

Volume II
Institutional Controls Plan

January 2017

U.S. Department of Energy

Revision 10
Final

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Emergency Contact

**Legacy Management 24-hour
Monitored Security Telephone Number**

(877) 695-5322

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Attachment B	Post-Closure Care and Inspection Plan
Attachment C	Groundwater/Leak Detection and Leachate Monitoring Plan
Attachment D	Integrated Environmental Monitoring Plan
Attachment E	Community Involvement Plan

Abbreviations

AR	Administrative Record
CAWWT	Converted Advanced Wastewater Treatment facility
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
CIP	Community Involvement Plan
D&D	decontamination and demolition
DOE	U.S. Department of Energy
EM	Office of Environmental Management
EPA	U.S. Environmental Protection Agency
FCAB	Fernald Citizens Advisory Board
FEMP	Fernald Environmental Management Project
FRESH	Fernald Residents for Environmental Safety and Health
FRL	final remediation level
GEMS	Geospatial Environmental Mapping System
GPS	global positioning system
GWLMP	Groundwater/Leak Detection and Leachate Monitoring Plan
IC	institutional control
IC Plan	Institutional Controls Plan
IEMP	Integrated Environmental Monitoring Plan
IRAR	<i>Interim Remedial Action Report for Operable Unit 5</i>
IRDP	Integrated Remedial Design Package
IRRA	<i>Interim Residual Risk Assessment Report</i>
LCS	leachate collection system
LDS	leak detection system
LM	Office of Legacy Management
LMICP	<i>Comprehensive Legacy Management and Institutional Controls Plan</i>
µg/L	micrograms per liter
NPDES	National Pollutant Discharge Elimination System
Ohio EPA	Ohio Environmental Protection Agency
OMMP	Operations and Maintenance Master Plan
OSDF	On-Site Disposal Facility
OU	operable unit

PCCIP	Post-Closure Care and Inspection Plan
ppb	parts per billion
RCRA	Resource Conservation and Recovery Act
RI/FS	remedial investigation/feasibility study
ROD	record of decision
SEP	Sitewide Excavation Plan
SWPPP	Storm Water Pollution Prevention Plan
WAC	waste acceptance criteria
WCS	Waste Control Specialists, LLC

Executive Summary

This *Comprehensive Legacy Management and Institutional Controls Plan* (LMICP) was developed to document the planning process and the requirements for the long-term care, or legacy management, of the Fernald Preserve. The LMICP is a two-volume document with supporting documents included as attachments to Volume II. Volume I provides planning details for management of the Fernald Preserve that go beyond those identified as institutional controls in Volume II. Primarily, Volume II is a requirement of 42 *United States Code* 103, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), providing institutional controls that will ensure that the cleanup remedies implemented at the Fernald Preserve will protect human health and the environment. The format and content of Volume II follows U.S. Environmental Protection Agency (EPA) requirements for institutional controls. Once approved, Volume II becomes enforceable under CERCLA authority.

Volume I is the Legacy Management Plan. This plan is not a required document under the CERCLA process, and it is not a legally enforceable document. It provides the U.S. Department of Energy (DOE) Office of Legacy Management (LM) with a plan for managing the Fernald Preserve and fulfilling DOE's commitment to maintain the Fernald Preserve following closure. The plan discusses how DOE, specifically LM, will approach the legacy management of the Fernald Preserve. It describes the surveillance and maintenance of the entire site, including the On-Site Disposal Facility (OSDF). It explains how the public will continue to participate in the future of the Fernald Preserve. Also included in the Legacy Management Plan is a discussion of records and information management. The plan concludes with a discussion on funding for legacy management of the site.

Volume II is the Institutional Controls Plan (IC Plan). The IC Plan is required under the CERCLA remediation process when a physical remedy does not allow for full, unrestricted use, or when hazardous materials are left onsite. The plan is a legally enforceable CERCLA document and is part of the remedy for the site (an EPA requirement). The plan outlines the institutional controls that are established for and enforced across the entire site, including the OSDF, to ensure that human health and the environment continue to be protected following the implementation of the remedy.

The IC Plan has five attachments that lend support to and provide details regarding the established institutional controls. The attachments provide further information on the continuing groundwater remediation (pump-and-treat) system (Attachment A), the OSDF cap and cover system (Attachment B), the leak detection and leachate management systems for the OSDF (Attachment C), the environmental monitoring that will continue following closure (Attachment D), and the CERCLA-required Community Involvement Plan (Attachment E). The Community Involvement Plan explains in detail how DOE will ensure that the public has appropriate opportunities for involvement in post-closure activities.

The LMICP was first approved in August 2006. It is anticipated that the LMICP revisions will be finalized by January each year, to correspond with calendar-year monitoring and reporting. EPA and Ohio Environmental Protection Agency comments will be addressed between October and January.

The future LMICP schedule will be as follows:

- Each June, the annual Site Environmental Report will be submitted. It will make recommendations based on the previous year's monitoring information.
- Each September, an annual review of the LMICP will be submitted. It will identify updates as necessary.
- Each January, the LMICP will be finalized to correspond with the monitoring and reporting schedule.

1.0 Introduction

The U.S. Department of Energy (DOE) manages the Fernald Preserve, owned by the federal government, which is situated on a 1,050-acre tract of land approximately 18 miles northwest of Cincinnati, Ohio. The Fernald Preserve is located near the unincorporated communities of Ross, Fernald, Shandon, New Baltimore, and New Haven. Land use in the area consists primarily of residential areas, farming, gravel excavation operations, light industry, and parks.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is the primary driver for the environmental remediation of the Fernald Preserve. The site was divided into five operable units (OUs), and a remedial investigation and feasibility study (RI/FS) was conducted for each unit. Based on the results of the RI/FSs, Records of Decision (RODs) were issued outlining the selected remedy for each OU.

- **ROD for OU1, Waste Pits Area:** The remedy for OU1 included removing all material from the waste pits, stabilizing the material by drying it, and shipping it offsite for disposal. OU1 field activities ended June 2005.
- **ROD for OU2, Other Waste Units:** The remedy for OU2 included removing material from the various units, disposing of material that met the onsite waste acceptance criteria (WAC) in the On-Site Disposal Facility (OSDF), and shipping all other material offsite for disposal. The WAC were developed by DOE and regulators, with input from the stakeholders and the public, to strictly control the type of waste disposed of onsite. The WAC are documented in the *Waste Acceptance Criteria Attainment Plan for the On-site Disposal Facility* (DOE 1998a). OU2 field activities ended November 2003.
- **Final ROD for OU3, Production Area:** The OU3 remedy included decontaminating and decommissioning all contaminated structures and buildings, recycling waste materials whenever possible, disposing of material that met the onsite WAC in the OSDF, and shipping all other material offsite for disposal. OU3 field activities ended October 2006.
- **ROD for OU4, Silos 1–4:** The OU4 remedy included removing and treating all material from the silos, dismantling the silos, and shipping the waste materials and silo debris offsite for disposal.

Pneumatic retrieval, conditioning, and packaging of Silo 3 material was initiated March 23, 2005. A total of 1,416 containers were filled via pneumatic retrieval through October 21, 2005, when mechanical retrieval was initiated. Retrieval and packaging of Silo 3 material was completed March 21, 2006. A total of 2,297 containers were filled (including 50 containers of material generated during safe shutdown of the facility) and transported to Envirocare of Utah for disposal.

Bulk processing in the Silos 1 and 2 Remediation Facility was completed March 19, 2006. A total of 3,776 containers of treated material from Silo 1 and 2 (including 80 containers produced through direct loadout in support of the safe shutdown of the facility) were packaged and shipped to the Waste Control Specialists, LLC (WCS) facility in Andrews, Texas, for disposal. On May 29, 2008, the State of Texas granted a byproduct license to WCS, which allowed the canisters of Silos 1 and 2 waste to be permanently disposed of at WCS. Final permanent disposal of Silos 1 and 2 treated waste materials began on October 7, 2009. The last container was placed on November 2, 2009.

- **ROD for OU5, Environmental Media:** OU5 includes all environmental media, such as soil, sediment, surface water, groundwater, and vegetation. The Site-Wide Excavation Plan (SEP) (DOE 1998b) describes the remediation of soils, which includes the excavation of soils that exceed the risk-based final remediation levels (FRLs) for a list of constituents of concern as listed in the SEP. The OU5 ROD (DOE 1996) describes the approved remediation method of pump-and-treat for groundwater until levels of uranium in groundwater are less than 30 parts per billion (ppb). In the original ROD, the FRL for uranium in groundwater was 20 ppb. After the U.S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (Ohio EPA) approved the change, the FRL was raised to 30 ppb, as written in the *Explanation of Significant Differences for Operable Unit 5* (DOE 2001). OU5 field activities related to care and maintenance of the OSDF and aquifer restoration are ongoing.

A list of the RODs and all associated documents is included in Appendix A of this volume.

The Declaration of Physical Completion, or closure, occurred on October 29, 2006. The construction of the OSDF and all site cleanup activities—with the exception of the ongoing actions necessary to achieve the final cleanup of the Great Miami Aquifer—were completed. Once the aquifer is restored, the Converted Advanced Wastewater Treatment facility (CAWWT) and associated infrastructure will be decommissioned and dismantled, and the utility corridors and the CAWWT footprint will be remediated (see Volume I, Figure 3). Modeling results indicate that the projected date of completion of the pump and treat operation of the aquifer restoration is 2035.

Ecological restoration followed remediation and was the final step to completing the cleanup of the site. Ecological restoration activities at the site were also being implemented to address wetland mitigation requirements under the Clean Water Act and to stabilize and revegetate areas impacted during remediation. Approximately 900 acres of the Fernald Preserve have been ecologically restored, having been graded following excavations, amended, seeded, planted, or otherwise enhanced to create ecosystems comparable to native presettlement southwestern Ohio.

The OSDF, located on the eastern side of the Fernald Preserve, is complete. The OSDF consists of eight disposal cells, the footprint of which covers an area of approximately 75 acres. A buffer area and a perimeter fence are established around the disposal facility, and the total fenced OSDF area is approximately 98 acres. A few additional facilities remain onsite. These include the Visitors Center (former Silos Warehouse), CAWWT and supporting infrastructure, extraction wells and associated piping and utilities, the outfall line to the Great Miami River, the former Dissolved Oxygen Building, the Restoration storage shed, and the former Communications Building. Several public amenities have been added to the site since opening to the public in 2008. These include a program shelter located adjacent to the Visitors Center, a 7-mile trail system, several observation decks, a wetland boardwalk, and a wildlife observation blind. Figure 1 shows the Fernald Preserve's land use.

The DOE Office of Environmental Management (EM) was responsible for the remediation of the Fernald Site. Post-remediation responsibilities have transitioned to the DOE Office of Legacy Management (LM). LM is responsible for the post-remediation operations (including decontaminating and dismantling the aquifer remediation infrastructure), maintenance, and enforcement of institutional controls (ICs) at the site.

FERNALD LEGACY MANAGEMENT

LAND USE

- 395 acres of Woodlots
- 352 acres of Prairies and Grassland
- 98 acres of OSDF
- 83 acres of Wetlands
- 60 acres of Open Water
- 33 acres of Savannas
- 29 acres of Infrastructure



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Figure 1. Fernald Preserve Land Use

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1.1 Purpose and Organization of this Institutional Controls Plan

This Institutional Controls Plan (IC Plan) outlines the institutional controls established and enforced since remediation was completed, with the exception of the groundwater remediation at the Fernald Preserve. This IC Plan documents DOE's approach to maintaining institutional controls as required by EPA under CERCLA. The institutional controls outlined in this plan are designed to ensure the continued protection of human health and the environment following closure of the site. LM is responsible for monitoring, maintaining, reporting on, and implementing institutional controls at the Fernald Preserve. This IC Plan will be reviewed annually to determine if revisions are required. All revisions will be subject to regulatory agency review and will be made available to the public. This IC Plan will also be reviewed every 5 years in conjunction with the CERCLA Five-Year Review, and revisions will be made as necessary. Revisions can always be made on an as-needed basis if the results of site and OSDF inspections and monitoring require them.

In addition, changes to any of the support plans attached to this IC Plan may trigger revisions to the IC Plan. The approved IC Plan is part of the CERCLA remedy for the Fernald Preserve.

The documents attached to this IC Plan provide further detail and more subject-specific information regarding institutional controls and other post-closure activities. These documents include:

- Attachment A—Operations and Maintenance Master Plan for the Aquifer Restoration and Wastewater Treatment (OMMP).
- Attachment B—Post-Closure Care and Inspection Plan (PCCIP).
- Attachment C—Groundwater/Leak Detection and Leachate Monitoring Plan (GWLMP).
- Attachment D—Integrated Environmental Monitoring Plan (IEMP).
- Attachment E—Community Involvement Plan (CIP).

