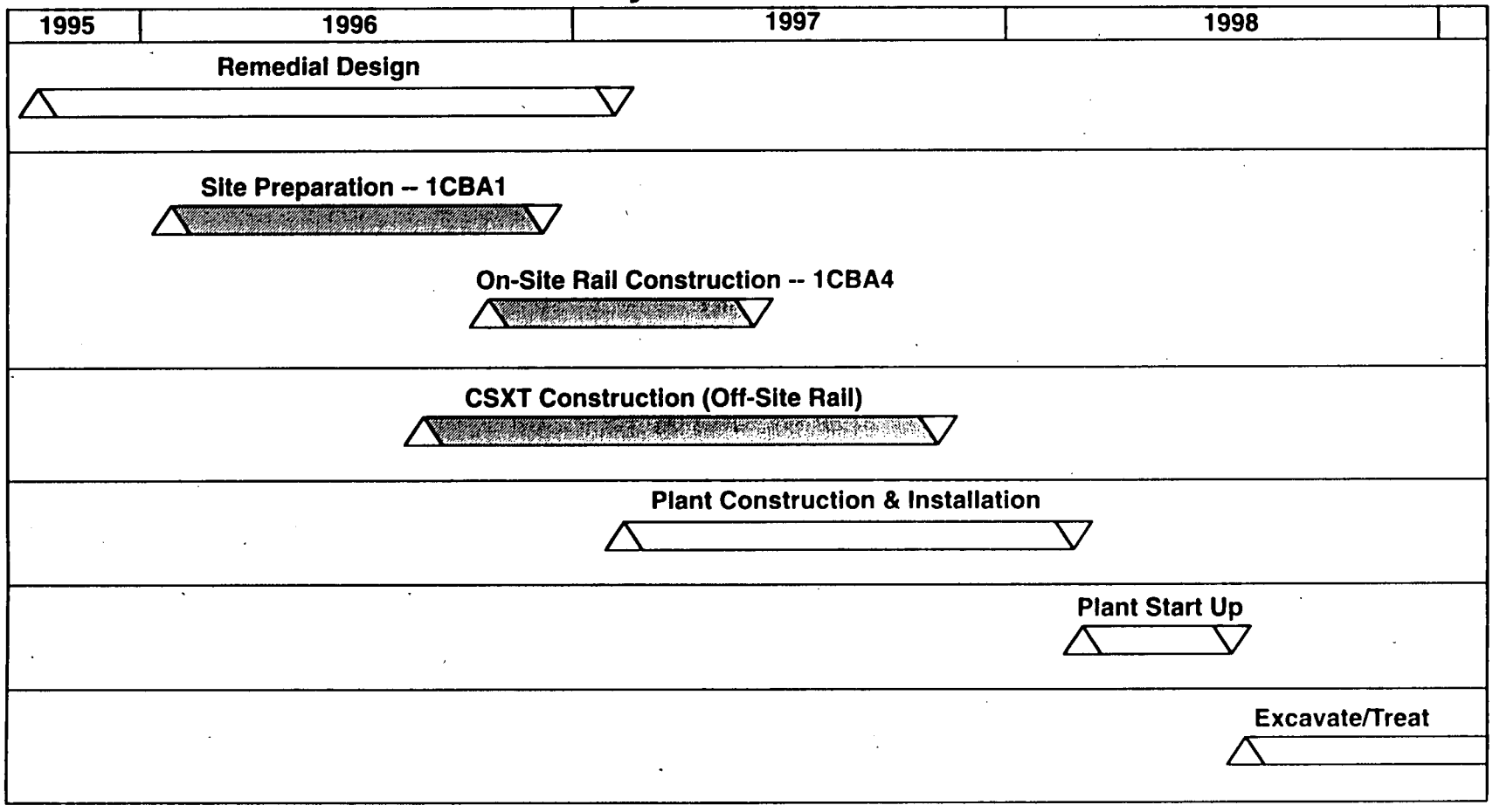
Project Schedule



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WASTE PITS REMEDIAL ACTION PROJECT

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Schedule Goals & Challenges

Goal: Meet all Identified Enforceable Dates Within Context of 10-Year Plan

Challenges:

- Procurement: Enters Critical Path for Design & Construction
- Fabrication Times of Long Lead Equipment vs "Just in Time Financing/Delivery"
- Safety analyses: Meeting the terms of the DOE Orders, keeping this process off critical path
- Uncertainties of Funding

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PUBLIC PARTICIPATION OVERVIEW

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- Required Public Involvement Activities During Remedial Design Process
  - Public Notification of Availability of Key Remedial Design Documents
  - Supplemental Public Involvement Activities During Remedial Design Process

- All Remedial Design Documents Submitted to U.S. EPA will be Available at the Public Environmental Information Center (PEIC) Located at 10845 Hamilton-Cleves Highway -- (513) 738-0165

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PUBLIC PARTICIPATION OVERVIEW

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For Additional Information About Public Involvement Opportunities During the Remedial Design Process, Please Call:

Gary Stegner
Public Information Officer
Fernald Area Office
(513) 648-3153

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OU1 Preliminary Design Package Contents

