

## **Appendix C**

### **Ecological Restoration**

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## Abbreviations

CC	coefficient of conservatism
DOE	U.S. Department of Energy
FQAI	Floristic Quality Assessment Index
GEMS	Geospatial Environmental Mapping System
LMICP	<i>Comprehensive Legacy Management and Institutional Controls Plan</i>
NRRP	Natural Resource Restoration Plan
OSDF	On-Site Disposal Facility
RAMP	Restored Area Maintenance Plan

## Measurement Abbreviation

m <sup>2</sup>	square meters
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## C.1.0 Ecological Restoration Monitoring

This appendix presents data collected as part of ecological restoration monitoring activities at the Fernald Preserve, Ohio, Site, along with results from routine inspections of the site and the On-site Disposal Facility (OSDF). Ecological restoration monitoring in 2022 included an evaluation of prairie and successional communities across the site.

Ecological restoration monitoring is required as part of the natural resource damage settlement among the U.S. Department of Energy (DOE), the Ohio Environmental Protection Agency, and the U.S. Department of the Interior. The Fernald Preserve Natural Resource Restoration Plan (NRRP) (State of Ohio 2008) specifies ecological restoration monitoring requirements.

Vegetation goals for restored areas were established in the NRRP. These include 50% native species composition and 90% total cover. This document established the ecological restoration monitoring program at the Fernald site. The *Fernald Preserve, Ohio, Restored Area Maintenance Plan* (RAMP, DOE 2012) is an additional document that was required by the NRRP. The RAMP established a maintenance program for ecologically restored areas across the site. The NRRP called for a 10-year review of the RAMP by the Fernald Natural Resource Trustees. That review was conducted in 2020 and resulted in the development of the draft final *Fernald Preserve, Ohio, Site Natural Resource Management Plan*. The Fernald Natural Resource Trustees agreed that requirements in the RAMP could be refined to include an evaluation component, since both monitoring and evaluation help to direct maintenance activities. As a result, the Natural Resource Management Plan includes not only refinements to maintenance requirements for restored areas but also refinements to ongoing monitoring requirements. Beginning in 2023, the Natural Resource Management Plan is included as Appendix A of Volume I of the Fernald Preserve *Comprehensive Legacy Management and Institutional Controls Plan* (LMICP) (DOE 2023). Further detail regarding the revised monitoring approach is provided below.

Prior to 2021, a two-tier ecological monitoring program was used to assess restoration efforts. Implementation monitoring was used to evaluate vegetation establishment following seeding and planting projects. Functional monitoring was used to assess the progress of the development of a restored community (prairie, wetland, forest) by comparing floristic quality parameters to those of baseline and reference sites (DOE 2002). Reference sites are offsite communities that represent an ideal end-state for site restoration projects. In 2020, a review of 10 years of data showed that NRRP goals for native species were mostly met, there had been much improvement over baseline conditions, and comparison to reference sites were sometimes met. Based on this review, the Fernald Natural Resource Trustees agreed that a shift from project-specific functional monitoring to a community-based approach for ecological monitoring is more appropriate.

The community-based monitoring involves the development of floristic inventories for each restoration community. Floristic inventories are compiled by conducting a series of walkdowns within a particular community type throughout the growing season. The result is a comprehensive list of vascular plant species for each monitoring area. Figure C-1 shows the breakdown of community types for which floristic inventories are completed. Remediation wetland areas, remediation prairie areas, and remediation successional areas are areas of the site where extensive ground disturbance took place. They are characterized by having little to no topsoil or nearby established vegetation in place when ecological restoration efforts began.

Perimeter wetland areas, perimeter successional areas, restoration forest areas, and existing forest areas are areas where little or no ground disturbance took place. Topsoil was usually still in place at the time ecological restoration efforts began. Each community type will be evaluated on a 3-year rotation. The rotation was implemented in 2021 beginning with perimeter and remediation wetland areas. Remediation prairie areas and remediation successional areas were monitored in 2022; results of that monitoring are presented in this report. Existing forest areas, restoration forest areas and perimeter successional areas will be monitored in 2023. In 2024, the monitoring cycle will repeat with monitoring of perimeter and remediation wetland areas.

Vegetation monitoring of the OSDF is required in accordance with Volume II of the LMICP (DOE 2019a). Monitoring to determine the percentage of native cover on one-third of the OSDF cap is completed annually so that the entire cap is monitored over a 3-year period. DOE and the regulatory agencies agree that the goal is not necessarily to establish a functioning prairie on the OSDF cap, but having 90% total cover and 50% native cover are goals established for the vegetated cap. Vegetation on OSDF cell caps 7 and 8 were monitored in 2022, and the results were presented in the September 2022 quarterly inspection report. Results indicate that the vegetative total cover of both cells is greater than 98%. Native cover for OSDF cell caps 7 and 8 were 65% and 67%, respectively. With approval from the regulators and stakeholders, DOE is planning to provide results of the OSDF vegetation monitoring in the annual Site Environmental Report rather than the OSDF quarterly inspection reports beginning in 2023. This will include a map showing the monitoring location and a summary of the results compared to the goals.

## C.2.0 Functional Monitoring

Prior to 2015, functional monitoring was conducted on a sitewide community basis, with wetland monitoring completed one year, prairie monitoring the next, and forest monitoring the third year. From 2015 through 2020, a management-area approach was implemented to ensure that restored areas were maintained on a 3-year rotation (Figure C-2). Functional monitoring in prairie and woodland areas consisted of establishing 15 random 1 square meter (m<sup>2</sup>) quadrats that were surveyed for herbaceous vegetation during the growing season (April through September). Surveys were divided into three rounds of five quadrats to ensure coverage throughout the growing season. For each quadrat, species richness and cover data were recorded for herbaceous vegetation. Additional 1,000 m<sup>2</sup> plots were used to collect woody data from each forest community. Species abundance and size data using diameter at breast height measurements were collected for woody vegetation in forest communities. Wetland communities were surveyed via fixed grids as described in the *Fernald Preserve Wetland Mitigation Monitoring Plan* (DOE 2009).

In 2021, wetland communities were evaluated through the revised approach to functional monitoring using the new floristic inventory method. In 2022, remediation area communities across the site were evaluated through this revised approach to functional monitoring. Remediation areas were divided into remediation successional areas, where the long-term management goal is to allow natural forest succession to take place, and remediation prairie areas, where restored prairies will be maintained as prairie communities through vegetation management.

The monitoring areas were surveyed in three rounds to ensure that data were collected through the entire growing season. For each round, the entire monitoring area was examined, and each species observed was recorded. Native and non-native species richness and species composition, average coefficient of conservatism (CC), and Floristic Quality Assessment Index (FQAI) were calculated from the data. Processes for calculating monitoring parameters for all communities are described in the *Fernald Preserve, Fernald, Ohio, Ecological Monitoring Methods Plan and Procedures* (DOE 2021). The latest Ohio FQAI database (Gara 2013) was used to determine nativity status and CC values. The floristic inventory results presented in Table C-1 allow for comparison of the two communities. A total of 266 species were observed with slightly more species identified in remediation successional areas than remediation prairie areas, 222 and 209 species, respectively. Remediation successional areas also had higher native species percent, mean CC, and FQAI scores (Table C-1).

Table C-2 provides a multiyear comparison of mean CC value, FQAI, and percent native species for areas surveyed in 2022. For data presented in Table C-2 from 2010 to 2020, a species list was compiled from previous ecological monitoring data and used to calculate mean CC, FQAI and percent native species for the current floristic inventory areas (Figure C-1). While FQAI is included in Table C-2, this value is influenced by the size of the surveyed area. The new floristic inventory method requires surveys of much larger areas than those previously surveyed for functional monitoring. Because of this, FQAI will be more useful for comparisons of future floristic inventories. Mean CC is a more appropriate index for historical comparisons using previous methods. Spyreas (2016) has shown that mean CC values are useful for comparison when there is variability in plot size and sampling intensity, as well as species misidentification. Mean CC will also be useful for comparisons to future floristic inventories. Species nativity will have value for historical comparisons; however, this could also be influenced slightly by the larger survey areas. This metric will also be useful for future comparisons. It should also be noted that for the remediation successional areas, the 2022 monitoring activities were the most extensive to date. Some remediation successional areas monitored in 2022 have never been monitored or were not consistently monitored. This reinforces the need to use mean CC and native species percent for historical comparison rather than FQAI, which is affected by survey area size.

Table C-2 shows a slight increase in mean CC for remediation successional areas since 2010. For remediation prairie areas, the highest mean CC value was recorded in 2022; however, remediation prairie areas have remained relatively stable since 2010. FQAI scores for both monitoring areas have continued to increase since monitoring began in 2010. Increases in the 2022 FQAI scores were anticipated due to the larger areas surveyed using the new functional monitoring method. Conclusions cannot be drawn from the 2022 FQAI scores alone. Future surveys will be required for comparison. Native species percent continues to increase in both remediation prairie areas and remediation successional areas to 67% and 70%, respectively. In 2022, 155 of the 222 species identified in remediation successional areas are native species. Of these, 18 species of *Carex* sedges were identified (Table C-1). *Carex* sedges are of particular interest due to their high diversity and the many sensitive species in the genus. Several species of interest were observed in remediation successional areas in 2022. Narrow-leaved ladies' tresses (*Spiranthes vernalis*) and rosepink (*Sabatia angularis*) were observed for the first time at the Fernald Preserve. Several high CC value species observed included blue and white false indigo (*Baptisia australis* and *Baptisia lactea*), sideoats grama grass (*Bouteloua curtipendula*), fescue sedge (*Carex festucacea*), Muhlenberg's sedge (*Carex muhlenbergii*), purple coneflower

(*Echinacea purpurea*), Canada wildrye (*Elymus canadensis*), rattlesnake master (*Eryngium yuccifolium*), winged monkeyflower (*Mimulus alatus*), compass plant (*Silphium laciniatum*), prairie dock (*Silphium terebinthinaceum*), cup plant (*Silphium perfoliatum*), lesser ladies' tresses (*Spiranthes ovalis*), and stiff goldenrod (*Solidago rigida*). Additionally, several high CC value species indicative of wooded habitats were observed, including sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), sycamore (*Platanus occidentalis*), white oak (*Quercus alba*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), chinquapin oak (*Quercus muehlenbergii*), northern red oak (*Quercus rubra*), and American basswood (*Tilia americana*). The presence of these tree species is encouraging as the long-term management goal for the remediation successional areas is forest development. The presence of high CC woody and prairie species is evidence that while these areas are still dominated by prairie habitats, forest succession is underway. The extensive soil disturbance from restoration activities throughout these areas may slow the successional process, which in undisturbed conditions can take decades, or even centuries. Continued monitoring and management for invasive species will be needed to achieve this goal.

Of the 209 species identified in remediation prairie areas in 2022, 140 are native species and 15 species of *Carex* sedges were observed. Several high CC species were observed in the remediation prairie areas, including sessile toothcup (*Ammannia robusta*), blue and white false indigo (*Baptisia australis* and *Baptisia lactea*), sideoats grama grass (*Bouteloua curtipendula*), purple coneflower (*Echinacea purpurea*), Canada wildrye (*Elymus canadensis*), rattlesnake master (*Eryngium yuccifolium*), spotted joe pye weed (*Eutrochium maculatum*), compass plant (*Silphium laciniatum*), prairie dock (*Silphium terebinthinaceum*), cup plant (*Silphium perfoliatum*), and stiff goldenrod (*Solidago rigida*). Relatively few high CC woody species were observed. These included buttonbush (*Cephalanthus occidentalis*), sycamore (*Platanus occidentalis*), and northern red oak (*Quercus rubra*). In total, 28 woody species were observed in the remediation prairie areas compared to 41 in the remediation successional areas (Table C-1). Two factors are likely contributing to the difference in woody species richness in these areas. First, the remediation prairie areas have had frequent use of prescribed fire as a management tool in the years since restoration activities were completed. The remediation successional areas have seen little to no prescribed burn activity. Another factor is that only small portions of the remediation prairie areas are adjacent to existing wooded areas, while a large part of the remediation successional areas have contact with existing wooded areas and, therefore, seed sources for woody species (Figure C-1). The difference in the woody species composition is desirable for the long-term management goals of these areas. The somewhat lower total species richness in the remediation prairie areas may also be related to prescribed burns, as the burns keep successional species suppressed, and create disturbances that may favor some species like Canada goldenrod (*Solidago canadensis*), which can quickly dominate recently disturbed areas. Continued monitoring and management activities, including mowing, prescribed burns, and invasive species control will be necessary to maintain these remediation prairie areas as prairies.

### **C.3.0 Site and On-Site Disposal Facility Inspections**

The Fernald Preserve LMICP (DOE 2019a) identifies the inspection process for the site and the OSDF. Inspections are conducted quarterly with participation from regulators. Site inspections also include quarterly point-specific institutional control inspections as well as weekly trail inspections. Inspections document evidence of unauthorized uses of the site, the effectiveness of

institutional controls, and the need for repairs. Additional inspections are also completed following prescribed burns.

Site inspection finding locations are identified on Figure C-3; OSDF finding locations are identified on Figures C-4A and C-4B. Follow-up maintenance activities are conducted to address findings from site and OSDF inspections. For some findings, it is determined that continued monitoring or no action is required. Some 2022 inspection findings remain to be addressed. DOE continues to resolve older findings even as new ones are generated.

