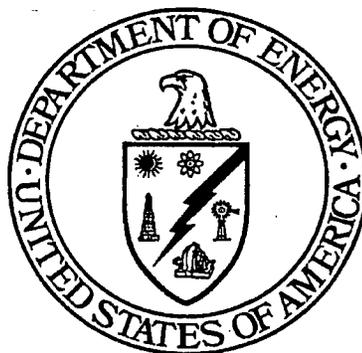


FORMER PRODUCTION AREA CONCEPTUAL RESTORATION DESIGN PLAN

FERNALD CLOSURE PROJECT
FERNALD, OHIO



JUNE 2004

U.S. DEPARTMENT OF ENERGY

20810 & 20800-PL-0004
REVISION A
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ACRONYM LIST

CDL	Certification Design Letter
DOE	U.S. Department of Energy
FCP	Fernald Closure Project
FPA	former production area
MDC	Main Drainage Corridor
NRRDP	Natural Resource Restoration Design Plan
NRT	Natural Resource Trustees
OSDF	On-site Disposal Facility
SSOD	Storm Sewer Outfall Ditch
SWRB	Storm Water Retention Basin

1.0 PURPOSE OF CONCEPTUAL RESTORATION DESIGN PLAN

This Conceptual Restoration Design Plan is intended to provide the Fernald Natural Resource Trustees (NRTs) and the regulatory agencies (U.S. and Ohio Environmental Protection Agency) an opportunity to review and comment on DOE's restoration grading and surface water management approach for the former production area (FPA). The FPA is shown on Figure 1-1. This area consists of Certification Areas 3A, 3B, 4A, 4B, 5, a portion of Area 6, the eastern portion of Area 7, the Main Drainage Corridor (MDC), and the Storm Water Retention Basin (SWRB). It is important that the NRTs and Agencies provide input to this Conceptual Restoration Design due to the complexity of the FPA project and the phased approach to implementation before the development of the full Natural Resource Restoration Design Plan (NRRDP). The Conceptual Restoration Design will help to define the project boundary, establish a schedule for implementation, and describe the general restoration activities planned for the FPA. This plan is consistent with the 2001 Natural Resource Restoration Plan and the Operable Unit 5 Record of Decision.