Deliverable	Components	Content
PACKAGE I		
PLANT FACILITIES DESIGN CRITERIA PACKAGE	Design Criteria Document (DCD)	Documents the specific criteria which affect the design, including all pertinent DOE orders, engineering design codes, standards and requirements, etc.
	ARARs and TBC Requirements Tables (Appendix A of DCD)	Discusses how the ARARs and TBCs are addressed through the design.
	Results of the Studies/Tests Relevant to Remediation System Design (Appendix B of DCD)	Summarizes the results of studies, reports, and/or evaluations in support of the design. (Does not include detailed results from DEEP; these are included in the Preliminary Technical Summary of DEEP Test Data).
PLANT FACILITIES ENGINEERING	Process Description	Describes the operation and process used to treat the waste, including wastewater handling as shown on the Process Flow Diagrams.
	Control Philosophy	Covers the general operating and control philosophy for the design, including a description of the instrumentation concept, operation, and process control on a system-by-system basis for each process shown on the Process Flow Diagrams.
	Mass and Energy Balances	Includes Mass Balances for Pit 6 (which are also included on the Process Flow Diagrams). The other Mass and Energy Balances will be included in the Pre-final Design Package.
	Process Flow Diagrams	Includes process flow diagrams for waste retrieval, waste preparation, drying and off-gas treatment, and dried waste blending and loadout. Also includes mass balances for Pit 6.
	Material and Equipment List	Currently includes a listing of the equipment associated with the process. Subsequent issues will include material as appropriate.
	General Arrangement Drawings	Includes a civil conceptual site plan, a civil conceptual utility plan, and material handling plans and sections for the pit waste remediation area, waste preparation area, the drying facility, and the blending and rail loadout facility.
EQUIPMENT SPECIFICATIONS	Shredder	Includes the performance specification for the shredder, motor, and associated electrical materials. These specifications are currently being finalized for procurement.
	Indirect Dryer	Includes the performance specification for the indirect rotary dryer, motor, electrical materials, piping, pipe supports, and insulation. These specifications are currently being finalized for procurement.
	Off-Gas Control System	Includes a discussion on the basis of the Off-Gas Control System, and draft performance specification for the various components of the Off-Gas Control System.
	Waste Loadout System	Includes the waste loadout system specification basis. Additional information will be provided in the Pre-final Design Package.
SITE IMPROVEMENT PLAN	Description of Site Preparation Activities	Presents the contents of the Site Improvement Plan and their interrelationship.
	Site Plan	Drawing depicting the general improvements to the site.
	Grading Plan and Details	Drawings depicting the grading plan in support of the construction of the remediation facilities.
	Utility Plan	Drawing showing the location of subsurface utilities.

OU1 Preliminary Design Package Contents (Continued)

Deliverable	Components	Content
PACKAGE I (Continued)		
SITE IMPROVEMENT PLAN (Continued)	Civil Specifications	Contains construction specifications to support the site improvement activities.
	Utility Requirements	Preliminary estimate of utility needs for the proposed OU1 remediation facilities.
	Design of On-Site Rail Improvements	Description of on-site rail improvements, including a layout drawing showing the rail upgrades and construction required to support on-site operations, along with a description of the logistics associated with receiving, loading, storing, and moving of full and empty cars.
	Off-Site Rail Upgrades	A discussion of the work to be performed by CSXT to repair or upgrade the rail system from the FEMP to Cottage Grove, Indiana.
CONSTRUCTION SCHEDULE	Construction Schedule	Estimate of the time required to complete the remedial action activities including an identification of the major construction tasks and subtasks.
PACKAGE II		
Deliverable	**Components**	**Content**
EXCAVATION PLAN	Waste Excavation Plan	Description of processes to be used in the excavation of waste from each of the various waste units and transfer to the processing facility, the basis of which will be reflective of the results of the Dewatering Excavation Evaluation Program. Discussion will also be provided on stormwater management, dust and fugitive emissions control, and monitoring during excavation, although specific sampling and analysis details will be identified in the Remedial Action Work Plan. The plan will also discuss needed coordination with Operable Unit 5 (OU5) relative to soils excavation, and with Operable Unit 3 (OU3) for the management of oversized debris.
	Materials Management (Appendix A of Excavation Plan)	Discusses various forms of materials which can expected to be generated through the OU1 excavation activities, and special waste handling needs associated with some of these materials (i.e., those which could potentially go to OU3 or OU5 for disposal in the on-property disposal facility).
	Conceptual Drawings (Appendix B of Excavation Plan)	Provides drawings of various excavation plans, sections, and civil details.
	Preliminary Technical Summary of DEEP Test Data	Provides a summary of the results of the various phases of DEEP, which have been completed to date.
SITE RESTORATION PLAN - Although identified in the RDWP, this design activity is no longer within the scope of the OU1 design, but will be more appropriately covered on a site-wide basis as an aspect of the OU5 design process.		
TRANSPORTATION AND DISPOSAL PLAN	Transportation and Disposal Plan	Description of plan for shipping waste to the PCDF and as required to NTS, including discussion of rail transportation concepts, shipment containers, plan for tracking of shipments, emergency response plan, and waste characterization testing and analysis requirements associated with meeting the waste acceptance criteria of the PCDF.