1.2 Summary of Attachments

The OMMP (Attachment A) establishes the design logic and priorities for the major flow and water treatment decisions needed to maintain compliance with the Fernald Preserve's National Pollutant Discharge Elimination System (NPDES) permit and ROD (OU5) surface water discharge limits. The OMMP is designed to guide and coordinate the extraction, collection, conveyance, treatment, and discharge of all groundwater and leachate (from the OSDF). A summary of the information in the OMMP is included in Section 3.4, "Groundwater Remedy and Monitoring."

The PCCIP (Attachment B) addresses the inspection, monitoring, and maintenance activities necessary to ensure the continued proper performance of the OSDF. Key concepts addressed include ownership, access controls and restrictions, deed and use restrictions, environmental monitoring, OSDF cap and buffer area inspections, custodial maintenance, contingency repair, corrective actions, emergency notifications, reporting, and public involvement. Additional details from this plan are included in Section 3.5.1, "OSDF Inspection and Maintenance."

The GWLMP (Attachment C) specifies the frequencies and parameters being monitored in four horizons for each cell of the OSDF. These horizons are the leachate collection system (LCS), the

leak detection system (LDS), perched water in the glacial overburden, and the Great Miami Aquifer (both upgradient and downgradient of each cell). Cell-specific data from these four horizons are evaluated holistically to verify the integrity of the cells. To date, the data from this comprehensive leak detection program indicate that the liner systems for all the cells are performing within the specifications established in the OSDF design documentation. The GWLMP will be reviewed with the *Comprehensive Legacy Management and Institutional Controls Plan* (LMICP) annually. Any modifications to the plan will be based on analysis of the data collected from the ongoing leak detection sampling. The GWLMP governs the post-closure leak detection and leachate monitoring program for the OSDF. Further details from the GWLMP are included in Section 3.5.2, “Leak Detection/Leachate Monitoring.”

The IEMP (Attachment D) directs environmental monitoring program elements that support site remediation activities. The document outlines all regulatory requirements for sitewide monitoring, reporting, and remedy performance tracking activated by the applicable or relevant and appropriate requirements identified in the remedy selection documents. The various elements of environmental monitoring that are addressed in the IEMP include groundwater monitoring (Section 3.0), surface water and treated effluent (Section 4.0), and Dose Assessment Program (Section 5.0). Section 6.0 provides a review and summary of the various programs and reporting requirements. The Natural Resource Monitoring Plan is also included as an appendix to the IEMP.

The CIP (Attachment E) documents how DOE will ensure that the public has appropriate opportunities for involvement in site-related decisions, including site controls, management, and monitoring.

1.3 Definition and Purpose of Institutional Controls

Institutional controls are important to help minimize the potential for exposure to, and the release of, residual contaminants, ensuring the protection of human health and the environment. Institutional controls are also important in helping to protect engineered remedies by providing a means to ensure that the remedy remains effective, is not showing signs of failure, and is not being vandalized or damaged by outside elements (natural or human) in any way. Section 1.4 describes the types of institutional controls at the site.

EPA, in *Institutional Controls: A Site Manager’s Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups* (EPA 2000), has defined institutional controls as administrative or legal controls (i.e., non-engineered) that help to minimize the potential for human exposure to contamination or protect the integrity of a remedy. Institutional controls work by limiting land or resource use by providing information to modify or guide human behavior at the site.

DOE has defined institutional controls as mechanisms designed to appropriately limit access to or uses of land and facilities, to protect cultural and natural resources, to maintain the physical security of DOE facilities, and to prevent or limit inadvertent human and environmental exposure to residual contaminants. Institutional controls include methods to preserve knowledge and to inform current and future generations of hazards and risks (DOE 2000).

Although the DOE and EPA definitions differ slightly—DOE includes physical controls, such as fences and gates, as institutional controls—they both focus on the goal of protecting human health and the environment from residual hazards.

1.4 Types of Institutional Controls

The types of institutional controls being used at the Fernald Preserve, which are outlined in this plan, serve two functions: (1) to eliminate the disturbance and monitor the use of the Fernald Preserve and (2) to minimize human and environmental exposure to residual contaminants, as described below. The site was divided into two subsections for institutional control purposes: the Fernald Preserve and the OSDF. The OSDF includes the disposal facility and its buffer area. This area is enclosed by a fence and gates that are locked at all times, unless authorized personnel require access. The Fernald Preserve is all of the remaining property onsite. The Fernald Preserve Visitors Center and associated trails and overlooks are accessible to the unescorted public. The two sections of the site are treated separately because of the greater restrictions that apply to the OSDF.

- **Controls to Eliminate Disturbance and Unauthorized Use of the Fernald Preserve (Section 2.0):** Describes institutional controls, applicable to both the Fernald Preserve and the OSDF, that are designed to limit access and land use. These controls focus on ensuring that the Fernald Preserve remains in a configuration consistent with the designated land use and that unauthorized uses of the Fernald Preserve do not occur. These include proprietary controls; governmental controls; and the prevention of unauthorized use by means of informational devices, security, physical barriers, and routine inspections. As part of the informational devices, the Visitors Center was established to house site information. Also discussed are the methods of controlling, restricting, or prohibiting recreational activities. (Refer to Table 1 and Table 2 for a summary of these controls.)
- **Controls to Minimize Human and Environmental Exposure to Residual Contaminants (Section 3.0):** Describes the institutional controls (i.e., monitoring and sampling) used to ensure the continued protection of human health and the environment. These controls focus on maintaining engineered systems and infrastructure that are designed to protect human health and the environment. This category also includes the use of the Visitors Center to provide educational information on the site remedy and measures required to monitor and maintain the remedy. These include routine inspections, permits, continuing groundwater remedial activities, routine maintenance and monitoring, and leachate management practices.

1.5 Agency Requirements for Institutional Controls

The need for institutional controls is described in the OU2 and OU5 RODs (Appendix B). Page 9–16 of the OU5 ROD states: “One element of the selected remedy that will be used to ensure protectiveness is institutional controls, including continued access controls at the site during the remediation period, alternative water supplies to affected residential and industrial wells, continued federal ownership of the disposal facility and necessary buffer zones, and deed restrictions to preclude residential and agricultural uses of the remaining regions of the Fernald Environmental Management Project (FEMP) property.” The intent of the IC Plan is to describe the institutional controls, both physical and administrative, used at the Fernald Preserve. This IC Plan was submitted to EPA and Ohio EPA under the OU5 ROD as a primary document and is part of the remedy for the Fernald Preserve.

Table 1. Controls on Disturbance and Use of the Fernald Preserve

Control	Requirement	Frequency	Scope
Proprietary Controls 1. Establish points of contact	1. LM guidance	1. Initially and when updates are needed	1. Provide primary and backup points of contact for emergencies. Points of contact will be updated in the Legacy Management Plan as needed. The LM 24-hour emergency line is (877) 695-5322.
2. Ownership	2. OU2 ROD OU5 ROD LM guidance	2. Not applicable	2. The federal government will maintain ownership of site property. Management is the responsibility of LM.
Governmental Controls 1. Notations on land records or real estate restrictive license	1. OU2 ROD OU5 ROD	1. Annual verification	1. If management of portions of the Fernald Preserve (outside of the disposal facility area) is transferred to another federal entity at any time, all zoning and real estate restrictions will be communicated to the appropriate parties, and proper notifications will be provided as required.
Preventing Unauthorized Use of the Fernald Preserve 1. Informational devices	1. OU2 ROD OU5 ROD	1. Not applicable	1. Informational devices <ul style="list-style-type: none"> • The Visitors Center provides information onsite remediation, site restrictions, ongoing maintenance and monitoring, and residual risks. • In order to maintain the integrity of the site, access may need to be limited or restricted in some areas. Signs indicating restricted access will require monitoring and maintenance to ensure their legibility and integrity.
2. Security of the site	2. OU2 ROD OU5 ROD	2. Daily	2. Security <ul style="list-style-type: none"> • There will be routine patrols of the Fernald Preserve and perimeter postings to prevent unauthorized access and use of the site. • Site facilities and structures will be locked when personnel are not present during non-business hours. • Some site facilities and structures will be fenced and locked at all times, and only authorized access will be permitted.
3. Routine site inspections	3. OU2 ROD OU5 ROD	3. Annually	3. Formal inspections will be conducted to ensure that infrastructure, signs and postings, fences and gates, perimeter areas, and access points are in a secure and safe configuration, and to prevent unauthorized use of the site.

Table 2. Controls on Disturbance and Use of the On-Site Disposal Facility

Control	Requirement	Frequency	Scope
Proprietary Controls			
1. Establish points of contact	1. OAC 3745-27-11(B)(3) OAC 3745-66-18(c)(3) OAC 3745-68-10 40 CFR 258.61(c)(2) 40 CFR 265.118(c)(3) 40 CFR 264.118(b)(3)	1. Initially and when updates are needed	1. Provide primary and backup points of contact to ensure authorized and emergency access. Points of contact are provided in Table 8 of the PCCIP. Updates will be provided as needed. The LM 24-hour emergency number is (877) 695-5322.
2. Ownership	2. OU2 ROD OU5 ROD	2. Not applicable	2. The federal government will maintain property ownership of the area comprising the OSDF and associated buffer areas. Management is the responsibility of LM.
Governmental Controls			
1. Notations on land records or real estate restrictive license	1. OU2 ROD OU5 ROD	1. Annual review	1. If real estate restrictions are in place, annually verify that they are still in place. Restrictions will be provided in the deed, and proper notifications will be provided as required.
Preventing Unauthorized Use of the Fernald Preserve			
1. Informational devices	1. OU2 ROD	1. Not applicable	1. Signs and postings include information on restrictions, access information, contact information, and emergency information.
2. Engineered barriers	2. OU2 ROD	2. Not applicable	2. Access to the OSDF is physically restricted by means of fences, gates, and locks.
3. Routine OSDF inspections	3. OU2 ROD OU5 ROD	3. Quarterly	3. Inspect the OSDF as specified in the PCCIP.

1.6 Updates to the Institutional Controls Plan

The future LMICP schedule will be as follows:

- Each June, the annual Site Environmental Report will be submitted. The report will make recommendations based on the previous year's monitoring information.
- Each September, an annual review of the LMICP will be submitted. It will identify updates as necessary.
- Each January, the document will be finalized to correspond with the monitoring and reporting schedule.

Upon EPA and Ohio EPA approval, it is anticipated that the LMICP will be finalized by January each year to correspond with calendar-year monitoring and reporting. Between October and January, EPA and Ohio EPA comments will be addressed.

2.0 Controls to Eliminate Disturbance and Unauthorized Use of the Fernald Preserve

2.1 Fernald Preserve

The primary institutional controls established to eliminate disturbance and unauthorized use of the Fernald Preserve include continued federal ownership, real estate restrictions (if necessary), and using access controls and inspections to prevent unauthorized use of the Fernald Preserve. The institutional controls established to eliminate disturbance and unauthorized use of the Fernald Preserve are discussed in the following subsections and are summarized in Table 1.

2.1.1 Proprietary Controls and Points of Contact

Proprietary controls are controls that originate from the responsibilities associated with the ownership of property. These controls are established to ensure that the Fernald Preserve remains in a configuration consistent with the designated land use and that unauthorized uses do not occur. In the case of the Fernald Preserve, the federal government will maintain ownership, as stated in the OU2 ROD (DOE 1995). Primary and secondary points of contact have been established for emergency purposes, to ensure authorized access, and to ensure open communication (Appendix C). If an onsite emergency occurs, if unacceptable behavior is observed, or if someone has questions, the points of contact should be contacted.

The actions and items listed below are prohibited to ensure the ongoing protection of the site and anyone using the site. DOE will consider adding prohibited actions and items (e.g., unmanned aerial systems) on a case-by-case basis. Updates to site postings will be reviewed annually. The following list of prohibited actions and items is posted at the site entrance, and it applies to all unauthorized personnel:

- Alcohol and illegal drugs
- Firearms
- Removal or intentional damage of plants
- Mushroom gathering
- Soil excavation
- Removal or damage of archaeological materials
- Swimming and wading
- Camping
- Hunting, trapping, and fishing
- Dumping
- Fires, open flames, and smoking
- Tampering, manipulating, or damaging structures, fences, signs, water control devices, or any other federal property
- Traveling off public roadways and trails
- Pets of any kind

An interim residual risk assessment was performed to evaluate post-closure risks associated with the Fernald Preserve. The risk assessment was carried out in two phases. Phase I focused on the development of a Geographic Information System–based risk assessment tool to evaluate the final land-use receptors identified in the OU5 ROD (i.e., undeveloped park user, expanded trespasser, and offsite farm resident) using certification data available in early 2006. This phase was completed in early 2007, and subsequent planning activities determined that there was no long-term need to maintain this tool for future risk-assessment work. Phase II produced the *Interim Residual Risk Assessment Report*, which was released as Revision 1 in July 2007 (DOE 2007). This report demonstrates that the incremental lifetime cancer risk to six receptors (undeveloped park user, museum visitor, museum worker, groundskeeper, building maintenance personnel, and construction workers) that visit or work at the site is less than 1×10^{-4} lifetime cancer risk, which is consistent with CERCLA guidance. The receptors are exposed to residual contamination in the air, soil, and surface-water pathways. All pathways will be evaluated after the completion and certification of the groundwater remedial actions.