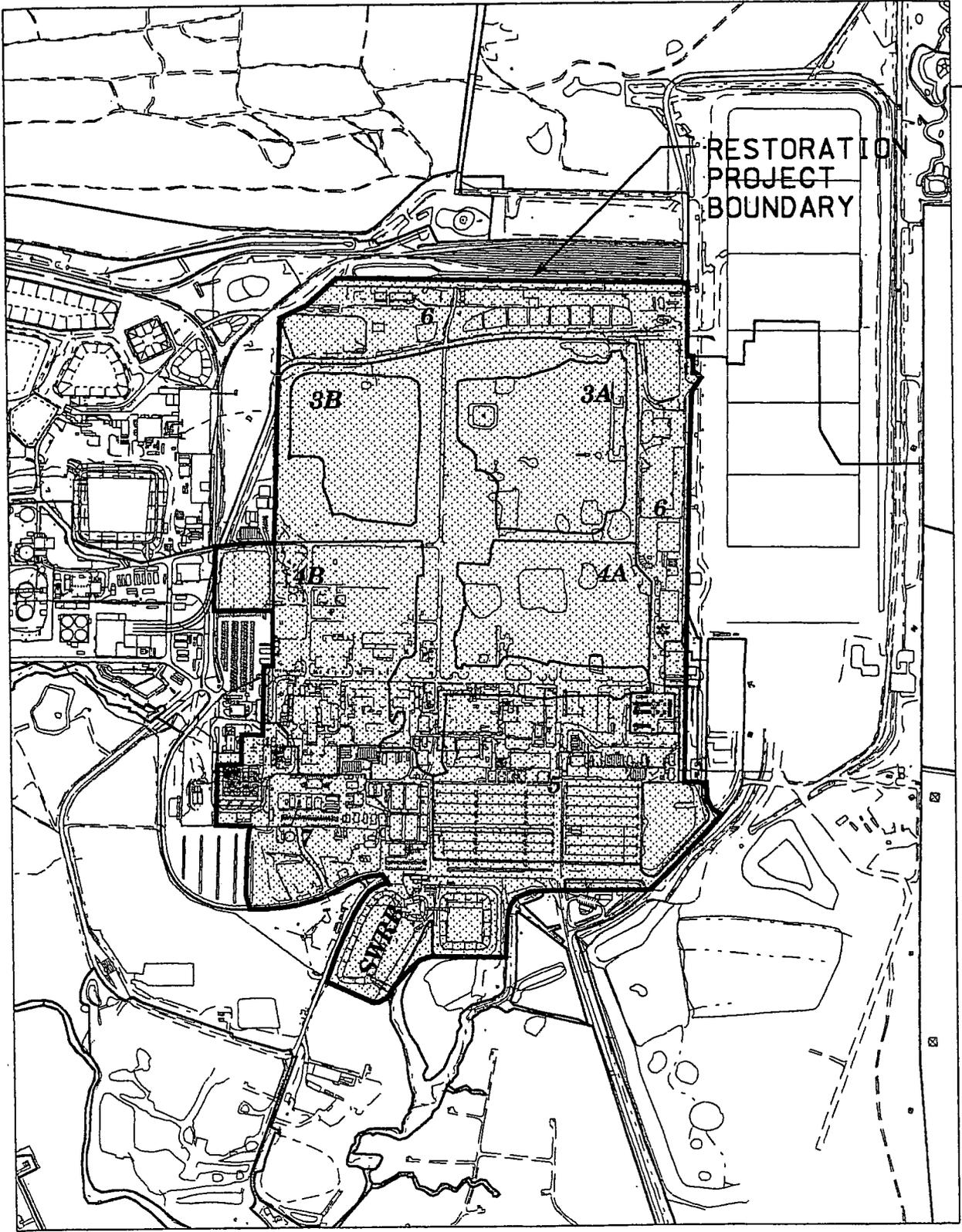
The FPA restoration project will be designed and implemented in phases due to the required integration with ongoing remedial activities. Surface water runoff control will need to be maintained for several areas, since certain upgradient soil will not be certified until later. Therefore, restoration areas within the FPA cannot be integrated into a single watershed until all areas are certified. This will require a phased implementation to the FPA Restoration Project, which is defined further in Section 3.0.

This conceptual restoration design will not provide planting patch and seeding tables, although the same techniques and species used in previous restoration efforts are planned for this project. Issues such as the monitoring approach and planned maintenance activities are also not discussed. The NRRDP will address the above-noted issues, along with input received on this Conceptual Design.

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STATE PLANNING COORDINATE SYSTEM 1983

30-JUN-2004



RESTORATION PROJECT BOUNDARY

3B

3A

4B

4A

SUPER

SCALE

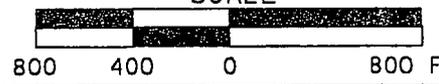


FIGURE 1-1. FORMER PRODUCTION AREA CONCEPTUAL RESTORATION PLAN - PROJECT BOUNDARY

2:0 FORMER PRODUCTION AREA PROJECT BOUNDARY

The FPA Restoration Project boundary is shown on Figure 1-1. The project encompasses what was once the production area at the Fernald Closure Project (FCP). As stated in Section 1, FPA restoration includes Certification Areas 3A, 3B, 4A, 4B, 5, and part of Areas 6 and 7. Generally, these areas are bounded by the On-site Disposal Facility (OSDF) to the east and the restored Northern Pines to the north. The remaining portion of Area 6 borders the western edge of the FPA project. The Paddys Run East Restoration Project is located just south of the FPA Restoration Project. The MDC consists of several utility corridors that run between Areas 3A/4A and 3B/4B towards the SWRB. The SWRB outfalls into the Storm Sewer Outfall Ditch (SSOD).

3.0 SCOPE OF RESTORATION WORK

The conceptual restoration plan for the FPA is shown on Figure 3-1. In general, the plan calls for a series of wetland and open water habitats, surrounded by a mosaic of native shrub plantings and seeded areas. Access paths and staging areas are also shown on Figure 3-1.

