4.7 Cumulative Impacts of Construction

This section discusses cumulative impacts to the environment that could result from the construction of Fermi 3. A cumulative impact is defined in the Council of Environmental Quality (CEQ) regulations (40 CFR 1508.7) as an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions."

The construction impacts of Fermi 3, as described in Chapter 4, are combined with other past, present, and reasonably foreseeable future actions that would affect the same resources in the vicinity. Cumulative impacts anticipated during construction phases are discussed in this section.

To determine whether cumulative impacts to the existing environment near the Fermi site are likely to occur, the baseline environmental information and proposed, ongoing and future development projects in the Fermi area of similar magnitude (Chapter 2) are considered herein along with the environmental impacts (Chapter 4) of constructing a new unit on the Fermi site. For purposes of this review, the geographical area considered for cumulative impacts from construction is Monroe County, and the focus includes and Fermi 3 along with other comparable projects. Apart from Fermi 3, the only known major construction project planned in Monroe County is the installation of scrubbers at the Monroe Power Plant. The respective environmental impacts from Fermi 3 and Monroe Power Plant construction are anticipated to be contained within the respective sites by various regulatory and permit requirements. Furthermore, potential cumulative impacts related to the scrubber installation (e.g., air quality effects from construction equipment, increased temporary work force size, and commuter traffic) are anticipated to decrease before Fermi 3 construction is started. Therefore, Fermi 3 is considered the primary action influencing cumulative impacts for the Fermi 3 project.

As discussed in the Chapter 4 introduction, activities involving Fermi 1 and 2 will be taking place during the Fermi 3 construction period (e.g. deconstruction of Fermi 1, relocation of Fermi 2 outbuildings, access separation between Fermi 2 and 3, etc.). Although they are separate activities from Fermi 3 construction, there is still a close interdependent environmental relationship. Accordingly, the Chapter 4 impacts previously took these activities into consideration in characterizing the Fermi 3 construction impacts, and no specific itemization is provided in this section for Fermi 1 and 2 cumulative impacts.

4.7.1 Land Use

For purposes of this analysis, the geographical area considered for cumulative impacts to land use resulting from construction is a circular area within 7.5 miles of the existing facility, centered on the proposed Fermi 3 location. Approximately ~~290~~ 302 acres of the existing 1260-acre Fermi site will be used for construction of Fermi 3. Of the ~~290~~ 302 acres required, approximately ~~108~~ 112 acres already are developed and contain structures, pavement or other maintained areas; the remainder is composed of various terrestrial habitats as discussed in Subsection 4.3.1 and shown on Figure 4.3-2. The construction and operation of Fermi 2 did not stimulate substantial industrial growth in Monroe County, and impacts from construction of Fermi 3 are expected to be similar. Land use in the

construction excavation phase. The construction dewatering impact is discussed in Section 4.2. Once details related to construction are determined following final project design, the drawdown impact on groundwater users in the affected area will be further investigated before dewatering is started.

Considering that no discharges to groundwater will occur and the low volume of dewatering required during excavation, with the implementation of mitigation measures discussed in Section 4.6, Fermi 3 construction impacts to groundwater are expected to be SMALL and are not anticipated to affect groundwater use away from the Fermi site.

4.7.3.4 Groundwater Quality

Because of changes in seepage patterns from temporary redirection of surface flows for construction and stormwater runoff control, groundwater recharge may be temporarily reduced during the construction phase of Fermi 3. As building construction and paving progresses, increased runoff and decreased seepage on the developed portion of the site may occur. However, there will be no groundwater discharges, so groundwater quality will not be affected by influents or seepage.

The impact of this reduction in groundwater recharge on groundwater quality is expected to be minimal because the larger area surrounding the construction site will not be affected. Execution of the SESC Plan and its housekeeping elements will limit potential groundwater contamination resulting from the potential seepage of construction materials/supplies into groundwater. Potential contamination of groundwater from Fermi 3 construction activities will be limited by such actions as preventing spills, leaks and material releases under the SESC Plan, the PIPP, appropriate use of chemical storage systems, and frequent inspections of material storage systems.

Combined with existing and proposed activities at the Fermi site and in Monroe County, the cumulative impacts to groundwater quality are expected to be SMALL, and no mitigative measures are needed.

4.7.4 Ecology

The Fermi 3 site layout and construction plan was designed to minimize site-specific and cumulative impacts to the terrestrial ecosystem to the greatest feasible extent while meeting the project purpose. Currently developed and previously disturbed land will be preferentially used wherever practicable. Approximately ~~2.75~~ 9.34 acres of wetlands and ~~7.28~~ 5.18 acres of open water habitats would be permanently impacted.

A 29.4-mile 345 kV transmission line corridor, with an assumed width of 300 feet, between the Fermi site and the Milan Substation is being proposed. Route selection will use already developed land to avoid impacts to terrestrial resources. The land in the transmission corridor is not owned or controlled by Detroit Edison. Accordingly, any impacts would be addressed by ITC*Transmission*. Should any such impacts be unavoidable, mitigation to alleviate the adverse effects would be expected to be provided in coordination with the appropriate land authority (e.g., MDNR) in compliance with applicable regulatory oversight.

There are no other past, present, or known planned actions in Monroe County that involve major effects on wildlife and wildlife habitat similar to those from construction of Fermi 3. Most impacts from construction would be temporary or limited in effect through site management and regulatory compliance mechanisms. American lotus in wetlands affected by construction activities will be subject to future consultation with MDNR to minimize impacts (Subsection 4.3.1.2.1). Construction activities near bald eagle nests, particularly noise, will be limited during the nesting season to reduce the effects of disturbance. Therefore, cumulative impacts to county rare species, plant communities or wildlife will be SMALL, and no mitigative measures are needed.

4.7.4.1 Terrestrial Ecology

The geographic area evaluated for cumulative effects to terrestrial resources (vegetation and wildlife) is the vegetation or species-specific habitat within one mile of the Fermi 3 site and along the offsite transmission corridor. Existing terrestrial resources are described in Subsection 2.4.1, and the potential impacts to these resources are discussed in Subsection 4.3.1. As noted in Subsection 4.3.1, aside from developed or temporarily impacted areas, Fermi 3 construction will impact ~~1692.75~~ 9.34 acres of wetlands. In the region (50-mile radius) there are 910,711 acres of this habitat where the total wetland acreage was derived by combining open water, emergent herbaceous and woody wetland acreage (Table 2.2-7). As a percentage of the regional acreage, approximately 0.001 percent of the total disturbance will be in wetland habitats. These impacts are the minimum needed to satisfy the project need and purpose and impacts will have been reduced by avoiding adverse effects to protected species, wildlife resources, wetlands, and other resources as discussed in Subsection 4.3.1. Construction work is subject to regulatory compliance requirements, which further promotes impact avoidance. Terrestrial resource use in the region will not be dramatically shifted from agricultural to industrial or urban uses because of the addition of another nuclear unit to the Fermi site. Thus, the cumulative impacts to terrestrial resources from construction of Fermi 3 are considered SMALL, and no additional mitigative measures are needed.

Coastal Emergent Wetlands 5.77 and other wetlands yet to be identified will be avoided 3.57 to the extent ~~pas~~ 5.18 sible. Approximately ~~2.75~~ 9.34 acres of wetland, composed of forested wetland (~~0.52~~ acres), and emergent wetland (~~2.23~~ acres), associated with DRIWR, would be permanently impacted. An additional ~~7.28~~ acres of open waters also would be permanently impacted. Wetland acreage filled for Fermi 3 construction may require separate mitigation. Cumulative impacts to wetlands are expected to be MODERATE. The type and extent of wetland mitigation will be determined during the Clean Water Act Section 404 permitting process.

The cumulative impacts from offsite transmission line construction were assessed using desktop research and ground studies. Detroit Edison does not own the offsite ROW and does not control the construction or operation activities in the offsite transmission corridor. Resource agency consultation is expected by ITC*Transmission* during the final stages of offsite transmission route development. This will allow for measures to be taken to avoid or minimize impacts. However, line routing uses already developed lands as much possible, including avoiding protected species, wetlands and other important terrestrial resources wherever feasible. Because wildlife impacts from construction, including wildlife displacement, fugitive dust and noise from construction are

affecting the south canal. Eastern fox snakes could be minimally affected by Fermi 3 construction.

are found on the Fermi site. American lotus

localized, temporary and minimized in accordance with regulatory limitations, they are considered cumulatively SMALL, and no mitigative measures are needed.

No Federal-listed threatened, endangered, or other protected species would be affected. Two state-listed species (American lotus, and eastern fox snake) would be minimally affected by Fermi 3 construction. Potential impacts are minimized to the extent practicable by minimizing impacts to the habitat areas used by these species. Clearing of wooded areas has been planned so that wildlife corridors and roosting or nesting areas would be avoided. Temporarily disturbed sites will be replanted with native vegetation following completion of the project. In some cases (e.g., erosion control), revegetation would occur sooner in locations vulnerable to degradation unless stabilized by vegetation.

and in the case of the fox snake, the preparation of a mitigation plan

The potential impact of construction on bird collisions associated with the cooling tower or construction cranes is a poorly understood topic. However, experience suggests that any impacts are relatively small. In a recent study by Detroit Edison, 19 individual birds in 13 species were found dead below the Fermi 2 cooling towers during a 73-day period from March to June 2008. This averages to 0.26 bird per day, a collision rate unlikely to affect the population size of these birds. Based on current knowledge with the Fermi 2 towers and experience during Fermi 2 construction, it is reasonable to assume that the use of construction cranes during Fermi 3 cooling tower construction would have little cumulative effect on regional bird populations.

In sum, the anticipated cumulative impacts of onsite and offsite activities are expected to remain SMALL relative to terrestrial ecology.

4.7.4.2 Aquatic Ecology

For this analysis, the geographic region encompassing past, present and foreseeable construction actions (including Fermi 3) is the area immediately surrounding the Fermi site, including adjoining sections of Lake Erie, offsite ponds or lakes (e.g., the Quarry Lakes), and offsite transmission line rights-of-way that cross surface water resources. There are no known projects of similar scale to Fermi 3 started or planned within the construction timeframe of Fermi 3. Cumulative impacts to wetlands are described in Subsection 4.7.4.1. Direct impacts to onsite aquatic resources at the Fermi site from Fermi 3 construction activities are expected to be minimal.

Dredging of a barge slip within the existing Lake Erie intake embayment may be conducted to allow delivery of heavy construction equipment and building materials during Fermi 3 construction and for removal of construction debris. If done, this activity may result in a localized temporary loss of benthic biota. Dredging also may take place at the intake embayment to allow for the addition of a new water intake for Fermi 3. These dredging activities are expected to be similar to ongoing operations and maintenance (O&M) dredging activities used to maintain the barge slip and the intake embayment in operable condition under an existing USACE permit. Because dredging must comply with the existing permit, the added barge traffic would not substantively increase existing barge traffic in Lake Erie and no new roads or other transportation means would be required, no adverse impacts are anticipated from this activity. Dredge spoils are expected to be contained in the Spoils Disposal Pond at Outfall 013, as designated in the Fermi 2 NPDES permit.

Table 4.8-1 Summary of Construction and Pre-Construction Related Impacts (Sheet 1 of 10)

Section Reference	Potential Impacts and Significance[a]	Estimated Impacts Percentage		Basis for Estimate
		Construction	Pre-Construction	
Section 4.1 Land Use Impacts				
Subsection 4.1.1.1 The Site and Vicinity, Site and Vicinity Land Use Impacts	S – Land Use	10%	90%	Estimates are based on the area of land use that will be dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1). It is assumed that the construction of SSC's will occur on no more than approximately 25 acres of the project area being developed (i.e., ~~290~~ 302 acres, excluding offsite electric transmission lines)
Subsection 4.1.1.2.1 Local Monroe County and Frenchtown Township Land Use	S – Land Use	10%	90%	Estimates are based on the area of land use that will be dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1). It is assumed that the construction of SSC's will occur on no more than approximately 25 acres of the project area being developed (i.e., ~~290~~ 302 acres, excluding offsite electric transmission lines)
Subsection 4.1.1.2.2 Agricultural and Soil Issues	S – Land Use	10%	90%	Estimates are based on the area of land use that will be dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1). It is assumed that the construction of SSC's will occur on no more than approximately 25 acres of the project area being developed (i.e., ~~290~~ 302 acres, excluding offsite electric transmission lines)

Table 4.8-1 Summary of Construction and Pre-Construction Related Impacts (Sheet 2 of 10)

Section Reference	Potential Impacts and Significance[a]	Estimated Impacts Percentage		Basis for Estimate
		Construction	Pre-Construction	
Subsection 4.1.1.2.3 Federal, Regional, and State Land Use Plans	S – Land Use	10%	90%	Estimates are based on the area of land use that will be dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1). It is assumed that the construction of SSC's will occur on no more than approximately 25 acres of the project area being developed (i.e., ~~290~~ 302 acres, excluding offsite electric transmission lines)
Subsection 4.1.1.3 The Site and Vicinity, Transportation and Rights-of-Way	S – Land Use	70%	30%	Estimates are based on the area of land use that will be dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1). Estimates also based on percent of man hours expected to be dedicated to the construction of activities within the definition of construction of SSC as this provides a measure of impacts to vicinity and transportation relative to land use.
Subsection 4.1.2 Transmission Corridors and Offsite Areas, Planning and Zoning	S – Land Use	0%	100%	Activities within transmission corridors are not included within the definition of construction of SSC's.
Subsection 4.1.2.1 Planning and Zoning	S – Land Use	0%	100%	Activities within transmission corridors are not included within the definition of construction of SSC's.
Subsection 4.1.2.2 Transmission Corridors and Offsite Areas, Transportation and Rights-of-Way	S – Land Use	0%	100%	Activities within transmission corridors are not included within the definition of construction of SSC's.

Table 4.8-1 Summary of Construction and Pre-Construction Related Impacts (Sheet 5 of 10)

Section Reference	Potential Impacts and Significance[a]	Estimated Impacts Percentage		Basis for Estimate
		Construction	Pre-Construction	
Subsection 4.2.2.4 Water-Use Impacts, Water Quality Changes Due to Substratum Exposure	S – Water	25%	75%	Estimates based upon the expected contribution of activities within the definition of construction of SSC's resulting in the discharge of water from the Spoil Disposal Pond and impacts to the intake and discharge areas.
Subsection 4.2.2.5 Water-Use Impacts, Effects of Alterations on Other Water Users	S – Water	95%	5%	Estimates based upon the expected contribution of activities within the definition of construction of SSC's to the need for dewatering.
Section 4.3 Ecological Impacts of Construction				
Subsection 4.3.1.1.1 Vegetation on the Site and in the Vicinity	S – Terrestrial Ecosystems	10%	90%	Estimates are based on the acreage that will be dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1).It is assumed that the construction of SSC's will occur on no more than approximately 25 acres of the project area being developed (i.e., ~~290~~ 302 acres, excluding offsite electric transmission lines)
Subsection 4.3.1.1.2 Wildlife on the Site and in the Vicinity	S – Terrestrial Ecosystems	10%	90%	Estimates based upon the expected contribution of activities within the definition of construction of SSC's resulting in takes or displacement of wildlife, fugitive dust emissions, bird collisions with elevated construction equipment, pollutant spills, and noise.

Table 4.8-1 Summary of Construction and Pre-Construction Related Impacts (Sheet 6 of 10)

Section Reference	Potential Impacts and Significance[a]	Estimated Impacts Percentage		Basis for Estimate
		Construction	Pre-Construction	
Subsection 4.3.1.2.1 Important Species	S – Terrestrial Species	10%	90%	Estimates are based on the area of land use and potential presence of important species within those areas dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1). It is assumed that the construction of SSC's will occur on no more than approximately 25 acres of the project area being developed (i.e., ~~290~~ 302 acres, excluding offsite electric transmission lines)
Subsection 4.3.1.2.2 Important Habitats	M – Terrestrial Habitats	5%	95%	Estimates are based on the expected acreage of land delineated as wetlands that that will be dedicated to Structures, Systems and Components (SSC) with a reasonable nexus to radiological health and safety and common defense and security, and meet the criteria in 10 CFR 50.10(a)(1).
Subsection 4.3.1.5 Terrestrial Ecosystems, Transmission Corridors and Other Offsite Areas	S – Terrestrial Ecosystems	0%	100%	Activities within transmission corridors are not included within the definition of construction of SSC's.
Subsection 4.3.2.1 Aquatic Ecosystems, Impacts to Impoundments and Streams	S – Aquatic Ecosystems	25%	75%	Estimates based upon the expected contribution of activities within the definition of construction of SSC's resulting in increased sedimentation and turbidity, increased sediment/silt loads into onsite impoundments, surface drainages, site clearing and grading, loss of vegetated buffer zones, and site dewatering.
Subsection 4.3.2.2 Aquatic Ecosystems, Impacts to Lake Erie	S – Aquatic Ecosystems	5%	95%	Estimates based upon the expected contribution of activities within the definition of construction of SSC's resulting in dredging activities within Lake Erie and dewatering.