Land-use restriction changes that substantially alter the Environmental Covenants and/or the RODs need to be approved by Ohio EPA and EPA, respectively.

2.1.2 Governmental Controls

A part of the governmental controls at the Fernald Preserve will be the use of real estate notations and restrictions, should they become necessary (i.e., another organization would have the responsibility of managing the property). Notations on land records or similar restrictive real estate licenses will be in place for the Fernald Preserve and offsite property that is impacted by Fernald Preserve activities. LM will ensure that real estate notations remain in place as long as they are needed. In addition, if the management of any part of the site is transferred from DOE to another federal entity, DOE will ensure that the controls remain in place. According to the OU2 and OU5 RODs, LM will annually review deed restrictions, if implemented, to ensure that they remain in effect with the local authorities. A review of notations or real estate restrictions and other institutional controls was also part of the most-recent CERCLA Five-Year Review process which was completed in 2016.

If DOE leases or transfers the management of the property to an entity other than DOE, the appropriate regulatory approvals will be secured, and restrictions and limitations will be communicated and implemented (e.g., zoning restrictions). In such cases, DOE will work with the agency to ensure that institutional controls for the active site will remain effective. This may be documented in a Memorandum of Understanding or other appropriate instrument. A description of the various types of institutional controls pertaining to the ownership or transfer of DOE land is included in the *Institutional Controls in RCRA and CERCLA Response Actions at Department of Energy Facilities* (DOE 2000).

2.1.3 Preventing Unauthorized Use of the Fernald Preserve

2.1.3.1 Informational Devices

Signs posted along the perimeter of the Fernald Preserve are designed to discourage public access to the site at locations other than the Willey Road entrance. These signs state the following:

Authorized Personnel Only

Site access should be made through the Willey Rd. entrance.
In case of an emergency or to report suspicious activities or items, call (513) 910-6107 or (877) 695-5322 after hours.

The unauthorized entry upon any facility, installation, or real property subject to the jurisdiction, administration, or in the custody of the Department of Energy, which has been designated as a subject to the provisions contained in Title 10, Code of Federal Regulations (CFR), Part 860, is prohibited. The unauthorized carrying, transporting, or otherwise introducing or causing to be introduced, any dangerous weapon, explosive or other dangerous instrument or material likely to produce substantial injury or damage to persons or property, into or upon such facility, installation, or real property is likewise prohibited.

Whoever willfully violates these regulations, shall, upon conviction, be punishable by a fine of not more than \$5,000. Whoever willfully violates these regulations with respect to any facility, installation, or real property enclosed by a fence, wall, floor, roof, or other structural barrier, shall be guilty of a misdemeanor and, upon conviction, shall be punished by a fine not to exceed \$100,000 or imprisonment for not more than one year, or both. (Title 42, United States Code, § 2278(a); Title 18, United States Code, § 3571).

By authority of Section 229 of the Atomic Energy Act of 1954, as amended (Title 42, United States Code, § 2278(a)) and Title 10, CFR, Part 860 of the rules and regulations of the Department of Energy, this facility, installation, or real property has been designated as subject to these regulations by the United States Department of Energy. Trespassers may be subject to the provisions stated above.

Final site configuration includes postings at access points and other strategic locations, indicating prohibited activities and site contact information (Figure 2).

DOE opened a Visitors Center onsite in the former Silos Warehouse, which was refurbished. The Visitors Center was completed in the summer of 2008. It contains information on and context for the remediation of the Fernald Preserve, including information onsite restrictions, ongoing maintenance and monitoring, and residual risks. The Visitors Center also houses a computer (so that visitors may access electronic copies of documents and records), a meeting place, and other educational information as appropriate. A primary goal of the Visitors Center is to fulfill an informational and educational function within the community. The information in the Visitors Center serves as an institutional control, makes visitors aware of the Fernald Preserve's history and current condition, and helps prevent unsafe disturbances and uses of the site.

The Visitors Center is maintained and operated under the direction of LM. With stakeholder input, DOE will periodically evaluate the use of the Visitors Center and the programming provided there. The conceptual design of the Visitors Center was completed by the University of Cincinnati, with input from stakeholders. DOE will continue to obtain stakeholder input on decisions regarding changes to the Visitors Center or its ongoing operation.

The OU3 ROD required that all site structures be removed, including the former Silos Warehouse. Realizing that certain structures needed to remain at the Fernald Preserve to support the continued management of the site, DOE reconciled the OU3 ROD via a fact sheet (DOE 2006a). The fact sheet identified several other buildings, structures, and materials that were to remain onsite to support long-term use and included the Former Dissolved Oxygen Building, Former Communication Building, Restoration Shed, a concrete pad for the Visitor Center parking area, and the former railroad trestle (Figure 2). Clean concrete and railroad ballast were also identified for reuse during site restoration.

The structures subject to the OU3 ROD reconciliation were those that were present solely to support the legacy management of the site. Other facilities at the site, under the authority of OU5, are required for the continued implementation of the ongoing groundwater remedy, the maintenance of the OSDF, and environmental monitoring.

2.1.3.2 Security of Site Facilities and Infrastructure

During non-business hours, site facilities and structures will be locked when personnel are not present. A gate installed at the main site access location, the south Willey Road Entrance, will be open during the day to allow for public access. Other access points (for example, those along Paddys Run Road) are protected with access controls consisting of cables and gates mounted on posts. Some site infrastructure, such as the OSDF restricted area, the CAWWT, and unhooded extraction wells, have fences constructed around them and will remain locked to prevent unauthorized access. Controls also include enforcing the land use restrictions, maintaining fences and other infrastructure (as needed), and replacing or updating postings as needed to ensure the site's security (Figure 2).

An onsite LM presence is responsible for routine patrols and inspections of the Fernald Preserve. The patrols will ensure that no unauthorized use of the site is occurring and that facilities and structures are secure. Any unauthorized activity should be reported to the site contact immediately (Appendix C).

The public also plays a role in ensuring the security and safety of the site. The Visitors Center and trail system (see Section 2.1.3.1) attracts a public presence on the site. The final site configuration includes posting contact information at access points and other strategic locations (visible to the public); members of the community may call anytime they notice anything out of the ordinary or suspicious, or if they just have questions.

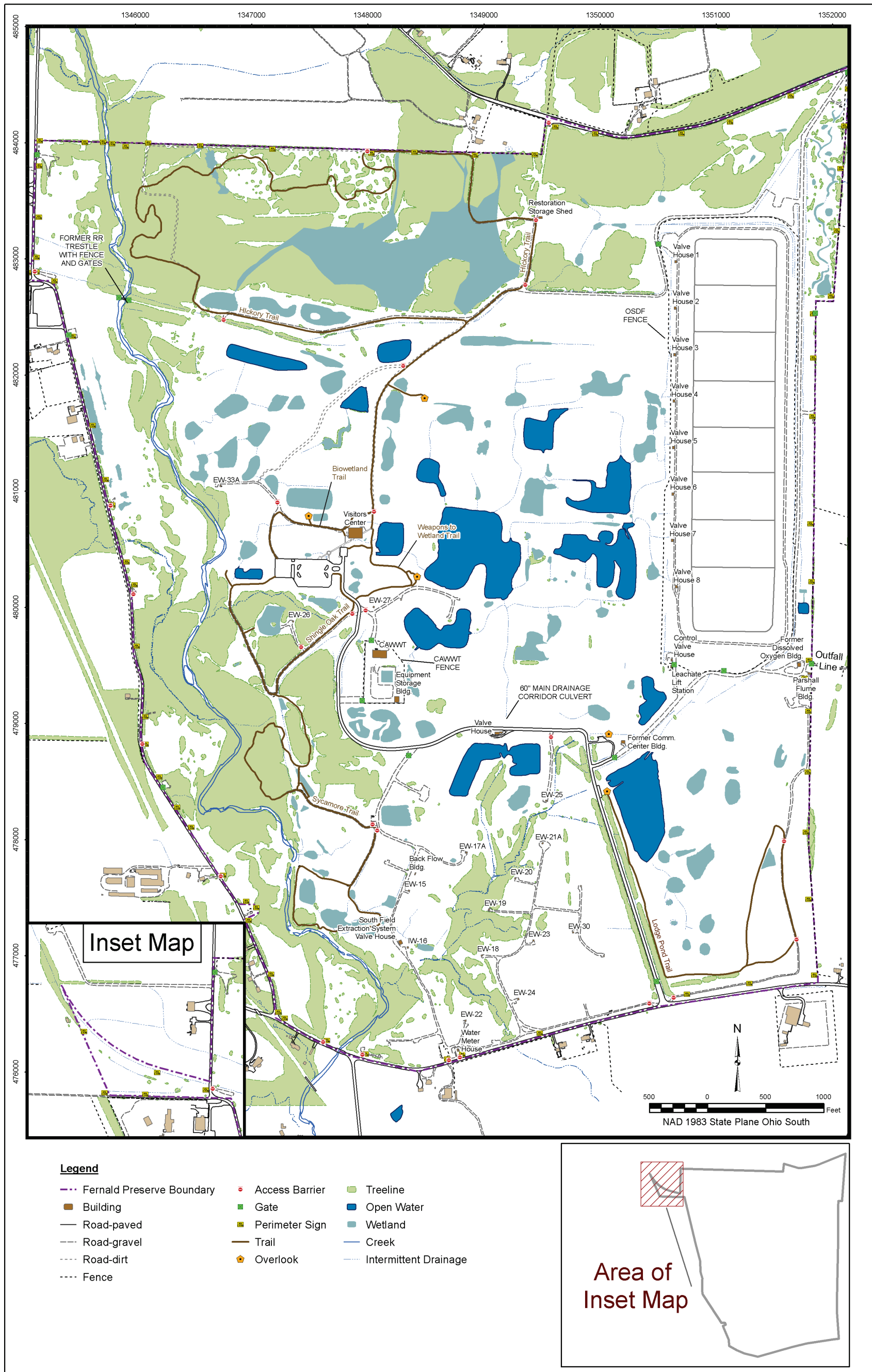


Figure 2. Fernald Preserve Site Configuration

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2.1.3.3 Routine Inspection of Property

Site inspections consist of two components: point-specific inspection of institutional controls and field walkdowns. Point-specific institutional control inspections include inspecting the following: access points, perimeter authorized vehicle access locations, perimeter signs, fences, interior authorized vehicle access locations, buildings and structures, the 60-inch culvert, uncertified areas, known cultural resource sites, and roads and parking areas (Figure 2). Field walkdowns are conducted to verify that no unauthorized access or use of the site is taking place, note that the desired results from restoration activities (e.g., seeding and planting) are being achieved, observe whether nuisance species are out of control or are not responding to mitigation efforts, document the presence of debris or newly formed erosion in the area, and ensure that institutional controls are being maintained. To organize the field walkdowns, areas of the site have been divided into quadrants (Figure 3). Additional area-specific walkthroughs occur more frequently as activities (e.g., maintenance projects, ecological monitoring) warrant. Trails and overlooks are inspected weekly to ensure they are safe for public use.

Prior to 2015, field walkdowns occurred quarterly when areas were most easily and safely accessible. For example, the west quadrant (north woodlot and Paddys Run corridor) was inspected in the winter and the central quadrant (the former production area) was inspected in the spring. During these quarterly inspections of each quadrant, the point-specific institutional controls were also inspected across the site.

Vegetation establishment over the years has prevented optimal inspection coverage in many areas. Heavy vegetation hinders identification of inspection findings (e.g., unauthorized trails, erosion rills), but also creates safety hazards for the participants, especially in wooded areas. To ensure safe and effective inspections, the schedule was modified in 2015 to focus on walkdown completion during the dry, cooler months of November through April. Coverage of field walkdowns will generally correspond with the quadrants identified in Figure 3. Performing walkdowns of the four quadrants during months when less vegetation is present optimizes visibility of site conditions and allows access to more areas. Point-specific institutional control inspections continue on a quarterly basis throughout the year.

The field walkdown portion consists of participants being organized to ensure that all accessible portions of the inspection area are covered. Optimally, a “police line” is formed, with personnel spaced at regular intervals (e.g., 100 feet) that proceed in unison. Access limitations (i.e., steep slopes, open water) require modification of the police line format in some locations.

Grating that was installed to prevent access to the 60-inch Main Drainage Corridor culvert is inspected as part of the quarterly point-specific institutional control inspection. This culvert, along with an adjacent 18-inch culvert that is completely buried, was left in place even though it has fixed radiological contamination. These culverts are located directly below the OSDF leachate conveyance system and the main effluent line running between the CAWWT and the Great Miami River. Because of their location, these culverts could not have been removed without potentially impacting ongoing CAWWT and OSDF operations. Instead, metal grating was installed to prevent access to the 60-inch culvert. Site inspections will ensure that the 60-inch culvert grating is in place and is serviceable, and that the 18-inch culvert is not exposed through erosion or other ground disturbance. The fact sheet identifying clean buildings and structures for beneficial reuse under legacy management provides additional information regarding these culverts (DOE 2006a).