As stated in Section 1, surface water from uncertified areas will be diverted away from areas that are certified until remediation is complete. Because of this, the FPA restoration project will consist of five separate efforts. Each of the four Certification Areas (3A, 3B, 4A, 4B) will be remediated to function as independent, stand-alone drainage systems in the near term. Restoration of the MDC, coupled with certification and restoration of Areas 5, 6, and 7 will connect the four areas via surface water inflow and outflow. Therefore, some grading, installation of infrastructure, and planting activities will be conducted in anticipation of future watershed connectivity. In addition, surface water collected within certified areas will be pumped to nearby certified runoff locations. By doing this, the amount of surface water requiring treatment will be minimized.

While each area is handled independently, there are several design components common to all of the FPA. First, the restoration grade for each area will be planned to take advantage of post-remediation topography. Several deep excavations will remain as open water habitat within restored areas. Also, interceptor ditches (which are not shown on Figure 3-1) and ponds will be incorporated into the MDC drainage patterns. In this way, the extent of grading required to achieve restoration topography is minimized. The conceptual design reflects this approach. However, cut and fill soil balances and restoration contours will be developed as part of the NRRDP.

A second common design component involves the addition of soil amendments into restored areas. Each certification area within the FPA will have all topsoil removed. The remaining glacial till subsoil will probably be severely compacted and virtually devoid of organic matter and nutrients. To remedy this, restoration areas will be deep-tilled in order to reduce compaction. If topsoil is not available, yard waste compost will then be imported to the restored area and incorporated into the soil. Pan scrapers and other equipment will be used to spread compost approximately three inches deep across planting and seeding areas. The compost will then be tilled into the soil about one foot deep. Once the compost is incorporated into the soil, only low ground pressure equipment will be able to access planting and seeding areas. Fertilizer and mycorrhizal inoculant will also be added to the soil during seeding operations.

Species lists, planting densities, seeding rates, and installation specifications will be similar across the FPA. Approximately 1,600 shrubs are planned for the FPA. As Figure 3-2 shows, the majority of these shrubs will be installed in Areas 3A and 3B. In addition, approximately 4,800 herbaceous wetland plugs will be installed within wetland areas. Detailed information regarding these activities, as well as monitoring and maintenance requirements, will be provided in the FPA NRRDP.

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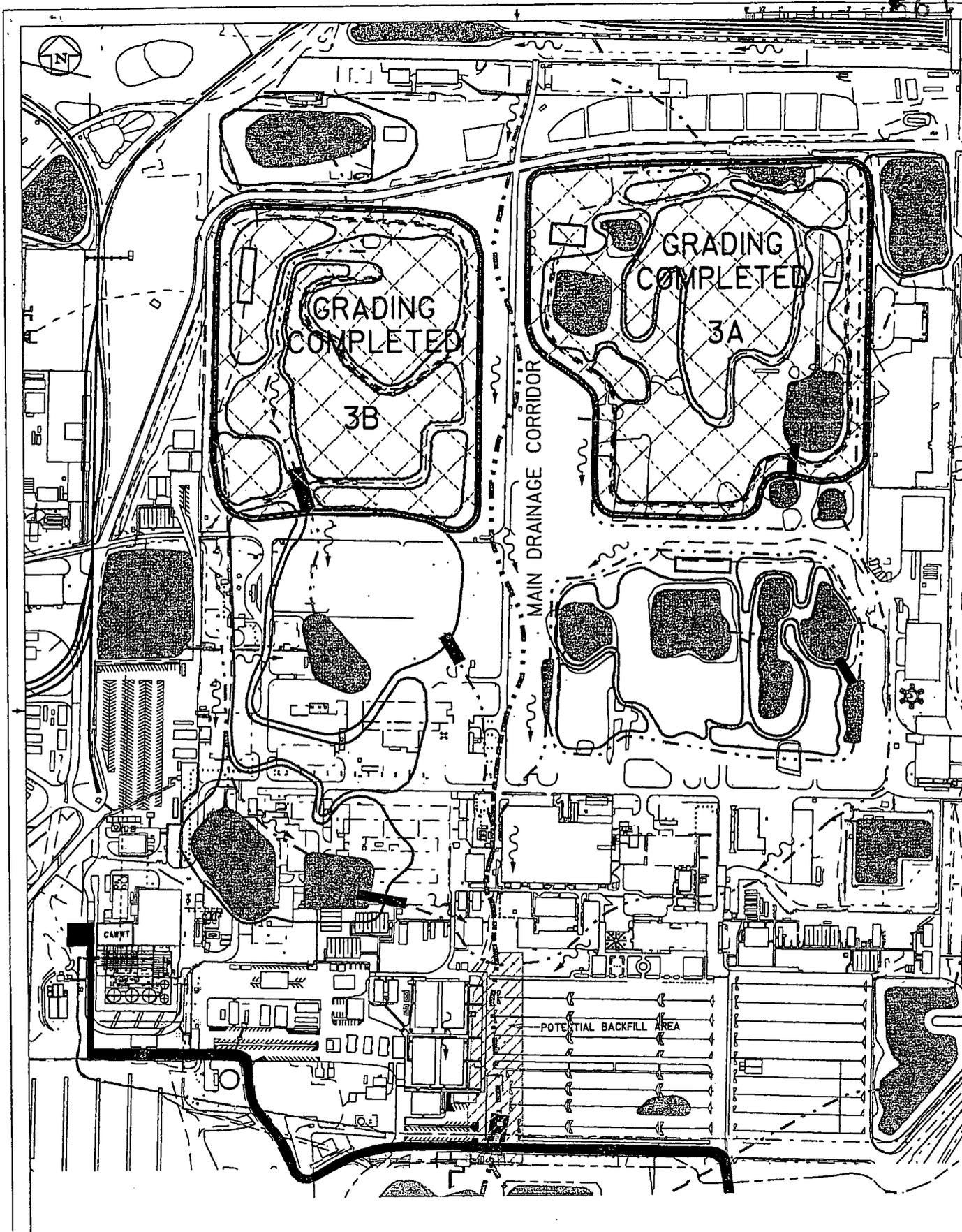
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4.0 FORMER PRODUCTION AREA PROJECT SCHEDULE