Table 4.8-1 Summary of Construction and Pre-Construction Related Impacts (Sheet 10 of 10)

Section Reference	Potential Impacts and Significance[a]	Estimated Impacts Percentage		Basis for Estimate
		Construction	Pre-Construction	
Section 4.5 Radiation Exposure to Construction Workers				
Subsection 4.5.2 Radiation Sources	S – Radiation	80%	20%	Estimates based on percent to man hours on site and consideration of proximity of workers to radiation sources.
Subsection 4.5.3 Measured and Calculated Radiation Dose Rates	S – Radiation	80%	20%	Estimates based on percent to man hours on site and consideration of proximity of workers to radiation sources.
Subsection 4.5.4 Construction Worker Dose Estimates	S – Radiation	80%	20%	Estimates based on percent to man hours on site and consideration of proximity of workers to radiation sources.

Notes:

a. As discussed in the associated sections, the assigned potential impact significance levels of (S)MALL, (M)ODERATE, or (L)ARGE are based on the assumption that mitigation measures and controls would be implemented, where identified.

b. Detroit Edison has no control or ownership over the ~~proposal~~ transmission corridors. ITC*Transmission* follows the applicable regulatory processes and approvals in order to implement changes to the transmission system. Accordingly, Detroit Edison cannot reasonably provide the transmission system detailed impacts encountered by ITC*Transmission*. It would be expected that ITC*Transmission* would conduct the necessary cultural resource surveys consistent with State and Federal regulatory requirements.

proposed offsite

5.1.1.5 Other Land Use Considerations

Noise levels during Fermi 3 operation are expected to be similar to ambient noise levels during Fermi 2 operation. Operational noise levels for Fermi 2 have not impacted land use in the vicinity. Therefore, it is reasonable to assume that Fermi 3 noise impacts during operation will be SMALL and will likewise not impact land use in the vicinity. Noise impacts during operation are discussed in more detail in Subsection 5.8.1.3.

Subsection 5.8.2.4.2 describes the potential for significantly increased traffic flow following Fermi 3 commercial operation. However, it is likely that significant traffic congestion would only be seen during outage periods, typically during shift changes. Accordingly, it is judged that the impacts to land use based on increased traffic would be SMALL.

5.1.2 Transmission Corridors and Offsite Areas

As stated in NUREG-1555, Section 5.1.2:

> In some cases transmission lines may be constructed and operated by an entity other than the applicant. In such cases, impact information may be limited and the reviewer should proceed with the assessment using the information that can be obtained.

The 345 kV transmission system and associated corridors are exclusively owned and operated by ITC*Transmission*. The Applicant has no control over the construction or operation of the transmission system. Accordingly, the operational impacts are based on publicly available information, and reasonable expectations of the configurations and practices that ITC*Transmission* would likely follow based on standard industry practice. However, the information described in this subsection does not imply commitments made by ITC*Transmission* or Detroit Edison, unless specifically noted.

A description of the existing and proposed transmission corridors associated with the Fermi site is provided in Subsection 2.2.2 and Section 3.7. The transmission corridor already exists and has been maintained as a transmission corridor, but is undeveloped in one section. Three new 345 kV transmission lines are proposed from the Fermi site to the Milan Substation. Land use within a 0.5 mile band of the existing and proposed 345 kV transmission corridors is discussed in Subsection 2.2.2, and the Fermi transmission corridors (120 kV and 345 kV) are shown on Figure 2.2-3.

Insert 22

Effects of transmission line corridor construction on land use were evaluated in Subsection 4.1.2 . Various aspects of transmission line operation (e.g., ozone production and noise) have the potential for an indirect impact to land use through their effects on wildlife and humans. These effects are evaluated in Section 5.6. None of these potential impacts is expected to be significant to agricultural or other land uses in the area.

The transmission corridor is expected to have only minimal impact on land use during operation of Fermi 3. There would be occasional vehicular traffic in the corridor for maintenance purposes, which could result in SMALL impacts to vegetation and soils and minor amounts of soil erosion.

Insert 22

Onsite

The approximate route and impact areas associated with the short length of new transmission corridor that would be constructed within the Fermi site are shown on Figure 2.1-4 and described in Subsections 2.2.2.2, and land use construction impacts from the onsite transmission line are described in Subsection 4.1.2.

The majority of the impacts from the new onsite transmission corridor will occur during construction. During operation, some towers may occasionally be flooded at their bases due to large precipitation events or seiche events in Lake Erie that fill the drainage area up to the boundaries of the adjacent forested areas; however, the presence of the towers in these areas will not affect the water carrying capacity (function) of the drainage area. The towers will be designed for corrosion resistance and the tower foundations will be designed to accommodate the onsite conditions. Impacts to the DRIWR during operation are expected to be minimal and are described in Section 5.6.

It is expected that Detroit Edison would contract with ITC*Transmission* to maintain the corridor, transmission towers, and transmission lines on the Fermi site. It is expected that ITC*Transmission* would implement the same maintenance practices and procedures as those used on transmission equipment owned by ITC*Transmission*.

Maintenance activities along the new onsite transmission corridor would be occasional. Typical maintenance activities will likely involve trimming of tree branches infringing on the ROW from surrounding forested areas near Toll Road and Doxy Road near the cooling tower. Vegetation management is to be limited to the minimum needed to keep the transmission line free from intrusion of vegetation that could interfere with safe, reliable operation of the line. During operation, access to the formerly forested portions of the corridor near Toll Road would be from the new Fermi Drive northeast along the corridor within the already cleared area, and Doxy Road would provide access to the small forested portion near the cooling tower. Access to the towers near the drainage area in the central portion of the transmission line would be from established access pathways following those same pathways used during construction, as shown on Figure 2.1-4. These pathways would not become permanent access roads; rather, they would be established pathways similar to a non-paved trail so that permanent access road impacts are avoided. Vehicles will not be driven on the access pathways during operation; maintenance access to the onsite transmission corridor will be by other means so that impacts to the wetland areas around the transmission corridor are avoided. The central portion of the onsite transmission corridor near the drainage area and other areas with vegetation with limited height (largely phragmites and cattail) would need very little maintenance since the natural vegetation height would not present a safety hazard to the transmission lines.

Refer to Subsections 5.6.3.4 and 5.8.1.3 for descriptions of operation-related noise impacts on the Fermi site. Visual impacts during operation are described in Subsections 5.6.3.1 and 5.8.2.6.

Insert 22 (Continued)

Measures to minimize impacts from the onsite transmission corridor during operation include selective use of pesticides and herbicides only if and where needed in accordance with ITC*Transmission*'s membership in the EPA voluntary Pesticide Environmental Stewardship Program (PESP), minimizing the potential for impacts to wildlife and the nearby drainage. During operation of the onsite transmission corridor, vegetative cover would be expected to be in place to stabilize the soil and prevent erosion; this vegetation would include both existing vegetation in the central portion of the corridor and re-established low-height vegetation in the formerly forested areas.

Maintenance activities are expected to be executed using Best Management Practices (BMPs) with the goal of avoiding and minimizing erosion during equipment access to the onsite transmission corridor. The Soil Erosion and Sedimentation Control Plan and the Pollution Incident Prevention Plan (PIPP) for Fermi 3 or similar practices are expected to be used by ITC*Transmission* during all maintenance or other activities during operation of the onsite transmission corridor.

In light of the measures described above that will be taken to minimize impacts from operation of the onsite transmission corridor, impacts to land use on the Fermi site are expected to be minimal.

Offsite

5.1.2.3 Agricultural and Soil Issues

Agricultural land use is prevalent along the transmission corridor route. Agricultural land usually has minimal occupancy so that there would not be a significant number of residences in close proximity to the transmission lines. Some agricultural uses may be slightly curtailed in the areas directly adjacent to or under the corridor. Agricultural use on the Fermi site occurs only on the rectangular parcel in the southwest; this parcel would not be affected by operation of the transmission lines because the lines are on the north side of Fermi Drive and the agricultural activity is south of Fermi Drive.

Maintenance activities undertaken during operation of the transmission corridors would occur within ~~the 500-foot onsite main corridor~~ the new 170-foot wide onsite corridor and an assumed 300-foot wide offsite corridor and would not impact land use in adjacent areas. Seasonal maintenance may cause some temporary erosion and compaction along certain portions of the transmission corridor and on any access roads that have gravel or other unpaved surfaces. Erosion impacts are not expected to affect adjacent properties outside the transmission corridor. During operation of the transmission lines, vegetative cover will have been established and will prevent erosion onto adjacent land. The use of best management practices along the corridor during operation would minimize erosion impacts.

It is expected that ITC*Transmission* will implement best management practices. This would likely involve minimal maintenance vehicles and access roads to the extent possible, and limiting transmission line maintenance work during wet weather conditions. For these reasons, SMALL impacts to agricultural land and soils are expected both along the new offsite transmission corridor and to soils in and around the expanded onsite corridor.

5.1.2.4 Spills

It is anticipated that ITC*Transmission* spill prevention and response will be in accordance with applicable regulatory standards typically through the observance of preventative measures. It is expected that care will be taken during operation to avoid spills of transformer oils and fluids and to avoid using maintenance vehicles with oil or other fluid leaks when performing maintenance work on the transmission lines.

5.1.2.5 Maintenance Activities

There will be new impacts created as a result of operation of Fermi 3 with regard to maintenance of transmission corridors. Fermi 3 would use three new 345 kV transmission lines in the existing transmission corridors discussed in Subsection 2.2.2 and Section 3.7. Therefore, the impacts due to operation of the new transmission lines would be expected to be greater than those associated with the operation of Fermi 2 because of the greater area occupied by the lines serving both units compared to only one unit.

The impacts usually associated with transmission line right-of-way maintenance consist of erosion/siltation and disturbance of wildlife and wildlife habitat, and similar impacts where rights-of-way cross floodplains and wetlands. Right-of-way maintenance is expected to be conducted similar to current operations because the corridor used for the proposed route is already maintained.

The new onsite transmission lines are expected to be constructed in a short new corridor through the western portion of the site using new towers. The new Fermi 3 switchyard is expected to be constructed at the intersection of Fermi Drive and Toll Road.

5.6 Transmission System Impacts

This section discusses the possible environmental impacts of the transmission system during the operation of Fermi 3. Potential impacts from transmission system operation and maintenance, which include transmission corridor maintenance and transmission line use, are discussed relative to terrestrial and aquatic ecosystems and members of the public.

The 345 kV transmission system and associated corridors are exclusively owned and operated by ITC*Transmission*. The Applicant has no control over the construction or operation of the transmission system. Accordingly, the operation impacts are based on publicly available information and reasonable expectations of the configurations and controls that ITC*Transmission* would likely follow based on standard industry practice. However, the information described in this subsection does not infer commitments made by ITC*Transmission* or Detroit Edison, unless specifically noted.

5.6.1 Terrestrial Ecosystems

The 345 kV transmission system associated with Fermi 3 is owned, operated and maintained by ITC*Transmission*, which includes the rights-of-way from Fermi 3 to Milan Substation. Accordingly, the potential operational impacts discussed are based on publicly available information and reasonable expectations of the applicable regulatory processes and approvals that ITC*Transmission* would likely follow based on standard industry practice.

ITC*Transmission* operates within the Midwest ISO regional reliability area, a FERC –approved regional transmission organization. The Midwest ISO and ITC*Transmission* determine necessary upgrades to the transmission system. This process has been followed for the proposed connection of Fermi 3 to the ITC*Transmission* system.

offsite

Baseline terrestrial ecosystem information on the proposed transmission corridor is provided in Subsection 2.4.1.9. The effects of transmission line corridor construction were evaluated in Subsection 4.3.1. Impacts due to the operation of the transmission system are discussed as outlined in ESRP Section 5.6.1. The ESRP considers the effects of right-of-way maintenance and an assessment of impacts to important terrestrial species and habitats. The new transmission lines are expected to be constructed in existing corridors both by the re-configuration of existing towers and conductors as well as the installation of new towers/poles and conductors in selected segments. The Milan Substation may also be expanded into a previously disturbed area.

In the offsite portion, e

As discussed in the following subsections, impacts due to the project and cumulative impacts to the terrestrial ecosystem from the operation of the new transmission lines are expected to be SMALL.

5.6.1.1 Vegetation

onsite and offsite portions of

Operation of the transmission system is expected to have no significant effects on vegetation. Existing corridors and towers are planned to be used for the majority of the new lines, and the proposed substation addition is located on previously disturbed land. Access to sensitive areas, such as wetlands, that may be needed is expected to be accomplished using matting to avoid soil disturbance and minimize damage to plants.

Maintenance of the right-of-way is expected to be scheduled in accordance with ITC*Transmission's* vegetation management plan. The work will likely consist of periodic removal of trees to provide adequate clearance from the lines. Pesticides and herbicides may also be used selectively as needed to maintain the right-of-way. Selective removal of undesirable species by hand cutting and/or mowing as needed will likely be the practice routinely used; this would encourage the growth of vegetation types that provide desirable low-growing ground cover, erosion control, improved appearance, treatment of invasive species (as defined in Executive Order 13112), and wildlife habitat. Maintenance of the right-of-way is discussed further in Subsection 5.1.2.

and on new towers in the short onsite route

The right-of-way is typically inspected by helicopter and ground patrolled periodically to ensure that the corridor is in proper condition for safe operation of the transmission line.

and the new onsite corridor

offsite

offsite

5.6.1.2 **Wildlife**

A minimal increase in impacts to wildlife (e.g., bird collisions and habitat loss) would be expected from the addition of the new lines to the existing towers and potential new towers in the existing corridor. NUREG-1437, Section 4.5.6.2, provides a thorough discussion of the topic and concludes that bird collisions associated with the operation of transmission lines will not cause long-term reductions in bird populations. In this instance, the new lines are expected to be installed largely on existing towers in about two-thirds of the route. The remaining third of the route is located in a partly established right-of-way on a combination of new towers and/or steel poles. The overall effect of the new line on wildlife is expected to be minor, since most of the corridor is previously developed and in less maintained areas there are existing disturbances, such as farming, neighboring residences, and roadways. Because of these local conditions, it is not anticipated that ITC*Transmission* will implement any new wildlife management practices with the right-of-way.

or impacted,

,

new Fermi 3 switchyard onsite and the

forest, wetland,

The operation of the expanded substation at Milan would be expected to have an insignificant effect on wildlife in the area due to the presence of an existing substation (to which area wildlife has adjusted), the relatively small area of substation expansion, and the degraded nature of the maintained grass and cropland habitat in the surrounding vicinity.

new onsite switchyard and offsite

use of the site as a power generation facility and the

5.6.1.3 **Important Terrestrial Species and Habitats**

onsite or

No important terrestrial species or habitats (including critical habitats), as discussed in Subsection 2.4.1.2 and Subsection 2.4.1.9, are known to occur within the offsite transmission system. Therefore, the operation of the transmission system is expected to have no impact on these resources and no mitigation is anticipated.

portions of the

Insert 23

5.6.1.4 **Wetlands and Floodplains**

Minimal impacts to wetlands and floodplains are anticipated from the operation of the new transmission lines or Milan Substation. Areas within the corridor that have the potential to regenerate in forest vegetation are expected to be periodically hand cleared of woody vegetation for line safety clearance. Access to these areas for maintenance would likely be on foot or by the use of matting for vehicle equipment, so as not to disturb the soil. As noted in Subsection 5.6.1.1, there should be only selected and occasional pesticide or herbicide use in specific areas where needed

In the offsite portion, m

Insert 23

In the short new portion of the transmission corridor onsite, minimal impacts to wetlands and floodplains are anticipated. The portion of the onsite transmission corridor parallel to Toll Road will permanently impact approximately 1.53 acres of palustrine forested wetland. During operation, this area will be maintained as a wetland with lower-height vegetation more typical of an emergent wetland. No transmission towers are expected to be located in the central portion of the drainage area of the onsite transmission corridor. Operation of the onsite transmission corridor is not expected to affect any other wetland areas.

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map 26115C0259D, the area surrounding the majority of the onsite transmission corridor near the onsite drainage area (Berns Drain) is within Zone AE, a special flood hazard area inundated by a 100-year flood (Reference G). There is also a portion of the onsite transmission corridor parallel to Toll Road that would fall within Zone X, an area of either 500-year flood or 100-year flood with shallow depth, limited drainage area, or protected by levees. The small areas occupied by the transmission towers in the floodplain would not impact the carrying capacity of the drainage area or the floodplain, and the towers and foundations would be in place as designed for corrosion resistance in periodically flooded conditions in that area of the site.

Maintenance of the onsite corridor is anticipated to be very similar to the offsite corridor maintenance detailed below.

in the corridor. It is expected that the use of such chemicals in the right-of-way would be minimized to the greatest extent possible in wetlands areas to protect these important resources.