Through calendar year 2021, inspection reports that included the specific findings of the site and OSDF inspections were submitted to the regulators on a quarterly basis, posted on the internet, and summarized in the annual Site Environmental Report. Beginning with calendar year 2022, a more streamlined reporting process was implemented. A report documenting completion of the inspections will continue to be submitted to the regulators on a quarterly basis; however, inspection finding details will only be reported in the annual Site Environmental Report, with one exception. If inspection findings indicate that activity and use limitations for the site are not in compliance, these findings will be discussed with the regulators during routine site meetings with timely notifications as necessary, and the finding details will be included in that quarter's inspection report. Inspection reports are also posted at <https://www.energy.gov/lm/fernaldd-preserve-ohio-site>. Additional requirements concerning notifications of significant OSDF findings to the regulators are discussed in Attachment B, "OSDF Post-Closure Care and Inspection Plan" of the LMICP. The only inspection finding reported in the 2022 quarterly inspection reports is discussed in Section C.3.1.

### **C.3.1 Site Inspections Findings**

To manage the site inspections more easily, the site was divided into four quadrants: central, south, east, and west. The field walkdowns are conducted by quadrant. Inspection of the west quadrant, originally scheduled for December 2022, was delayed until early 2023 due to inclement weather. As discussed in Section 5.1, two prescribed burns of approximately 20 acres of prairie were completed on December 2, 2022. The required post-burn walkdown of these areas was completed in January 2023. The results of both inspections will be reported in the 2023 Site Environmental Report.

The 2022 quarterly site inspection findings, resolution detail, and date of resolution are presented by quadrant in Tables C-3 through C-5. The approximate location of each finding for which a location was identified during the inspection is presented in Figure C-3. Similar to the findings from recent years, site inspection findings for 2022 consisted mainly of the presence of noxious and invasive vegetation and damage to deer enclosure fencing. Only one inspection finding was reported in the 2022 quarterly inspection reports. The finding was identified during the December 2022 point-specific institutional control inspection and is associated with the main drainage corridor culvert access control grating. The 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 Converted Advanced Wastewater Treatment facility and the Great Miami River. Because of their location, these culverts could not have been removed without potentially impacting ongoing Converted Advanced Wastewater Treatment and OSDF operations. Instead, metal grating was installed to prevent access to the 60-inch culvert.

Site inspections 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 approximate location of the main drainage corridor grating is identified on Figure C-2. The last quarterly inspection of 2022 identified that the grate had experienced natural degradation of the concrete which caused the rebar grate to become dislodged. Plans are being developed to repair the grating in 2023.

### **C3.1.1 Debris**

Debris (e.g., asphalt, tile, and concrete) continues to be identified, primarily in the Former Production Area and former Waste Storage Area located in the central quadrant. The site radiological control technician performs a radiological scan of all debris identified. Table C-6 provides a comparison of debris quantities by year. Debris is discovered through the site inspection process as well as during construction activities, site maintenance, and casual observation. In 2022, 128 pieces of debris were identified, radiologically surveyed, and removed. None of the debris had fixed radiological contamination above background levels. It is often the case that when one piece of debris is observed during an inspection, additional debris is discovered nearby when returning to remove the debris. Beginning in 2022, a GPS unit will be used to document the location of debris that is above background radiological levels. This information will be presented in the annual Site Environmental Report. No radiologically contaminated debris was identified in 2022.

### **C3.1.2 Annual Site and OSDF Inspection Photographs**

Annual site inspection photographs have been taken across the site (Figure C-5) since 2007. The 2018 Site Environmental Report (DOE 2019b) was the first time these photos were included as part of the Site Environmental Report. Before that, they were made available through the Geospatial Environmental Mapping System (GEMS), an internet-based interface that allows for public access to monitoring and inspection data. Due to changes in the internal review process for posting to this public interface, annual site photographs have not been posted on GEMS since 2015. The 2022 photo set is provided in this report. The first photograph taken at each location along with photographs from 2022 are provided in Figures C-5A through C-73. Note that the angle and perspective at some locations has shifted slightly over the years. The series of photographs show significant vegetation growth and development and generally stable conditions across the site. The annual site inspection photograph process was established to document the restoration following the extensive soil remediation completed in 2006. Additional photographs have been added over the years as newer restoration projects were completed. Because of the successful establishment of vegetation throughout the site, these annual site inspection photographs are less useful in documenting changing conditions.

In the 2021 Site Environmental Report (DOE 2022), DOE proposed to reduce the annual site inspection photographs to include only those required for the OSDF in accordance with Attachment B, “Post-Closure Care and Inspection Plan” of the LMICP. In 2022, the photographs required in accordance with the Post-Closure Care and Inspection Plan were included in the quarterly inspection reports. Beginning in 2023, these photographs will be included only in the annual Site Environmental Report.

### C.3.2 OSDF Inspection Findings

OSDF inspections consist of a quarterly walkdown around the perimeter of the OSDF and an annual walkdown of the vegetated cap. Erosion rills, animal burrows, noxious weeds, woody vegetation, settlement cracks, and other indications that there may be an issue with the proper functioning of the cap are identified and repaired. Tables C-7 through C-10 provide the 2022 OSDF findings, resolution detail, and date of resolution. Figure C-4A identifies the approximate location of each listed finding for the March, June, and September inspections. Figure C-4B identifies the approximate location of each listed finding for the December inspection, which was the annual vegetated cap walkdown. In 2022, there were no signs that the integrity of the cap had been compromised. As in previous years, findings consisted mainly of woody vegetation and noxious weeds. Callery pear (*Pyrus calleryana*) and other woody vegetation continue to invade the OSDF cap. Field personnel physically remove or apply herbicide to woody vegetation to keep trees from becoming established on the cap.

### C.3.3 Proposed Changes to Site and OSDF Inspection Reporting

As in previous years, site inspection findings for 2022 have consisted mainly of noxious or invasive vegetation and deer enclosure fence damage; 2022 OSDF findings are predominantly woody vegetation. With approval from the regulators and stakeholders, beginning in 2023, DOE will no longer include the tables detailing each inspection finding, but will report the findings in map format. The maps will include the location of each finding identified, the type of finding, and the finding resolution, if the finding has been resolved.

Site inspection findings will generally be grouped by category of most common findings as follows:

- Bio-intrusion (i.e., animal burrow)
- Trash
- Debris (e.g., concrete, asphalt, graphite)
- Debris with fixed contamination above background levels
- Drainage
- Erosion
- Fencing
- Signage
- Structure
- Unauthorized use
- Noxious or invasive vegetation

OSDF inspection findings will also include the following:

- Presence of rocks
- Settlement

As required by the Institutional Controls Plan, which is Volume II of the LMICP (DOE 2023), findings associated with activity and use limitation issues will be discussed with the regulators, reported in the quarterly inspection reports, and discussed in the annual Site Environmental Report. Photographs of the issue may also be included. Requirements associated with additional reporting related to OSDF findings is included in the Post-Closure Care and Inspection Plan, Attachment B of the LMICP.

#### **C.4.0 Monitoring and Inspection Activities in 2023**

The revised approach to functional monitoring using floristic inventories implemented in 2021 will continue in 2023 for perimeter successional, remediation forest, and existing forest areas (Figure C-1). Herbaceous monitoring of the OSDF cap will continue. Cell caps 1, 2, and 3 will be evaluated in 2023. DOE suggests that beginning in 2023, OSDF vegetation data be reported in the Site Environmental Report rather than the quarterly inspection reporting process.

Quarterly site inspections will continue to be used to identify issues that need to be addressed through restored area maintenance. To better access remote areas of the site, the timing of field walkdowns is focused in the winter months. This allows for greater visibility and access in densely vegetated areas. Post-burn walkdowns in the central quadrant and the OSDF will also be conducted.

#### **C.5.0 References**

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Table C-1. 2022 Remediation Area Functional Monitoring Summary

	Remediation Prairie Areas	Remediation Successional Areas
<b>Total Species</b>	209	222
<b>Native Species</b>	140	155
<b>Non-Native Species</b>	69	67
<b>Native Species (percent)</b>	67%	70%
<b>Average Coefficient of Conservatism (CC), range between 0-10</b>	1.9	2.3
<b>Floristic Quality Assessment Index</b>	28.0	33.6

Species	Common Name	Type	CC	Species Identified	
				Remediation Prairies	Remediation Successional Areas
<i>Acalypha rhomboidea</i>	RHOMBIC THREE-S. MERCURY	forb	0	X	X
<i>Acer negundo</i>	BOX ELDER	tree	3	X	X
<i>Acer rubrum</i>	RED MAPLE	tree	2		X
<i>Acer saccharinum</i>	SILVER MAPLE	tree	3	X	
<i>Achillea millefolium</i>	YARROW	forb	1	X	X
<i>Agrimonia parviflora</i>	SMALL-FLOWERED AGRIMONY	forb	2	X	X
<i>Alisma subcordatum</i>	SOUTHERN WATER-PLANTAIN	forb	2	X	X
<i>Ambrosia artemisiifolia</i>	COMMON RAGWEED	forb	0	X	X
<i>Ammannia robusta</i>	SESSILE TOOTH-CUP	forb	7	X	
<i>Amorpha fruticosa</i>	FALSE INDIGO	forb	3		X
<i>Andropogon gerardii</i>	BIG BLUESTEM	grass	5	X	X
<i>Andropogon virginicus</i>	COMMON BROOM-SEDGE	grass	3	X	
<i>Apocynum cannabinum</i>	INDIAN HEMP	forb	1	X	X
<i>Asclepias incarnata</i>	SWAMP MILKWEED	forb	4	X	X
<i>Asclepias syriaca</i>	COMMON MILKWEED	forb	1	X	X
<i>Asclepias tuberosa</i>	BUTTERFLY-WEED	forb	4	X	X
<i>Asplenium platyneuron</i>	EBONY SPLEENWORT	fern	3		X
<i>Aster ericoides</i>	WHITE HEATH ASTER	forb	2		X
<i>Aster lanceolatus</i>	EASTERN LINED ASTER	forb	3		X
<i>Aster lateriflorus</i>	CALICO ASTER	forb	2	X	X
<i>Aster novae-angliae</i>	NEW ENGLAND ASTER	forb	2	X	X
<i>Aster pilosus</i>	AWL ASTER	forb	1	X	X
<i>Aster racemosus</i>	SMALL-HEADED ASTER	forb	2	X	X
<i>Baptisia australis</i>	BLUE FALSE INDIGO	forb	6	X	X
<i>Baptisia lactea</i>	WHITE FALSE INDIGO	forb	8	X	X
<i>Bidens connata</i>	PURPLE-STEMMED BEGGAR'S-TICK	forb	3	X	
<i>Bidens frondosa</i>	DEVIL'S BEGGAR'S-TICK	forb	2	X	X
<i>Bouteloua curtipendula</i>	SIDE-OATS GRAMA GRASS	grass	8	X	X
<i>Calamagrostis canadensis</i>	CANADA BLUEJOINT	grass	4	X	X
<i>Calystegia sepium</i>	HEDGE BINDWEED	forb	1	X	X
<i>Carex amphibola</i>	E. NARROW-LEAVED SEDGE	sedge	5		X
<i>Carex annectens</i>	YELLOW FOX SEDGE	sedge	3	X	X
<i>Carex blanda</i>	COMMON WOOD SEDGE	sedge	1	X	X
<i>Carex cephalophora</i>	OVAL-HEADED SEDGE	sedge	5	X	
<i>Carex comosa</i>	BEARDED SEDGE	sedge	2	X	X
<i>Carex cristatella</i>	CRESTED SEDGE	sedge	3	X	X
<i>Carex festucacea</i>	FESCUE SEDGE	sedge	7		X
<i>Carex frankii</i>	FRANK'S SEDGE	sedge	2	X	X
<i>Carex granularis</i>	MEADOW SEDGE	sedge	3	X	X
<i>Carex grisea</i>	NARROW-LEAVED SEDGE	sedge	4		X
<i>Carex lupulina</i>	HOP SEDGE	sedge	3	X	X
<i>Carex lurida</i>	BOTTLEBRUSH SEDGE	sedge	3	X	
<i>Carex molesta</i>	TROUBLESOME SEDGE	sedge	3		X
<i>Carex muhlenbergii</i>	MUHLENBERG'S SEDGE	sedge	7		X
<i>Carex normalis</i>	LARGE STRAW SEDGE	sedge	4	X	X
<i>Carex scoparia</i>	POINTED BROOM SEDGE	sedge	3	X	X
<i>Carex shortiana</i>	SHORT'S SEDGE	sedge	2	X	X
<i>Carex stipata</i>	CROWDED SEDGE	sedge	2	X	X
<i>Carex tribuloides</i>	BLUNT BROOM SEDGE	sedge	4	X	X
<i>Carex vulpinoidea</i>	FOX SEDGE	sedge	1	X	X
<i>Carya ovata</i>	SHAGBARK HICKORY	tree	6		X
<i>Cephalanthus occidentalis</i>	BUTTONBUSH	shrub	6	X	
<i>Cercis canadensis</i>	REDBUD	small tree	3	X	X