The target date for submittal of the final Phase I NRRDP is August 26, 2004. The final Phase I NRRDP will address restoration of Areas 3A, 3B, and 4A. This will allow adequate time for the resolution and incorporation of NRTs and Agency comments on the Conceptual Restoration Design Plan. The final Phase II NRRDP for Areas 4B, 5, 6, 7, the MDC, and the SWRB is planned to be submitted by summer 2005.

Field restoration activities will not commence until areas are certified. The Certification Design Letter (CDL) for Areas 3A and 3B is due July 1, 2004. The CDL for Area 4A is due December 31, 2004. Areas 4B, 5, 6, 7, the MDC and the SWRB will be certified later. As stated in Section 1, restoration will be conducted in phases to accommodate remediation and certification schedules. Figures 4-1, 4-2, and 4-3 show the sequence of restoration across the FPA. Areas 3A and 3B will be restored first, in Fall 2004. The majority of grading activities and incorporation of soil amendments will occur in the fall, followed by planting and seeding activities in spring 2005.

Restoration of Area 4A will begin in spring 2005. Grading, planting, and seeding activities should be completed by June 2005. Areas 4B, 5, 6, 7, the MDC, and the SWRB will be restored last following certification. All restoration activities will be completed by closure. When possible, restoration will be accelerated.



0' 50' 100' 200' 300'

FORMER PRODUCTION AREA
 CONCEPTUAL RESTORATION PLAN
 RESTORATION STATUS
 DECEMBER 2004

NO.	REVISIONS	DATE	BY	APP'D.	REF. DWG. NO.

CONTRACTOR'S DESIGN DRAWING
 FLUOR FERNALD
 CAD DRAWING
 DO NOT REVISE
 MANUALLY.