5.6.1.5 Impact of Electromagnetic Fields on Flora and Fauna

Electromagnetic fields (EMF) are unlike other agents that have an adverse impact (e.g., toxic chemicals) in that dramatic acute effects cannot be demonstrated and long-term effects, if they exist, are subtle, according to the NRC's Generic Environmental Impact Statement for License Renewal (GEIS) conclusions (Reference 5.6-7). As discussed in the GEIS, a careful review of biological and physical studies of EMFs did not reveal consistent evidence linking harmful effects with field exposures. Thus the conclusion presented in the GEIS was that the impacts of EMFs on terrestrial flora and fauna were of small significance at operating nuclear power plants, including transmission systems variable numbers of power lines. On this basis, it is concluded that the incremental EMF impacts posed by possible additions of new power lines for the Fermi 3 project would be minimal and mitigation is not anticipated.

5.6.1.6 Other Projects within the Area with Potential Impacts

Other projects that may be affected by the operation of the transmission line are not known to the Applicant at this time.

5.6.1.7 Consultation

No direct consultation has been made with Federal, State, or local agencies at this time regarding the transmission line routing, new switchyard construction, and substation expansion; however, the USFWS and MDNR were consulted for information on known occurrences of federal and state listed protected species in the project vicinity (Subsection 2.4.1.9.6). Although no regulatory consultation has occurred for the transmission route, Federal and State web sites have been consulted. As the transmission system design is formalized, it is expected that agency consultations would be initiated to ensure the protection of terrestrial resources. It is the desire of the Applicant to avoid or minimize impacts to natural resources through the use of existing corridors along the entire route and existing towers in most segments of the route.

5.6.1.8 Mitigation

Impacts to terrestrial ecosystems resulting from transmission activities are expected to be minor, and no mitigation is anticipated at this time.

5.6.2 Aquatic Ecosystems

Baseline aquatic ecosystem information on the proposed transmission corridors are provided in Subsection 2.5.2.9. The effects of transmission line corridor construction on aquatic ecosystems were evaluated in Subsection 4.3.2. Impacts that were considered due to the operation of the transmission system are outlined in ESRP Section 5.6.2. The ESRP considers the effects of right-of-way maintenance and an assessment of impacts to important species and habitats (defined in ESRP Table 2.4.1-1). No important aquatic species or habitats would be affected by operation of the transmission system. Based on anticipated maintenance plans for the transmission systems as discussed in Subsection 5.6.1.1, no impacts are expected due to maintenance activities.

the onsite transmission structures would be visible from the majority of vantage points only on the Fermi site. Members of the public would be able to see parts of the transmission structures from the limited viewpoints just outside the Fermi entrance or from Toll Road and Langton Road where the view is not obstructed by forested areas.

Therefore, impacts to the aquatic ecosystem due to operation of the transmission system are expected to be SMALL, and no mitigation is anticipated.

5.6.3 Impacts to Members of the Public

As described in Section 3.7, three new transmission lines and a separate switchyard will be needed for Fermi 3 per System Impact Study Report (MISO G867) performed by ITC*Transmission* (Reference 5.6-8). These enhancements to the ITC*Transmission* system will be used to transport power generated from Fermi 3 to local distribution systems as well as the Eastern Interconnection.

Upon completion of the new transmission lines, no additional land disturbances other than routine right-of-way maintenance is likely to occur. Impacts to members of the public are not expected for the portions of the new transmission system within the Fermi site because members of the public are not permitted access to the site.

Potential impacts to members of the public from the expanded ITC*Transmission* system would be minimal. Anticipated operational and maintenance impacts of the expanded transmission system may result in visual impacts, electric shock hazards, electromagnetic field exposure, noise impacts, and radio and television interference.

Interference with wireless Internet services and cellular phones is possible, but would only occur in the unlikely event that use of these devices by members of the public occurred directly under the transmission line or within the corridor area.

5.6.3.1 Visual Impacts

Existing transmission lines for Fermi 2 were designed with consideration given to minimizing impacts on environmental resources and visual values. These considerations would be continued throughout the proposed transmission system modifications described in Section 3.7. The visual impacts of the onsite transmission system would not change significantly as a result of the addition of new transmission lines because ~~the new lines would be located in the existing transmission corridor that has been in place for over 50 years~~. The appearance of the new structures and conductors in the existing offsite corridor would be consistent with the present structures and conductors and result in very little visual change. Based on the proposed design, the visual impacts to members of the public from the transmission system operation are considered SMALL, and no mitigative measures are anticipated.

5.6.3.2 Electric Shock Potential

Objects located near transmission lines can become electrically charged because of their immersion in the lines' electrical field. This charge results in a current that flows through the object to the ground. This is called an induced current because there is no direct connection between the line and the object. Induced current can also flow to the ground through the body of a person who touches the charged object.

Transmission line electrical fields can cause an induced current in nearby grounded objects, as well as buildup of voltage on nearby ungrounded objects such as automobiles, electric or non-electric fences, railroad tracks, and rain gutters.

of Environmental Health Sciences (NIEHS) and the U.S. Department of Energy. Their findings (Reference 5.6-2) state that, "The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak." Nevertheless, the NIEHS concluded that such exposure could not be ruled entirely safe, but that the evidence was insufficient to warrant aggressive regulatory concern. In a subsequent 2002 bulletin, the NIEHS provided an overview of recent scientific studies and summarized various expert review panel evaluations of the body of evidence regarding EMF (Reference 5.6-3). This bulletin reiterated and accepted the conclusions provided in the 1999 study report.

Acute and chronic effects of transmission line operation to members of the public appear to be minimal and unknown, respectively, according to the body of scientific research on the subject. Most EMF research studies call attention to the need for further research because of the adverse effects reported in some studies. EMF experts recommend a policy of "prudent avoidance," or reducing EMF exposure whenever possible without excessive cost or inconvenience (Reference 5.6-3). ITC*Transmission* has not encountered significant environmental problems associated with EMF from its transmission system. If problems arise, it is likely that they can be eliminated by modifications of the lines or right-of-way (Reference 5.6-4). Accordingly, impacts to members of the public from EMF associated with the transmission system operation are considered SMALL, and no mitigative measures are expected.

5.6.3.4 **Noise**

High-voltage transmission lines can emit noise when the electrical field strength surrounding them is greater than the breakdown threshold of the surrounding air, creating a discharge of energy. This energy loss, known as corona discharge, is affected by ambient weather conditions such as humidity, air density, wind, and precipitation, and by irregularities on the energized surfaces. The transmission lines that provide service to the Fermi site are designed with hardware and conductors that have features to eliminate corona discharge and to ensure that they are corona free up to their maximum operating voltage. Nevertheless, during wet weather, the potential for corona loss increases, and it could occur if insulators or other hardware have any defects. NUREG-1437 explains that corona discharge results in audible noise, radio and television interference, energy losses, and the production of ozone, but is generally not a problem.

Potential noise sources for transmission systems include transformers and transmission line conductor corona discharge. ~~No new substation transformers are planned for the Fermi site.~~ Typical worst-case noise levels from corona discharge (i.e., during periods of heavy rain) are below 70 dB(A) at ground level directly below the transmission lines.

Corona-induced noise along the existing transmission lines is very low, except possibly directly below the line on a quiet, humid day. Accordingly, complaints are not expected on nuisance noise from the onsite transmission lines, or from nuisance noise from the expanded offsite transmission corridor. Any additional noise from the new onsite or offsite structures and lines would not be readily discernible from noise associated with the existing transmission corridor that the public has become accustomed to. Since transmission line corona noise does not have adverse effects on humans

Federal Emergency Management Agency National Flood Insurance Program, Flood Insurance Rate Map, Monroe County, Michigan (All Jurisdictions), Panel 259 of 510, Map Number 26115C0259D, effective date: April 20, 2000.

cellular phone, and wireless Internet interference from the proposed new transmission corridor would be SMALL, and no mitigative measures are expected.

5.6.4 References

5.6-1 Institute of Electrical and Electronics Engineers, "National Electrical Safety Code," C2-2007, Part 2, Rules 232C1 and 232D3c, 2007.

5.6-2 National Institutes of Health, National Institute of Environmental Health Sciences, "NIEHS Report on Health Effects from Exposure to Power-Line Frequency and Electric and Magnetic Fields", Publication No. 99-4493, May 1999.

5.6-3 National Institutes of Health, National Institute of Environmental Health Sciences, "EMF Questions & Answers, Electric and Magnetic Fields Associated with the Use of Electric Power", June 2002.

5.6-4 Neuert Electromagnetic Services, "FAQs webpage," http://www.emfcenter.com/faqs.htm, accessed 27 March 2008.

5.6-5 Medtronic Guideline, "Tachyrrhythmia, Home and Work, Guidelines," 2008, http://www.medtronic.com/servlet/ContentServer?pagename=Medtronic/Website/StageArticle&ConditionName=Tachyarrhythmia&Stage=Treatment&Article=tachy_art_home_and_work, accessed 27 March 2008.

5.6-6 Southern California Edison, "Antelope-Pardee 500-kV Transmission Project Final Environmental Impact Report/Environmental Impact Statement, Appendix 8, Draft EIR/EIS Comments and Responses, Comment Set C.189: Laurie De Santis-Staschik and Family," December 2006, http://www.cpuc.ca.gov/environment/info/aspen/antelopepardee/EIR/Appendices/Appendix%208-Comments%20and%20Responses/C.%20Individuals/C-189_LaurieDeSantis-Staschik.pdf, accessed 27 March 2008.

5.6-7 U.S. Nuclear Regulatory Commission, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437, 1996.

5.6-8 ITC*Transmission*, "System Impact Study Report (MISO G867)," Generation Interconnection in Monroe County, MI, July 21, 2008.

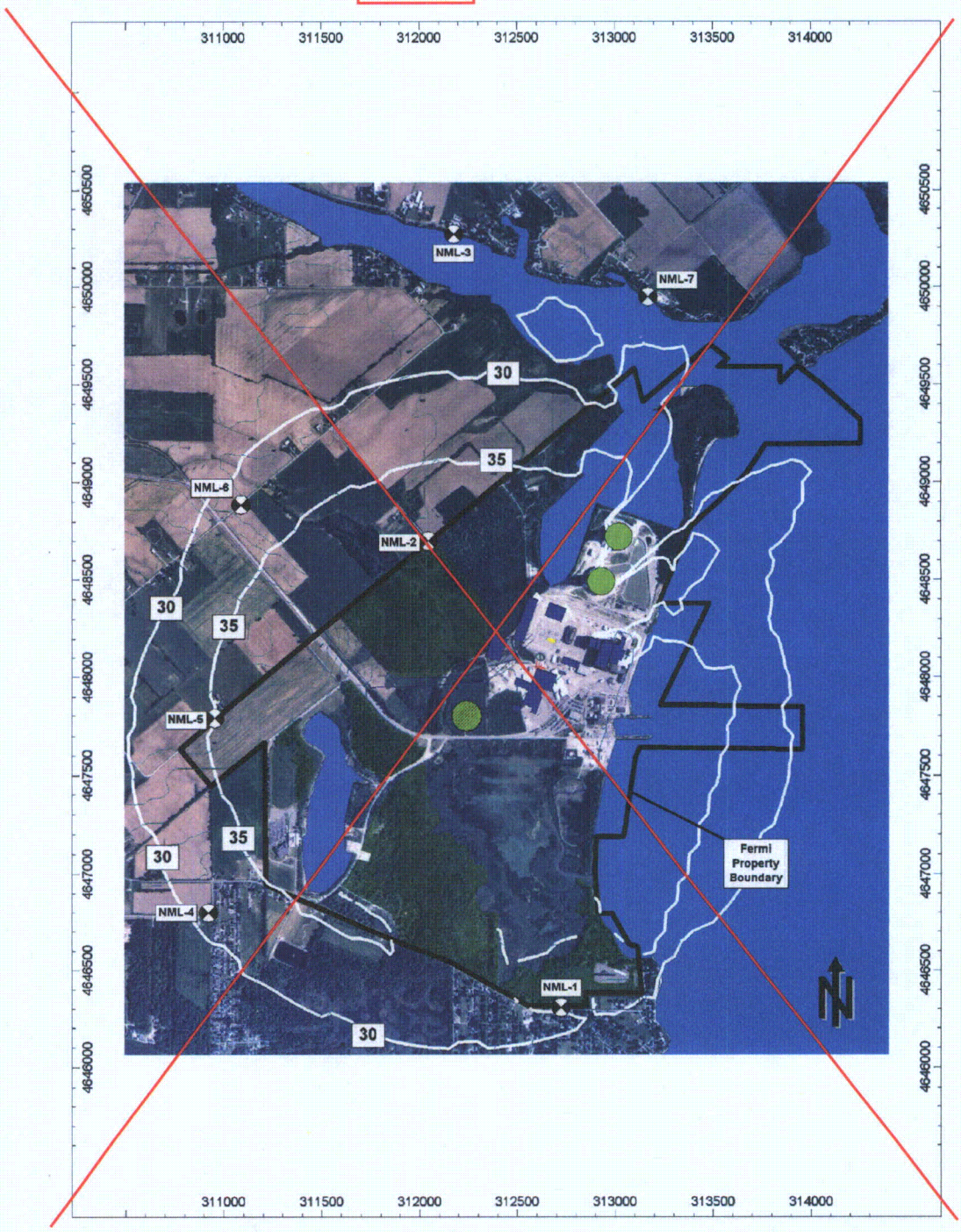
Table 5.8-1 Estimated Facility Noise Impacts – Increase in Ambient Sound Level (Cooling Systems and Transformers)

Receptor[1]	Predicted Fermi 3 Sound Level (dB(A)) Includes Cooling Systems and Transformer Noise Contributions	Lowest Nighttime Ambient Hourly Sound Level (dB(A))	Predicted Future Ambient Sound Level (dB(A)) during Fermi 3 Operation	Predicted Increase in Ambient Sound Level (dB) due to Fermi 3 Operation
NML-1	29	34	35	1
NML-2	37	32	38	6
NML-3	26 → ~~27~~	32	33	1
NML-4	31	40	41	1
NML-5	35	39	41	2
NML-6	31	42	42	0
NML-7	27	37	38	1

1. See Figure 2.5-32 for Receptor Locations.

Figure 5.8-1 Estimated Environmental Noise Emissions—A-Weighted Sound Pressure Level Contours (dB(A))—Resulting from Normal Operation (Fermi 3 Cooling Systems and Transformers)

Insert 24



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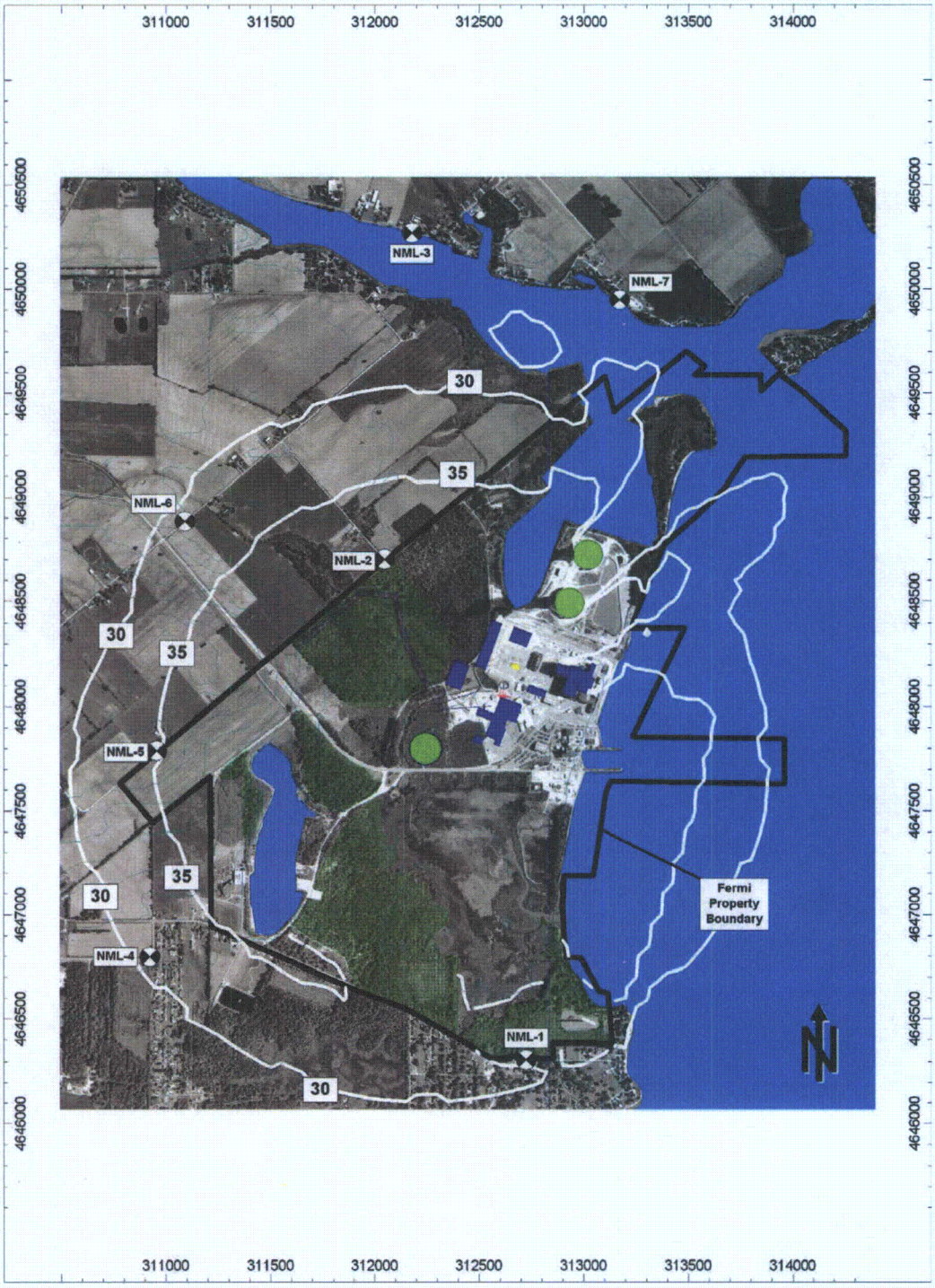
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NML-5
NML-4
NML-1
30
35
Fermi Property Boundary
N

likely to be a concern for agricultural producers because most cooling tower drift impacts will be confined to the site, with minimal drift reaching beyond the site property boundary.