Table C-1. 2022 Remediation Area Functional Monitoring Summary (continued)

<i>Chamaecrista fasciculata</i>	PARTRIDGE-PEA	forb	3	X	X
<i>Cirsium discolor</i>	FIELD THISTLE	forb	4	X	X
<i>Claytonia virginica</i>	SPRING-BEAUTY	forb	2		X
<i>Conyza canadensis</i>	HORSEWEED	forb	0	X	X
<i>Cornus racemosa</i>	GRAY DOGWOOD	shrub	1	X	
<i>Crataegus crus-galli</i>	COCKSPUR HAWTHORN	small tree	3	X	
<i>Cuscuta gronovii</i>	COMMON DODDER	forb	3	X	
<i>Cyperus esculentus</i>	YELLOW NUT-SEDGE	sedge	0	X	X
<i>Cyperus strigosus</i>	STRAW-COLORED UMBRELLA-S.	sedge	1	X	
<i>Desmodium canadense</i>	CANADA TICK-TREFOIL	forb	4	X	X
<i>Desmodium canescens</i>	HOARY TICK-TREFOIL	forb	4	X	X
<i>Desmodium paniculatum</i>	SHOWY TICK-TREFOIL	forb	3		X
<i>Diospyros virginiana</i>	PERSIMMON	small tree	4		X
<i>Echinacea purpurea</i>	PURPLE CONEFLOWER	forb	6	X	X
<i>Eleocharis erythropoda</i>	RED-FOOTED SPIKE-RUSH	sedge	4	X	X
<i>Eleocharis obtusa</i>	BLUNT SPIKE-RUSH	sedge	1	X	X
<i>Elymus canadensis</i>	CANADA WILD RYE	grass	6	X	X
<i>Epilobium coloratum</i>	PURPLE-LEAVED WILLOW-HERB	forb	1	X	X
<i>Equisetum hyemale</i>	SCOURING-RUSH	fern	2	X	X
<i>Erechtites hieracifolia</i>	PILEWORT	forb	2	X	X
<i>Erigeron annuus</i>	DAISY FLEABANE	forb	0	X	X
<i>Erigeron philadelphicus</i>	PHILADELPHIA FLEABANE	forb	2	X	
<i>Erigeron strigosus</i>	ROUGH FLEABANE	forb	1	X	X
<i>Eryngium yuccifolium</i>	RATTLESNAKE-MASTER	forb	7	X	X
<i>Eupatorium altissimum</i>	TALL BONESET	forb	0	X	X
<i>Eupatorium coelestinum</i>	MISTFLOWER	forb	3		X
<i>Eupatorium maculatum</i>	SPOTTED JOE-PYE WEED	forb	6	X	
<i>Eupatorium perfoliatum</i>	COMMON BONESET	forb	3	X	X
<i>Eupatorium purpureum</i>	PURPLE JOE-PYE WEED	forb	5		X
<i>Eupatorium rugosum</i>	WHITE SNAKEROOT	forb	3	X	X
<i>Eupatorium serotinum</i>	LATE-FLOWERING BONESET	forb	2	X	X
<i>Euphorbia nutans</i>	EYEBANE	forb	0	X	
<i>Euthamia graminifolia</i>	FLAT-TOPPED GOLDENROD	forb	2	X	X
<i>Fraxinus pennsylvanica</i>	GREEN ASH	tree	3	X	X
<i>Galium aparine</i>	CLEAVERS	forb	0	X	X
<i>Geranium carolinianum</i>	CAROLINA CRANE'S-BILL	forb	3	X	X
<i>Geum canadense</i>	WHITE AVENS	forb	2		X
<i>Geum laciniatum</i>	ROUGH AVENS	forb	2	X	
<i>Gleditsia triacanthos</i>	HONEY LOCUST	tree	4	X	X
<i>Hackelia virginiana</i>	VIRGINIA STICKSEED	forb	2		X
<i>Helianthus grosseserratus</i>	SAWTOOTH SUNFLOWER	forb	4		X
<i>Heliopsis helianthoides</i>	SMOOTH OXEYE	forb	5	X	X
<i>Hibiscus moscheutos</i>	SWAMP ROSE-MALLOW	forb	4	X	
<i>Juglans nigra</i>	BLACK WALNUT	tree	5		X
<i>Juncus dudleyi</i>	DUDLEY'S RUSH	forb	3	X	X
<i>Juncus tenuis</i>	PATH RUSH	forb	1	X	X
<i>Juncus torreyi</i>	TORREY'S RUSH	forb	3	X	X
<i>Juniperus virginiana</i>	EASTERN RED CEDAR	tree	3	X	X
<i>Lactuca canadensis</i>	WILD LETTUCE	forb	1	X	X
<i>Leersia oryzoides</i>	RICE CUT GRASS	grass	1	X	X
<i>Lespedeza capitata</i>	ROUND-HEADED BUSH-CLOVER	forb	5	X	
<i>Leucospora multifida</i>	LEUCOSPORA	forb	5	X	
<i>Lindernia dubia</i>	FALSE PIMPERNEL	forb	2		X
<i>Liquidambar styraciflua</i>	SWEETGUM	tree	6		X
<i>Liriodendron tulipifera</i>	TULIP TREE	tree	6		X
<i>Lobelia inflata</i>	INDIAN-TOBACCO	forb	1		X
<i>Lobelia siphilitica</i>	GREAT BLUE LOBELIA	forb	3	X	
<i>Ludwigia palustris</i>	WATER-PURSLANE	forb	3	X	X
<i>Lycopus americanus</i>	AMERICAN WATER-HOREHOUND	forb	3	X	X
<i>Mentha arvensis</i>	FIELD MINT	forb	2	X	
<i>Mimulus alatus</i>	WINGED MONKEY-FLOWER	forb	6		X
<i>Mimulus ringens</i>	COMMON MONKEY-FLOWER	forb	4	X	X
<i>Monarda fistulosa</i>	WILD BERGAMOT	forb	3	X	X
<i>Oenothera biennis</i>	COMMON EVENING-PRIMROSE	forb	1	X	
<i>Oxalis stricta</i>	COMMON YELLOW WOOD-SORREL	forb	0	X	X
<i>Panicum capillare</i>	WITCH GRASS	grass	1	X	X
<i>Panicum clandestinum</i>	DEER'S-TONGUE PANIC GRASS	grass	2	X	
<i>Panicum virgatum</i>	SWITCH GRASS	grass	4	X	X

Table C-1. 2022 Remediation Area Functional Monitoring Summary (continued)

<i>Parthenocissus quinquefolia</i>	VIRGINIA CREEPER	vine	2	X	X
<i>Penstemon digitalis</i>	FOXGLOVE BEARD-TONGUE	forb	2	X	X
<i>Phyla lanceolata</i>	FOG-FRUIT	forb	3	X	X
<i>Physalis longifolia</i>	SMOOTH GROUND-CHERRY	forb	1		X
<i>Phytolacca americana</i>	POKEWEED	forb	1	X	X
<i>Pinus strobus</i>	WHITE PINE	tree	6		X
<i>Platanus occidentalis</i>	SYCAMORE	tree	7	X	X
<i>Populus deltoides</i>	EASTERN COTTONWOOD	tree	3	X	X
<i>Prunella vulgaris</i>	SELF-HEAL	forb	0	X	X
<i>Prunus americana</i>	AMERICAN PLUM	small tree	3	X	
<i>Prunus munsoniana</i>	MUNSON'S PLUM	small tree	3		X
<i>Pycnanthemum tenuifolium</i>	NARROW-LEAVED MOUNTAIN-MINT	forb	4	X	X
<i>Quercus alba</i>	WHITE OAK	tree	6		X
<i>Quercus bicolor</i>	SWAMP WHITE OAK	tree	7		X
<i>Quercus imbricaria</i>	SHINGLE OAK	tree	5		X
<i>Quercus macrocarpa</i>	BUR OAK	tree	6		X
<i>Quercus muehlenbergii</i>	CHINQUAPIN OAK	tree	7		X
<i>Quercus rubra</i>	RED OAK	tree	6	X	X
<i>Ranunculus sceleratus</i>	CURSED CROWFOOT	forb	1	X	
<i>Ratibida pinnata</i>	GRAY-HEADED CONEFLOWER	forb	5	X	X
<i>Rhus aromatica var. aromatica</i>	FRAGRANT SUMAC	shrub	3	X	X
<i>Rhus glabra</i>	SMOOTH SUMAC	shrub	2	X	
<i>Rhus typhina</i>	STAGHORN SUMAC	shrub	2		X
<i>Robinia pseudoacacia</i>	BLACK LOCUST	tree	0	X	
<i>Rosa palustris</i>	SWAMP ROSE	shrub	5		X
<i>Rubus allegheniensis</i>	COMMON BLACKBERRY	shrub	1	X	X
<i>Rubus occidentalis</i>	BLACK RASPBERRY	shrub	1		X
<i>Rudbeckia hirta</i>	BLACK-EYED SUSAN	forb	1	X	X
<i>Ruellia strepens</i>	SMOOTH RUELLIA	forb	5		X
<i>Sabatia angularis</i>	ROSE-PINK	forb	4		X
<i>Salix exigua</i>	SANDBAR WILLOW	shrub	1	X	X
<i>Salix nigra</i>	BLACK WILLOW	tree	2	X	X
<i>Sambucus canadensis</i>	COMMON ELDERBERRY	shrub	3		X
<i>Schizachyrium scoparium</i>	LITTLE BLUESTEM	grass	5	X	X
<i>Schoenoplectus tabernaemontani</i>	SOFT-STEMMED BULRUSH	sedge	2	X	X
<i>Scirpus atrovirens</i>	GREEN BULRUSH	sedge	1	X	X
<i>Scirpus cyperinus</i>	WOOL-GRASS	sedge	1	X	
<i>Scirpus pendulus</i>	DROOPING BULRUSH	sedge	2	X	X
<i>Senna hebecarpa</i>	NORTHERN WILD SENNA	forb	4	X	
<i>Silphium laciniatum</i>	COMPASS PLANT	forb	8	X	X
<i>Silphium perfoliatum</i>	CUP-PLANT	forb	6	X	X
<i>Silphium terebinthinaceum</i>	PRAIRIE DOCK	forb	8	X	X
<i>Sisyrinchium angustifolium</i>	STOUT BLUE-EYED-GRASS	forb	2		X
<i>Solidago canadensis</i>	CANADA GOLDENROD	forb	1	X	X
<i>Solidago juncea</i>	PLUME GOLDENROD	forb	2		X
<i>Solidago rigida</i>	STIFF GOLDENROD	forb	8	X	X
<i>Sorghastrum nutans</i>	INDIAN GRASS	grass	5	X	X
<i>Sparganium eurycarpum</i>	GIANT BUR-REED	forb	4	X	
<i>Spartina pectinata</i>	PRAIRIE CORD GRASS	grass	5	X	X
<i>Spiranthes ovalis</i>	LESSER LADIES TRESSES	forb	6		X
<i>Spiranthes vernalis</i>	NARROW-LEAVED LADIES'-TR.	forb	7		X
<i>Symphoricarpos orbiculatus</i>	CORALBERRY	shrub	3	X	X
<i>Teucrium canadense</i>	AMERICAN GERMANDER	forb	3		X
<i>Tilia americana</i>	AMERICAN BASSWOOD	tree	6		X
<i>Toxicodendron radicans</i>	POISON-IVY	vine	1	X	X
<i>Tradescantia ohiensis</i>	OHIO SPIDERWORT	forb	5	X	X
<i>Ulmus americana</i>	AMERICAN ELM	tree	2		X
<i>Ulmus rubra</i>	SLIPPERY ELM	tree	3	X	X
<i>Valerianella umbilicata</i>	BEAKED CORN-SALAD	forb	2	X	
<i>Verbena hastata</i>	BLUE VERVAIN	forb	4	X	X
<i>Verbena stricta</i>	HOARY VERVAIN	forb	3	X	
<i>Verbena urticifolia</i>	WHITE VERVAIN	forb	3	X	X
<i>Vernonia gigantea</i>	TALL IRONWEED	forb	2	X	X
<i>Viburnum prunifolium</i>	BLACK-HAW	shrub	4	X	X
<i>Vitis riparia</i>	RIVERBANK GRAPE	vine	3		X
<i>Vitis vulpina</i>	FROST GRAPE	vine	3	X	
<b><i>Alliaria petiolata</i></b>	<b>GARLIC MUSTARD</b>	forb	0	X	X
<b><i>Allium vineale</i></b>	<b>FIELD GARLIC</b>	forb	0	X	X

Table C-1. 2022 Remediation Area Functional Monitoring Summary (continued)