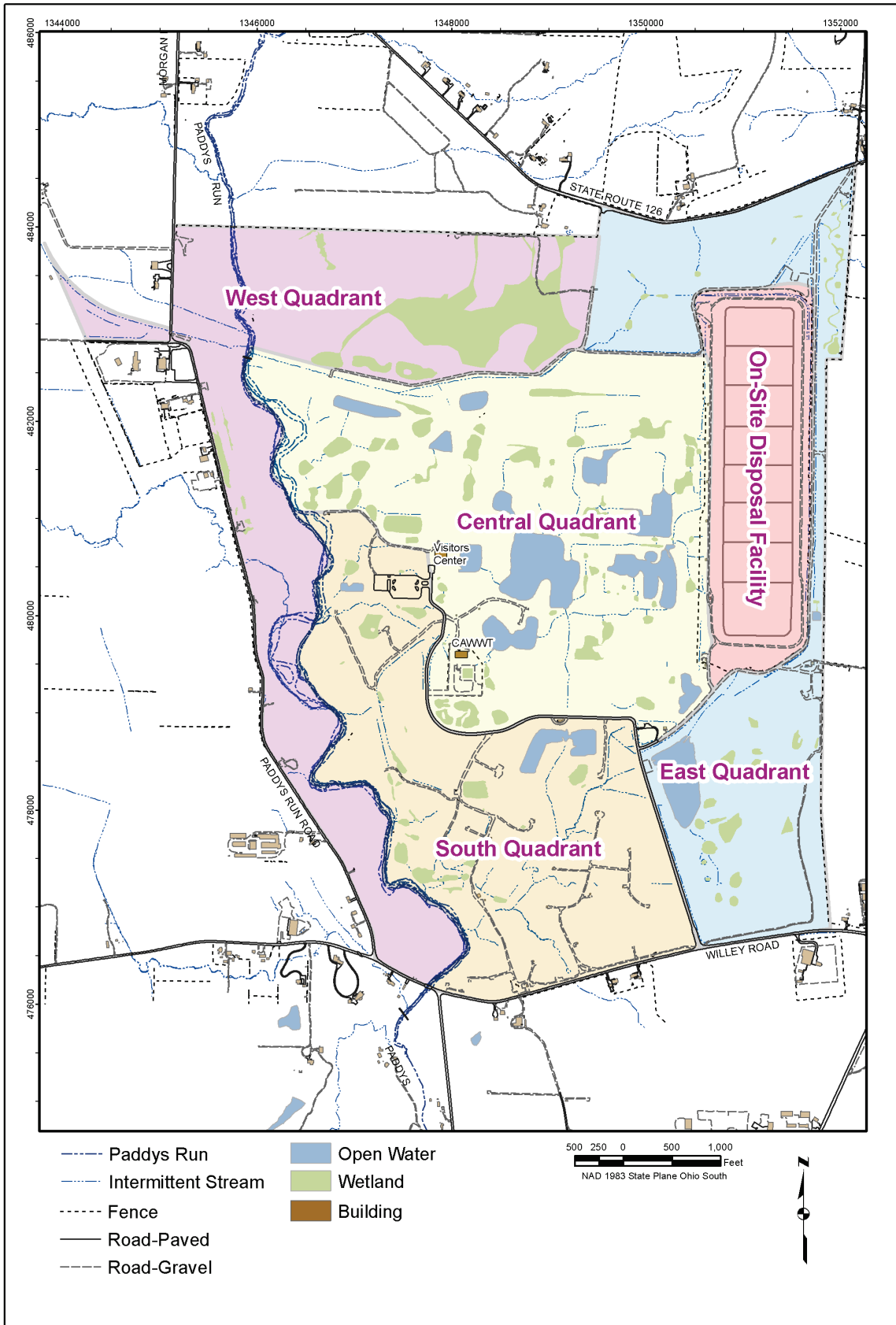


Figure 3. Site Inspection Field Walkdown Quadrants

Findings for the field walkdowns, point-specific institutional control inspections, and weekly trail inspections are recorded on inspection forms. Example inspection forms are included in Appendix D. Findings are generally mapped or identified in the field using pin flags (yellow flags are used for items of radiological concern). Global positioning systems (GPS) can be used to document the location of findings, especially during the growing season. Inspection findings are consolidated and logged into a maintenance action item list (Appendix D), where resolution is tracked. In addition to field walkdowns and institutional control inspections, the OSDF is inspected quarterly. Section 3.5.1 and the PCCIP describe the OSDF inspection process.

Results of winter field walkdowns, quarterly institutional control inspections, and quarterly OSDF inspections are sent to the regulators on a quarterly basis, and also posted on the Internet. A summary of inspection findings and associated maps are included in the annual Site Environmental Report. Section 5.1 provides additional information regarding public access to inspection reports.

The site inspections, how they are conducted, and elements of the inspections will continue to evolve and be refined as site conditions and activities change. The inspection process will be reviewed carefully each year, and revisions will be made as necessary. The process is detailed in the *Inspection Procedure for the Fernald Preserve* (DOE 2015b).

The CAWWT and the groundwater restoration systems are also inspected. Details of this process are included in Attachment A.

DOE has a voting membership with the Ohio Utility Protection Service. With this membership, DOE will be notified any time an entity will be digging within a quarter of a mile of the site. DOE will then be able to contact the contractor or company doing the work to ensure that they are not impacting the Fernald Preserve property.

The LM site manager is responsible for the management and monitoring of the post-closure site, along with other duties, including managing the organization of and conducting formal inspections of site property. LM exercises a portion of this responsibility through various subcontracts.

2.2 OSDF

The primary institutional controls for the disturbance and use of the OSDF include continued federal ownership, real estate restrictions (if necessary), and the prevention of unauthorized use of the OSDF and its associated buffer area. Engineered barriers, such as fencing, gates, and locks, are also important institutional controls (Figure 2). The institutional controls for the OSDF are summarized in Table 2. The table includes descriptions of the institutional controls, places where the institutional controls are referred to, and the requirements that drive the institutional controls. Primary and secondary points of contact have been established for emergency purposes, to ensure authorized access, and to ensure open communication (Appendix C). The OSDF will continue to be inspected quarterly, as specified in the PCCIP.

2.2.1 Proprietary Controls and Points of Contact

Proprietary controls are controls that originate from the responsibilities associated with the ownership of property. The first is that the federal government will maintain ownership of the OSDF property in perpetuity, as stated in the OU2 ROD. The management of the OSDF (along with the management of the Fernald Preserve) transferred from EM to LM; the OSDF and the site will always remain under federal ownership. The second is that primary and secondary points of contact have been established for emergency purposes, to ensure authorized access, and to ensure open communication.

2.2.2 Governmental Controls

A fundamental part of governmental controls will be the use of real estate notations and restrictions. Notations on land records or similar restrictive real estate licenses are in place for the land occupied by the OSDF. LM will ensure that real estate notations remain in place. DOE will also maintain the responsibility of managing and maintaining the OSDF and all other activities needed to ensure that remedies remain effective. Any contracted support employees required to implement specific aspects of maintenance and monitoring will be made aware of all restrictions regarding the use and disturbance of the OSDF.

2.2.3 Preventing Unauthorized Use

Physical barriers to restrict access to the OSDF and its surrounding buffer area include exclusion fencing, gates, and locks, which will be maintained. Signs and postings include information on restrictions, access information, contact information, and emergency information (Figure 2). Weather-resistant signs around the OSDF say the following:

CAUTION
Underground Radioactive Material,
Contact Site Manager Prior to Entry
513-910-6107

Signs on the access gates to the OSDF contain slightly different information. The gate signs contain the following information:

- The name of the site.
- The international symbol indicating the presence of radioactive material.
- A notice that trespassing is forbidden on this U.S. government-owned site.
- A local DOE telephone number and a 24-hour DOE emergency telephone number.

Calls to the 24-hour DOE emergency telephone number will be recorded. Additionally, local agencies have agreed to notify DOE in the event of an emergency or breach of site security or integrity.

The final configuration of the OSDF includes monuments installed at the corners of the engineered disposal facility, and markers placed on the top and the east and west toes of the cell caps (indicating the boundaries between the cell caps). The corner monuments consist of

concrete cylinders 12 inches in diameter and 48 inches long. They are installed to a depth of 42 inches, with 6 inches of concrete remaining above the surface. A brass plate with pertinent identification and location information is flush-mounted to the top surface of the concrete. The individual cell cap markers are brass plates with pertinent identification and location information attached to a brass rod and flush-mounted to the ground surface. Cell cap boundaries are also identified with signs on the OSDF perimeter fence.

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3.0 Controls to Minimize Human and Environmental Exposure to Residual Contaminants

The preliminary interim residual risk assessment performed for the second CERCLA Five-Year Review of the Fernald Preserve showed that the remedy is protective of human health and the environment. Section 6.4.4, “Review of Post-Remedial Action Contaminant Toxicity Assumptions,” in the *Second Five-Year Review Report for the Fernald Closure Project* (DOE 2006b) explains the assessment process for residual constituents. Table 6–3, “Comparison of the CRARE [Comprehensive Remedial Action Risk Evaluation] and Present Risk for All Pathways,” illustrates that the risks are below CERCLA limits. This preliminary interim residual risk assessment has been replaced by the final *Interim Residual Risk Assessment Report* (IRRA) (DOE 2007) as discussed in Section 2.0.

The *Third Five-Year Review Report for the Fernald Preserve* (DOE 2011) examined updated EPA risk values for 2010 and compared them to values used in the 2007 IRRA to identify values that had changed and determine if those changed values had produced significant changes in human-health risk to the receptors evaluated in the IRRA. Results presented in the *Third Five-Year Review Report for the Fernald Preserve* indicated a slight decrease in human-health risk relative to the IRRA, and the risk assumptions remained valid for the OU5 post-remedial conditions.

The *Fourth Five-Year Review for the Fernald Preserve* (DOE 2016) was completed in a similar manner to the third Five-Year Review. Updated toxicity values published in 2015 were used to calculate human health risk using IRRA concentrations. Additionally, EPA exposure factors were reviewed and updated values were utilized in the calculations. The overall result of this effort demonstrated a slightly lower risk than what was reported in the third Five-Year Review report. Again, the risk assumptions remain valid for the OU5 post-remedial conditions.

Institutional controls have been established for the Fernald Preserve to minimize the potential for human and environmental exposure to residual contaminants, ensuring that it is below acceptable limits. These controls include the inspection and maintenance of engineered systems and infrastructure designed to protect human health and the environment, and monitoring and sampling to ensure continued protection from exposure. Sections 3.2 through 3.4 and Table 3 provide additional information about these controls.

3.1 Uncertified Areas and Subgrade Utility Corridors

The SEP (DOE 1998b) defined the overall approach for soil and at- and below-grade debris in accordance with the OU2 ROD (DOE 1995), OU3 ROD (DOE 1996), and OU5 ROD (DOE 1996). Remediation of the sitewide soil and sediment was accomplished on a geographic area basis. The SEP identified 10 general remediation areas. The general steps for excavation of each remediation area include predesign investigation, remedial design, remedial action (including material handling and disposal), precertification, certification, and post-remediation activities. Individual designs for the area-specific excavations were submitted and approved by EPA and Ohio EPA in the form of Integrated Remedial Design Packages (IRDPs). The IRDPs presented area-specific contamination data. As needed, additional sampling and analysis

Table 3. Controls to Minimize Human and Environmental Exposure to Residual Contaminants at the Fernald Preserve

Control	Requirement	Frequency	Scope
Fernald Preserve Inspections	OU2 ROD OU5 ROD	<ul style="list-style-type: none"> • Field walkdowns conducted annually, with portions of the site inspected when access is optimal. • Point-specific institutional controls inspected quarterly and onsite trail inspections conducted weekly. • Frequency will be reevaluated through the CERCLA Five-Year Review process. 	<ul style="list-style-type: none"> • Inspect infrastructure in place for protection against human exposure to contaminants, such as fences and postings, to ensure their proper condition and function. • Ensure that there is no removal of soil by wind or water erosion. Inspect water control structures, swales, and discharge points. • Inspect access control grating on the 60-inch Main Drainage Corridor culvert. • Conduct an inspection to ensure that prohibited activities, such as digging, off-road travel, camping, or hunting, are not taking place onsite. • Identify exposed debris.
Surface Water Discharge Inspections	NPDES Storm Water Pollution Prevention Plan (SWPPP)	<ul style="list-style-type: none"> • Monitoring conducted semiannually (Paddys Run at the former storm sewer outfall ditch) and daily (discharge to Great Miami River). • Evaluations conducted annually, at a minimum. • Inspections conducted weekly during construction projects with storm water controls and within 24 hours of 0.5 inch of rain. 	<ul style="list-style-type: none"> • Monitor surface water drainage to Paddys Run at the former storm sewer outfall ditch and discharge to the Great Miami River. • Complete the comprehensive site compliance evaluation and industrial activity inspection in accordance with the SWPPP (DOE 2015a). • Inspect construction activities in accordance with the SWPPP.
Groundwater Remedy Sampling and Monitoring	IEMP	Frequency of sampling and monitoring of groundwater is dependent upon the effectiveness of the remediation efforts and will vary over time.	Monitor groundwater to ensure that the remedy is functioning properly until remedy certification is complete. Details are provided in the IEMP.