5.11.1 Land Use

The geographic area considered for potential cumulative impacts to land use from Fermi 3 operation encompasses a 7.5-mile area centered on the Fermi site (Figure 2.1-2).

Cumulative impacts to land use include new development to accommodate workers and worker-related services. Development would result in land conversion from forested and agricultural land to various development types, such as housing, gas stations and shopping centers. Impacts from general work force changes are expected to be minor since the operations work force is expected to relocate from a wider area than Monroe County, which may include the metro regions of Detroit, Michigan and Toledo, Ohio. Because the work force will be dispersed over these larger cities in the labor supply region, the induced impacts on land use (from operations of a new unit at the Fermi site) can be easily absorbed within the surrounding region. The exception is the vicinity of the Fermi site. Historically, the area contained within the Fermi site was agricultural and undeveloped lands undergoing slow development. Therefore, cumulative impacts would accrue with more effect, positive or negative, within Frenchtown Township nearest the Fermi site.

As discussed in Subsection 4.1.1, approximately ~~125~~ 155 acres of the Fermi site will be permanently occupied by facilities associated with Fermi 3 until the unit is decommissioned. The existing Fermi 2 facility occupies 172 acres, including the remaining Fermi 1 structures. Proposed operation of Fermi 3 will contribute to changing land use within the Fermi site. Fermi 3 operation is not likely to encourage offsite industrial or urban development on a scale similar to Fermi 2, in part because of county and township zoning, which favors preservation of agricultural and rural land use. No large-scale industrial or commercial projects are planned near the Fermi site. Following construction of Fermi 2, Monroe Country did not experience increased development and similar results are expected for Fermi 3. Fermi 3 has a projected commercial in-operation date of 2020, which will spread any projected impacts over a greater length of time, making it less likely to have any discernible cumulative impacts. Because Fermi 3 construction will comply with all applicable county and township land use and zoning regulations, the cumulative impacts from Fermi 3 operation are anticipated to be SMALL.

As noted in Subsection 2.2.2.2, an ITC*Transmission* study has indicated that a separate switchyard and three new transmission lines will be needed for power output from the proposed Fermi 3. It is assumed that the existing Milan Substation may be expanded from its current size of 350 by 500 feet to an area approximately 1,000 by 1,000 feet to accommodate the addition of the three new transmission lines. This expansion would be into maintained grass and agricultural areas. The proposed expansion of the transmission corridor would affect predominately agricultural or forested land along the approximate 29.4-mile route.

The new transmission route would pass through Monroe, southwest Wayne, and southeast Washtenaw Counties along an assumed 300-foot wide corridor currently used or previously characterized for transmission purposes, thereby avoiding environmentally sensitive areas, such as population concentrations, National Forest lands, military installations, large bodies of water, wildlife

1356 m (4449 ft)

1450 m (4757 ft)

adverse wake effects exerted by the structure. The reactor building is located approximately ~~1341.1 m (4400 ft)~~ northnorthwest of the new onsite meteorological tower. The height of the reactor building is approximately 48.2 m (158 ft) above plant grade. Using the method suggested by Regulatory Guide 1.23 the zone of turbulent flow created by the reactor building will be limited to approximately 481.6 m (1580 ft). The 4-cell MDCT will be located approximately ~~1235.5 m (4054 ft) north~~ of the new onsite meteorological tower. The height of the MDCT will be considerably lower than the reactor building, and will exert a smaller zone of turbulent flow. Therefore, the reactor building and MDCT are located at distances that will not produce adverse wake effects on the wind direction and speed measurements at the new meteorological tower.

north-northwest

Other structures near the location of the new meteorological tower include a NDCT and water tower. The NDCT is hyperbolically shaped and has a maximum width at the base of the tower, which has an outer diameter of 140.2 m (460 ft). The downwind wake zone for hyperbolically shaped and sloping structures is expected to be smaller than for structures that are square or rectangular and have sharp edges. 40 CFR 51.100(ii)(3) defines good engineering practices (GEP) stack height as that which ensures that emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures, or nearby terrain features. "Nearby structures" is defined in 40 CFR 51.100(jj)(1) as that distance up to five times the lesser of the height or width dimension of a structure. Furthermore, the wake zone area becomes increasingly smaller as the height to width ratio of a structure increases (Reference 6.4-2). For the NDCT the lesser dimension is the width, which is the base width. Therefore, a conservative method to calculate the outermost boundary of influence exerted by the NDCT is to multiply the maximum width by five.

1422 m (4665 ft)

Using this method, with a maximum width of 140.2 m (460 ft) at the base of the tower, the downwind wake effect is estimated to extend 701.1 m (2300 ft) from the base of the NDCT. The NDCT is located approximately ~~1268 m (4160 ft)~~ northwest of the new meteorological tower. Thus, the new meteorological tower is at a distance that will not be affected by the wake zone of the NDCT.

The water tower near the location of the new meteorological tower has a height of 44.2 m (144.9 ft) and a maximum width of approximately 16.2 m (53.3 ft) at the equator of the tank head. The tank head of the water tower structure is spherical and has a sloping surface and like the NDCT exerts a downwind wake zone that is conservatively estimated as five times the maximum width of the water tank head. Thus, for the water tower with a maximum width of 16.2 m (53.3 ft), the outermost boundary of influence exerted by the water tower is conservatively estimated to be 81 m (265.8 ft). The water tower is located approximately ~~210.9 m (692 ft) southeast~~ of the new meteorological tower. Thus, the new meteorological tower is at a distance that will not be affected by the wake zone of the water tower.

153 m (502 ft) southwest

Natural obstructions that can influence wind measurements near the new meteorological tower include trees that are taller than 5 m (16 ft). The location of the new meteorological tower ~~is wooded and~~ contains trees that would influence wind measurements if left at their current height. However, prior to installing the new meteorological tower the trees will be trimmed to a height less than 5 m (16 ft) outwards to a distance that satisfies the 10-building-height distance of separation stated in Regulatory Guide 1.23.

area surrounding the

6.5 Ecological Monitoring

The following subsections present information regarding ecological monitoring for terrestrial ecology and land use (Subsection 6.5.1), and aquatic ecology (Subsection 6.5.2) of the Fermi site. The discussion centers on areas likely to be affected by site preparation, construction, and operation of Fermi 3. The monitoring programs discussed are based on the environmental impacts anticipated during the various stages of project development.

Monitoring programs aimed at the detection of changes to the terrestrial and aquatic ecosystems began prior to the COL application submittal and will continue during site preparation, construction, and operation of Fermi 3. An evaluation of the standardization, adequacy, and accuracy of data collection and analytical methods used in the monitoring programs is included where appropriate.

6.5.1 Terrestrial Ecology and Land Use

The following subsections present information on monitoring programs for terrestrial ecology likely to be affected by site preparation, construction, or operation of Fermi 3. No specific land use monitoring is planned. The monitoring designs are based on anticipated environmental impacts through the various stages of project implementation.

Site features and land use are described in Subsection 2.2.1 and transmission corridors are described in Subsection 2.2.2. Subsection 2.4.1 describes the major plant communities, wildlife and important species, and habitats for the Fermi site and transmission corridors. Descriptions of potential impacts that may affect the existing conditions of the project area are addressed in Subsection 4.3.1.

6.5.1.1 Pre-Application Monitoring

Field studies were conducted on the Fermi site between the fourth quarter of 2006 and mid-2008 to determine the extent and condition of terrestrial communities and important habitats and the status of protected species present. The results of these monitoring activities are presented in Subsection 2.4.1, including a map showing the distribution of major plant communities (Figure 2.4-5). Note that the details of the type and frequency of these observations can be found in the individual reports for the field studies discussed in Subsection 2.4.1. Life history information is also discussed in Subsection 2.4.1. Potential terrestrial impacts associated with modifications from Fermi 3 development, including such items as the construction of the natural draft cooling tower, and parking and storage areas, to the existing terrestrial resources are described in Subsection 4.3.1.

offsite

Three state threatened species are known to occur on the Fermi site, American lotus, Eastern fox snake, and the bald eagle, as discussed in Subsection 2.4.1.2. The U.S. Fish and Wildlife Service (USFWS) conducts an annual monitoring of the Fermi site in late winter or early spring to determine whether bald eagles are utilizing any of the nests present on the site. No continuous monitoring is required or being conducted for American lotus or other terrestrial plants and animals on the site. No important species are known to occur in the transmission corridors. Therefore, no pre-application monitoring is expected by ITC*Transmission* in association with the transmission system.

offsite

Mitigation for unavoidable impacts to wetlands on the Fermi site will be prepared in consultation with the U.S. Army Corps of Engineers (USACE) and MDEQ pursuant to Federal and State guidelines in accordance with the Clean Water Act Section 404 Permit and Michigan Wetlands Protection Permit, respectively. Monitoring of mitigation success will be defined and implemented in the mitigation plan to be developed following the receipt of a Jurisdictional Determination of the wetlands present. No impacts to wetlands from transmission activities are expected and no monitoring is anticipated to performed by ITC*Transmission*.

be

offsite

The Detroit River International Wildlife Refuge (DRIWR) Lagoona Beach Unit is located completely within the Fermi site and encompasses approximately half of the site. The plant and animal attributes of the DRIWR are the same as described for the Fermi site in Subsection 2.4.1. No special monitoring is planned for the DRIWR.

6.5.1.2 Site Preparation, Construction and Pre-Operational Monitoring

offsite

Construction and pre-operational monitoring activities at this stage of the project relate to the protection of wetlands habitats, terrestrial habitats, and avian collisions associated with elevated construction equipment in work areas. The anticipated impacts to terrestrial resources are described in Subsection 4.3.1. No monitoring is anticipated with regard to transmission system activities by ITC*Transmission* based on discussions in Subsection 4.3.1.5 and Subsection 5.6.1. The pre-operational phase is expected to be short, relative to the construction and operational phases. Therefore, the pre-operation phase is considered to be an extension of the construction phase.

The status of the bald eagle nesting on the Fermi site is expected to be monitored annually by the USFWS in late winter or early spring. The need for monitoring the eagles or restricting activities around the nesting areas during the nesting season will be determined through consultation with the MDNR and USFWS.

The American lotus will be subject to a construction mitigation strategy to be established through consultation with MDNR, as discussed in Subsection 4.3.1.2.1. Accordingly, the need for additional monitoring will be determined in concert with these consultations.

Protective activities to avoid the permanent loss of wetlands are expected to begin concurrently with the project construction. The form, extent of protective activities, and reporting methods will be determined in consultation with the USACE and MDEQ following the issuance of a Jurisdictional Determination of wetlands present on the site. Detroit Edison will be responsible for any monitoring program established in this regard. Wetland areas adjacent to the construction areas will be flagged as 'no entry' areas. Where entry is needed to wetlands in temporarily impacted areas, appropriate measures would be taken to avoid or minimize impacts, such as using mats for vehicle access to avoid rutting the ground and damage to vegetation. Wetlands and other terrestrial habitats will be protected by compliance and monitoring activities associated with the NPDES Stormwater Construction Permit, SESC Plan, and PIPP. The site work areas will be inspected during site preparation, construction and pre-operations periods on at least a weekly basis by environmental compliance personnel. The results of the inspections will be provided to project

9.2.3.1 Coal-Fired Generation

In general, the environmental impacts of constructing a typical coal-fired power plant are well known because coal, as discussed earlier, is the most prevalent type of central generating technology in the United States. The impacts of constructing a large coal-fired power plant at a "greenfield" site can be substantial, particularly if it is sited in a rural area with considerable natural habitat (Reference 9.2-2).

9.2.3.1.1 Land Use and Related Impacts to Ecology

Since this alternative would involve new construction, one key environmental impact area is land use. In Reference 9.2-2 it is estimated that approximately 1700 acres would be needed for a 1000 MWe coal-fired power plant. This estimate would be scaled up for the approximately 1600 MWe capacity of the proposed coal-fired alternative (i.e., 2720 acres), which is considerably larger than that required for Fermi 3 (approximately ~~290~~ acres total, including permanent and temporary impacts). The Fermi site is approximately 1260 acres total, as noted in Section 2.2. Thus, the current site would not support a comparable sized coal-fired power plant. 302

Since large quantities of coal and lime (or limestone) would be delivered via rail line, new construction would be required to support railcar turnaround facilities. Given the substantial land use (relative to Fermi 3), the associated impacts related to land clearing, erosion and sedimentation, air quality from construction vehicles, impact to the ecology, etc., would be proportionally much greater for the coal-fired alternative.

In Reference 9.2-2, it is estimated that approximately 22,000 acres would be affected for mining the coal and disposing of the waste to support a 1000 MWe coal-fired power plant during its operational life. Thus, the equivalent land usage requirement for 1600 MWe coal-fired production would be approximately 35,200 acres. In contrast, based on estimates discussed in Reference 9.2-2, uranium mining and processing required to supply fuel during the operating life of a nuclear facility of 1600 MWe capacity would be approximately 1600 acres.

9.2.3.1.2 Waste Generation and Emissions

It is assumed that the new coal-fired power plants would primarily use western sub-bituminous coal – similar to the current fleet of Detroit Edison coal-fried power plants. It is estimated that the proposed power plant would consume approximately 7 million tons/yr of pulverized sub-bituminous coal with corresponding ash content (determined from information in Reference 9.2-14 for Detroit Edison historical coal usage versus power generation). Lime or limestone, used in the scrubbing process for control of sulfur dioxide emissions, is injected as a slurry into the hot effluent combustion gases to remove entrained sulfur dioxide. The lime-based scrubbing solution reacts with sulfur dioxide to form calcium sulfite, which precipitates and is removed from the process as sludge.

As discussed in Reference 9.2-27, coal combustion products (CCP) are among material targeted by the U.S. Environmental Protection Agency (EPA) Resource Conservation Challenge (RCC). The RCC is designed to facilitate changes in the economics and practice of waste generation,

9.2.3.1.7 Coal-Fired Generation Conclusion

In conclusion, as discussed above, coal-fired generation is not expected to be an environmentally preferable alternative. This conclusion is based on significantly increased air emissions and land usage requirements.

9.2.3.2 Natural Gas-Fired Generation

The environmental impacts of the natural gas-fired alternative are examined in this subsection, considering both the Fermi site and an unnamed alternate site. The analysis assumes a closed-cycle cooling system since the once-through system is considered to have greater overall environmental impacts (for reasons discussed in the preceding analysis of the coal-fired alternative).

9.2.3.2.1 Land Use and Related Impacts to Ecology

As reported in Subsection 2.2.1.2.7, the closest natural gas pipeline is approximately 10 miles west of the Fermi site. Thus, for the case in which the natural gas-fired power plant is built at (or near) the Fermi site, there would be an associated considerable impact related to pipeline construction. For the purposes of this assessment, without performing more detailed evaluations of pipeline capacity, it is assumed that the capacity of this closest pipeline would be sufficient. This provides a conservative assessment as this assumption minimizes the potential land use and ecological impacts.

In Reference 9.2-2, it is estimated that approximately 110 acres would be needed for a 1000 MWe natural gas-fired power plant. This estimate would be scaled up for the approximately 1600 MWe capacity of the natural gas-fired alternative, resulting in 176 acres. The natural gas-fired power plant likely could be sited on the Fermi site on land that was previously disturbed in the construction of Fermi 1 and 2 and on land previously not disturbed. From Reference 9.2-18, approximately 100 acres would be impacted by a new five mile gas pipeline. Thus, the 10 miles of new pipeline need to locate a natural gas-fired power plant at the Fermi site would impact an additional 200 acres. Thus, the total land use commitment (for siting the natural gas-fired power plant at the Fermi site) would be approximately 376 acres.

155 155

Fermi 3 is expected to require approximately ~~125~~ acres. Thus, the natural gas-fired power plant's footprint (if sited at the Fermi site) is larger than the Fermi 3 land use (176 acres vs. ~~125~~ acres). This does not include land impacted by transmission changes. Impacts to transmission will be similar for either the natural gas-fired power plant or Fermi 3. As the land permanently impacted for either a natural gas-fired power plant or the proposed project is approximately equivalent, the impacts to wildlife would also be approximately equivalent. Therefore, in sum from this perspective, the natural gas-fired power plant would not be considered environmentally preferable to Fermi 3.