<i>Alopecurus pratensis</i>	MEADOW FOXTAIL	grass	0	X	X
<i>Amaranthus cruentus</i>	RED AMARANTH	forb	0		X
<i>Anagallis arvensis</i>	SCARLET PIMPERNEL	forb	0	X	
<i>Artemisia vulgaris</i>	COMMON MUGWORT	forb	0		X
<i>Barbarea vulgaris</i>	YELLOW ROCKET	forb	0	X	X
<i>Bromus inermis</i>	HUNGARIAN BROME	grass	0		X
<i>Cardamine hirsuta</i>	HOARY BITTER CRESS	forb	0		X
<i>Carduus nutans</i>	NODDING THISTLE	forb	0	X	X
<i>Catalpa speciosa</i>	NORTHERN CATALPA	tree	0	X	X
<i>Chrysanthemum leucanthemum</i>	OX-EYE DAISY	forb	0	X	
<i>Cichorium intybus</i>	CHICORY	forb	0	X	X
<i>Cirsium arvense</i>	CANADA THISTLE	forb	0	X	X
<i>Cirsium vulgare</i>	BULL THISTLE	forb	0	X	X
<i>Conium maculatum</i>	POISON-HEMLOCK	forb	0	X	X
<i>Convolvulus arvensis</i>	FIELD BINDWEED	forb	0	X	
<i>Coronilla varia</i>	CROWN-VETCH	forb	0	X	X
<i>Dactylis glomerata</i>	ORCHARD GRASS	grass	0		X
<i>Daucus carota</i>	QUEEN-ANNE'S-LACE	forb	0	X	X
<i>Dianthus armeria</i>	DEPTFORD-PINK	forb	0	X	X
<i>Dipsacus fullonum</i>	WILD TEASEL	forb	0	X	X
<i>Dipsacus laciniatus</i>	CUT-LEAVED TEASEL	forb	0	X	X
<i>Echinacea pallida</i>	PALE PURLPE CONEFLOWER	forb	0	X	X
<i>Echinochloa crusgalli</i>	BARNYARD GRASS	grass	0	X	X
<i>Elaeagnus umbellata</i>	AUTUMN-OLIVE	small tree	0		X
<i>Elytrigia repens</i>	QUACKGRASS	grass	0	X	
<i>Festuca elatior</i>	TALL FESCUE	grass	0	X	X
<i>Glechoma hederacea</i>	GROUND IVY	forb	0	X	X
<i>Hordeum jubatum</i>	SQUIRREL-TAIL BARLEY	grass	0	X	
<i>Lactuca saligna</i>	WILLOW-LEAVED LETTUCE	forb	0	X	
<i>Lactuca serriola</i>	PRICKLY LETTUCE	forb	0		X
<i>Lamium purpuream</i>	PURPLE DEAD-NETTLE	forb	0	X	X
<i>Lepidium campestre</i>	FIELD PEPPER-GRASS	forb	0	X	X
<i>Lespedeza cuneata</i>	CHINESE BUSH-CLOVER	forb	0	X	X
<i>Lolium multiflorum</i>	ITALIAN RYEGRASS	grass	0	X	X
<i>Lonicera japonica</i>	JAPANESE HONEYSUCKLE	vine	0	X	X
<i>Lonicera maackii</i>	AMUR HONEYSUCKLE	shrub	0	X	X
<i>Lotus corniculatus</i>	BIRD'S-FOOT TREFOIL	forb	0	X	X
<i>Medicago lupulina</i>	BLACK MEDICK	forb	0	X	X
<i>Melilotus alba</i>	WHITE SWEET-CLOVER	forb	0	X	X
<i>Melilotus officinalis</i>	YELLOW SWEET-CLOVER	forb	0	X	X
<i>Morus alba</i>	WHITE MULBERRY	tree	0	X	X
<i>Narcissus pseudonarcissus</i>	DAFFODIL	forb	0		X
<i>Pastinaca sativa</i>	WILD PARSNIP	forb	0		X
<i>Phalaris arundinacea</i>	REED CANARY GRASS	grass	0	X	X
<i>Phleum pratense</i>	TIMOTHY	grass	0		X
<i>Phragmites australis subsp. australis</i>	GIANT REED	grass	0	X	
<i>Pinus nigra</i>	AUSTRIAN PINE	tree	0	X	X
<i>Plantago lanceolata</i>	ENGLISH PLANTAIN	forb	0	X	X
<i>Plantago major</i>	COMMON PLANTAIN	forb	0	X	X
<i>Poa annual</i>	ANNUAL BLUEGRASS	grass	0	X	X
<i>Polygonum persicaria</i>	LADY'S THUMB	forb	0	X	X
<i>Pyrus callieryana</i>	CALLIERY PEAR	small tree	0	X	X
<i>Rosa multiflora</i>	MULTIFLORA ROSE	shrub	0	X	X
<i>Rumex crispus</i>	CURLY DOCK	forb	0	X	X
<i>Saponaria officinalis</i>	SOAPWORT	forb	0	X	X
<i>Schoenoplectus mucronatus</i>	RICEFIELD BULRUSH	sedge	0	X	
<i>Senecio glabellus</i>	BUTTERWEED	forb	0	X	X
<i>Setaria faberi</i>	GIANT FOXTAIL GRASS	grass	0	X	X
<i>Setaria glauca</i>	YELLOW FOXTAIL GRASS	grass	0	X	X
<i>Setaria viridis</i>	GREEN FOXTAIL GRASS	grass	0	X	
<i>Solanum carolinense</i>	HORSE NETTLE	forb	0	X	X
<i>Sorghum halepense</i>	JOHNSON GRASS	grass	0	X	
<i>Stellaria media</i>	COMMON CHICKWEED	forb	0	X	X
<i>Taraxacum officinale</i>	COMMON DANDELION	forb	0	X	X
<i>Thlaspi arvense</i>	FIELD PENNY CRESS	forb	0	X	X
<i>Torilis arvensis</i>	FIELD HEDGE-PARSLEY	forb	0	X	X
<i>Trifolium hybridum</i>	ALSIKE CLOVER	forb	0	X	X
<i>Trifolium pratense</i>	RED CLOVER	forb	0	X	X

Table C-1. 2022 Remediation Area Functional Monitoring Summary (continued)

<i>Trifolium repens</i>	WHITE CLOVER	forb	0	X	X
<i>Typha angustifolia</i>	NARROW-LEAVED CAT-TAIL	forb	0	X	X
<i>Typha x glauca</i>	HYBRID CAT-TAIL	forb	0	X	X
<i>Valerianella locusta</i>	EUROPEAN CORN-SALAD	forb	0	X	
<i>Verbascum blattaria</i>	MOTH MULLEIN	forb	0	X	X
<i>Verbascum thapsus</i>	COMMON MULLEIN	forb	0	X	X
<i>Veronica arvensis</i>	CORN SPEEDWELL	forb	0	X	X
<i>Viola arvensis</i>	EUROPEAN FIELD-PANSY	forb	0	X	
<i>Xanthium strumarium</i>	COMMON COCKLEBUR	forb	0	X	X

Highlighted species are non-native, X indicates the species is present in the monitoring area.

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Table C-2. Comparison of Remediation Prairie and Remediation Successional Area Ecological Monitoring Metrics

Time Period	Mean Coefficient of Conservatism		Floristic Quality Assessment Index		Native Species	
	Remediation Prairie Areas	Remediation Successional Areas	Remediation Prairie Areas	Remediation Successional Areas	Remediation Prairie Areas	Remediation Successional Areas
2010	1.8	1.5	20.0	14.7	64%	52%
2013	1.7	1.4	20.1	13.6	60%	49%
2015 to 2017 <sup>a</sup>	1.5	1.8	15.6	21.7	59%	61%
2018 to 2020 <sup>a</sup>	1.6	1.7	14.3	20.7	59%	63%
2022 <sup>b</sup>	1.9	2.2	28.0	33.2	67%	70%

<sup>a</sup> Monitoring rotated among site management areas over a 3-year period.

<sup>b</sup> Revised functional monitoring approach implemented using floristic inventories.

Table C-3. Central Quadrant Site Inspection Findings, February 2022

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Teasel	Herbicide applied	6/27/2022
2	Culvert blocked	Removed blockage	2/23/2022
3	Animal burrows and slumping	To be determined	To be determined
4	Top missing from barn owl box	No action required	12/29/2022
5	Pear trees	Herbicide applied	3/15/2023
6	Mugwort rosettes	Herbicide applied	6/16/2022
7	Phragmites	No action required	6/28/2022
8	Concrete	Free released and disposed <sup>a</sup>	3/15/2022
9	Asphalt	Free released and disposed <sup>a</sup>	3/15/2022
10	Rubber	Free released and disposed <sup>a</sup>	3/15/2022
11	Plastic	Removed plastic	4/6/2022
12	Hard black plastic embedded in turf	Removed plastic	4/6/2022

<sup>a</sup> 10 CFR 835, "Occupational Radiation Protection."

Table C-4. South Quadrant Site Inspection Findings, March 2022

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Phragmites	No action required	6/29/2022
2	Concrete	Free released and disposed <sup>a</sup>	3/15/2022
3	Tree protection cages and metal posts	To be determined	To be determined
4	Transite	Free released and disposed <sup>b</sup>	3/15/2022
5	Bundle of silt fence	Silt fence discarded	4/6/2022
6	Blue surveyor flag	No action required	4/1/2022
7	Hole in deer fence	Deer fence repaired	4/13/2022
8	Unvegetated area	No action required	4/6/2022
9	Hole in deer fence	Deer fence repaired	4/28/2022

Table C-4. South Quadrant Site Inspection Findings, March 2022 (continued)

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
10	Erosion and exposed landscape fabric	To be determined	To be determined
11	Geotextile exposed	No action required	12/29/2022
12	Hole in deer fence	Deer fence repaired	4/7/2022
13	Hole in deer fence	Deer fence repaired	4/7/2022
14	Section of deer fence down	Deer fence repaired	4/28/2022
15	Deer fence torn and down	Deer fence repaired	4/14/2022
16	Deer fence gate open	Deer fence gate repaired	4/6/2022
17	Honeysuckle	Herbicide applied	11/8/2022
18	Honeysuckle	Herbicide applied	11/2/2022
19	Concrete	Free released and disposed <sup>a</sup>	3/15/2022

<sup>a</sup> 10 CFR 835, "Occupational Radiation Protection."

Table C-5. East Quadrant Site Inspection Findings, March 2022

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Holes in deer fence	Deer fence repaired	4/14/2022
2	Broken drainpipe and erosion	No action required	4/14/2022
3	Pears and honeysuckle	Herbicide applied	1/11/2023
4	Pear trees	To be determined	To be determined
5	Teasel	To be determined	To be determined
6	Corrugated plastic on tree	Removed plastic	4/11/2022
7	Pear trees	To be determined	To be determined
8	Teasel	To be determined	To be determined
9	Corrugated plastic	Removed plastic	4/11/2022
10	White corrugated material	Removed material	4/11/2022
11	Pear trees and honeysuckle	To be determined	To be determined
12	Tree protection cage buried in grasses	Removed deer cages	4/13/2022
13	Deer fence post	Removed deer fence post	4/13/2022
14	Pear trees	Herbicide applied	4/21/2022
15	Pear trees	Herbicide applied	4/21/2022
16	Pear trees	Herbicide applied	10/27/2022
17	Pear trees	Herbicide applied	10/27/2022
18	Pear trees	To be determined	To be determined
19	Teasel	Herbicide applied	6/8/2022
20	Teasel	To be determined	To be determined
21	Poison hemlock	To be determined	To be determined
22	Pear trees	To be determined	To be determined
23	Bottom falling out of kestrel box	Repaired kestrel box	4/14/2022
24	Pear trees and honeysuckle	To be determined	To be determined
25	Honeysuckle and autumn olive	To be determined	To be determined

Table C-5. East Quadrant Site Inspection Findings, March 2022 (continued)

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
26	Honeysuckle, pear trees, autumn olive trees	To be determined	To be determined
27	Pear trees and honeysuckle	To be determined	To be determined
28	Honeysuckle	To be determined	To be determined
29	Phragmites	Herbicide Applied	6/28/2022
30	Asphalt	Free released and disposed <sup>a</sup>	3/15/2022
31	Pear trees and honeysuckle	To be determined	To be determined
32	Honeysuckle	To be determined	To be determined
33	Honeysuckle and pear trees	To be determined	To be determined
34	Honeysuckle	To be determined	To be determined

<sup>a</sup> 10 CFR 835, "Occupational Radiation Protection."

Table C-6. Annual Debris Quantities

Year	Free-Release Debris Count <sup>a,b</sup>	Contaminated Debris Count <sup>a</sup>	Percent Contaminated <sup>a,b</sup>
2007	-	108	-
2008	-	128	-
2009	-	36	-
2010	-	21	-
2011	204	4	1.9%
2012	1,480	12	0.8%
2013	391	8	2.0%
2014	814	8	1.0%
2015	453	13	2.8%
2016	261	9	3.3%
2017	574	3	0.5%
2018	294	3	1.0%
2019	925	0	0.0%
2020	241	1	0.4%
2021	143	6	4.0%
2022	128	0	0.0%

<sup>a</sup> 10 CFR 835, "Occupational Radiation Protection."

<sup>b</sup> DOE began recording free-release debris counts in 2011.