(documented in Project-Specific Plans) was conducted to supplement data from the remedial investigation concerning the nature and extent of contamination. Based on the extent of contamination, the IRDP presented a detailed design of the area-specific remediation elements and the lessons learned during previous phases of the site-wide remediation process. Certification of the completed remediation for each remediation area followed a process defined in the SEP and included processes for FRL and hot spot attainment. Upon analytical confirmation that FRLs (and any other requirements) were achieved, Certification Reports were prepared as a final-step area-specific remediation deliverable. The Certification Reports primarily documented the remedial actions that occurred, described the certification process, presented all data supporting the certification attainment and described access controls implemented to prevent recontamination. The *Interim Remedial Action Report for Operable Unit 5* [(IRAR) DOE 2008] provides a list of all 55 Certification Reports. Following certification, final grading and restoration of the site was guided by the Natural Resources Restoration Plan (DOE 2002).

By the end of 2006, the contaminant sources at the Fernald Preserve were removed and soil and on-property sediments were certified as defined in the SEP, with the exception of those areas indicated in Figure 4. The IRAR recognized that the Great Miami Aquifer restoration activities would continue beyond the 2006 baseline closure date; therefore, the IRAR was written to address completion of soil restoration activities and closure of the OSDF, but remains open until groundwater actions are complete. The IRAR for Operable Unit 5 (DOE 2008) states:

The closeout report is considered “interim” for the following reasons:

- Aquifer restoration activities must continue until the affected portions of the Great Miami Aquifer have been remediated to Operable Unit 5 FRLs.
- Final surface water and sediment certification in the Great Miami River cannot be completed until final discharges to the river from the groundwater remedy have been completed.
- Soil remediation is complete in all areas, except for necessary future soil remediation beneath the required remaining groundwater infrastructure.
- The OSDF is subject to a 30-year monitoring requirement after closure.

Figure 4 identifies the subgrade utility corridors and the two remaining uncertified areas: CAWWT and South Field Valve House footprints. Certification of these areas will be completed following completion of the aquifer remediation. The uncertified portion of the subgrade utility corridor consists of the utility itself (e.g., fiber optic cable, underground electric, or piping) and associated bedding material (e.g., sand). The soil and at- and below-grade structures associated with CAWWT and South Field Valve House footprints will also require certification. Any soil or debris originating in these two uncertified areas (CAWWT and South Field Valve House footprints) and subsurface soils in the subgrade utility corridors cannot be moved to certified areas. Project-specific requirements along with the inspection process described below ensure that uncertified soil is not disturbed.

3.2 Fernald Preserve Inspections

Point-specific institutional controls and the OSDF are inspected quarterly; site walkdowns are conducted annually in the winter months. Section 2.1.3.3 describes the inspection process for the

Fernald Preserve. The process is detailed in the *Inspection Procedure for the Fernald Preserve* (DOE 2015b).

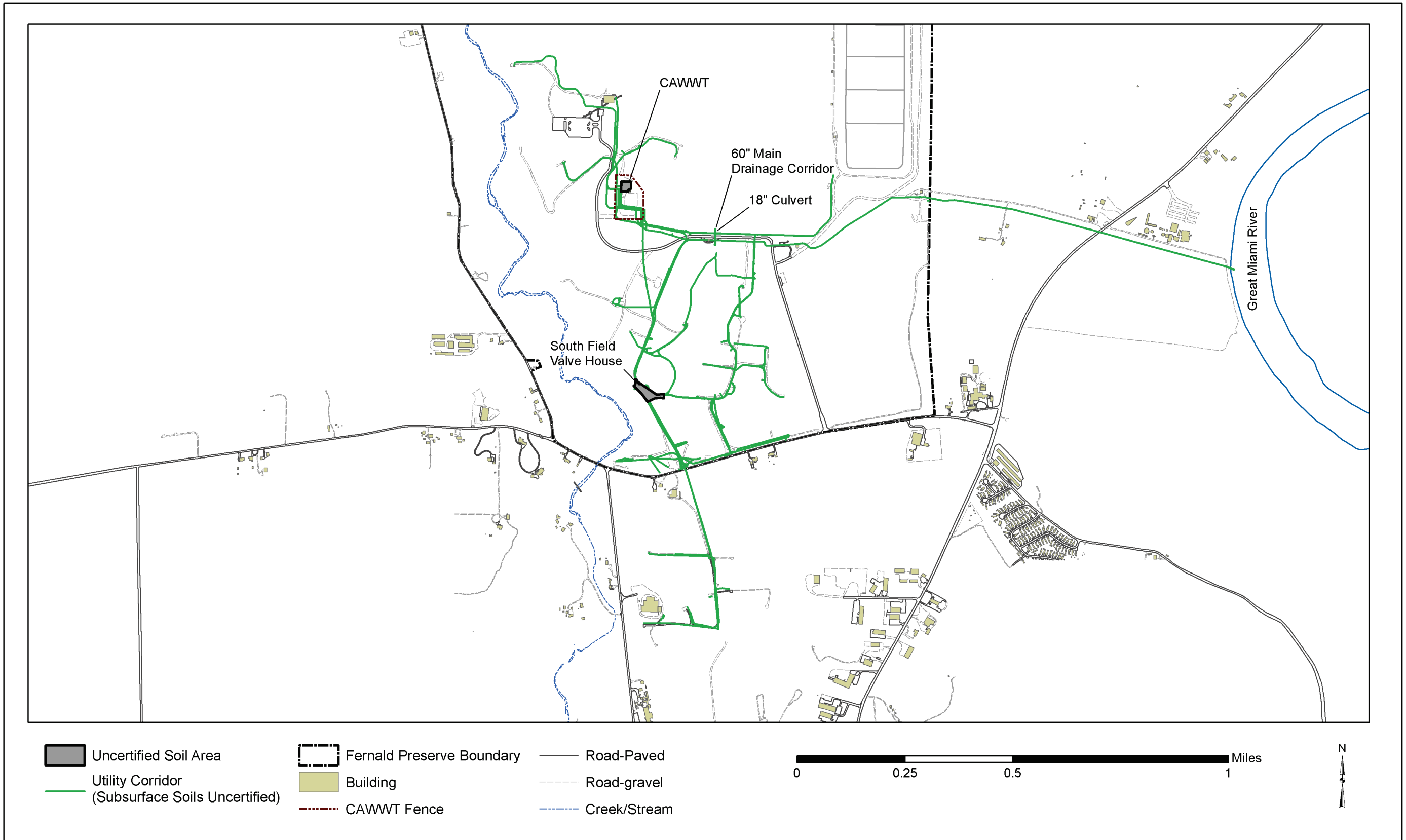
A list of prohibited activities is posted at the primary site access point. Inspections of the area outside the OSDF are performed and documented on the Fernald Preserve Field Walkdown Inspection Form or the Fernald Preserve Institutional Control Inspection Form (Appendix D), as appropriate, to ensure that there is no digging or soil removal of any kind, including wind or water erosion, and that infrastructure designed and in place for protecting against human exposure to contaminants, such as fences and signs, are in good condition and functioning as intended.

Inspections also include the CAWWT, the groundwater restoration system, and the outfall line. The inspection of the outfall line includes ensuring sufficient soil coverage over the pipeline over the entire length of the outfall line. A proper check of the soil cover on the outfall line involves a field survey over the length where the thickness of soil is determined by comparing topographic elevation above the pipeline to the pipeline profile in the area affected by mining operations. In addition to the topographical survey, any structures encroaching over the pipeline shall be surveyed, located, and identified. The survey will also identify the edge of any excavation within 75 feet north and south of the pipeline. A plan and profile drawing of the entire length of the pipeline developed from the field survey will be reviewed by an engineer who will do a field inspection. The field inspection will compare the survey information to the field conditions. The manholes will be inspected for any damage and to ensure accessibility. The survey is completed annually in the fall, after the harvest. If soil cover over the pipeline is insufficient, DOE will notify the landowner and the regulators. DOE will then take the necessary corrective actions, in consultation with the landowner. The inspection of uncertified areas (Figure 4) includes ensuring that there is no digging or disturbance of the soils and no tampering with any signs that may be posted to define the areas.

Grating that was installed to prevent access to the 60-inch Main Drainage Corridor Culvert is inspected as well. More frequent inspections may be required under certain circumstances (a pattern of unauthorized activities or uses). Since completion of the Visitors Center, a workforce is present onsite daily. It is part of the workforce's responsibilities to help ensure that prohibited activities are not taking place.

3.3 Surface Water Discharge

Until the groundwater remedy is complete, and as long as surface water discharges to the Great Miami River, an NPDES permit or similar permit mechanism needs to be in place. Inspections, monitoring and reporting to maintain compliance with the permit requirements will be part of post-closure responsibilities at the Fernald Preserve. Once there is no longer any surface water discharge to the river, the permit for surface water discharge may be closed out. Prior to the completion of the remedy, if it is decided that monitoring a particular outfall location is no longer necessary, LM may request that Ohio EPA remove that particular location from the permit at that time. Ohio EPA issues and maintains the NPDES permit.



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Figure 4. Uncertified Areas and Subgrade Utility Corridors

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3.4 Groundwater Remedy and Monitoring

The institutional controls to prevent the use of groundwater in the off-property area where groundwater contamination is greater than the 30 ppb uranium final remediation level consist of the following:

- The DOE-funded public water system, which provides an alternate water supply for residents in the areas affected by groundwater contamination from the Fernald Preserve.
- The Hamilton County water well permitting process. Drinking water wells cannot be installed until a permit has been obtained from the Hamilton County Health Department. DOE will ensure that the Health Department is aware of the off-property areas where groundwater contamination is greater than 30 ppb uranium. DOE submitted a letter and map documenting the contaminated area to the Hamilton County Health Department and requested that no permits be issued in this area, given the contamination and the ongoing aquifer remediation (DOE 2006c). Additionally, the letter requests that DOE be notified of any proposed drilling activities in the vicinity of the plume. If DOE is made aware of any drilling activities in the area of the offsite plume, the regulators must be notified. As a result of additional discussions with Hamilton County Public Health in early 2015, the information was provided to the department in an electronic format.
- Daily well field operational inspections and routine groundwater sampling. Operational personnel make daily rounds of the South Plume well field and will be instructed to notify management of any unusual activity in the area (e.g., well drilling). Groundwater sampling personnel will also be in the area of the South Plume for routine groundwater monitoring and will be instructed to notify management of any unusual activities.

Aquifer restoration operations and maintenance activities are part of an ongoing remedial action governed by the OU5 ROD. The requirements for the operations and maintenance activities are outlined in the OMMP (Attachment A). The OMMP, as originally written, defines the operating philosophy for the extraction and re-injection treatment systems (re-injection is not being used at this time), the establishment of operational constraints and conditions for given systems, and the establishment of the process for reporting and instituting corrective measures to address exceedances in discharge limits. How to address exceptional operating conditions is also addressed.

Section 2.0 of the OMMP discusses the general commitments of the aquifer restoration and provides details regarding the aquifer cleanup levels, discharge limits, groundwater treatment capacity, groundwater treatment decisions, and extraction rates. Section 3.0 of the OMMP goes into more specific detail about the design of the groundwater remediation systems, well field designs, and pump details. Section 4.0 discusses the projected flow during remediation activities. Section 5.0 discusses the operations plan, Section 6.0 discusses operations and maintenance, and Section 7.0 discusses roles and responsibilities. Sections 6.0 and 7.0 provide information that pertains directly to institutional controls.

In July 2014, operational changes were made to the ongoing pump-and-treat remediation (DOE 2014). Prior to these changes, groundwater was being treated on an as-needed basis to meet required discharge limits. In 2014, three extraction wells located in areas of the aquifer where uranium concentrations were low were no longer providing a benefit, so the wells were turned off. Pumping was increased in areas of the plume where uranium concentrations were

higher. The changes resulted in an increase in the mass of uranium being removed from the aquifer. This increase resulted in the need to treat more groundwater utilizing more of the existing approved groundwater treatment capacity (i.e., 600 gallons per minute) to meet the required discharge limits. It is anticipated that the need to treat more groundwater will be short-lived. Eliminating the capability for groundwater treatment altogether will not be pursued (1) at the expense of compromising mass removal or (2) if significant deviations from desired aggressive pumping rates are required. The CAWWT will undergo decontamination and demolition (D&D) once it has been documented to EPA and Ohio EPA that the facility is no longer needed to meet uranium discharge limits.

When DOE has certified the groundwater remedy complete (which is defined in the *Fernald Groundwater Certification Plan* [DOE 2006d]) and EPA has approved it, well field infrastructure will be decommissioned and disposed of. All needed soil excavation and certification associated with D&D of the CAWWT and the removal of well field infrastructure will be in accordance with SEP (DOE 1998b) requirements.