155

In addition to the use of ~~125~~ acres for permanent structures for Fermi 3, up to ~~165~~ additional acres could be affected (temporarily) during construction of Fermi 3. Land used temporarily during construction would be subject to standard mitigation procedures to minimize impact. Appropriate measures would also be taken to restore the land, and long-term impact is not expected.

approximately 147

Table 10.1-1 Unavoidable Adverse Environmental Impacts of Construction (Sheet 1 of 5)

Impact Category	Adverse Impact	Potential Actions to Mitigate Impacts	Unavoidable Adverse Impact
Land Use	Construction of new buildings and impervious surfaces clears vegetation, disturbs area soils, and increases stormwater runoff. Soils are stockpiled onsite. Land is not available for other uses. Many of these impacts continue into the operational phase.	Limit ground disturbances to the smallest amount of area practical to construct Fermi 3 (approximately ~~290~~ 302 acres). Use Best Management Practices (BMPs) and minimize footprint of the designated construction area. Restrict soil stockpiling and reuse to designated areas within the construction footprint on the Fermi site. Conduct ground-disturbing activities in accordance with permit requirements. Implement erosion control measures described in the Fermi 3 Soil Erosion and Sedimentation Control (SESC) Plan. Limit vegetation removal to those areas designated for construction activities. Restore temporarily disturbed areas to allow their inclusion in the Detroit River International Wildlife Refuge on the Fermi site. The material to be dredged will be disposed in the onsite Spoil Disposal Pond, which is isolated from the surrounding environment. If it becomes necessary to remove the dredged material from the Spoil Disposal Pond, the dredged material would be subjected to chemical analysis to ascertain if the material can be disposed via land application or if an alternate disposal method is required.	Disturbance of ~~290~~ 302 acres of land occupied by one ESBWR unit and ancillary structures. Mitigation measures allow most of this land to return to its pre-disturbed state. Much of the land is currently dedicated to Fermi 1 and 2 uses.

Table 10.1-1 Unavoidable Adverse Environmental Impacts of Construction (Sheet 2 of 5)

onsite and offsite

Impact Category	Adverse Impact	Potential Actions to Mitigate Impacts	Unavoidable Adverse Impact
	~~Construction of new transmission towers and stringing of new line in a new (maintained) corridor will cause a reduction in agricultural land use and habitats. Much of these impacts continues into operational phase and constitutes a long-term commitment of resources.[1]~~	Limit vegetation removal and construction activities in the new portion of the 345 kV route to Milan Substation to the existing maintained corridor. Revegetate disturbed areas with native species. Restrict transmission corridor/ROW access for construction vehicles to designated routes.[1] Minimize potential impacts through avoidance and compliance with permitting requirements, BMPs, and applicable laws and regulations Minimize land use impacts through the use of an existing transmission corridor, use of a maintained ROW for the new 10-mile portion of the line, and use of existing access roads.[1] Plan and schedule construction activities to minimize temporary disturbance/ displacement of crops and interference with farming activities.	Long-term commitment of land for the transmission corridor. Mitigation measures allow some of the disturbed land to be returned to its pre-disturbed state, and allow agricultural uses to continue on portions of the corridor.[1]
	Construction debris is disposed in permitted landfills; this will occur through the construction phase.	Establish waste minimization program to reduce the volume of debris that is generated. Recycle debris, where possible.	Some land is used to the long-term disposal of construction debris and is not available for other uses. This impact constitutes a commitment of land.
Hydrological and Water Use	Construction and ground disturbing activities could erode soils and increase sedimentation in area surface waters, degrading water quality. These impacts are temporary and short-term.	Comply with applicable permits, plans, and regulations. Minimize area and duration of disturbance, identify controls to minimize onsite and offsite erosion, and establish an inspection and maintenance schedule.	Minimal or no unavoidable adverse impact.
	Construction equipment spills of petroleum or other chemicals that could enter area surface waters. This impact occurs through the construction phase.	Implement measures and controls contained in the Pollution Incident Prevention Plan (PIPP) that would be prepared specifically for Fermi 3 construction activities.	Minimal or no unavoidable adverse impact.

Construction of new onsite and offsite transmission towers and stringing of new line in a new (or maintained) corridor will cause a reduction in agricultural land use and forested and wetland habitats. Many of these impacts continue into operational phase and constitute long-term commitments of resources.[1]

Table 10.1-1 Unavoidable Adverse Environmental Impacts of Construction (Sheet 5 of 5)

Impact Category	Adverse Impact	Potential Actions to Mitigate Impacts	Unavoidable Adverse Impact
Environmental Justice	Some activities affect minority or low-income populations.	There is no disproportionate impact on minority or low income populations.	No unavoidable adverse impacts that require mitigation.

Notes:

1. The 345 kV transmission system and associated corridors are exclusively owned and operated by the ITC*Transmission*. The applicant has no control over the construction or operation of the transmission system. The construction impacts are based on publicly available information and reasonable expectations on the configurations and practices that ITC*Transmission* is likely to use based on standard industry practice. Such efforts would likely include transmission design considerations and Best Management Practices that would minimize the effects on land use.

offsite

Changes (shown in bold) to markup provided in RAIs GE3.1-1/TE4.3.1-1 in NRC3-10-0014, dated March 24, 2010 (ML100850542)

Table 10.1-2 Unavoidable Adverse Environmental Impacts of Operation (Sheet 1 of 4)

Impact Category	Adverse Impact	Mitigation Measures	Unavoidable Adverse Impact
Land Use	Commitment of ~~approximately 200~~ approximately ~~125~~ **155** acres ~~(permanent and temporary)~~ for uses related to Fermi 3 onsite, and 1069 acres ~~with the~~ within transmission corridor.[1] ~~This~~ **offsite** impact will occur for the operational life of Fermi 3.	The major plant structures are located, for the most part, on areas that were environmentally altered for construction and operation of Fermi 1 and Fermi 2. Uses are consistent with land use plans. Some of the disturbed land is revegetated following construction and after maintenance activities in the corridor.	Continued commitment of land use for the operational life of Fermi 3.
	Operation of Fermi 3 increases radioactive and nonradioactive wastes that are stored onsite (temporarily) and disposed of in permitted disposal facilities or landfills. Mixed waste generation and disposal occurs long-term through operation.	The established waste minimization program minimizes waste.	Land dedicated for the disposal of Fermi 3 waste is not available to other uses. This effect is long-term.
	New Independent Spent Fuel Storage Installation (ISFSI) for Fermi 3 will increase quantity of spent fuel storage onsite.	The ISFSI is sited to minimize radiation exposure to plant staff.	Land dedicated for spent fuel storage is not available to other uses for the operational life of Fermi 3.
	The cooling tower is visible from nearby locations and constitutes a small visual impact. The transmission corridor also constitutes a small visual impact.[1] These impacts occur through the operational phase.	Station operation does not contribute an additional impact to the viewshed, and no measures or controls are necessary.	The viewshed continues to be impacted over the operational phase but no more so than at the present.
	Archeological sites could be obscured or damaged through ground-disturbing activities related to operation and maintenance. This potential exists through the operational phase.	The shoreline is sensitive for archaeological resources. Shoreline stabilization may be required if NRHP-eligible archaeological resources are encountered during station operation. Continued station operation is unlikely to impact significant archaeological sites, and no measures or controls are necessary.	Minimal or no unavoidable adverse impacts.

Table 10.1-2 Unavoidable Adverse Environmental Impacts of Operation (Sheet 4 of 4)

Impact Category	Adverse Impact	Mitigation Measures	Unavoidable Adverse Impact
	Potential adverse impact to traffic flows on highways and access roads to the Fermi site. Traffic at the site and on surrounding roadways would increase as operational staff for the two units commute to the Fermi site.	Detroit Edison has performed a Level of Service analysis (Reference 10.2-8). Consultations were made with the Michigan Department of Transportation (MDOT) and the Monroe County Road Commission. Improvements include: signal installations and signal modifications, staggering worker shifts, bussing employees from off-site, minor lane additions and/or a second entrance to the site.	Small unavoidable impacts.
	Episodic loud noises are generated by Fermi 3 operation and routine maintenance on corridors may impact adjacent workers and residents for the duration of operation.	Noise levels do not typically exceed background levels. Sound attenuation measures (as part of facility and transmission corridor equipment design) reduce noise impacts.[1] Protective equipment is provided to employees. No mitigation measures are expected to be necessary.	Minimal or no unavoidable adverse impacts.
Radiological	Discharges of small amounts of radioactive liquid and gases within regulatory limits.	Potential doses to workers and public will be within regulatory limits. No mitigation measures are necessary.	Small unavoidable adverse impact of radiation exposure.
Atmospheric and Meteorological	Cooling towers emit water vapor plumes that cause fogging/icing, cloud formation, plume shadowing, humidity, and additional precipitation.	The occurrence of plumes and fogging are low. Use Best Available Technology for installing and operating the cooling tower. No mitigation measures are expected to be necessary. The plumes cause little to no effect on humans or surrounding vegetation. No mitigation measures are expected to be necessary.	Minimal or no unavoidable adverse impacts.
offsite	Small quantities of waste salts and chemicals are discharged into the atmosphere.	No mitigation measures are expected to be necessary.	Minimal or no unavoidable adverse impacts.

Notes:

1. The 345 kV transmission system and associated corridors are exclusively owned and operated by the ITC*Transmission*. The applicant has no control over the construction or operation of the transmission system. The construction impacts are based on publicly available information and reasonable expectations on the configurations and practices that ITC*Transmission* is likely to use based on standard industry practice. Such efforts would likely include transmission design considerations and Best Management Practices that would minimize the effects on land use.

10.2 Irreversible and Irretrievable Commitments of Resources

This section describes the expected irreversible and irretrievable environmental resources used during construction and operation of Fermi 3. Environmental resources are considered "irreversible" when they are changed by the construction or operation of Fermi 3 and cannot be restored at some later time to the resource's pre-construction or pre-operation state (such as the permanent use of land). Irretrievable resources are generally materials (such as petroleum) that are used for Fermi 3 in such a way that the materials could not be, by practical means, recycled or restored for other uses.

Impacts from construction and operation of Fermi 3 will be similar to that of any major construction project, and the expected loss of resources used in construction is anticipated to be of small consequence with respect to the availability of such resources. The main resource irretrievably committed by operation of Fermi 3 is uranium, which is available in sufficient quantities such that the irreversible and irretrievable commitment of uranium would be of small consequence. The irreversible and irretrievable commitments of resources and materials resulting from construction and operation of Fermi 3 are discussed below and summarized in Table 10.2-1.

10.2.1 Irreversible Environmental Resource Commitments

Irreversible environmental commitments resulting from construction and operation of Fermi 3 encompass the following:

- Land Use Productivity
- Alteration of Terrestrial and Aquatic Habitat and Biota
- Socioeconomic Changes
- Degradation of Water and Air Quality
- Resource Commitments of the Uranium Fuel Cycle

10.2.1.1 Land Use Productivity

155

As described in Chapter 4 and Chapter 5, construction and operation of Fermi 3 temporarily and permanently modifies land uses on the Fermi site. Land uses onsite and in the transmission corridor are committed to Fermi 3 facility and electrical transmission uses, and are largely unavailable for other uses. Approximately ~~125~~ acres from Fermi 3 are lost to other uses until after decommissioning of Fermi 3 (Fermi 2 occupies approximately 172 acres). Once Fermi 3 ceases operations and is decontaminated and decommissioned in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements, the land that supports the facilities may be returned to other industrial or non-industrial or similar uses.

Fermi 3 generates radioactive, chemical, and nonhazardous waste during operations that requires storage and disposal. Chemical wastes are accumulated onsite and transferred offsite to licensed/permitted facilities. Hazardous, mixed, and radioactive wastes are disposed of in permitted landfills or facilities. An irreversible commitment of land occurs because this land cannot be used for other purposes.

(including 0.08 acre of open water)

19

26

9.34

23.75

5.18

10.2.1.2 **Alteration of Terrestrial and Aquatic Habitat and Biota**

Construction activities disrupt or destroy flora and fauna in areas of and adjacent to the Fermi 3 site and the associated transmission corridor. As discussed in Section 4.3, approximately ~~59~~ acres (temporary) and ~~2~~ acres (permanent) of the Lagoona Beach Unit of the Detroit River International Wildlife Refuge (DRIWR) will be affected by construction. Fermi 3 construction activities will permanently convert ~~2.75~~ acres of wetland and ~~7.28~~ acres of open water to Fermi 3 uses, which constitutes an irreversible commitment of resources. Fermi 3 construction activities will temporarily impact ~~39.44~~ acres of wetlands that could return to their pre-construction condition.

American lotus specimens that occur ~~along the western edge of the South Lagoon~~ within the south canal will be affected by the construction of the Fermi 3 cooling tower. The American lotus will be subject to a construction mitigation strategy to be established through consultation with MDNR, as discussed in Subsection 4.3.1.2.1. Specific plants that perish during transplanting, or specimens located below-ground that are not identified for transplanting and consequently perish during construction, will be irreversibly committed. Healthy populations of American lotus, however, exist across this area of Michigan.

Minimal impact on mammals, reptiles, and aquatic species occur during construction and operation of Fermi 3. Although losses of these individual species represent an irreversible commitment of resources, the overall populations of terrestrial and aquatic biota will remain healthy at the site and in the region.

10.2.1.3 **Socioeconomic Changes**

Short-term and long-term changes in the population and the local socioeconomic structure of Monroe County, and perhaps neighboring counties, will occur as a result of Fermi 3. Construction and operation of Fermi 3 will lead to an increase in population of these areas, which in turn, will spur increased housing construction and increased tax revenue. Impacts to infrastructure, schools, and community services will be mitigated by using the increased tax revenue to fund necessary improvements. Changes in noise levels, traffic congestion, and crime rates may only be partially mitigated resulting in potentially long-term changes in the overall community character.

10.2.1.4 **Degradation of Water and Air Quality**

In order to minimize environmental impacts, Detroit Edison intends to operate Fermi 3 as a zero-release radioactive liquid effluent plant. However, Fermi 3 will be configured for monitored radioactive liquid effluent releases, should it become necessary. Such releases will be in compliance with all applicable regulations and all necessary permits will be obtained.

Water quality can become slightly degraded as treated effluents containing small quantities of chemical and radioactive constituents enter area surface waters. Some chemical constituents are easily broken down and dissipate quickly; however, others may persist for longer periods of time. Radionuclides also vary in how long they remain in an area, depending on their half-life and total suspension time in the air.

Table 10.2-1 Summary of Irreversible and Irretrievable Commitment of Environmental Resources (Sheet 2 of 2)

Environmental and Material Resources	Irreversible	Irretrievable
Uranium Fuel Consumption		The operation of Fermi 3 contributes a relatively small increase in the depletion of uranium.

Notes:

1. The 345 kV transmission system and associated corridors are exclusively owned and operated by the ITC*Transmission*. The applicant has no control over the construction or operation of the transmission system. The construction impacts are based on publicly available information and reasonable expectations on the configurations and practices that ITC*Transmission* is likely to use based on standard industry practice. Such efforts would likely include transmission design considerations and Best Management Practices that would minimize the effects on land use.

offsite

Table 10.3-1 Comparison of Short-Term Uses to Long-Term Productivity (Sheet 1 of 3)

	Short-Term Uses and Benefits	Relationship to Maintenance and Enhancement of Long-Term Environmental Productivity
Land Use	The construction and operation of Fermi 3 would preclude these lands from being available for other uses.	Construction and operation of Fermi 3 does not necessarily represent a long-term impact to productivity of the human environment as the land might be available for other uses after the nuclear facility is decommissioned.
	offsite ~~The construction~~ and operation of a new transmission ~~route~~[1] would convert 242 acres of agricultural land use and wildlife habitat.	The construction and operation of new transmission lines does not result in any significant impact to agricultural land use or wildlife impact. New transmission lines will use existing transmission corridor infrastructure to the maximum extent possible. The acreage might be available again for agriculture production and wildlife habitat if the transmission lines are decommissioned upon decommissioning of the nuclear facility.[1]
	The construction and operation of a new onsite transmission route would convert approximately 5.9 acres of wildlife habitat.	
Hydrological and Water Use	Construction is expected to require an anticipated maximum quantity of 600,000 GPD from Lake Erie. The water withdrawal from Lake Erie for the operation of Fermi 3 is approximately 34,000 gpm. The Frenchtown Township, which obtains its water from Lake Erie, will be the source of potable water for Fermi 3. The daily potable water consumed during construction is approximately 8700 gallons per day. Construction of the building foundations will require dewatering of groundwater.	The consumptive use of water during construction and operations does not result in any significant long-term impacts to water resources. Upon decommissioning of Fermi 3, the water would be available for other uses. Dewatering activities will not affect the long-term productivity of the groundwater aquifer. Dewatering is a temporary activity.