Table C-7. OSDF Inspection Findings, March 2022

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Cedar tree	Removed	4/4/2022
2	Cedar tree	Removed	4/4/2022
3	Cedar trees	Removed	4/4/2022
4	Cedar trees	Removed	4/4/2022
5	Cedar tree	Removed	4/4/2022
6	Cedar tree	Removed	4/4/2022
7	Cedar tree	Removed	4/4/2022
8	Cedar tree	Removed	4/4/2022
9	Cedar tree	Removed	4/4/2022
10	Cedar tree	Removed	4/4/2022
11	Asphalt pieces	Unable to locate	3/2/2023
12	Blackberry	Herbicide applied	9/1/2022
13	Cedar trees	Removed	4/4/2022
14	Pear tree	Herbicide applied	3/20/2023
15	Cedar trees	Removed	4/4/2022
16	Cedar trees	Removed	4/4/2022
17	Cedar trees	Removed	4/4/2022
18	Cedar tree	Removed	4/4/2022
19	Cedar tree	Removed	4/4/2022
20	Burrows and sand	To be determined	To be determined
21	Cedar trees	Removed	4/4/2022

Table C-8. OSDF Inspection Findings, June 2022

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Vegetation disturbance due to vehicle travel	No action required; vegetation recovered	12/6/2022
2	Woody vegetation	Herbicide applied	10/27/2022
3	Woody vegetation	Herbicide applied	10/27/2022
4	Woody vegetation	Herbicide applied	10/27/2022
5	Woody vegetation	Herbicide applied	10/27/2022
6	Woody vegetation	Herbicide applied	10/27/2022
7	Woody vegetation	Herbicide applied	10/27/2022

Table C-9. OSDF Inspection Findings, September 2022

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Sycamore trees	Herbicide applied	9/13/2022
2	Woody vegetation	Herbicide applied	9/13/2022
3	Callery pear tree	Herbicide applied	9/13/2022
4	Callery pear tree	Herbicide applied	9/13/2022
5	Callery pear trees	Herbicide applied	9/13/2022
6	Callery pear trees	No action required	9/13/2022
7	Callery pear trees	Herbicide applied	9/13/2022
8	Cedar tree	Herbicide applied	11/21/2022
9	Woody vegetation	Herbicide applied	9/21/2022
10	Woody vegetation	Herbicide applied	9/21/2022
11	Woody vegetation	Herbicide applied	9/21/2022
12	Pear tree	Herbicide applied	9/21/2022
13	Pear, rose, and honeysuckle	Herbicide applied	9/21/2022
14	Mulberry and honeysuckle	Herbicide applied	9/21/2022
15	Pear tree	Herbicide applied	9/21/2022
16	Hole under fence	To be determined	To be determined
17	Fence bent	No action required, no integrity issues	1/23/2023
18	Pear trees	Herbicide applied	10/27/2022
19	Erosion on south edge of gravel road	Erosion repair	10/4/2022
20	Pear trees	Herbicide applied	2/23/2023

Table C-10. OSDF Inspection Findings, December 2022

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Callery pear	Herbicide applied	3/22/2023
2	Callery pear	Herbicide applied	3/20/2023
3	Callery pear	Herbicide applied	3/20/2023
4	Callery pear	Herbicide applied	3/20/2023
5	Callery pear	Herbicide applied	3/20/2023
6	Callery pear	Herbicide applied	3/20/2023
7	Cedar tree	Herbicide applied	3/22/2023
8	Callery pear	Herbicide applied	3/20/2023
9	Callery pear	Herbicide applied	3/20/2023
10	Callery pear	Herbicide applied	3/20/2023
11	Callery pear	Herbicide applied	3/16/2023
12	Callery pear	Herbicide applied	3/16/2023
13	Callery pear	Herbicide applied	3/16/2023
14	Woody vegetation	Herbicide applied	3/22/2023
15	Callery pear	Herbicide applied	3/20/2023

Table C-10. OSDF Inspection Findings, December 2022 (continued)

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
16	Callery pear	Herbicide applied	3/20/2023
17	Callery pear	Herbicide applied	3/20/2023
18	Callery pear	Herbicide applied	3/20/2023
19	Cedar tree	Herbicide applied	3/20/2023
20	Callery pear	Herbicide applied	3/20/2023
21	Callery pear	Herbicide applied	3/20/2023
22	Teasel	Herbicide applied	4/26/2023
23	Callery pear	Herbicide applied	3/20/2023
24	Honeysuckle	Herbicide applied	3/20/2023
25	Callery pear	Herbicide applied	3/20/2023
26	Callery pear	Herbicide applied	3/20/2023
27	Callery pear	Herbicide applied	3/22/2023
28	Callery pear	Herbicide applied	3/16/2023
29	Callery pear	Herbicide applied	3/16/2023
30	Callery pear	Herbicide applied	3/16/2023
31	Callery pear	Herbicide applied	3/22/2023
32	Teasel	Herbicide applied	3/14/2023
33	Callery pear	Herbicide applied	3/16/2023
34	Callery pear	Herbicide applied	3/14/2023
35	Callery pear	Herbicide applied	3/20/2023
36	Callery pear	Herbicide applied	3/16/2023
37	Callery pear	Herbicide applied	3/16/2023
38	Callery pear	Herbicide applied	3/20/2023
39	Callery pear	Herbicide applied	3/16/2023
40	Callery pear	Herbicide applied	3/20/2023
41	Callery pear	Herbicide applied	3/20/2023
42	Callery pear	Herbicide applied	3/20/2023
43	Callery pear	Herbicide applied	3/20/2023
44	Callery pear	Herbicide applied	3/16/2023
45	Callery pear	Herbicide applied	3/16/2023
46	Callery pear	Herbicide applied	3/16/2023
47	Callery pear	Herbicide applied	3/16/2023
48	Callery pear	Herbicide applied	3/16/2023
49	Callery pear	Herbicide applied	3/16/2023
50	Callery pear	Herbicide applied	3/14/2023
51	Callery pear	Herbicide applied	3/14/2023
52	Callery pear	Herbicide applied	3/14/2023
53	Callery pear	Herbicide applied	3/14/2023
54	Callery pear	Herbicide applied	3/14/2023
55	Callery pear	Herbicide applied	3/14/2023

Table C-10. OSDF Inspection Findings, December 2022 (continued)

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
56	Callery pear	Herbicide applied	3/13/2023
57	Callery pear	Herbicide applied	3/20/2023
58	Callery pear	Herbicide applied	3/20/2023
59	Callery pear	Herbicide applied	3/20/2023
60	Callery pear	Herbicide applied	3/20/2023
61	Callery pear	Herbicide applied	3/20/2023
62	Callery pear	Herbicide applied	3/20/2023
63	Callery pear	Herbicide applied	3/20/2023
64	Callery pear	Herbicide applied	3/20/2023
65	Cedar tree	Herbicide applied	3/20/2023
66	Callery pear	Herbicide applied	3/20/2023
67	Callery pear	Herbicide applied	3/20/2023
68	Callery pear	Herbicide applied	3/20/2023
69	Callery pear	Herbicide applied	3/20/2023
70	Callery pear	Herbicide applied	3/20/2023
71	Callery pear	Herbicide applied	3/20/2023
72	Callery pear	Herbicide applied	3/20/2023
73	Callery pear	Herbicide applied	3/20/2023
74	Callery pear	Herbicide applied	3/20/2023
75	Callery pear	Herbicide applied	3/13/2023
76	Callery pear	Herbicide applied	3/13/2023
77	Callery pear	Herbicide applied	3/13/2023
78	Callery pear	Herbicide applied	3/13/2023
79	Callery pear	Herbicide applied	3/14/2023
80	Callery pear	Herbicide applied	3/9/2023
81	Callery pear	Herbicide applied	3/16/2023
82	Callery pear	Herbicide applied	3/9/2023
83	Callery pear	Herbicide applied	3/9/2023
84	Callery pear	Herbicide applied	3/16/2023
85	Callery pear	Herbicide applied	3/9/2023
86	Callery pear	Herbicide applied	3/16/2023
87	Callery pear	Herbicide applied	3/9/2023
88	Callery pear	Herbicide applied	3/16/2023
89	Callery pear	Herbicide applied	3/13/2023
90	Callery pear	Herbicide applied	3/9/2023
91	Honeysuckle	Herbicide applied	3/9/2023
92	Honeysuckle	Herbicide applied	3/16/2023
93	Honeysuckle	Herbicide applied	3/16/2023
94	Callery pear	Herbicide applied	3/16/2023
95	Callery pear	Herbicide applied	3/16/2023

Table C-10. OSDF Inspection Findings, December 2022 (continued)

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
96	Callery pear	Herbicide applied	3/16/2023
97	Callery pear	Herbicide applied	3/16/2023
98	Callery pear	Herbicide applied	3/9/2023
99	Callery pear	Herbicide applied	3/16/2023
100	Honeysuckle	Herbicide applied	3/16/2023
101	Callery pear	Herbicide applied	3/16/2023
102	Honeysuckle	Herbicide applied	3/16/2023
103	Callery pear	Herbicide applied	3/16/2023
104	Callery pear	Herbicide applied	3/16/2023
105	Callery pear	Herbicide applied	3/16/2023
106	Callery pear	Herbicide applied	3/16/2023
107	Callery pear	Herbicide applied	3/16/2023
108	Honeysuckle	Herbicide applied	3/16/2023
109	Callery pear	Herbicide applied	3/16/2023
110	Callery pear	Herbicide applied	3/16/2023
111	Callery pear	Herbicide applied	3/16/2023
112	Honeysuckle	Herbicide applied	3/16/2023
113	Callery pear	Herbicide applied	3/16/2023
114	Callery pear	Herbicide applied	3/16/2023
115	Callery pear	Herbicide applied	3/9/2023
116	Honeysuckle	Herbicide applied	2/23/2023
117	Callery pear	Herbicide applied	2/23/2023
118	Callery pear	Herbicide applied	2/23/2023
119	Callery pear	Herbicide applied	2/23/2023
120	Callery pear	Herbicide applied	2/23/2023
121	Callery pear	Herbicide applied	2/23/2023
122	Callery pear	Herbicide applied	2/23/2023
123	Callery pear	Herbicide applied	2/23/2023
124	Callery pear	Herbicide applied	2/23/2023
125	Callery pear	Herbicide applied	2/23/2023
126	Callery pear	Herbicide applied	2/23/2023
127	Callery pear	Herbicide applied	2/23/2023
128	Callery pear	Herbicide applied	2/23/2023
129	Honeysuckle	Herbicide applied	2/23/2023
130	Callery pear	Herbicide applied	2/23/2023
131	Callery pear	Herbicide applied	2/23/2023
132	Honeysuckle	Herbicide applied	2/23/2023
133	Callery pear	Herbicide applied	2/23/2023
134	Callery pear	Herbicide applied	2/23/2023
135	Callery pear	Herbicide applied	3/9/2023



Table C-10. OSDF Inspection Findings, December 2022 (continued)

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
136	Callery pear	Herbicide applied	3/9/2023
137	Callery pear	Herbicide applied	3/9/2023
138	Callery pear	Herbicide applied	3/9/2023
139	Callery pear	Herbicide applied	3/9/2023
140	Callery pear	Herbicide applied	3/9/2023
141	Callery pear	Herbicide applied	3/9/2023
142	Callery pear	Herbicide applied	3/9/2023
143	Callery pear	Herbicide applied	2/23/2023
144	Callery pear	Herbicide applied	3/9/2023
145	Callery pear	To be determined	To be determined
146	Callery pear	Herbicide applied	2/23/2023
147	Honeysuckle	To be determined	To be determined
148	Callery pear	Herbicide applied	2/23/2023
149	Honeysuckle	Herbicide applied	3/20/2023
150	Erosion	To be determined	To be determined