DATE	BY	APPROVED

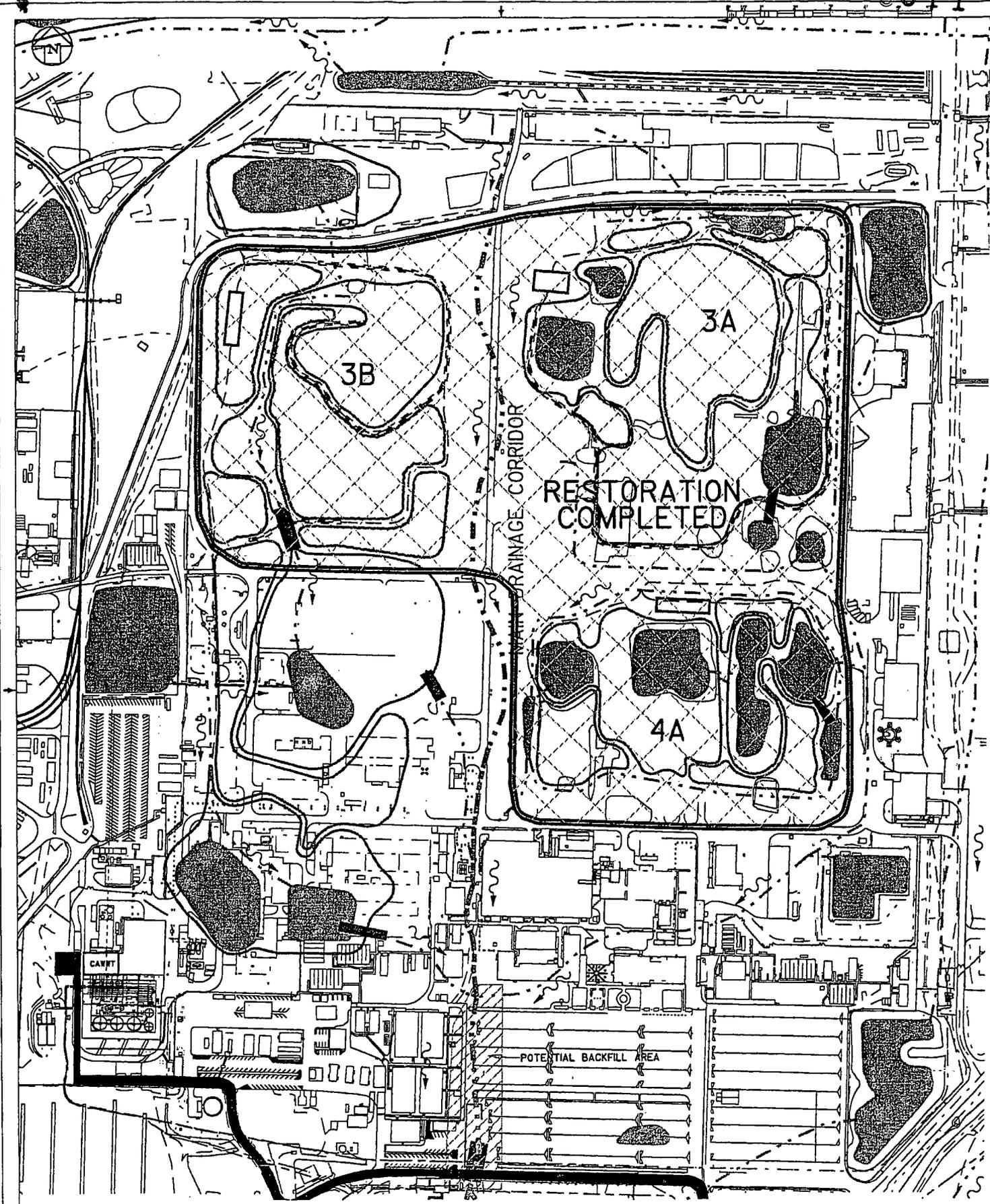
Fernald Closure Project

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U.S. DEPARTMENT OF ENERGY

FIGURE 4

FILE NAME: 8877/restoration/restoration



FORMER PRODUCTION AREA
 CONCEPTUAL RESTORATION PLAN
 RESTORATION STATUS
 JUNE 2005

0" 50' 100' 200' 300'

NO.	REVISIONS	DATE	BY	CHKD.	REF. DWG. NO.