Table 10.3-1 Comparison of Short-Term Uses to Long-Term Productivity (Sheet 2 of 3)

	Short-Term Uses and Benefits	Relationship to Maintenance and Enhancement of Long-Term Environmental Productivity
Ecological		
--Terrestrial Flora and Fauna	The construction of Fermi 3 and its associated infrastructure results in the impacts to habitat for plants and animals. Fermi 3 construction will permanently impact 27 acres of undeveloped land, inclusive of wetlands, designated wildlife refuge, forest land, and grassland. The potential for impacts to wildlife is small but, for instance, could include the temporary displacement of animals due to noise or bird collisions with tall equipment.	The construction of Fermi 3 and the associated offsite transmission lines would result in the long-term loss of biologically productive habitat as soil conditions could take hundreds of years to redevelop. Temporarily disturbed sites would be replanted with native vegetation following completion of the project. The wildlife species found on the Fermi site, in the region, and along the transmission route are not rare and would recover from displacement by the project. Wetlands impacts will be mitigated as required by USACE and the MDNR.
--Aquatic	Impacts to the aquatic ecosystem due to construction of a new intake structure and barge slip; and dredging at the intake bay.	The construction and operation of Fermi 3 does not result in any significant long-term impacts to biota or their habitats. Upon decommissioning of Fermi 3, the use of the intake structure and dredging would cease; thus, it is anticipated the aquatic ecosystems would return to a natural state.
Socioeconomic	Electrical power generation.	The long-term benefits of electrical power generation include helping to meet growing industrial, commercial, and residential baseload needs; the effects of which are expected to live beyond the life of the project. Additional long-term benefits include those related to air emissions avoidance by not relying on natural gas-fired or coal-fired electrical generation to meet energy demands.
	Increased state and local tax revenues, plant expenditures, and employee spending in the community during construction and operations results in both short-term and long-term growth in the local economy.	Tax revenues, plant expenditures, and employee spending leads to long-term growth in the local and regional economy, infrastructure (e.g. roads), and services that may continue after Fermi 3 is decommissioned.

Table 10.3-1 Comparison of Short-Term Uses to Long-Term Productivity (Sheet 3 of 3)

	Short-Term Uses and Benefits	Relationship to Maintenance and Enhancement of Long-Term Environmental Productivity
Irradiated Spent Fuel	The uranium provides a short-term supply of relatively clean energy	The spent fuel must be managed as a high-level radioactive waste and either reprocessed or isolated in a geological repository. Storage of the waste in a geological repository represents a long-term commitment of the disposal area and geological formation.
Other Radioactive Waste	The radioactively contaminated reactor vessel and equipment are required for the short-term production of nuclear energy	The contaminated waste would be disposed in a low level radioactive waste facility. This represents a long-term commitment of the disposal area.

Notes:

1. The 345 kV transmission system and associated corridors are exclusively owned and operated by the offsite ITC*Transmission*. The applicant has no control over the construction or operation of the transmission system. The construction impacts are based on publicly available information and reasonable expectations on the configurations and practices that ITC*Transmission* is likely to use based on standard industry practice. Such efforts would likely include transmission design considerations and Best Management Practices that would minimize the effects on land use.

total generation costs for coal-fired and natural gas-fired plants. The impact is more significant for coal-fired than for natural gas-fired generation due to the higher levels of carbon emissions associated with coal-fired generation. To summarize, as shown in Reference 10.4-2, the total generation cost associated with nuclear power is equivalent to, or lower, than other baseload load fuel sources, especially when additional costs associated with carbon emissions are included.

Measures to control adverse impacts related to operation are discussed in Section 5.10. There are monetary costs associated with the design and implementation of these measures which include such activities as training employees in environmental compliance and safety; treatment, storage, and disposal of any chemical wastes generated; and acquisition and compliance with required operational permits and environmental requirements.

10.4.2.2 External Costs

This discussion describes the external (non-monetary) environmental and social costs of constructing and operating Fermi 3. The environmental impacts of construction and operation of Fermi 3 are described in Section 4.6 and Section 5.10, respectively. Section 10.1 also provides details regarding potential mitigation and the unavoidable adverse impacts after mitigation measures have been considered. Several mitigation measures would be built into the project design, such as scheduling to ensure that construction is completed in the shortest possible time; using construction best management practices to limit erosion, fugitive dust, runoff, spills and air emissions; and providing first-aid stations at the construction site.

10.4.2.2.1 Land Use

43 147

Approximately ~~27~~ acres will be affected by the construction of Fermi 3 as a result of permanent facilities. An additional ~~162~~ acres will be disturbed on a short-term basis as a result of temporary activities and construction of temporary facilities and laydown areas. Clearing and removal of trees growing within the Fermi site will be required. Loss of land use is an external cost of the construction of Fermi 3. A detailed description of land use is provided in Section 4.1. As discussed in Subsection 9.2.3, the cost in land use for a nuclear-powered generating plant is about the same as that for a natural gas-fired power plant and less than that for a coal-fired power plant of comparable generation capacity. As discussed in Subsection 9.2.3, when overall land use requirements are considered, the cost in land use for a nuclear-power generation plant is less than that for both a coal-fired and natural gas-fired plant.

10.4.2.2.2 Hydrological and Water Use

Section 4.6 and Section 5.2 describe hydrologic alterations for construction and operation, respectively. As discussed in these sections, there are costs associated with providing water for various needs during construction and operation. The majority of water used for Fermi 3 operations would be surface-water drawn from Lake Erie. This water use represents only a small fraction of available water and is judged to be SMALL. There are also costs associated with potable water consumption that will be provided by the Frenchtown Township. Use of surface-water by the site should not impact off-site users in terms of either water availability or water quality. Relatively small levels of non-radioactive and radioactive effluents are introduced into Lake Erie (after treatment). It

Table 10.4-2 Internal and External Costs of Fermi 3 (Sheet 1 of 2)

Category of Cost	Description of Cost
Internal Costs	
Construction (Overnight Cost)	$3000 to $4000 per kW
Operation	$6.83 per MW-hr for O&M $4.64 per MW-hr for fuel cycle
Decommissioning (NRC Minimum)	$518,033,205
External Costs	
Land and Land Use	SMALL Fermi 3 will occupy approximately ~~125~~ 155 acres of the 1260 acres existing Fermi site.
Hydrological and Water Use	SMALL There are some costs associated with providing water for various needs during construction and operation. Cooling water will be taken from Lake Erie. Relatively small levels of chemical and/or radioactive effluents will be introduced into Lake Erie. Thermal plume resulting from cooling water blowdown will be discharged to Lake Erie. The effect of consumption of cooling water is relatively small.
Terrestrial and Aquatic Species	SMALL Some cost to wildlife due to mortality during construction operations is anticipated. However, these costs do not affect long term wildlife populations. Wildlife mortality, including aquatic biota, during operations is expected to be minimal.
Radioactive Effluents and Emissions	SMALL Radioactive waste will be generated. The plant will produce radioactive air emissions. Relatively small levels of radioactive effluents may be introduced into Lake Erie.
Chemical and Radioactive Waste	SMALL Storage, treatment, and disposal of high-level radioactive spent nuclear fuel. Commitment of underground geological resources for disposal of radioactive spent fuel.

NRC3-11-0002
RAI Question USACE-1
RAI Question USACE-2

Enclosure 1

Detroit Edison Company Response to U.S. Army Corps of Engineers Requests for Additional Information (w/o electronic shape files)
(following 225 pages)

The Detroit Edison Company
One Energy Plaza, Detroit, MI 48226-1279

DTE Energy
Detroit Edison

File No. LRE-2008-00443-1

January 10, 2011
2011-MEP-F3COLA-0004

John Konik
Department of the Army
Detroit District, Corps of Engineers
Regulatory Office
477 Michigan Avenue, 6th Floor
Detroit, MI 48223-2550

References:
1) Letter from Stephen Lemont (USNRC) to Peter W. Smith (Detroit Edison), "Requests for Additional Information Related to the Environmental Review for the Combined License Application for Fermi Nuclear Power Plant, Unit 3," dated May 12, 2009
2) Letter from Peter W. Smith (Detroit Edison) to USNRC, "Detroit Edison Company Response to NRC Requests for Additional Information Related to the Environmental Review," NRC3-09-0017, dated December 23, 2009
3) Letter from John Konik (USACE) to Randy Westmoreland (Detroit Edison), "USACE Supplemental Requests for Additional Information," dated November 19, 2010
4) Letter from Skiles W. Boyd (Detroit Edison) to Mary Vanderlaan (MDNRE), "Detroit Edison Proposed Fermi 3 Power Plant -- Request for Alternative Approach to Coastal Zone Management Act Certification," dated December 14, 2010
5) Letter from Skiles W. Boyd (Detroit Edison) to Mary Vanderlaan (MDNRE), "Detroit Edison Proposed Fermi 3 Power Plant -- Request for Alternative Approach to Clean Water Act Section 401 Certification," dated December 14, 2010
6) Letter from Adrian Muñiz (USNRC) to Peter W. Smith (DTE), "Fermi Nuclear Power Plant, Unit 3 Combined License Application Review Schedule," dated December 16, 2010

Subject: Detroit Edison Company Response to U.S. Army Corps of Engineers Requests for Additional Information

In Reference 1, the NRC transmitted U.S. Army Corps of Engineers (USACE) Requests for Additional Information (RAIs) to support the review of Part 3 (Environmental Report) of the Fermi 3 Combined License Applciation (COLA). Detroit Edison submitted responses to those USACE RAIs in Reference 2.

In Reference 3, USACE transmitted comments and supplemental RAIs related to Detroit Edison's RAI responses. The supplemental response to RAIs USACE-1 and USACE-2 is included as Attachment 1 to this letter. The supplemental RAI response was prepared utilizing the Clean Water Act (CWA) Section 404(b)(1) guidelines (40 CFR Part 230), the USACE public interest factors (33 CFR Part 320.4), and the USACE Detroit District generic master template document that facilitates consideration of the range of all possible impacts from projects within the purview of the USACE Regulatory Program. The supplemental RAI response discusses the project alternatives considered, the relevant environmental issues associated with those alternatives, and the environmental impacts associated with the Fermi 3 project, including those identified during the July 30, 2010, meeting with MDNRE and USACE.

The evaluation of proposed actions and alternatives, and the assessment of impacts indicate that the construction and operation of the proposed Fermi 3 plant will comply with the CWA Section 404(b)(1) guidelines and is compatible with the public interest. The analyses demonstrate that the Fermi site is:

- The Least Environmentally Damaging Practicable Alternative – the Fermi site is the practicable alternative site with the least impact to waters of the United States that does not have significant adverse impacts to other environmental resources.
- Compatible with the public interest – the construction and operation of Fermi 3 will not result in significant adverse impacts to relevant public interest factors.

In addition to compliance with state and federal requirements, implementation of appropriate and practicable steps will minimize potential adverse impacts of discharges and ensure that the proposed construction and operation of Fermi 3 will not result in significant degradation of wetlands and the aquatic environment. Appropriate and practicable mitigation measures are proposed to offset the anticipated wetland impacts within USACE's jurisdiction. To aid in the USACE review, Table 1-1 of the enclosed document correlates the USACE supplemental RAI comments to the specific sections of the document.

In References 5 and 6, Detroit Edison requested that MDNRE employ an alternative approach to Coastal Zone Management Act (CZMA) and CWA Section 401 Certifications for the Fermi 3 project. Both alternatives presented to MDNRE are permissible under the CWA and CZMA, as detailed in References 5 and 6, and would allow MDNRE to issue the CZMA and CWA Section 401 Certifications necessary for the NRC to issue a COL without MDNRE and USACE prematurely processing a Joint Permit Application. As such, the supplemental USACE RAIs are answered to a level of detail to support preparation of the NRC Environmental Impact Statement. Detroit Edison will submit a Joint Permit Application for the Fermi 3 project at the appropriate time in the future.

RAI USACE-1j requested shape files for the delineated wetland areas on the Fermi site and the proposed mitigation area(s). The requested files are provided electronically in the requested format.

Comment 1d in Reference 3 states that all figures submitted with a permit application must be legible when printed in black and white. Since Detroit Edison is not pursuing a Part 303 permit at this time, not all figures have been configured to be legible in black and white.

Reference 6 provided the NRC review schedule for the remainder of the Fermi 3 COLA. The schedule assumes that Detroit Edison will reach agreement with USACE on the proposed site layout and an overall strategy for mitigating impacts to waters and wetlands by March 1, 2011. Detroit Edison is committed to supporting USACE to this end.

If you have any questions, or need additional information, please contact me at (313) 235-3341.

Sincerely,

Peter W. Smith, Director
Nuclear Development – Licensing & Engineering
Detroit Edison Company

Attachments: 1) Detroit Edison Fermi 3 Project, Supplemental RAI Response

cc: Michigan Department of Natural Resources & Environment
SE Michigan District Office

DTE Energy®

Detroit Edison

Detroit Edison Fermi 3 Project

US Army Corps of Engineers Supplemental RAI Response

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

This document constitutes Detroit Edison's response to United States Army Corps of Engineers (USACE) supplemental requests for additional information (RAIs) 1 and 2, and all subparts. The response was prepared using the Clean Water Act (CWA) 404(b)(1) guidelines (40 CFR Part 230), the USACE public interest factors (33 CFR Part 320.4), and the USACE Detroit District generic master template document. The purpose of this response is to assist the USACE in assessing compliance with the CWA Section 404(b)(1) guidelines and determining whether the project is compatible with the public interest.

The USACE Supplement RAI Response is organized as follows:

- Section 1 maps the subparts of the RAI to the sections of the response document where the requested information can be found.
- Section 2 describes the baseline environmental setting for the USACE regulated activities associated with the construction and operation of Fermi 3.
- Section 3 describes the proposed Fermi 3 project, including the construction approach and sequence, and the mitigation techniques that will be implemented to minimize the effects on waters and wetlands of the United States.
- Section 4 provides an assessment of impacts (both beneficial and adverse) of the Fermi 3 project on relevant USACE public interest factors.
- Section 5 describes the alternatives that were considered to avoid and minimize the potential impacts of the Fermi 3 project.
- Appendix A contains a copy of the USACE Supplemental RAIs.
- Appendix B evaluates the candidate sites identified in the Detroit Edison service area to determine whether a practicable alternative site would be environmentally preferable to the proposed project at the Fermi site.
- Appendix C provides a conceptual strategy to mitigate the unavoidable impacts associated with the proposed project.

The evaluation of the proposed Fermi 3 project and alternatives, and the assessment of impacts in this supplemental RAI response indicate that the project will comply with the CWA Section 404(b)(1) guidelines and is compatible with the public interest. This evaluation includes analyses which clearly demonstrate that the Fermi site is:

1. The least environmentally damaging practicable alternative – The Fermi site is the practicable alternative site with the least impact on waters of the United States that does not have significant adverse impacts on other environmental resources.

2. Compatible with the public interest – The project will not result in significant adverse impacts on relevant public interest factors.

In addition to compliance with state and federal requirements, implementation of appropriate and practicable steps will minimize potential adverse impacts of discharges and ensure that the construction and operation of Fermi 3 will not result in significant degradation of wetlands and the aquatic environment. Further, the project proposes appropriate and practicable mitigation to offset the anticipated loss of wetlands within the USACE's jurisdiction.

This comprehensive CWA 404(b)(1) and Fermi site-specific public interest factor evaluation clearly demonstrates that the Fermi site has the smallest overall impact on environmental resources and is in accordance with the public's interest. Therefore, the Fermi site is the least environmentally damaging practicable alternative for the construction and operation of Fermi 3 in Detroit Edison's service area.

1.0 INTRODUCTION

This document constitutes Detroit Edison's response to the United States Army Corps of Engineers (USACE) Supplemental RAIs 1 and 2 (and all subparts) concerning the Fermi 3 project, provided to Detroit Edison on November 19, 2010. A copy of the USACE Supplemental RAIs is included in Appendix A of the response. Table 1-1 correlates the USACE Supplemental RAIs to the RAI response location.

The Supplemental RAI response was prepared utilizing the Clean Water Act (CWA) Section 404(b)(1) guidelines (40 CFR Part 230), the USACE public interest factors (33 CFR Part 320.4), and the USACE Detroit District generic master template document that facilitates consideration of the range of all possible impacts from projects within the purview of the USACE Regulatory Program. The Supplemental RAI response discusses the project alternatives considered and the relevant environmental issues associated with those alternatives and the environmental impacts associated with the Fermi 3 project.