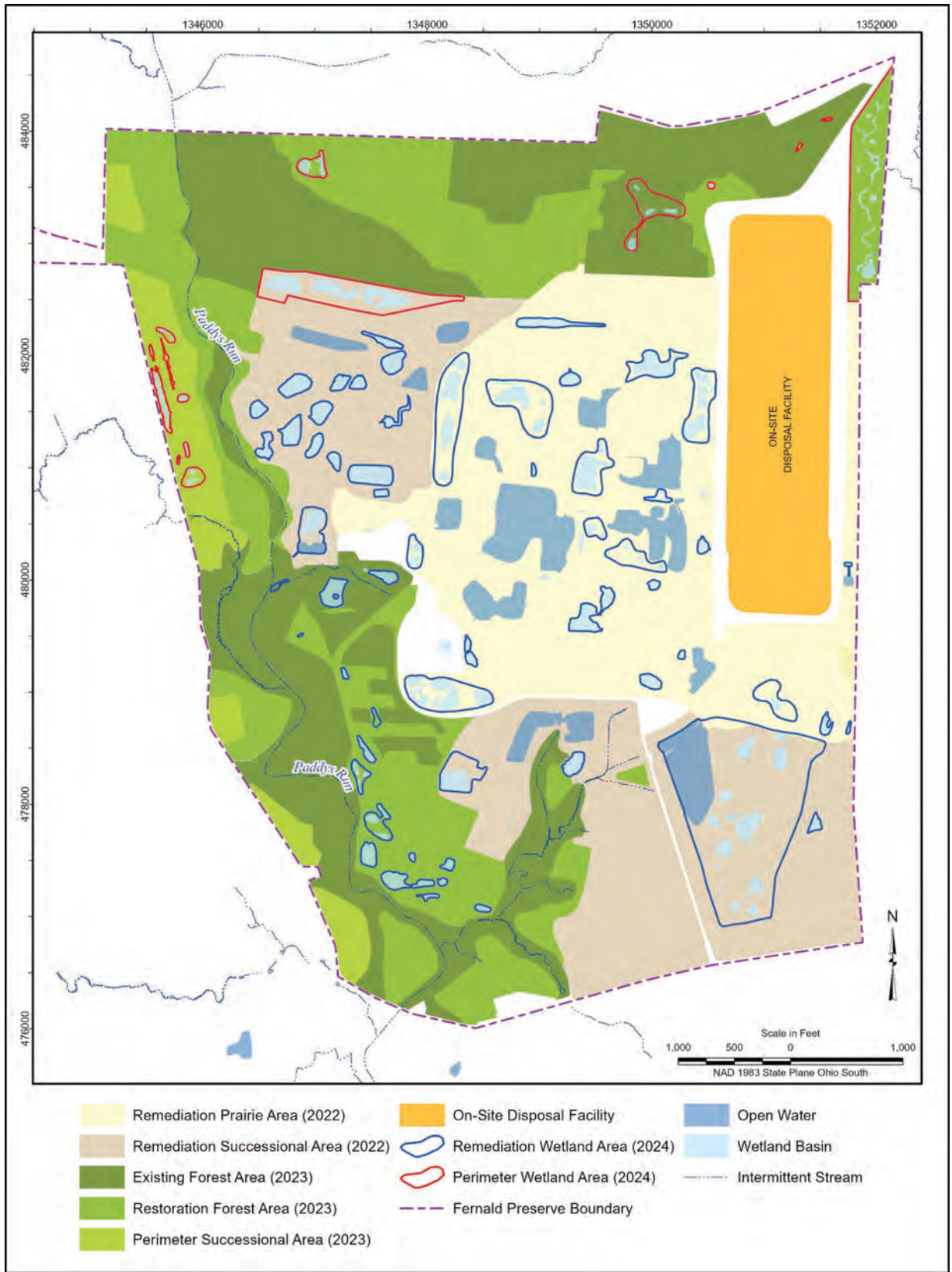
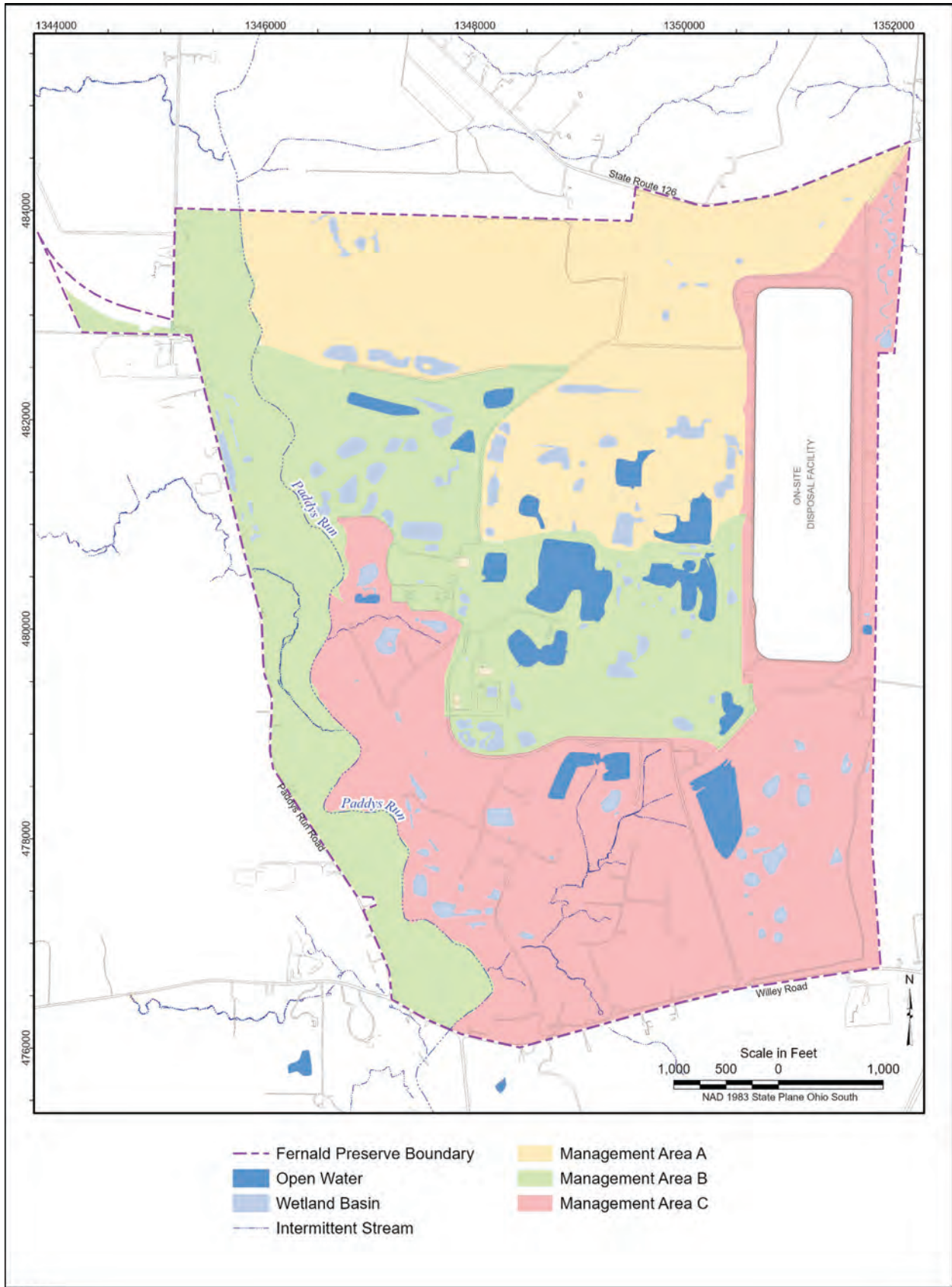


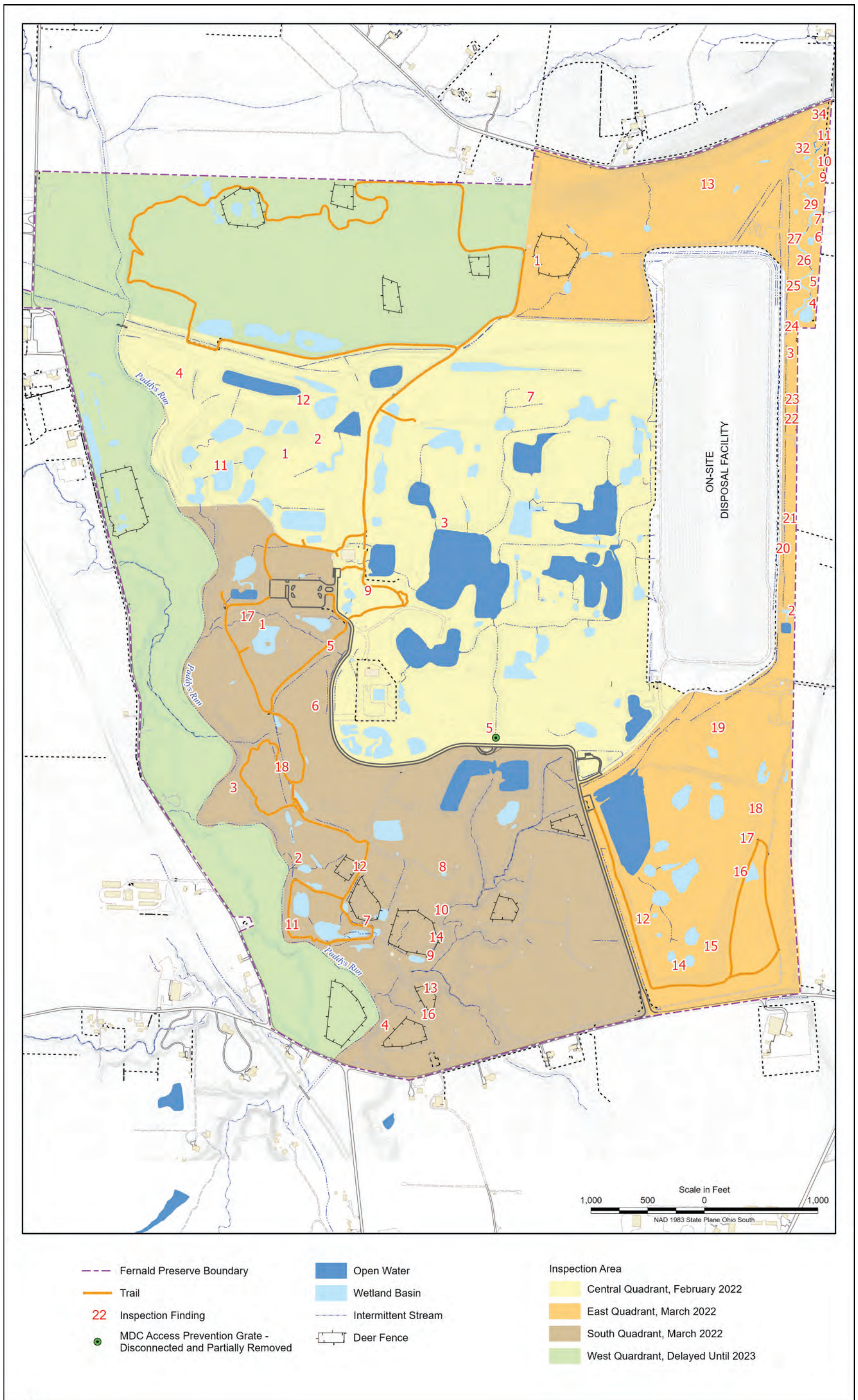
Figure C-1. Ecological Restoration Management Areas



043362

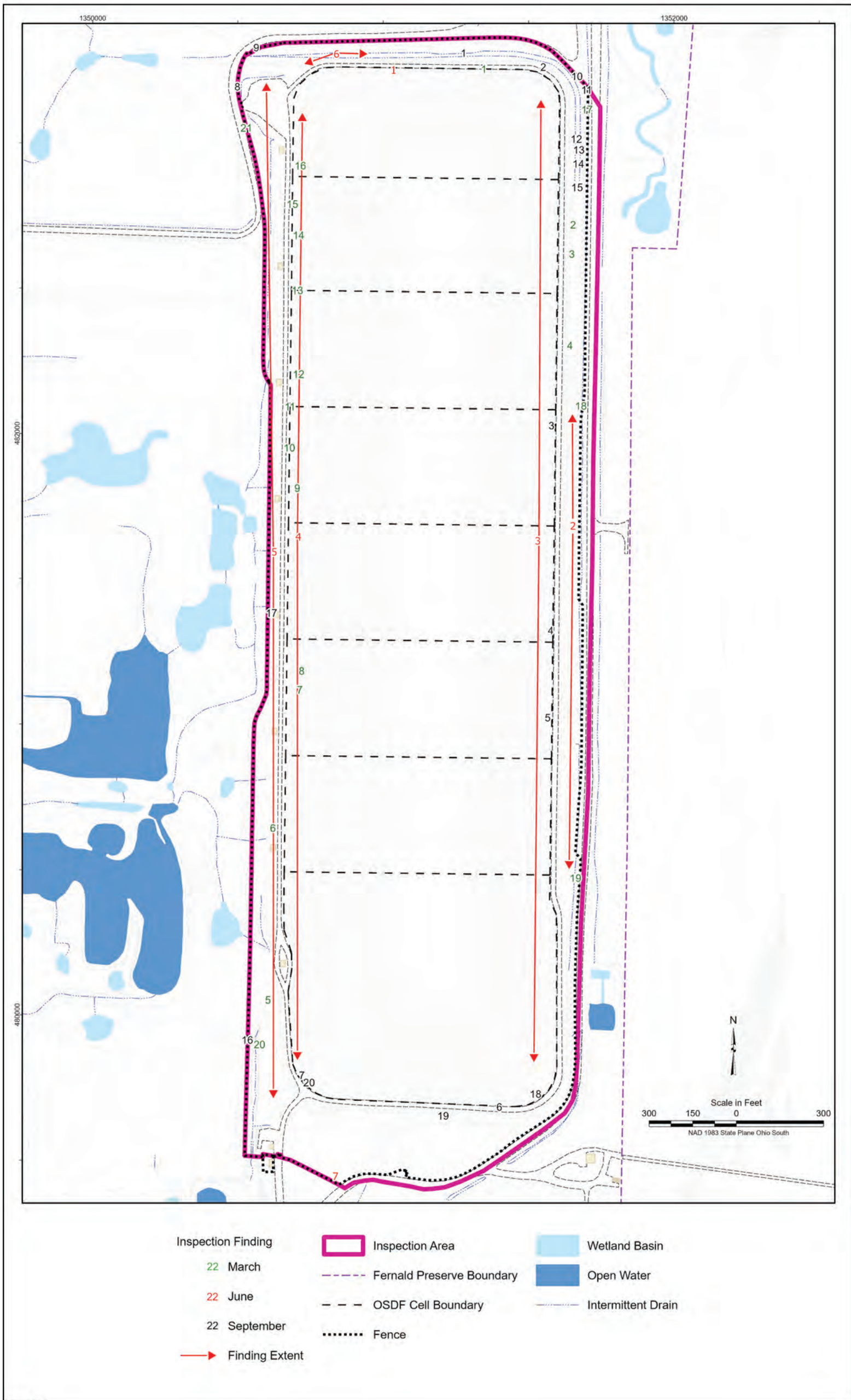
Figure C-2. Area-Based Approach Ecological Management Areas