Post-remedy long-term groundwater monitoring will be conducted. Requirements are defined in the Fernald Groundwater Certification Plan and will be implemented through the IEMP (Attachment D). Post-remedy long-term groundwater monitoring will be evaluated as part of the CERCLA Five-Year Reviews.

3.5 On-Site Disposal Facility

Institutional controls are necessary for the OSDF and its buffer area to ensure the prevention of human and environmental exposure to residual contaminants. Further information about these controls is given below and is included in Table 4. Details regarding OSDF inspection and maintenance are included in the PCCIP (Attachment B). The OSDF was constructed to permanently contain impacted materials derived from the remediation of the OUs at the Fernald Preserve. All material placed in the OSDF was required to meet pre-established WAC. The WAC are presented in Table 2 of the PCCIP. Table 3 of the PCCIP provides a description of the types of material or material categories that were allowed in the OSDF. The design and construction of the OSDF is described in Section 3.0. Section 4.0 of the PCCIP discusses the institutional controls for the OSDF, which have been included and summarized in this IC Plan. Table 7 of the PCCIP shows institutional controls for the OSDF as they were identified in the OU2 and OU5 RODs.

Section 5.0 of the PCCIP discusses environmental monitoring activities that are necessary to continue during the post-closure care period, including groundwater monitoring, and the monitoring of other media (e.g., surface water, vegetation). Section 6.0 addresses routine inspections, which are important institutional controls. (Section 3.5.1 of this IC Plan addresses these inspections in detail.) Also addressed in the PCCIP are unscheduled inspections (Section 7.0), custodial monitoring and contingency repairs (Section 8.0), and emergency notifications (Section 10.0).

Table 4. Controls to Minimize Human and Environmental Exposure to Residual Contaminants at the On-Site Disposal Facility

Control	Reference	Requirement	Frequency	Scope
OSDF Inspection and Maintenance 1. Routine OSDF cap inspection	1. PCCIP	1. OAC 3745-66-18(A) and (C) 40 CFR 264.118(b)(2) 40 CFR 265.118(c)(2) OU5 ROD	1. Quarterly for the toe and specific ICs. Annually for the complete cap walkdown, in the fall (to coincide with mowing/burning and favorable weather conditions.)	1. Detect and record any change in the following: <ul style="list-style-type: none"> • General health, density, and variety of vegetation cover • Presence of deep-rooted woody species • Evidence of burrowing animals on the cover • Presence, depth, and extent of erosion or surface cracking, indicating possible cap deterioration • Visibly noticeable subsidence, either locally or over a large area—any sufficient to pond water • Presence and extent of any leachate seeps • Integrity of run-on and runoff control features • Integrity of benchmarks
2. Unscheduled OSDF cap inspection	2. PCCIP	2. OU5 ROD	2. As needed	2. Unscheduled inspections include Follow-Up and Contingency inspections. Follow-Up inspections quantify specific problems encountered during a routine inspection of the OSDF. Contingency inspections are initiated following an event that may threaten the integrity of the OSDF (e.g., after significant natural events). Regulators will be notified immediately of the need for a Contingency inspection following a significant natural event. Contingency inspections will be conducted and reported to regulators no more than 60 days after the unique event.
3. Routine OSDF cap custodial and preventive maintenance	3. PCCIP	3. OAC 3745-66-18(A) and (C) 40 CFR 264.118(b)(2) 40 CFR 265.118(c)(2) OU5 ROD OU2 ROD	3. As needed	3. Routine custodial and preventive maintenance consists of the following: upkeep of the vegetation cover via prescribed burning or mowing, clearing of debris, removal of woody vegetation, prevention and repair of animal burrows, minor erosion repair, and reseeding.

Table 4 (continued). Controls to Minimize Human and Environmental Exposure to Residual Contaminants at the On-Site Disposal Facility

Control	Reference	Requirement	Frequency	Scope
4. Routine OSDF site area inspection	4. PCCIP	4. OAC 3745-66-18(A) and (C) 40 CFR 264.118(b)(2) 40 CFR 265.118(c)(2) OU5 ROD OU2 ROD	4. Quarterly for the toe and specific ICs. For site walkdown, annually, in the fall (to coincide with mowing/burning and favorable weather conditions).	4. Inspect the adjacent area within approximately 0.25 mile of the OSDF buffer area. Describe evidence of land use changes. <ul style="list-style-type: none"> Evaluate natural drainage courses in the immediate vicinity of the OSDF to determine whether there is a threat to the OSDF integrity. Walk approximately 1,000 feet of adjacent natural drainage courses and note unusual or changed sediment deposits, large debris accumulations, manmade or natural constrictions, and recent or potential channel changes. Evaluate and record the development of gullies. Evaluate growth of vegetation in channels. Determine the condition and required maintenance of on-property roads. Inspect and record the area adjacent to the OSDF for erosion channels, accumulations of sediment, evidence of seepage, and signs of animal or human intrusion.
5. Unscheduled OSDF site area inspection	5. PCCIP	5. OU5 ROD OU2 ROD	5. As needed	5. Unscheduled inspections include Follow-Up and Contingency inspections. Follow-Up inspections quantify specific problems encountered during a routine inspection of the OSDF. Contingency inspections are initiated following an event that may threaten the integrity of the OSDF (e.g., after significant natural events). Contingency inspections will be conducted and reported to regulators no more than 60 days after the unique event.
6. Routine OSDF site area custodial and preventive maintenance	6. PCCIP	6. OAC 3745-66-18(A) and (C) 40 CFR 264.118(b)(2) 40 CFR 265.118(c)(2) OU5 ROD	6. As needed	6. <ul style="list-style-type: none"> Repair/replace fencing, gates, locks, and signs due to normal wear, severe weather conditions, or vandalism. Mow/clear undesired woody vegetation; reshape, reseed, and repair banks; unplug culverts; and clean out run-on/runoff diversion channels.

Table 4 (continued). Controls to Minimize Human and Environmental Exposure to Residual Contaminants at the On-Site Disposal Facility

Control	Reference	Requirement	Frequency	Scope
Leak Detection/ Leachate Monitoring 1. OSDF leachate and environmental monitoring	1. GWLMP and IEMP	1. OAC 3745-27-6 OAC 3745-54-90 through 99 (applicable portions) ^a DOE 435.1	1. Varying frequencies depending on sampling stage (e.g., baseline)	1. <ul style="list-style-type: none"> • A routine monitoring program will be maintained for four zones within and beneath the OSDF. These zones include the LCS, the LDS, perched water within the glacial overburden, and the Great Miami Aquifer (GWLMP Section 3.2.1). Samples from the four zones are being collected and analyzed as specified in the GWLMP. • Environmental monitoring parameters and frequencies are identified in the GWLMP.
Leachate Management	GWLMP	OU5 ROD GWLMP	As needed	Leachate will continue to be treated.

^a OAC 3745-54-90 through 99 are not applicable in entirety (refer to the OSDF GWLMP, Appendix A).

3.5.1 OSDF Inspection and Maintenance

DOE conducts inspections and maintenance on the OSDF cap and cover system. Inspections consist of a cap “walkover” as well as an evaluation of fencing, drainages, roads, etc. Walkover inspections were conducted quarterly for 2 years following the completion of Cells 7 and 8. The frequency of inspections was to be reevaluated following the 2 years of quarterly monitoring. Beginning in spring 2009, walkover cap inspections of the entire OSDF cap were conducted semiannually, in the spring and fall. During the winter months, safely accessing the OSDF and scheduling of the inspection is difficult due to the frequency of inclement weather. During the summer months, vegetation on the majority of the cap is so dense that walking on the cap is difficult, and visibility of the ground surface is greatly reduced, limiting the quality of the actual inspection. These conditions have become more prevalent during the spring walkdown. Therefore, the complete cap walkover will be conducted annually in late fall or early winter, after warm-season grasses have gone dormant. Additional walkdowns of recently burned or mowed areas are also possible.

Although the frequency of complete cell cap walkdowns is now annual, quarterly inspections of the OSDF will continue. Areas of recent revegetation or other significant maintenance will be walked down quarterly. In addition, the cap along the toe of the slope, as well as drainage features and institutional controls related to the OSDF (e.g., fencing, signs, locks), will continue to be inspected quarterly. Custodial and preventive maintenance and unscheduled inspections will be conducted as needed. Table 4 provides current details on the required inspections and maintenance.

Routine inspections include monitoring the health of the vegetative cover, the presence of deep-rooted woody species, evidence of burrowing animals, the extent of surface erosion or cracking, subsidence (if any), the extent of any leachate seeps, the integrity of runoff controls, and the integrity of benchmarks. Inspections also include evaluating the condition of physical access controls (fences, gates, locks, and signs); observing adjacent properties for evidence of land-use changes; evaluating natural drainage courses in the immediate vicinity; and inspecting the general area for erosion, excess sediment, seepage, and signs of human or animal intrusion. If determined necessary or appropriate, the frequency of the routine inspections may be revised through the CERCLA Five-Year Reviews. More-frequent monitoring, due to changes in the cap or surrounding areas, is always a possibility; however a decrease in frequency would require discussion, review, and approval at the time of the Five-Year Review. No significant changes to the inspection process were identified during the 2016 CERCLA Five-Year review (DOE 2016). Routine custodial maintenance includes the upkeep of the vegetative cover, general mowing, the clearing of debris and woody plants, and reseeded.

The monitoring and management of the OSDF vegetative cover will be carried out to optimize the establishment and continued growth of the native grass mix specified and seeded on the OSDF cap. Monitoring will consist of the collection of data to determine the percentage of native cover on the OSDF cap. Vegetation monitoring is conducted on a 3-year rotation. Cells 7 and 8 were surveyed in 2013, Cells 1 to 3 in 2014, and Cells 4 to 6 in 2015. No changes to this approach were identified during the 2016 CERCLA Five-Year Review (DOE 2016). Sample collection consists of establishing a grid on each cell cap and collecting data from random 1-meter quadrat locations within the grid. Data are collected once during each sampling event in late summer. Results are presented to regulators as part of the fall quarterly inspection report, no later than October 15 of the collection year.

Routine management of the OSDF cap includes prescribed burning or mowing and baling to manage the prairie grassland and limit the establishment of woody vegetation and noxious weeds. Management occurs on a 3-year rotation. Cells 1, 2, and 3 are addressed in Year One; Cells 4, 5, and 6 are addressed in Year Two; and Cells 7 and 8 are addressed in Year Three. Additional activities may take place to manage weeds and promote native grass and forb establishment. Until 2016, mowing, raking and baling was the only form of management used on the OSDF. Controlled burning of the cell cap is the preferred management tool to maximize the growth of prairie grass. It also eliminates the need to handle haybales. Working with the community and regulators, DOE moved forward with a prescribed burn on Cells 4, 5, and 6 in March 2016. The burn was successful and DOE plans to continue the 3-year management rotation using spring prescribed burns. If spring burns are not possible, the area will be mowed in the fall. Selective herbicide will also be used as needed to control invasive or nuisance plants that are identified on the cap. Decisions regarding management of the cell caps are made after percent-native-cover data are collected.

As stated, the goal is to optimize the establishment of native grasses on the OSDF cap. DOE and the regulatory agencies agree that the goal is not necessarily to establish a functioning prairie on the OSDF cap. Native grasses (e.g., big bluestem, little bluestem, switchgrass) are more drought-tolerant than cool-season grasses, and their complex root structures will provide additional stability. A pass/fail criterion will not be set for the performance of the native grasses on the OSDF cap. However, a goal of 50 percent native cover has been considered for restored prairies on the site and will be used as a goal for native grasses on the OSDF. If the concentration of native grasses remains at or above 50 percent, management and monitoring will continue as outlined above. If the concentration of native grasses falls below 50 percent, LM will work with the regulators to determine whether additional action is necessary. If so, DOE will develop an appropriate plan for increasing the concentration of native grasses. Steps taken may include, but are not limited to, selective reseeding, installing native grass plugs, increasing the use of selective herbicide, and increasing the frequency of controlled burns on the cap, or some combination of these. The requirement to maintain 90 percent cover at all times after seeding on the OSDF cap will remain unchanged to minimize cap erosion. The 90 percent cover requirement applies to all vegetation on the cap and is not specific to native grasses.

Unscheduled inspections will be conducted as needed if specific circumstances warrant. An example would include following up on the completion of a maintenance action or conducting a cap inspection after an unusually large storm. Based on the results and determinations made from the inspections, DOE will take appropriate actions to address any identified problems.

The maintenance and monitoring of the general support systems for the OSDF will include ensuring that physical access controls and restrictions are maintained, conducting routine inspections of the OSDF and surrounding area, performing routine maintenance activities, and monitoring the environment. Table 4 provides additional information on the required monitoring and maintenance.

The federal government will remain the property owner, and access to the OSDF and buffer area will continue to be restricted in perpetuity by means of fences, gates, locks, and warning signs (Figure 2). Only the federal government will authorize access, which will be limited to personnel conducting inspections, monitoring, custodial maintenance, corrective action, and escorted tours.