Table 1-1. Location of USACE RAI Responses

USACE RAI Number	USACE RAI Brief Description	Location of Response in the USACE Report
USACE-1	**Conduct a Public Interest Review**	
USACE-1a	Public Interest Factor Baseline Condition	Section 2
USACE-1b	Coastal Wetlands	Sections 2 and 4
USACE-1c	Public Interest Impact Evaluation	Sections 3 and 4
USACE-1d	Water-related and Wetland Impact Discussion	Section 3
USACE-1e	Minimization of Discharges into the Waters of the United States and Adjacent Wetlands and Compensation	Sections 3 and 4
USACE-1f	Minimization of Detrimental Project Effects	Section 3
USACE-1g	Project Description	Section 3
USACE-1h	Consideration of General Criteria	Sections 4 and 5
USACE-1i	Impact Significance Levels	Sections 3 and 4
USACE-1j	Public Interest/NEPA Review Supportive Documentation	Shape files for updated wetland delineation and proposed mitigation areas provided on DVD.
USACE-2	**Alternative Analysis Package**	
USACE-2a	Project Description/Purpose & Need	RAI complete. No supplemental response is required.
USACE-2b	Alternative Site Analysis – Wetland Fill Avoidance Emphasis	Section 5 Appendix B
USACE-2c	Onsite Alternative Analysis	Section 5
USACE-2d	Analysis Supportive Documentation	All sections

2.0 BASELINE CONDITIONS

The information provided in the following subsections establishes a baseline environmental setting from which to assess the impact of the activities associated with the construction and operation of Fermi 3. The site-specific information describes the baseline condition regarding pertinent issues presented by federal and state agencies for the following factors: Conservation and Overall Ecology, Wetland, Fish & Wildlife, Historic Properties and Archaeological Resources.

2.1 Land Use

Land use on the Fermi site is split mainly into developed areas and swamp or wetland areas. Most of the forested areas on the site are subject to flooding, and, therefore, are considered woody wetlands. The majority of the Fermi site that is not developed is included as part of the Detroit River International Wildlife Refuge (DRIWR), known as the Lagoona Beach Unit. The DRIWR encompasses a 656-acre portion of the Fermi site.

The 1260 acre Fermi site is composed of approximately 16.8% developed areas and 5.1% cropland. Terrestrial habitats account for 61% of the property. The remaining 17% are water bodies, e.g., Quarry Lakes and the main body of Lake Erie that lies east and north of the site. Figure 2.1-1 illustrates the extent and location of the habitats identified and the developed areas on the Fermi site. A summary of the acres of each habitat type on the site is provided below (Reference 1).

Approximate Acres per Plant Community Present on the Fermi Site

Habitat	Acres	Percent of Site
Coastal Emergent Wetland (CEW) Open Water	35	2.8
Coastal Emergent Wetland (CEW) Vegetated	238	18.9
Grassland: Right-of-Way (GRW)	29	2.3
Grassland: Idle/Old Field/Planted (GOF)	75	6.0
Grassland: Row Crop (GRC)	64	5.1
Shrubland (SHB)	113	9.0
Thicket (TKT)	23	1.8
Forest: Coastal Shoreline (FCS)	47	3.7
Forest: Lowland Hardwood (FLH)	92	7.3
Forest: Woodlot (FWL)	117	9.3
Developed Areas (DA)	212	16.8
Lakes, Ponds, Rivers (LPR)	44	3.5
Lake Erie (main body)	171	13.6
Totals	1260	100

A brief description of the habitats is provided below.

Grassland: Row Crops (GRC): agricultural fields planted with a single species (usually corn or soybeans) and harvested annually.

Grassland: Idle/Old Field/Planted (GOF): communities of opportunistic plants that recolonize land once cleared for agriculture or other purposes. In some cases, these areas are initially planted with a cover grass, usually perennial brome or fescue, when the area is to remain idle for the long term.

Grassland: Right-of-way (GRW): linear features of previously disturbed land associated with roadways, railways, power lines, pipelines, etc. An existing power line right-of-way accounts for the majority of this classification. The power line right-of-way is periodically mowed to keep the area free of trees to maintain adequate line clearance.

Shrubland (SHB): generally upland areas with relatively dry soils dominated by deciduous shrubs. On the Fermi property, all shrublands are located in areas that were filled or otherwise severely disturbed by Fermi 1 and 2 construction activities.

Thicket (TKT): generally areas densely populated with small trees, shrubs, and saplings located between wetlands and uplands. Ground cover is sparse to lacking except in a few open areas. The low-quality species composition present suggests that the area was disturbed in the past.

Forest: Coastal Shoreline (FCS): a narrow, interrupted band along the east side of the property, adjacent to the main body of Lake Erie.

Forest: Lowland Hardwood (FLH): the most mature habitat on the Fermi property.

Forest: Woodlot (FWL): in the east-central and northwestern portions of the Fermi property. The FWL developed over fill material from Fermi 1 and Fermi 2 construction or on land otherwise heavily disturbed by Fermi 1 and 2 activities.

Coastal Emergent Wetland (CEW): the largest plant community on site. The area is divided between a north and south lagoon and an unnamed drainage corridor entering the site from the west.

Developed Areas (DA): buildings, parking areas, equipment storage areas, roadways, maintained lawns, and similar areas.

Lakes, Ponds and Rivers (LPR): water bodies including an unnamed stream draining east across the central portion of the site, Quarry Lakes, the South Canal, and Open Water H.

Lake Erie (main body): lies north and east of the project.

2.2 Topography

Topography in the vicinity is fairly flat, with some lower elevation wetland areas along the Lake Erie shoreline, including the Fermi site (Figure 2.2-1). To prevent flooding of the developed areas, these areas

were elevated during the construction of Fermi 2 using crushed limestone taken from the southwest portion of the Fermi site (Quarry Lakes). Site elevations range from the level of Lake Erie to approximately 25 feet above lake level on the western edge of the site (Reference 2). Topography on the Fermi site is relatively level in the undeveloped areas, with an elevation range of approximately 10 feet over the site according to U.S. Geological Service (USGS) topographic maps.

2.3 Soils

The overburden soils at the site consist of lacustrine deposits, glacial till, and rock fill. The rock fill is present only in the immediate area of the reactor; therefore, in the wetland areas, the overburden soils consist of lacustrine deposits and glacial till. The overburden is underlain by the Bass Islands Group dolomite bedrock. Groundwater is present in the overburden and the bedrock. The groundwater in the overburden is unconfined, while the Bass Islands Group aquifer is confined. The glacial till acts as an aquitard between the unconfined groundwater in the overburden and the confined groundwater in the Bass Islands Group aquifer.

The Monroe County Soil Survey (Reference 3) lists soil series Lenawee silty clay loam, ponded (Map Symbol 10) and Lenawee silty clay loam (21) as the primary mapped soil types on the Fermi site. Other soils found on the Fermi property include: urban land (63) on the eastern portion of the site where the existing Fermi 1 and Fermi 2 buildings and infrastructure are located; urban land-Lenawee complex (57) on the southern edge of the Fermi site; Aquents complex (31) and Blount loam (13A) on the northwestern side of the site; Pits-Aquents complex (33) in the southeast portion of the site; water (W) primarily in the southeast and northeast portions of the site; and beaches (27) along the eastern edge of the Fermi property adjacent to Lake Erie. Figure 2.3-1 depicts the soil series identified.

2.4 Vegetative Communities

Vegetative communities and wetland habitats were evaluated during detailed terrestrial surveys conducted from 2008 through 2010. In 2008 and 2009, spring, summer and fall pedestrian surveys of flora and fauna were conducted in all habitat types including wetlands on the Fermi site (Reference 4). In 2010 individual wetlands were revisited to determine Michigan Natural Community classification and wetland condition and quality. Field observations included additional vegetation inventory and evaluation of wetland characteristics similar to those suggested in the Michigan Rapid Assessment Method for Wetlands (Reference 5). The vegetative species are further described in Section 2.7. Important species habitats at the Fermi site are discussed below.

Requests for data concerning known or potential occurrences of endangered, threatened, candidate, or special concern species on the Fermi site were submitted to the United States Fish and Wildlife Service (USFWS) and the Michigan Natural Features Inventory as part of an Environmental Report to the Nuclear Regulatory Commission (NRC) in support of a Combined License Application (COLA) for the proposed Fermi 3 project. In addition, a list of threatened, endangered, or candidate species for Monroe County,

Michigan was obtained online from the Michigan Natural Features Inventory. Two species were identified by the Michigan Department of Natural Resources (MDNR) as occurring or potentially present. Species listed by MDNR as "species of special concern" are not protected under state endangered species legislation.

State-Listed Protected Species

Frank's Sedge: Frank's Sedge was previously listed as a State Species of Special Concern, but was delisted in 2009 (Reference 6). This sedge was observed in the transmission line (restored prairie area) in 2005, but was not observed in the terrestrial studies conducted from 2008 to 2010. Accordingly, no further consideration is being given to this species as being potentially affected by Fermi 3.

American Lotus: The American lotus (*Nelumbo lutea*) is a state threatened species. However, large local populations of American lotus are scattered in areas of southern Michigan, reaching an apparent peak in Monroe County (Reference 6). In the south lagoon, and to a lesser extent in the north lagoon, are large stands of American lotus. American lotus is also abundant in the South Canal (Figure 2.4-1).

2.5 Wildlife Habitat

The site was extensively surveyed for wildlife in 1973 and 1974 by NUS Corporation (Reference 7). In 2000, the Detroit Edison Fermi 2 Plant Wildlife Habitat Team, in cooperation with the Wildlife Habitat Council, prepared a Wildlife Management Plan, including updated onsite wildlife occurrences. The Wildlife Management Plan was re-certified in 2002, resulting in an updated wildlife occurrence list. The most recent terrestrial wildlife survey was conducted during 2008 and 2009 (Reference 8). Surveys were conducted quarterly in July and October 2008 and January and April 2009. Because wildlife habitats could be impacted by the construction and operation of the proposed Fermi 3 facility, the results are being used to identify wildlife present or potentially present in the project site. Most of the undeveloped portions of the Fermi site are included in the DRIWR (Figure 2.5-1). The wildlife study surveyed the onsite portion of the DRIWR.

The 2008/2009 survey was conducted to confirm data from earlier surveys and to further characterize the terrestrial wildlife species using the Fermi property. Secondarily, the survey aided in determining if important species use the site and to guide decisions concerning avoiding, minimizing or compensating for impacts to these species from the proposed expansion. As such, wildlife surveys focused on portions of the Fermi site where construction and operation of Fermi 3 could potentially impact wildlife, whether from habitat destruction, conversion to other habitat types or through general habitat degradation.

The following discussion reflects the results of the detailed wildlife survey conducted in 2008/2009 (Reference 8) and other information sources as cited, as it applies to U.S. Army Corps of Engineers (USACE) and Michigan Department of Natural Resources and Environment (MDNRE)-regulated activities.

2.5.1 Important Terrestrial Species and Habitats

The NRC's "Standard Review Plan for Environmental Reviews for Nuclear Power Plants" (NUREG-1555, Reference 9) defines "important species" as: 1) species listed or proposed for listing as threatened, endangered, candidate, or species of special concern in 50 CFR 17.11 and 50 CFR 17.12, by the USFWS, or the state in which the project is located; 2) commercially or recreationally valuable species; 3) species essential to the maintenance and survival of rare or commercially or recreationally valuable species; 4) species critical to the structure and function of local terrestrial ecosystems; or 5) species that could serve as biological indicators of effects on local terrestrial ecosystems. From the above definition, only element 1) is applicable to the species on the Fermi site and vicinity. "Important habitat" is defined by the NRC in NUREG-1555 as wildlife sanctuaries, refuges, or preserves, wetland, floodplains and areas identified as critical habitat by the USFWS. The important terrestrial species and habitats are addressed below.

Terrestrial Species - Federal Protected Species

The USFWS was consulted concerning the occurrence or potential occurrence of species on or in the vicinity of the Fermi property that are protected under the Endangered Species Act. The USFWS stated that the project occurs within the potential range of some federally listed species, but that the USFWS had no records of occurrence on the Fermi site or in the vicinity, nor was there any designated critical habitat in the area. The USFWS further stated that because of the types of habitat present at Fermi, no further action is required under Endangered Species Act. The USFWS did state that if more than 6 months pass before the project is initiated, then the USFWS should again be contacted to ensure there have been no regulatory changes. Detroit Edison will continue consultations with the USFWS per their recommendations.

The USFWS de-listed the bald eagle (*Haliaeetus leucocephalus*) as federally threatened under the Endangered Species Act, effective August 8, 2007. However, the species continues to receive federal protection under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, which prohibits the take, transport, sale, barter, trade, import and export, and possession of eagles, making it illegal for anyone to collect eagles and eagle parts, nests, or eggs without a USFWS permit.

Terrestrial Species - State-Listed Protected

The MDNR and the Michigan Natural Features Inventory (Reference 10) was consulted regarding the presence of known or potential occurrences of state-listed threatened or endangered species on the Fermi site. The only species in the USACE/MDNRE-regulated project areas is the Eastern fox snake (*Pantherophis gloydi*).

Bald Eagle: None of the previously observed bald eagle nests were observed on the Fermi site as of January 2011. The bald eagle has been delisted in Michigan; however, MDNR guidelines for bald eagle

management would follow those provided by the USFWS *National Bald Eagle Management Guidelines* (Reference 11).

Eastern Fox Snake: The Eastern fox snake is state threatened. Primarily an open wetland species, this snake inhabits emergent wetlands along Great Lakes shorelines and associated drainages where cattails are common. Little is known about the life history of the Eastern fox snake. They are typically active from mid-April to late October, usually throughout the day except during periods of intense heat. Breeding probably occurs annually beginning at two to four years of age with mating occurring in June or early July. The eggs are deposited in rotten stumps, mammal burrows, soft soil or mats of decaying vegetation. Eastern fox snakes eat small rodents and amphibians, insects and earthworms. In 2007, nine occurrences were reported in Monroe County (Reference 6). During 2008, while wetland surveys were being conducted, two fox snakes were observed on two separate occasions. In addition, fifteen separate sightings were made by Detroit Edison employees between 1990 and 2007 with 1-6 snakes identified on each occasion. In addition to minimizing wetland impacts, the fox snake's primary habitat, Detroit Edison has developed a draft mitigation plan which will be implemented to minimize the project's impact to the species.

2.5.2 Aquatic Habitat and Species Summary

The baseline conditions described in this section are based on the aquatic ecology survey conducted at the Fermi site from July 2008 through July 2009 (Reference 12). For that survey, nine representative sampling locations were chosen from a variety of aquatic habitats on and adjacent to the Fermi site. These locations were selected based on their ability to represent the aquatic resources adjacent to the site and those areas that are in proximity to the proposed new facilities and construction areas. Five of the locations selected for the study included two in Lake Erie adjacent to the intake, the South Canal, the North Canal, and Open Water H, and are discussed below (Figure 2.5-2). Open Water U was not sampled; however, because of culverts to the north (Figure 2.6-1) it is assumed to contain an assemblage of fish that is a subset of those in the North Canal.

The Lake Erie, South Canal, and North Canal locations were sampled monthly over the year-long survey period. The sampling of Open Water H ended in March 2009 because the populations in the isolated water body were not expected to undergo dramatic fluctuations.

Based upon the review of data collected in the aquatic sampling, there were no occurrences of federally and/or state listed threatened or endangered aquatic species. These results indicate that the occurrence of these species in the vicinity of the Fermi site is highly unlikely.

Lake Erie/Intake

Two areas were sampled in Lake Erie, including the Lake Erie – Intake (LE1-A) area adjacent to the intake structure and the Lake Erie – South Lagoon (LE2-A) (Figure 2.5-2).

Fish Community: A total of 1909 fish comprising 19 species were collected in eight sampling events at the LE1-A location from July 2008 through June 2009. The August 2008 sample contained the greatest total number of fish (1274) while the June 2009 sample yielded the fewest number of fish (5). Species composition was dominated by gizzard shad (*Dorosoma cepedianum*; 45%), white perch (*Morone americana*; 33%), emerald shiner (*Notropis atherinoides;* 7%), and spottail shiner (*N. hudsonius*; 6%). The 19 species of fish represented in the samples indicate an overall moderate level of species richness relative to the other locations. Monthly species richness ranged from a minimum of 1 species in November 2008 to a maximum of 12 species in July 2008.

A total of 3856 fish comprising 38 species were collected at the LE2-A location during monthly events from July 2008 through June 2009. Of the samples collected, August 2008 yielded the greatest total number of fish (1791) while the November 2008 sample represented the fewest number of fish (78). Species composition was dominated by goldfish (*Cyprinidae*; 28%), gizzard shad (16%), and emerald shiner (14%). The 38 species of fish represented in the samples indicate a relatively high level of species richness for the habitat. Monthly species richness ranged from a minimum of four species in November 2008 to a maximum of 23 species in August 2008 and October 2008.

Macroinvertebrate Community: A total of 260 individuals comprising 8 orders and 32 taxa were collected in seven monthly sampling events at the LE1-A between July 2008 and June 2009. The October 2008 sample contained the greatest number of individuals (100) while the May 2009 sample yielded no organisms and the November 2008 sample had 8. Sample composition was dominated by Amphipoda (61%) and Diptera (18%). *Gammarus fasciatus* (95%) made up a majority of the Order Amphipoda, while *Rheotanytarsus exiguus gr.* (21%) was the prevalent Dipteran.

A total of 32 taxa were represented in the samples, indicating moderate to high taxa richness for the habitat. Monthly taxa richness ranged from 0 individuals in the May 2009 sample to 19 taxa in the July 2008 sample.