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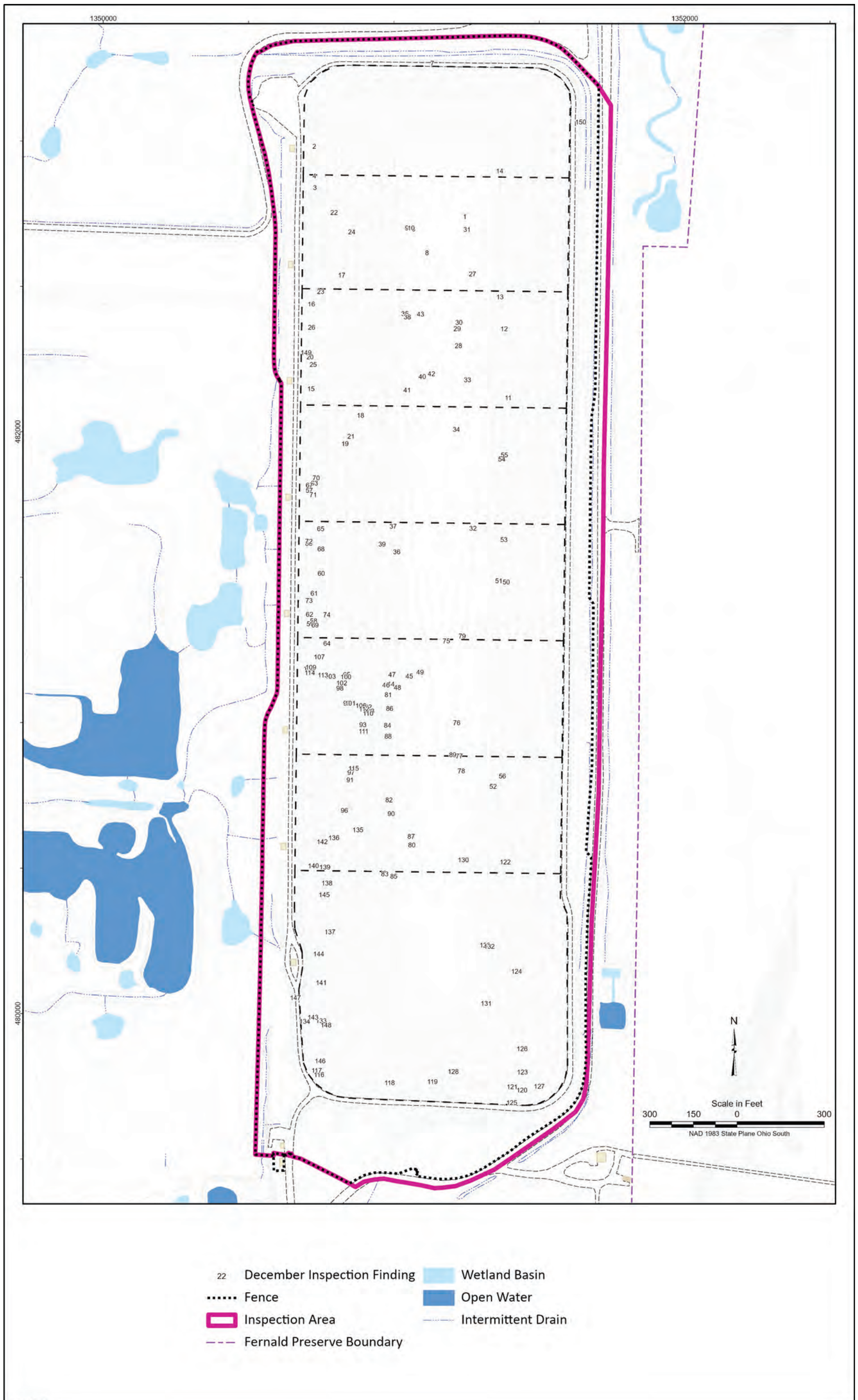
043365-R01

Figure C-3. Site Inspection Findings, 2022



043369-R01

Figure C-4A. OSDF Inspection Findings, March, June, and September 2022



043369-R02

Figure C-4B. OSDF Inspection Findings, December 2022

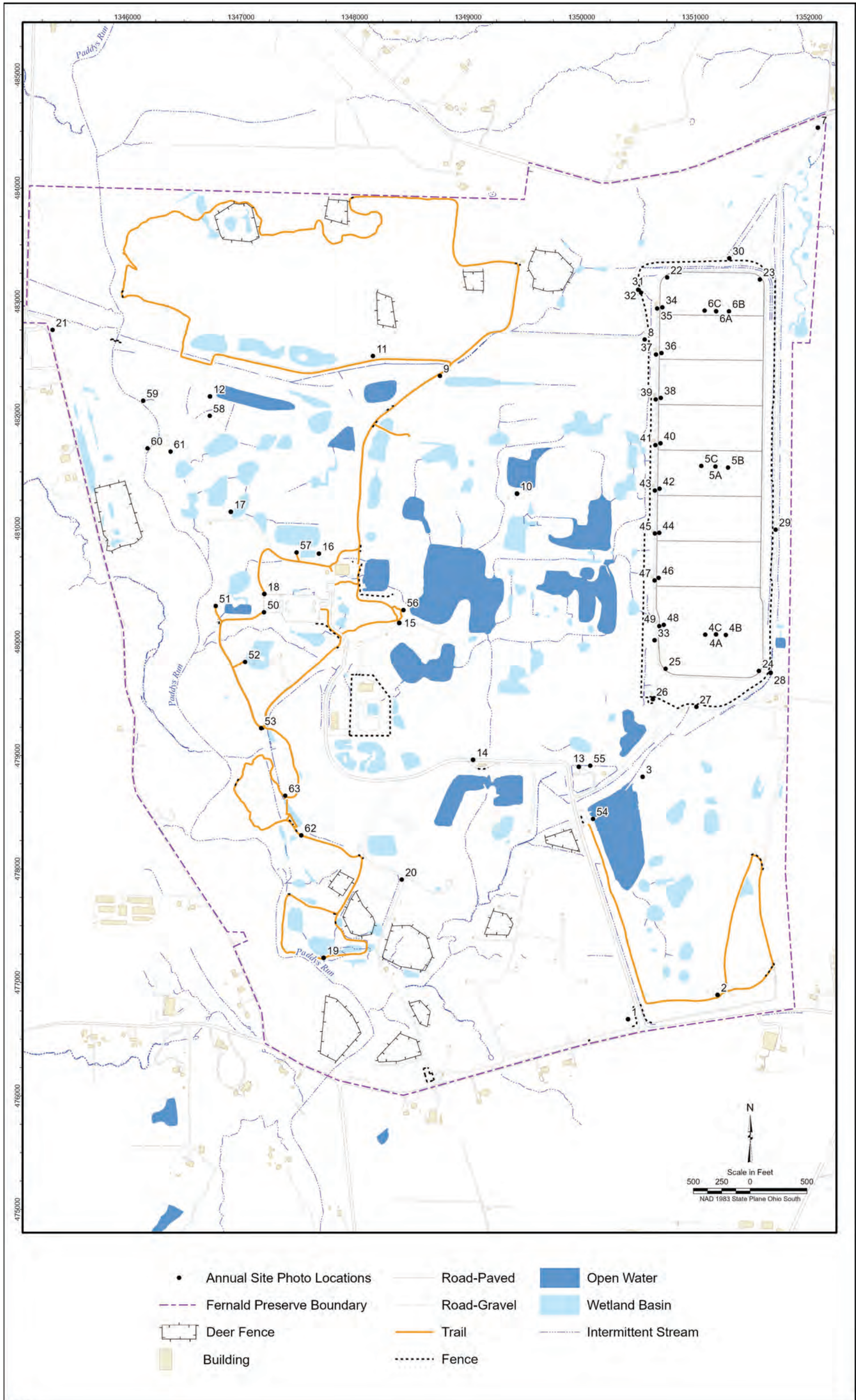


Figure C-5. Location of Site Inspection Photographs





**2007**



**2022**

*Figure C-5A. Location 1, South Well Field, West Perspective*



**2007**



**2022**

*Figure C-5B. Location 1, South Well Field, North Perspective*



2007



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Figure C-6A. Location 2, Borrow Area, West Perspective



2007



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Figure C-6B. Location 2, Borrow Area, West-Northwest Perspective



2007



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Figure C-6C. Location 2, Borrow Area, North Perspective



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Figure C-7A. Location 3, Borrow Area, South Perspective



**2007**



**2022**

*Figure C-7B. Location 3, Borrow Area, West Perspective*



**2007**



**2022**

*Figure C-8A. Location 4A, Top of OSDF Cell 8, South Perspective*



2007



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*Figure C-8B. Location 4A, Top of OSDF Cell 8, North Perspective*



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*Figure C-9. Location 4B, Top of OSDF Cell 8, East Perspective*



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*Figure C-10. Location 4C, Top of OSDF Cell 8, West Perspective*



2007



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*Figure C-11A. Location 5A, Top of OSDF Cell 5, South Perspective*



**2007**



**2022**

*Figure C-11B. Location 5A, Top of OSDF Cell 5, North Perspective*



**2007**



**2022**

*Figure C-12. Location 5B, Top of OSDF Cell 5, East Perspective*



**2007**



**2022**

*Figure C-13. Location 5C, Top of OSDF Cell 5, West Perspective*



**2007**



**2022**

*Figure C-14A. Location 6A, Top of OSDF Cell 1, South Perspective*





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*Figure C-14B. Location 6A, Top of OSDF Cell 1, North Perspective*



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*Figure C-15. Location 6B, Top of OSDF Cell 1, East Perspective*



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Figure C-16. Location 6C, Top of OSDF Cell 1, West Perspective



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Figure C-17A. Location 7, Northeast Property Corner, South Perspective



**2007**



**2022**

*Figure C-17B. Location 7, Northeast Property Corner, South-Southwest Perspective*



**2007**



**2022**

*Figure C-18. Location 8, Former Production Area, Southwest Perspective*



**2007**



**2022**

*Figure C-19. Location 9, Former Production Area, Southeast Perspective*



**2007**



**2022**

*Figure C-20A. Location 10, Former Production Area, South Perspective*



**2007**



**2022**

*Figure C-20B. Location 10, Former Production Area, Southwest Perspective*



**2007**



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*Figure C-20C. Location 10, Former Production Area, West Perspective*



**2007**



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*Figure C-20D. Location 10, Former Production Area, Northwest Perspective*



**2007**



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*Figure C-20E. Location 10, Former Production Area, North Perspective*