3.5.2 Leak Detection/Leachate Monitoring

Routine OSDF leak detection and leachate monitoring is currently governed by the GWLMP (Attachment C). Table 4 includes some of the details. Section 3.0 of the GWLMP provides the regulatory analysis and strategy for the OSDF monitoring. The regulatory drivers come from the applicable or relevant and appropriate requirements identified in the OU2, OU3, and OU5 RODs. Section 4.0 of the plan provides a significant amount of information on the OSDF leak detection monitoring program. The text includes the program elements, monitoring frequencies, selection of analytical parameters, and data evaluation. Section 5.0 is a discussion of the leachate management monitoring program. It covers the management approach and monitoring needs. Section 6.0 provides the reporting requirements and the notification and response actions for when flow in the leak detection system exceeds action levels, which could be an indication of a failure in the cap or liner and could pose a threat to human health or the environment. Table 3 of the GWLMP outlines these actions in detail.

3.5.3 Leachate Management

Also involved in the maintenance and monitoring of the OSDF system is the management of the leachate that enters the LCS. Additional information regarding leachate management is also found in Appendix D of the GWLMP. Leachate will be treated through the CAWWT until the CAWWT is no longer available. The quantity of leachate collected, treated, and discharged will be documented. A passive leachate treatment system is an option after the CAWWT is no longer available. Long-term treatment needs for the OSDF leachate during the period after the CAWWT is decommissioned will be evaluated prior to the shutdown and D&D of the CAWWT.

4.0 Contingency Planning

Site inspections, monitoring activities, and maintenance activities are designed to identify problems before they develop into a need for corrective action. In the unlikely case that a natural event, vandalism, or other event threatens the integrity or operation of the OSDF or remainder of the site, corrective actions will be carried out to mitigate the problem. In addition, DOE will evaluate the factors that caused the problem and ensure that the possibility of reoccurrence is minimized or avoided.

To the extent that contingency actions can be anticipated or planned, they have been, and will continue to be, incorporated into the LMICP or attached support plans. Unanticipated contingency actions will be subject to CERCLA processes prior to implementation. Stakeholders, regulatory agencies, and the public will be notified of any unanticipated contingency actions under CERCLA that have to be implemented.

4.1 Unacceptable Disturbances or Use

If an unacceptable condition or disturbance occurs at the Fernald Preserve during legacy management, corrective actions will be employed, and appropriate notifications will occur. Unacceptable conditions regarding the disturbance or use of the Fernald Preserve may include unauthorized access to the site (e.g., off-road vehicles), attempts to use soil or water on the site in an inappropriate manner, attempts to access the OSDF, or damage to fencing, gates, or postings. Section 2.1.1 provides an extensive listing of those actions that are prohibited and apply to all unauthorized personnel. Unacceptable conditions related to exposure to residual contaminants could include damage or disruption to the OSDF or attempts to use groundwater still undergoing remediation.

Contingency inspections are unscheduled inspections ordered by DOE when it receives information indicating that site integrity has been or may be threatened. Events that could trigger contingency inspections include severe vandalism, intrusion by humans or livestock, severe rainstorms, or unusual events of nature such as tornadoes or earthquakes. If any unacceptable activities were found to be occurring onsite, LM would implement the appropriate corrective actions, both to repair damage, if required, and to prevent or reduce the chances of reoccurrence. Some of the possible corrective actions LM may consider are increasing the frequency of surveillances by site personnel, requesting patrols by local law enforcement personnel, adding surveillance cameras, evaluating and possibly revising current postings at the site, and prosecuting individuals caught engaging in prohibited, destructive, or disruptive behavior.

Events that have caused severe damage to the OSDF or that pose an immediate threat to human health and the environment will be immediately reported to EPA and Ohio EPA. Detailed information regarding OSDF Follow-Up and Contingency inspections, corrective actions, and reporting are contained in the PCCIP (Attachment B).

Minor maintenance actions such as seeding small areas, minor erosion repairs on the OSDF or other parts of the site, the replacement of postings and signs, minor fence and gate repairs, and minor maintenance of site infrastructure will not be subject to the notification process described above. The need for minor maintenance will be identified on routine inspection forms issued to EPA and Ohio EPA and will be subject to follow-up inspections as discussed above.

4.2 Suspected Contaminated Soil, Material, or Debris

Suspected contaminated soil, material, or debris is defined as items found by either Fernald Preserve workers or visitors to the Fernald Preserve that could pose an environmental or health hazard. The potential hazard may be radiological (e.g., contaminated metal, concrete, asphalt, tile), discolored soils, unidentified objects or containers, or suspect liquids exposed by erosion or excavation. Debris consists mostly of construction rubble (i.e., small chunks of broken building materials). Metal items from heavy equipment, such as bolts and plates, may be found, as well as pieces of graphite, which was used to construct molds during the production processes.

Upon discovery, the suspect soil, material, or debris will be marked with a pin flag, and Radiological Controls or Safety and Health personnel shall be notified. The radiological control technician will follow proper protocol addressed in the *Fernald Preserve Procedure for Suspect Material or Debris Discoveries* (DOE 2012) for surveillance and disposition of the material or debris. Beginning in 2017, GPS may be used to document the location of debris. Field personnel are briefed regarding the actions to take upon discovery of debris during inspections and construction activities. In addition, a public brochure is available that addresses the potential for debris discoveries.

For debris, DOE-approved limits for contamination from residual radioactive material will be used to determine the proper disposal method. For soils with evidence of contamination (i.e., removable contamination or removed debris with instrument readings above background), these areas will be marked for additional investigation. Debris that does not meet the unrestricted release criteria and soils that exceed the cleanup criteria will be transported to an offsite disposal facility for disposal in accordance with the terms of the Amended Consent Agreement and EPA's Off-Site Rule. If unexpected large-scale soil contamination is identified, the protocol in the SEP (DOE 1998a) will be followed, which is the same protocol that will be used for the uncertified areas described in Volume I, Section 2.4.4.

The disposal of any contaminated debris or soil will be handled on a case-by-case basis once adequate historical knowledge of the soil is compiled and any additional characterization is complete. Until then, temporary storage in covered stockpiles or appropriate containers (depending on volume) will be established, and a path forward through final disposition will be developed for review and approval by appropriate agencies as necessary.

Although not expected, any tagged Fernald property items suspected to be from Fernald that are found onsite or offsite are to be reported by calling either the contractor site manager at (513) 910-6107 during business hours or the 24-hour LM emergency number at (877) 695-5322.

4.3 Unexpected Cultural Resource Discoveries

Although excavation activities on the Fernald Preserve are expected to be limited, several excavations are planned for ecological restoration, erosion repair, and the eventual removal of the CAWWT and associated aquifer restoration infrastructure. If unexpected cultural resources are identified within an excavation, the *Fernald Preserve Procedure for Unexpected Discovery of Cultural Resources at the Fernald Preserve* (DOE 2013) will be followed. This includes isolating the affected area until an on-call subcontractor can perform the necessary investigation. This follows the same process used during remediation and restoration activities. DOE will

continue to consult with the appropriate parties, such as the State of Ohio Historic Preservation Office, to determine an appropriate course of action.

4.4 Notification Process

Upon discovering any institutional control breaches, LM will notify EPA and Ohio EPA of the breaches and of DOE's plan for correcting them. Stakeholder notifications will be handled as deemed appropriate by DOE. LM will address any activity that is inconsistent with the institutional control objective or use restrictions as soon as practical, but in no case will the process begin later than 10 days after LM becomes aware of the violation.

DOE will notify EPA and Ohio EPA regarding how it has addressed or will address the breach within 10 days of the initial notification. A follow-up inspection will occur within 30 days of the completion of any corrective action. The results of follow-up inspections will be provided to EPA and Ohio EPA.

4.5 Coordination with Other Agencies

LM sent letters to the Hamilton County Sheriff's Department; the Butler County Sheriff's Department; and Ross, Crosby, and Morgan Township police and fire officials requesting that they notify LM if they observe any unauthorized human intrusion or unusual natural event.

LM sent a letter to the Ohio Earthquake Information Center, located at Alum Creek State Park in Delaware County, Ohio, requesting that they notify LM of any earthquake activity near the Fernald Preserve.

LM will monitor emergency weather notification system announcements and has requested notification from the National Weather Service (either Wilmington or Cincinnati) of severe weather alerts.

To notify LM of site concerns, the public may use the 24-hour security telephone numbers monitored at the DOE facility in Grand Junction, Colorado. The 24-hour security telephone numbers will be posted at site access points and other key locations on the site.

THE 24-HOUR EMERGENCY NUMBER

877-695-5322

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5.0 Information Management and Public Involvement

5.1 Information Management

The long-term retention of records and dissemination of information is another critical aspect of legacy management. LM will manage records that are needed for legacy management purposes. Records will be dispositioned in accordance with DOE requirements at the National Archives and Records Administration or a Federal Records Center for their required retention period or destroyed once they have reached the end of their required retention. LM will retain copies of selected records documenting past remedial activities (e.g., CERCLA Administrative Record [AR]) for legacy management purposes. In addition, newly acquired CERCLA AR records will be available to stakeholders. LM will also manage any centralized system to provide stakeholders with access to information.

For institutional control purposes, LM will retain and manage copies of selected information or data documenting past remedial activities (e.g., soil certification) and the design and contents of the OSDF. In addition, newly acquired information or data related to remedy performance will be readily available to the regulatory agencies and the public. LM currently uses the Geospatial Environmental Mapping System (GEMS), a web-based application, to provide the agencies and the public with Internet access to electronic environmental groundwater, surface water, sediment, and OSDF analytical data. Additionally, GEMS provides access to site and OSDF inspection photographs. Environmental dosimeter, air particulate, and radon data are available upon request by contacting site personnel at (513) 648-3330.

5.1.1 Fernald Preserve Data and Information

Site inspection data will include information from inspections of the general site area, perimeter, access points, infrastructure, and signs and postings. The Fernald Preserve Field Walkdown Inspection Form (Appendix D) will be used to collect the data and document the inspection. The site inspection reports are available at <http://www.lm.doe.gov/Fernald/Sites.aspx> and will be included in the annual Site Environmental Report.

The IEMP (Attachment D) defines environmental monitoring requirements for the Fernald Preserve. Monitoring data will include all environmental monitoring data associated with the site, including groundwater remediation data and ecological restoration monitoring data.

5.1.2 OSDF Data and Information

OSDF inspection data will include information from inspections of the cap, infrastructure (e.g., LCS/LDS pipe networks), perimeter fencing, buffer area, and signs and postings. The Fernald Preserve OSDF Walkdown Inspection Form and the LCS/LDS Inspection Checklists will be used to collect the data and document the inspections. The OSDF inspection reports are available at <http://www.lm.doe.gov/Fernald/Sites.aspx> and will be included in the annual Site Environmental Report.

The GWLMP (Attachment C) specifies the frequencies and parameters being monitored in four horizons for each cell of the OSDF.

5.1.3 Reporting

The annual Site Environmental Report will continue to be submitted to EPA, Ohio EPA, and the community on June 1 of each year. It will provide information on institutional controls, monitoring, maintenance, site inspections, and corrective actions while continuing to document the technical approach and summarizing the data for each environmental medium. It will also summarize CERCLA, Resource Conservation and Recovery Act (RCRA), and waste management activities. The report will include water quality and water accumulation rate data from the OSDF monitoring program. The summary report serves the needs of the regulatory agencies and other key stakeholders. The accompanying detailed appendixes of the Site Environmental Report are intended for a more technical audience. Additional continued reporting requirements under other regulatory programs will be addressed outside the annual Site Environmental Reports (e.g., NPDES monthly discharge reports).

Once it is determined that the institutional controls are functioning, the remedy is performing as intended, and the groundwater remediation is effective, the reporting frequency may be reevaluated. In the event of unacceptable conditions or disturbance, more frequent notification and reporting will be required as defined in Section 4.0.

Under CERCLA, a review of the remedy is required every 5 years at sites where the level of remaining contaminants limits site use. The CERCLA Five-Year Reviews at the Fernald Preserve focus on the protectiveness of the remedies associated with each of the five OUs. Also included will be summaries of the inspections conducted for the OSDF, the CAWWT, the groundwater restoration system, and the outfall line to the Great Miami River. To facilitate the review, a report addressing the ongoing protectiveness of the remedies will be prepared and submitted to EPA and Ohio EPA. The institutional controls portion of the report will include the data collected from monitoring and sampling, summaries of the inspections conducted of the Fernald Preserve and OSDF site and cap during the 5-year period, and a discussion of the institutional controls' effectiveness. If it is determined that a particular control is not meeting its objectives, then required corrective actions will be included. The review may lead to revisions to the monitoring and reporting protocols. The most recent Five-Year Review was finalized in 2016.

5.2 Public Involvement

The public played an important role in the remediation process at the Fernald Preserve, and the community remains involved in legacy management. DOE has written the CIP (Attachment E) to document how DOE will ensure the public's continued involvement in a variety of site-related decisions and activities, including post-closure monitoring. The CIP is a CERCLA-required document. Although the CIP contains all the requirements for public involvement under CERCLA, it also includes DOE's policy for public involvement, which extends beyond CERCLA requirements. Therefore, the CIP clearly identifies those elements that are not enforceable.