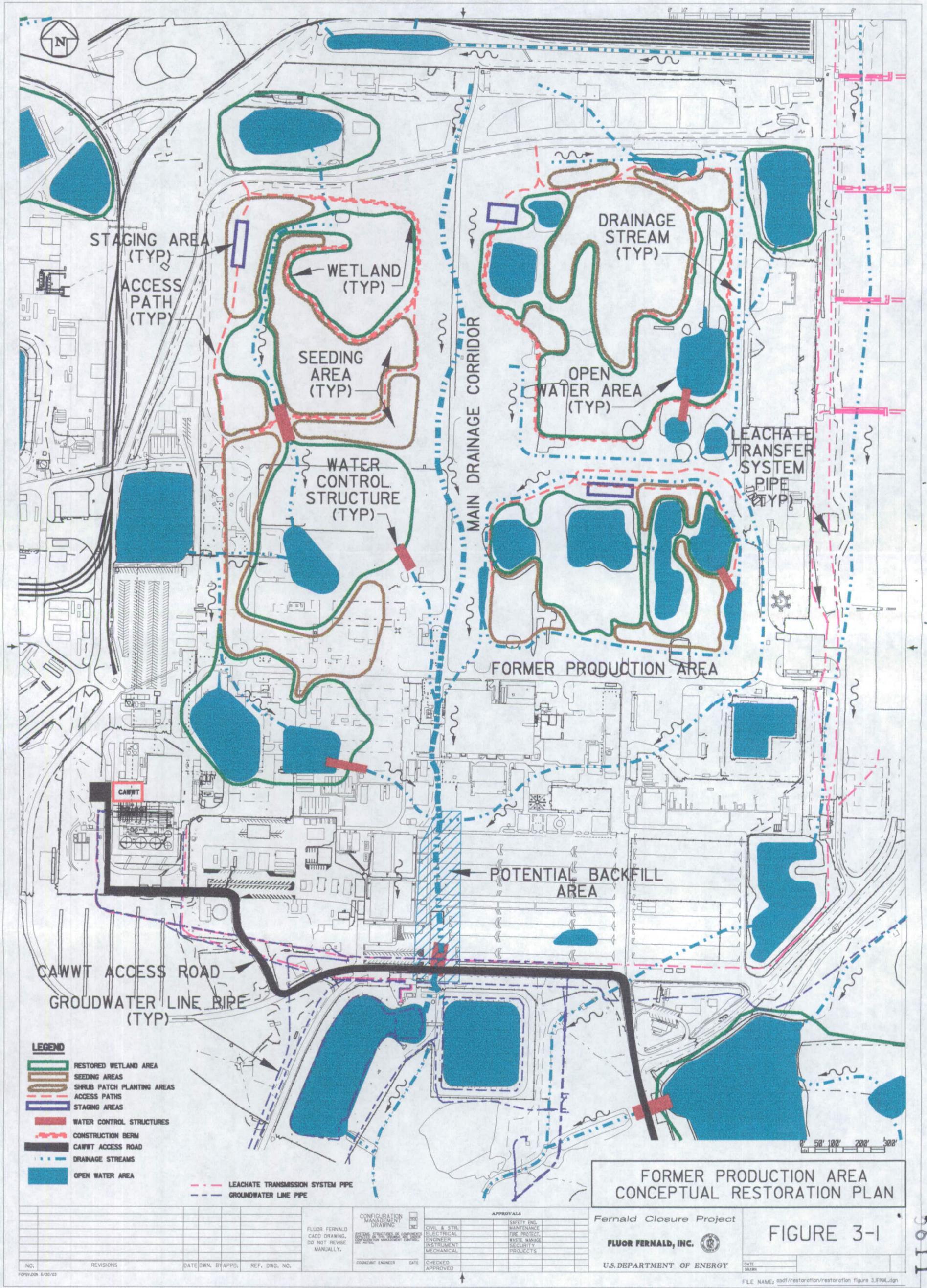
NO.	DESCRIPTION	DATE	BY	CHKD.	APPROVED

Fernald Closure Project
 FLUOR FERNALD, INC. 
 U.S. DEPARTMENT OF ENERGY

FIGURE 4-2
 DATE: _____
 FILE NAME: eed7/restoration/restoration figure

REFERENCES

U.S. Department of Energy, 2002, "Natural Resource Restoration Plan," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.



- LEGEND**
- ▬ RESTORED WETLAND AREA
 - ▬ SEEDING AREAS
 - ▬ SHRUB PATCH PLANTING AREAS
 - ▬ ACCESS PATHS
 - ▬ STAGING AREAS
 - ▬ WATER CONTROL STRUCTURES
 - ▬ CONSTRUCTION BERM
 - ▬ CAWWT ACCESS ROAD
 - ▬ DRAINAGE STREAMS
 - ▬ OPEN WATER AREA
 - ▬ LEACHATE TRANSMISSION SYSTEM PIPE
 - ▬ GROUNDWATER LINE PIPE

**FORMER PRODUCTION AREA
CONCEPTUAL RESTORATION PLAN**

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FIGURE 3-1

NO.	REVISIONS	DATE	BY	APP'D.	REF. DWG. NO.

NO.	DATE	BY	APP'D.

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