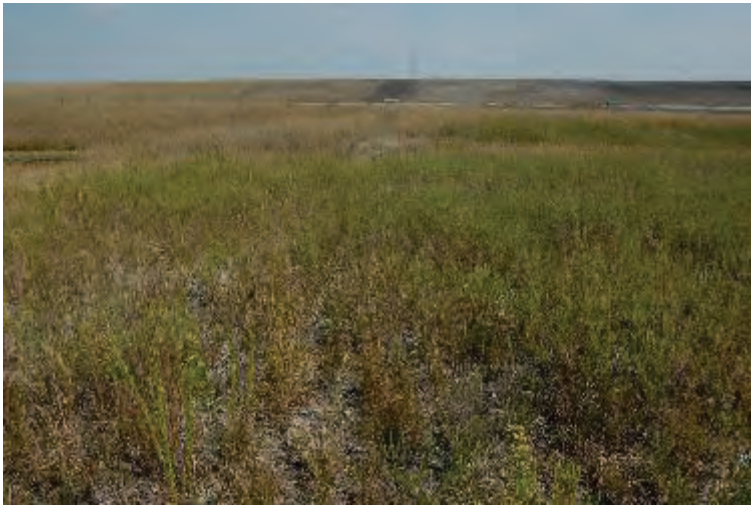


**2007**



**2022**

*Figure C-20F. Location 10, Former Production Area, Northeast Perspective*



**2007**



**2022**

*Figure C-20G. Location 10, Former Production Area, East Perspective*



**2007**



**2022**

*Figure C-20H. Location 10, Former Production Area, Southeast Perspective*



**2007**



**2022**

*Figure C-21. Location 11, Wetland Mitigation Phase II, West Perspective*





**2007**



**2022**

*Figure C-22A. Location 12, Former Waste Pits Area, East Perspective*



**2007**



**2022**

*Figure C-22B. Location 12, Former Waste Pits Area, Southeast Perspective*



**2007**



**2022**

*Figure C-22C. Location 12, Former Waste Pits Area, South Perspective*



**2007**



**2022**

*Figure C-23A. Location 13, Former Production Area, Northwest Perspective*



**2007**



**2022**

*Figure C-23B. Location 13, Former Production Area, Northeast Perspective*

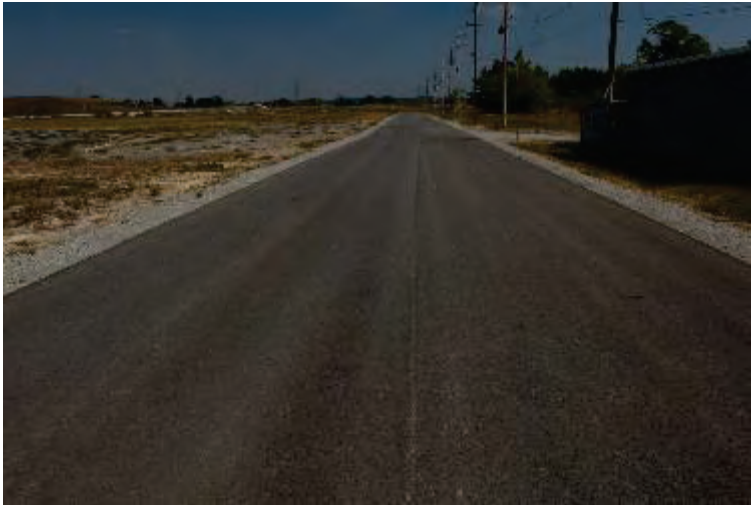


**2007**



**2022**

*Figure C-24A. Location 14, Former Production Area, North Perspective*

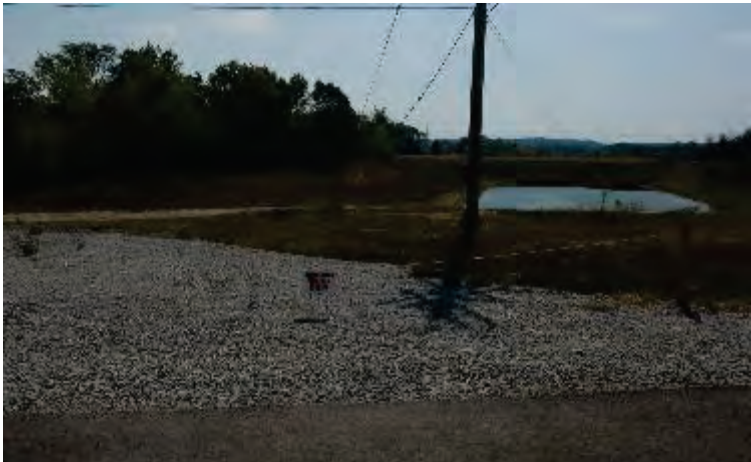


2007



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Figure C-24B. Location 14, Former Production Area, East Perspective

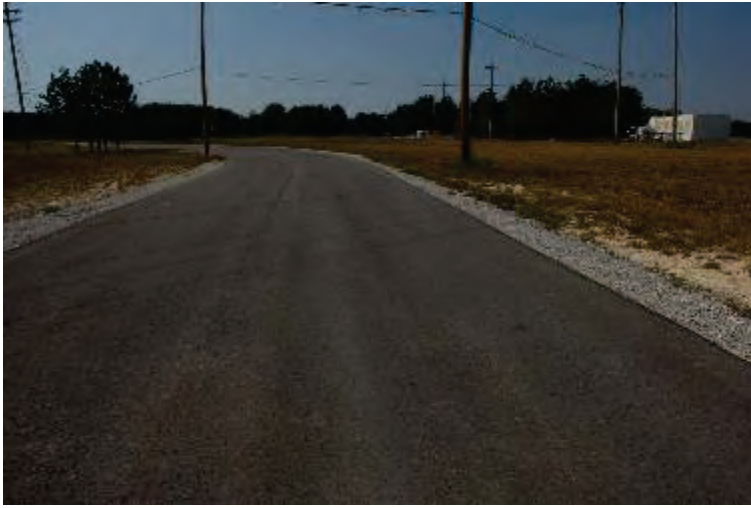


2007



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Figure C-24C. Location 14, Former Production Area, South Perspective



**2007**



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*Figure C-24D. Location 14, Former Production Area, West Perspective*



**2007**



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*Figure C-25A. Location 15, Former Production Area, North Perspective*



**2007**



**2022**

*Figure C-25B. Location 15, Former Production Area, Northeast Perspective*



**2007**



**2022**

*Figure C-25C. Location 15, Former Production Area, East Perspective*



**2007**



**2022**

*Figure C-25D. Location 15, Former Production Area, Southeast Perspective*



**2007**



**2022**

*Figure C-25E. Location 15, Former Production Area, South Perspective*



**2007**



**2022**

*Figure C-25F. Location 15, Former Production Area, Southwest Perspective*



**2007**



**2022**

*Figure C-25G. Location 15, Former Production Area, West Perspective*





**2007**



**2022**

*Figure C-25H. Location 15, Former Production Area, Northwest Perspective*



**2007**



**2022**

*Figure C-26A. Location 16, Biowetland, West-Northwest Perspective*



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*Figure C-26B. Location 16, Biowetland, West Perspective*



2007



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*Figure C-27A. Location 17, Former Waste Pits Area, West Perspective*



**2007**



**2022**

*Figure C-27B. Location 17, Former Waste Pits Area, Northwest Perspective*



**2007**



**2022**

*Figure C-27C. Location 17, Former Waste Pits Area, North Perspective*



**2007**



**2022**

*Figure C-28A. Location 18, Former Silos Area, West-Southwest Perspective*



**2007**



**2022**

*Figure C-28B. Location 18, Former Silos Area, West-Northwest Perspective*



2007



2022

Figure C-28C. Location 18, Former Silos Area, North Perspective



2007



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Figure C-28D. Location 18, Former Silos Area, East Perspective



**2007**



**2022**

*Figure C-29A. Location 19, Southern Waste Units Area, North-Northwest Perspective*



**2007**



**2022**

*Figure C-29B. Location 19, Former Southern Waste Units Area, North-Northeast Perspective*



**2007**



**2022**

*Figure C-29C. Location 19, Former Southern Waste Units Area, East-Southeast Perspective*



**2007**



**2022**

*Figure C-30. Location 20, Former Southern Waste Units Area, West-Southwest Perspective*



2007



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Figure C-31. Location 21, Western Paddys Run Corridor, South-Southeast Perspective



2007



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Figure C-32. Location 22, OSDF Survey Marker No. 01 (Northwest Corner)



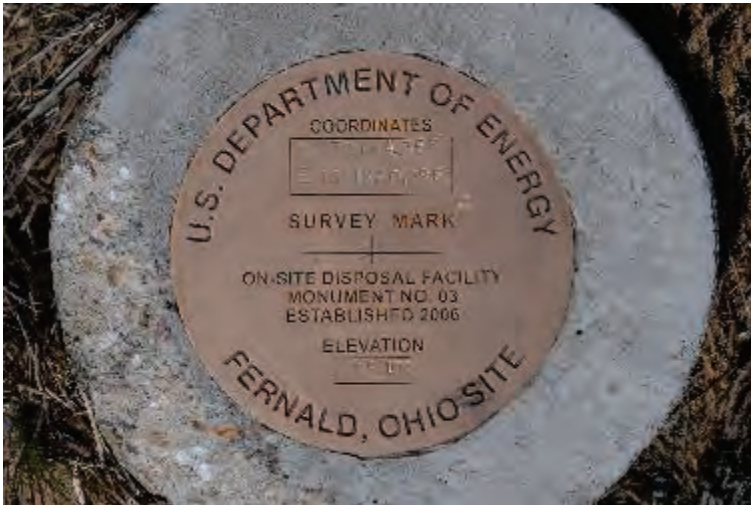


2007



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Figure C-33. Location 23, OSDF Survey Marker No. 02 (Northeast Corner)



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Figure C-34. Location 24, OSDF Survey Marker No. 03 (Southeast Corner)



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Figure C-35. Location 25, OSDF Survey Marker No. 04 (Southwest Corner)



2007



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Figure C-36. Location 26, OSDF Southwest Gate, North-Northeast Perspective



**2007**



**2022**

*Figure C-37. Location 27, OSDF South Gate, North-Northeast Perspective*



**2007**



**2022**

*Figure C-38A. Location 28, OSDF East Fence, North Perspective*



2007



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Figure C-38B. Location 28, OSDF East Fence, North Perspective



2007



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Figure C-38C. Location 28, OSDF East Fence Signage, West Perspective



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Figure C-38D. Location 28, OSDF East Fence Signage, North-Northwest Perspective



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Figure C-39. Location 29, OSDF East Fence, North Perspective



**2007**



**2022**

*Figure C-40A. Location 30, OSDF North Gate, Southwest Perspective*



**2007**



**2022**

*Figure C-40B. Location 30, OSDF North Fence, West Perspective*



**2007**



**2022**

*Figure C-41. Location 31, OSDF Northwest Gate, North-Northeast Perspective*



**2007**



**2022**

*Figure C-42. Location 32, OSDF West Fence, South-Southeast Perspective*



2007



2022

Figure C-43A. Location 33, OSDF Valve Houses 7 Through 1, North Perspective



2007



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Figure C-43B. Location 33, OSDF Valve Houses 8 Through 1, North Perspective





2007



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Figure C-44. Location 34, OSDF Valve House 1, West-Northwest Perspective



2007



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Figure C-45. Location 35, OSDF Cell 1 Wells, Northeast Perspective



2007



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Figure C-46. Location 36, OSDF Valve House 2, West-Northwest Perspective



2007



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Figure C-47. Location 37, OSDF Cell 2 Wells, Northeast Perspective



2007



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Figure C-48. Location 38, OSDF Valve House 3, West-Northwest Perspective



2007



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Figure C-49. Location 39, OSDF Cell 3 Wells, Northeast Perspective



2007



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Figure C-50. Location 40, OSDF Valve House 4, West-Northwest Perspective



2007



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Figure C-51. Location 41, OSDF Cell 4 Wells, Northeast Perspective



2007



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Figure C-52. Location 42, OSDF Valve House 5, West-Northwest Perspective



2007



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Figure C-53. Location 43, OSDF Cell 5 Wells, Northeast Perspective



2007



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Figure C-54. Location 44, OSDF Valve House 6, West-Northwest Perspective



2007



2022

Figure C-55. Location 45, OSDF Cell 6 Wells, Northeast Perspective



**2007**



**2022**

*Figure C-56. Location 46, OSDF Valve House 7, West-Northwest Perspective*



**2007**



**2022**

*Figure C-57. Location 47, OSDF Cell 7 Wells, Northeast Perspective*



2007



2022

Figure C-58. Location 48, OSDF Valve House 8, West-Northwest Perspective



2007



2022

Figure C-59. Location 49, OSDF Cell 8 Wells, Northeast Perspective





**2008**



**2022**

*Figure C-60. Location 50, Shingle Oak Trail, West Perspective at Trailhead*



**2008**



**2022**

*Figure C-61. Location 51, Shingle Oak Trail, North Perspective at Paddys Run Overlook*



**2008**



**2022**

*Figure C-62. Location 52, Shingle Oak Trail, East Perspective at Wildlife Viewing Area*



**2008**



**2022**

*Figure C-63. Location 53, Shingle Oak Trail, North Perspective at Southernmost Trail Section*



2007



2022

Figure C-64. Location 54, Lodge Pond Deck, East Perspective



2010



2022

Figure C-65. Location 55, Overlook Deck, North Perspective



2010



2022

Figure C-66. Location 56, Weapons-to-Wetlands Deck, East Perspective



2010



2022

Figure C-67. Location 57, Biowetland Deck, North Perspective



**2014**



**2022**

*Figure C-68. Location 58, Paddys Run, Streambank Stabilization Area, West Perspective*



**2014**



**2022**

*Figure C-69A. Location 59, Paddys Run, Downstream View*



**2014**



**2022**

*Figure C-69B. Location 59, Paddys Run, Upstream View*



**2014**



**2022**

*Figure C-70. Location 60, Paddys Run, Streambank Stabilization Area, Upstream View of Crossvane*



**2014**



**2022**

*Figure C-71. Location 61, Paddys Run, Streambank Stabilization Area, Northwest Perspective*



**2014**



**2022**

*Figure C-72A. Location 62, South End of Boardwalk, North Perspective*

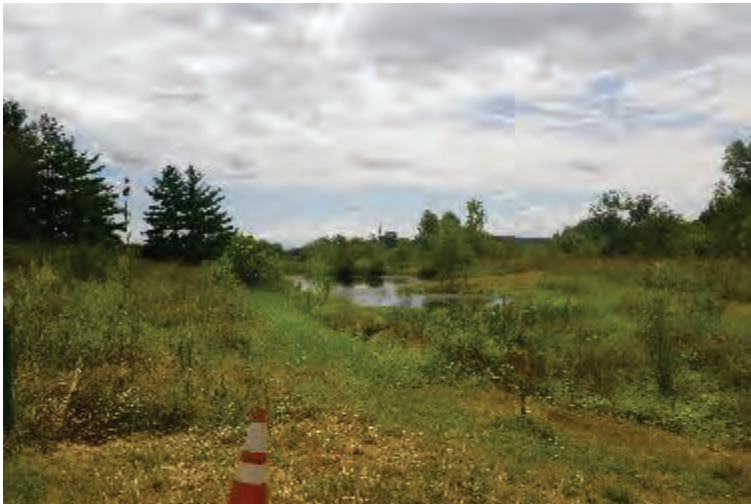


**2014**



**2022**

*Figure C-72B. Location 62, South End of Boardwalk, South Perspective*



**2014**



**2022**

*Figure C-73. Location 63, North End of Boardwalk, South Perspective*