5.2.1 Current Public Involvement via Groups and Organizations

Several groups followed the remediation and cleanup process at the Fernald Preserve, including the Fernald Citizens Advisory Board (FCAB), Fernald Residents for Environmental Safety and

Health (FRESH), and the Fernald Community Alliance (formerly known as Fernald Living History Inc.). The FCAB was established to formulate cleanup policy and to help guide the cleanup activities at the site. Representatives that included local residents, governments, businesses, universities, and labor organizations constituted the advisory board membership. In 1995, the FCAB issued recommendations to DOE on remedial action priorities, cleanup levels, waste disposition alternatives, and future uses for the Fernald Preserve property. The FCAB was actively involved in the final remediation and restoration activities for the Fernald Preserve, with monthly full-board meetings and meetings of the FCAB Stewardship Committee. DOE worked closely with the FCAB until September 2006, when the FCAB held its final meeting.

FRESH was formed by local residents in 1984 and has played an important role in providing community input on the characterization and remediation of the Fernald Preserve. The group held its final public meeting in November 2006, after 22 years of environmental activism.

The FCAB had co-sponsored (along with FRESH, the Community Reuse Organization, and the Fernald Living History Project) four “Future of Fernald” workshops. The workshops were open to the public and gave the community input on the final public-use decisions as described in the *Master Plan for Public Use of the Fernald Environmental Management Project* (DOE 2002). The later workshops led to the recommendation of a multi-use education facility at the site.

The Fernald Community Alliance, formerly known as Fernald Living History Inc., is dedicated to ensuring that the history of Fernald is available for future generations. The group remains active and is looking to expand its member base.

A list of other stakeholders considered to be critical for legacy management planning at the Fernald Preserve is given below. Additional stakeholders may be identified in the future.

- Local government and enforcement agencies
- Local volunteer organizations
- Local residents
- Universities
- Local school groups
- Environmental organizations
- Native American tribes
- Native American organizations
- Natural Resource trustees
- Regulatory agencies
- Fernald Community Alliance
- Local historical societies
- Local businesses

5.2.2 Ongoing Decisions and Public Involvement

The Visitors Center opened on August 20, 2008. The design phase of the Visitors Center was completed in 2007 and included community involvement from the very beginning. In 2006, a faculty/student team from the University of Cincinnati (College of Design, Architecture, Art, and Planning, Center for Design Research and Innovation) conducted a series of meetings with the community to produce a conceptual design for the reuse of an existing warehouse on the Fernald property. The plan for the new Visitors Center also included opportunities in landscape, sustainability, graphics, exhibits, branding, and delivering documentation of ideas suitable for transfer to a commercial architect–builder team for implementation. Information on the use is provided through LM community meetings, Fernald Community Alliance meetings, and regular email updates.

Input on future legacy management planning decisions will occur through formal document reviews and the annual community meeting. Currently, DOE holds briefings for interested stakeholders. DOE expects to continue these updates using a similar forum/format throughout legacy management. Notification of the annual community meeting and document reviews (i.e., the LMICP and CERCLA Five-Year Review) will be made through the stakeholder mailing list. The CIP (Attachment E) also discusses methods of reporting to the public.

Another process involving the public is the CERCLA Five-Year Review. The Five-Year Reviews are performed pursuant to CERCLA Section 121, “The National Contingency Plan” (see Title 40 *Code of Federal Regulations* Section 300 [40 CFR 300]), and the *Comprehensive Five-Year Review Guidance* (EPA 2001). These regulations state that a public comment and review period will be provided so that interested persons may submit comments. The public is notified of each CERCLA Five-Year Review prior to the start of the review through the stakeholder mailing list and at the annual community meeting. The CERCLA Five-Year Review is available for public comment at the Visitors Center and on the Fernald Preserve webpage (<http://www.lm.doe.gov/fernalld/Sites.aspx>). Input from the public regarding the legacy management of the site and the ongoing groundwater remediation will always be considered, just as it was during the remediation of the site.

5.2.3 Public Access to Information

The Visitors Center houses computing facilities for acquisition and access to electronic copies of the CERCLA AR. The CERCLA AR documents for the Fernald Preserve were scanned into industry-standard searchable Adobe Acrobat PDF files for viewing over the Internet. The AR documents are available to the public on the LM website (http://www.lm.doe.gov/CERCLA_Home.aspx). The documents are searchable by document number, document date, document title, and by searching the text of the document. Additionally, key document indexes were created and posted on the LM website for each operable unit. The Fernald Preserve records staff can be contacted by phone at (513) 648-7516 for assistance in searching for a document in the CERCLA AR. The CERCLA AR will be updated as new documents are created.

6.0 References

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Appendix A

Records of Decision and Associated Documents

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Records of Decision and Associated Documents

Federal Facility Compliance Agreement	1986
Work Plan (identifies specific units of the site for RI/FS)	1988
Consent Agreement	1990
Amended Consent Agreement	1991
Record of Decision for Operable Unit 4	1994
Interim Record of Decision for Operable Unit 3	1994
Record of Decision for Operable Unit 1	1995
Record of Decision for Operable Unit 2	1995
Final Record of Decision for Operable Unit 3	1996
Record of Decision for Operable Unit 5	1996
Explanation of Significant Differences for Operable Unit 4 Silo 3	1998
Recommendation that treatment of Silo 3 material be evaluated and implemented separately from treatment of Silos 1 and 2 material	
Final Record of Decision Amendment for Operable Unit 4 Silos 1 and 2	2000
Explanation of Significant Differences for Operable Unit 5	2001
Resulted in change of FRL for uranium in groundwater from 20 ppb to 30 ppb	
Explanation of Significant Differences for Operable Unit 1	2002
Recommendation for processing other FEMP waste streams through the Operable Unit 1 remediation facilities and processes	
Final Record of Decision Amendment for Operable Unit 1	2003
Final Record of Decision Amendment for Operable Unit 4 Silo 3	2003
Final Explanation of Significant Differences for Operable Unit 4 Silos 1 and 2	2003
Final Explanation of Significant Differences for Operable Unit 4	2005
Final Fact Sheet for Operable Unit 3	2006
Operable Unit 1 Final Remedial Action Report	2006
Operable Unit 2 Final Remedial Action Report	2006
Operable Unit 3 Final Remedial Action Report	2007
Operable Unit 4 Final Remedial Action Report	2006
Operable Unit 5 Interim Remedial Action Report	2008
Preliminary Close Out Report (U.S. EPA Document)	2006

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Appendix B

Institutional Control Records as Stated in the Records of Decision

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Operable Unit 2 Record of Decision (DOE 1995)

The selected remedy will include the following as institutional controls:

- Continued federal ownership of the OSDF site.
- OSDF access restrictions (fencing, gates, and warning signs) will be controlled by proper authorization and is anticipated to be limited to personnel for inspection, custodial maintenance, or corrective action.
- Restrictions on the use of property will be noted on the property deed before the property could be sold or transferred to another party.
- Groundwater monitoring following closure of the OSDF.

Operable Unit 5 Record of Decision (DOE 1996)

Long-term maintenance will be provided as part of the selected remedy. The selected remedy includes the following key components for institutional controls and monitoring:

- Continuation of access controls at the Fernald Preserve, as necessary, during the conduct of remedial actions. Property ownership will be maintained by the federal government and will comprise the disposal facility and associated buffer areas.
- Maintenance of remaining portions of the Fernald Preserve (outside the disposal facility area) under federal ownership or control (e.g., deed restrictions) to the extent necessary to ensure the continued protection of human health commensurate with the cleanup levels established by the remedy. If portions of the Fernald Preserve are transferred or sold at any future time, restrictions will be included in the deed, as necessary, and proper notifications will be provided as required by CERCLA. EPA must approve of all ICs, including types of restrictions and enforcement mechanisms, if the property is transferred or sold.
- Maintenance of the on-property disposal facility, to ensure its long-term performance and the continued protection of human health and the environment.
- An environmental monitoring program conducted during and following remedy implementation to assess the short- and long-term effectiveness of remedial actions.
- Provision of an alternative water supply to domestic, agricultural, and industrial users relying upon groundwater from the area of the aquifer exhibiting concentrations of contaminants exceeding the final remediation levels. The alternative water supply will be provided until such time as the area of the aquifer impacting the user is certified to have attained the final remediation levels.

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Appendix C

Fernald Preserve Contact Information

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Fernald Preserve Contact Information

EMERGENCY CONTACT

Legacy Management 24-Hour Monitored Security Telephone Number
(877) 695-5322

Fernald Preserve Emergency Telephone Number
911 or (513) 910-6107

OFFICE OF LEGACY MANAGEMENT—FERNALD

DOE Site Manager

Susan Smiley
U.S. Department of Energy
Office of Legacy Management
(513) 648-3333
Sue.Smiley@lm.doe.gov

Contractor Site Manager

Bill Hertel
Site Contractor
(513) 648-3894
Bill.Hertel@lm.doe.gov

ENVIRONMENTAL AGENCIES

Remedial Project Manager

U.S. Environmental Protection Agency
Region 5, SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590
(312) 886-7058
www.epa.gov

Fernald Project Coordinator

Ohio Environmental Protection Agency
401 East Fifth Street
Dayton, Ohio 45402-2911
(937) 285-6357
www.epa.ohio.gov

U.S. Fish and Wildlife Service

4625 Morse Road
Columbus, Ohio 43230-8355
(614) 416-8993
www.fws.gov

FERNALD PRESERVE COMMUNITY INVOLVEMENT COORDINATOR

Community Relations Specialist

Penny Borgman
Site Contractor
(513) 648-3334

LOCAL POLICE AUTHORITY

Crosby Township/Hamilton County Police
Administration Office
(513) 825-1500

Ross Township/Butler County Police
Administration Office
(513) 863-2337, Ext. 1

Note: This information will be updated as necessary. Additional state and local contact information can be found in Appendix A (Contacts List) of Attachment E, Community Involvement Plan.

Appendix D

Examples of OSDF and Fernald Preserve Inspection Forms

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Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve Field Walk-down Inspection

Date: _____ Inspector: _____

No.	Area	Sub-Area	Location Details	GPS?	Type of Finding								Description	Photo? (File No.)
					Debris	Erosion	Fencing	Signage	Structure	Unauthorized Use	Vegetation	Other		

Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve Field Walkdown Inspection (continued)

No.	Area	Sub-Area	Location Details	GPS?	Type of Finding								Description	Photo? (File No.)
					Debris	Erosion	Fencing	Signage	Structure	Unauthorized Use	Vegetation	Other		

Additional Notes

Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve OSDF Walk-down Inspection

Date _____ Inspector _____

No.	Sub-Area (cell/ perimeter)	Location Details	GPS?	Type of Finding									Description	Photo? (File No.)
				Biointrusion	Drainage	Erosion	Fencing	Rock	Settlement	Signage	Vegetation	Other		

Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve OSDF Walkdown Inspection (continued)

Date _____ Inspector _____ Cell Cap/Area _____

No.	Sub-Area (cell/ perimeter)	Location Details	GPS?	Type of Finding										Description	Photo? (File No.)	
				Bioinfrusion	Drainage	Erosion	Fencing	Rock	Settlement	Signage	Vegetation	Other				

Additional Notes

Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve OSDF Walkdown Inspection (continued)

Date _____ Inspector _____ Cell Cap/Area _____

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Fernald Preserve Institutional Control Inspection

Date _____ Inspector _____ Area _____

Institutional Control	Type of Finding (See Definitions Page)				Description	Photo? (File No.)	Follow Up		
	Signage	Barrier	Grounds keeping	Other			Corrected	Maintenance Req'd	Cont. Observation
Access Points									
South Access									
North Access									
Eco Park									
Forest Demo									
Perimeter Authorized Vehicle Access									
Perimeter Signage									

Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve Institutional Control Inspection (continued)

Date _____ Inspector _____ Area _____

Fencing										
CAWWT										
OSDF										
Utility										
Trestle										
Interior Authorized Vehicle Access										
Buildings and Structures										
Communication Building										
DO Building										
Restoration Storage Shed										
Other IC										
60-Inch Culvert										
Uncertified Areas										
Roads and Parking Areas										
Cultural Resource Areas										

Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve Institutional Control Inspection (continued)

Date _____ Inspector _____ Area _____

Additional Notes

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Fernald Preserve Trail Inspection

Date: _____ Inspector: _____

Area	Type of Finding						Description	Photo? (File No.)	Follow Up		
	Trail Surface	Barriers	Overlooks	Signage	Groundskeeping	Prohibited Activities			Other	Corrected	Maintenance Req'd
Weapons to Wetland Trail											
Lodge Pond Trail											
Shingle Oak Trail											
Biowetland Trail											

Contractor to U.S. Department of Energy Office of Legacy Management

Fernald Preserve Trail Inspection (continued)

Date: _____ Inspector: _____

Eco Park												
Hickory Trail												
Sycamore Trail												

Additional Notes

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