The LE2-A station samples provided a total of 592 individuals representing 43 taxa for the seven monthly samples collected between July 2008 and June 2009. No sample was collected in September 2008 as a result of weather conditions. Of the samples collected, August 2008 exhibited the greatest total number of individuals (127) while the April 2009 sample had the fewest individuals (12).

Sample composition was dominated by Ephemeroptera and Amphipoda (19% each). Order Ephemeroptera was comprised entirely of *Caenis sp.,* while Amphipoda was dominated by *Gammarus fasciatus* (85%).

A total of 43 taxa were represented in the samples, indicating a high taxa richness for the habitat. Monthly taxa richness ranged from 5 taxa in November 2008 to 17 in the October 2008 and June 2009 samples.

Conclusions: Sample locations LE1-A and LE2-A had relatively high numbers of fish and species richness, which is representative of a healthy ecosystem. Gizzard shad was most prevalent in both Lake Erie stations. This is consistent with their habitat requirements which suggest that they are more common in open water environments.

The two Lake Erie sample locations had comparatively different species richness and abundance. The LE1-A location had much lower species richness and abundance levels. Even though the sampling methodologies were different, differences between the two locations are more likely attributed to differences in habitat structure associated with each location. The LE1-A location is located along a sand to gravel beach in the open waters of Lake Erie with little to no structure or habitat present for cover or spawning. The LE2-A location has sand and gravel shoreline and vegetated shoreline to support structure for cover and spawning. In addition, the LE2-A location is at the confluence of the South Lagoon which has extensive aquatic vegetation that potentially supports a larger fish population which can move freely from the lagoon out into the main body of the lake.

Macroinvertebrate samples indicate that these locations support a sufficiently structured benthic community and were moderately to highly diverse, dominated by amphipods, midges and mayflies.

South Canal

The South Canal sample location is identified as CS-A (Figure 2.5-2).

Fish Community: The South Canal samples consisted of a total of 2438 fish comprising 28 species collected from July 2008 through June 2009. The October 2008 sample contained the greatest number of fish (1,707), while the fewest were collected in June 2009 (51). Species composition was dominated by goldfish (63%), common carp (*Cyprinus carpio*; 10%), bluegill (*Lepomis macrochirus*; 5%), golden shiner (*Notemigonus crysoleucas*; 5%), and pumpkinseed (*L. gibbosus*; 5%). The 28 species of fish in the samples indicate high species richness relative to the other locations. Monthly species richness ranged from a minimum of 7 in April 2009 to a maximum of 17 in August 2008.

Macroinvertebrate Community: The South Canal samples yielded a total of 768 individuals comprising 63 taxa from the monthly samples collected between July 2008 and June 2009. The June 2009 sample had the greatest number of individuals (142), while the fewest were collected in May 2009 (70).

The samples were dominated by Ephemeroptera (26%), Amphipoda (25%), and Diptera (20%). *Caenis sp.* (98%) was the dominant Ephemeroptera, while *Hyalella azteca* (95%) and *Paratanytarsus sp.* (17%) were dominate in the Amphipoda and Diptera, respectively.

A total of 25 taxa were represented in the samples indicating a comparatively high taxa richness for the habitat. Monthly taxa richness ranged from 15 in July 2008 to 23 taxa in September 2008.

Conclusions: The South Canal sample location has relatively high numbers of fish and species richness which is representative of a healthy ecosystem. The South Canal is hydrologically connected to the south

lagoon and Lake Erie, which allows for movement of fish species to and from each of these areas. Fish composition within these areas is highly diverse with no one species being dominant.

Macroinvertebrate samples in the South Canal indicate the location supports a sufficiently structured benthic community and included high macroinvertebrate family diversity dominated by oligochaetes and mayflies.

North Canal

The North Canal sample location is identified as CN-A (Figure 2.5-2).

Fish Community: The North Canal samples consisted of a total of 1822 fish comprising 30 species in seven samples collected from July 2008 through June 2009. The September 2008 sample contained the greatest total number of fish (574), while the fewest were collected in April 2009 (52). Species composition was dominated by bluegill (22%), followed by pumpkinseed (16%), emerald shiner (11%), and gizzard shad (10%). The 30 species of fish in the samples indicate a comparatively high level of species richness for the habitat. Monthly species richness ranged from a minimum of 11 in October 2008 to a maximum of 19 species in July 2008.

Macroinvertebrate Community: The North Canal samples yielded a total of 763 individuals representing 34 taxa in seven samples collected from July 2008 through June 2009. The October 2008 sample contained the greatest total number of individuals (131), while the fewest were collected in July 2008 (99). The samples were dominated by Ephemeroptera (28%), Diptera (24%), and Tubificida (14%). *Caenis* sp. (99%) was the dominant Ephemeroptera, Diptera consisted mostly of *Dicrotendipes modestus* (18%), and Tubificida was dominated by *Naidinae* (65%).

A total of 34 taxa were represented in the samples indicating a comparatively high level of taxa richness for the habitat. Monthly taxa richness ranged from a minimum of 14 in October 2008 to a maximum of 25 taxa in April 2009.

Conclusions:

The North Canal sample location has relatively high numbers of fish and species richness which is representative of a healthy ecosystem. The North Canal is hydrologically connected to Lake Erie, Open Water U, and Swan Creek, which allows for movement of fish species to and from each of these areas. Fish composition within these areas is highly diverse with no one species being dominant.

Macroinvertebrate samples in the North Canal indicate the location supports a sufficiently structured benthic community and included high macroinvertebrate family diversity dominated by oligochaetes and mayflies.

Open Water H

Open Water H is an isolated component of the canal system. Although it appears to be part of the canal system there is not a hydrological link from Open Water H to Open Water U or the South Canal. Open Water H sample location is identified as IC-A (Figure 2.5-2).

Fish Community: A total of 861 fish comprising 13 species were collected in four samples between July 2008 and October 2008. August 2008 yielded the greatest number of fish (316); the July 2008 sample contained the fewest (118). Species composition was dominated by bluegill (58%), gizzard shad (13%), largemouth bass (*Micropterus salmoides*; 11%), and white crappie (*Pomoxis annularis*; 6%). The 13 species of fish indicate a moderate level of species richness compared to the other habitats sampled. Monthly species richness ranged from 7 in July 2008 11 in September 2008.

Macroinvertebrate Community: A total of 323 individuals representing 38 taxa were collected in four samples from July 2008 through October 2008. October 2008 yielded the greatest numbers of individuals (123); the July 2008 sample had the fewest (37).

Sample composition was dominated by Amphipoda (36%) and Diptera (31%). Order Amphipoda was consisted mostly of *Crangonyx sp.* (57%) while Diptera was made up mostly of *Tanytarsus sp.* (24%).

A total of 25 taxa were represented in the samples, indicating a comparatively moderate taxa richness for the habitat. Monthly taxa richness ranged from 11 in July 2008 to 21 taxa in August 2008.

Conclusions: Open Water H had high numbers of fish, but low to moderate numbers of species. These lower values may be attributed to the isolated nature the system. This system does consist of aquatic habitat such as fringing wetland vegetation and prey organisms necessary for supporting fish populations.

Open Water H exhibited less diversity in macroinvertebrate community compared to the other canal sites and was dominated by amphipods and oligochaetes. Open Water H had fewer individuals than the rest of the sample stations. The low numbers can be attributed to the steep banks, deep water, and rock substrate which typically do not support the types of benthic organisms identified at the other sample locations.

2.6 Site Hydrology

Currently the hydrology of the area is influenced by the physical processes of Lake Erie. Lake Erie has a perfect seiche fetch. With a predominant southwest wind, specific locations on Lake Erie are susceptible to great fluctuations in water levels due to sustained winds pushing the lake water to the east, and then, as the winds subside, the water levelizes across the lake. This creates large waterless expanses followed quickly by water inundating creek and river mouths, resulting in a bathtub like "sloshing" effect. This creates unique opportunities for both plants and wildlife. Other local hydrological conditions are dictated by the Swan Creek.

Water is seasonally to permanently present throughout the majority of the Fermi site. Average annual precipitation is 31.5 inches and generally well distributed throughout the year. The site receives direct, surface runoff from a 2440 acre drainage basin with cropland, wetland and forest as the primary cover types. Surface water is received from Lake Erie during periods of high water and storm events. (Reference 13)

Construction of Fermi 3 will likely require pumping groundwater to dewater the excavation, which will extend into the Bass Islands Group dolomite bedrock. Several potential approaches for dewatering are under consideration. All the dewatering approaches include hydraulic barriers to prevent groundwater from entering the excavation. Even with the hydraulic barriers in place, it is likely that some groundwater will still leak into the excavation. Use of the barriers will minimize the amount of groundwater that will be removed, thereby minimizing any impacts to areas outside of the installed hydraulic barriers.

The hydrology of the Fermi palustrine emergent (PEM) wetland areas is controlled almost entirely by the elevation of surface water in Swan Creek and Lake Erie. As shown on Figure 2.6-1, the surface water in Swan Creek to the north and Lake Erie to the south of the existing Fermi units is directly connected to the PEM areas on the Fermi site. Figure 2.6-1 shows locations of five sets of large-diameter culverts that connect the majority of the inland PEM areas west of Doxy Road with the PEM areas that are directly connected with Swan Creek and Lake Erie. These culverts allow free flow of surface water throughout the interconnected PEM areas. Therefore, the surface water level in the majority of the PEM areas is directly controlled by the surface water elevation of Lake Erie and Swan Creek, rather than groundwater levels.

Palustrine forested (PFO) and palustrine scrub-shrub (PSS) areas on the Fermi site are, for the most part, contiguous with the PEM areas. Therefore, these areas are hydraulically connected with the PEM wetlands, so the groundwater level in these areas is influenced by the surface water levels in Swan Creek and Lake Erie. With the exception of a few wetlands isolated by berms or roads, the majority of wetland communities on the Fermi property are hydrologically connected and thus considered one wetland system.

The extent of aquatic vegetation on the Fermi site fluctuates annually depending on water conditions in Lake Erie. High water years are associated with more open water on the site and less aquatic vegetation. The 1981 aerial photograph in Figure 2.6-2 illustrates relatively high water conditions, while Figure 2.6-1 (which was taken in 2005) shows an increase in vegetation in the lagoons during low water periods.

Figure 2.6-3 provides hydrographs from June 2007 to May 2008 for monitoring wells and piezometers at the Fermi site. Monitoring wells MW-381S, MW-388S, and MW-393S monitor the groundwater in the overburden and are located away from the PEM areas, near the PFO and PSS areas. At MW-381S and MW-393S, the groundwater level in the shallow wells varied approximately 5 to 7 feet, while at MW-388S the groundwater level varied approximately 4 feet over the year of measurements, with all three wells

showing the same fluctuation trend. During this time no improvement or deterioration in the PFO and PSS areas was reported. This 4- to 7-foot natural variation in the groundwater level in the overburden indicates that groundwater level variations do not negatively impact the PFO and PSS areas, and that precipitation has more influence on these systems.

As part of the COL application, a groundwater model was developed to estimate the dewatering impacts within the Bass Islands Group dolomite. The estimated drawdown of the potentiometric surface of the Bass Islands Group aquifer beneath the PFO and PSS areas ranges from less than 1 foot to approximately 3 feet, depending on the hydraulic barrier installed. The dewatering pumping rate estimated using the groundwater model ranges from approximately 50 to 90 gallons per minute, and depends on the type of hydraulic barrier system in place.

The glacial and lacustrine deposits are characterized by very low horizontal hydraulic conductivity. A slug test in clay at Piezometer P-389 yielded a horizontal hydraulic conductivity estimate of 0.13 feet/day. Vertical hydraulic conductivity is generally assumed to be significantly lower than horizontal hydraulic conductivity, due to bedding plane structures and the flat, plate-like shape of clay particles. Laboratory test results for (vertical) hydraulic conductivity in samples of clay collected from P-385S, MW-387S, and MW-384S are 5.8E-5 feet/day, 6.2E-5 feet/day, and 3.7E-5 feet/day, respectively. These vertical hydraulic conductivity values for the clay overburden are lower than the hydraulic conductivity in the bedrock. Therefore, based on these hydraulic conductivities, dewatering is not expected to have significant impacts to wetlands.

2.7 Aquatic Resources

2.7.1 Wetland Mapping, Delineation, and Jurisdiction

In 2008, Detroit Edison delineated wetland boundaries on 1106 acres at the Fermi site and presented the delineation results in the 2008 Wetland Investigation Report (Reference 13). The wetland delineation was conducted between May 16, 2008 and June 13, 2008 using the 1987 USACE Wetlands Delineation Manual (Reference 14), cross-referencing the MDNRE delineation methods. All wetlands on the site were surveyed, the boundaries were mapped and wetland types were classified according to Reference 15. Summaries of key soil, vegetation and hydrology characteristics used to determine wetland boundaries and classifications were provided.

The 2008 Wetland Investigation Report was provided to MDNRE and USACE in 2008 with a request for review and a jurisdictional determination. Jurisdictional determination letters were provided by MDNRE on November 7, 2008 (Reference 16) and March 30, 2009 (Reference 17) and by USACE on November 9, 2010 (Reference 18). Minor modifications were made to the wetland boundaries in 2010 in response to the jurisdictional determination. Additional updates to the wetland delineation were based on site visits and verbal and written feedback from MDNRE and USACE. These include a delineation of wetland fringe around open water H and open water U and reclassification of the South Canal from open water (OW) to

palustrine emergent marsh (PEM). Watershed assessments of the northern section of the Ottawa-Stony Creek and the Western Lake Erie Coastal Zone were completed to further inform development strategies and conservation priorities at the Fermi site.

2.7.2 Wetland Conditions, Functions and Values

Wetland habitats were evaluated during detailed terrestrial surveys conducted from 2008 through 2010. In 2008 and 2009 pedestrian surveys of flora and fauna were conducted in all habitat types, including wetlands, on the Fermi site (Reference 4 and Reference 8). In 2010 individual wetlands were revisited to determine Michigan Natural Community classification and wetland condition and quality. Field observations included additional vegetation inventory and evaluation of wetland characteristics similar to those suggested in the Michigan Rapid Assessment Method for Wetlands. These wetland characteristics include wetland size and connectivity, adjacent area use, hydrologic alterations and soil disturbance, habitat structure, and presence of invasive species. The results of the 2008/2009 terrestrial surveys, 2010 field visits, and feedback from regulatory staff were used to further evaluate individual wetlands potentially impacted by proposed Fermi 3 development activities and to define appropriate compensation ratios. The wetland delineation boundaries on the Fermi site are presented on Figure 2.7-1. The following section details the results of this evaluation and identifies compensation ratios for each wetland area discussed.

2.7.2.1 Michigan Natural Community Classification and Mitigation Ratios

Chapter 324, Section 303.01(t) of the Michigan Natural Resources and Environmental Protection Act identifies Michigan Natural Communities that are considered rare and imperiled. These include Great Lakes marsh and southern swamp (southern hardwood swamp). At the Fermi site, these communities are found relatively intact in Wetlands C, M and the South Canal (Great Lakes marsh) and I, F, BB/EE/FF and L (southern swamp). Impacts to these wetlands will require a 5:1 replacement ratio. Wetland E is a combination of emergent marsh/wet meadow and southern shrub carr with direct surface water connection to Lake Erie requiring a 2:1 replacement ratio (coastal wetland ratio).

The other wetlands potentially impacted by Fermi 3 activities do not readily fall into a natural community category due to variables such as fragmentation and disturbance. Any wetland considered "other" that is connected hydrologically to Lake Erie or is within 1000 feet of the ordinary high water mark (elevation 571.6 ft IGLD 1955) is considered coastal and a 2:1 mitigation ratio applies. This excludes Wetland A and possibly Open Water H and Wetlands II and JJ. If any of the open water areas were officially developed as stormwater areas exemptions may apply. The depth of open water areas H and U may mean they are not protected as wetlands. Anything up to 2 meters in depth is considered wetland. MDNRE staff indicated that condition and quality are relevant factors in any mitigation proposed for areas that are fragmented with a high level of disturbance (not just invasive species), limited functions and that do not match a natural community description. It would not be expected that these areas, which include

B, D, R, T, Y, AA, II, JJ, and KK would require a 5:1 mitigation ratio. These "other" wetlands would require a 2:1 ratio if they are considered coastal and a 1.5:1 ratio if they are not.

2.7.2.2 Wetlands Potentially Impacted by Activities at Fermi

The following section provides details associated with individual wetlands that may be impacted by activities associated with the Fermi 3 project. Wetlands are grouped according to area and potential impact rather than listed singly and organized by letter. Table 2.7-1 provides a quick cross-reference for individual wetlands discussed.

2.7.2.2.1 Wetlands AA, II, JJ (Figure 2.7-2)

Description, Condition, Functions and Values

Wetland AA is a triangular-shaped PEM wetland containing 0.80 acres northeast of Fox Road and south of wetland L. Wetland II is a 0.52-acre ditch southwest of Wetland AA and along the south side of Fox Road. Wetland JJ is a 1.37-acre ditch on the north side of Acorn Road and east side of Quarry Lake Road (Figure 2.7-2). Wetlands AA, II and JJ are in an established spoil area and share the following properties:

- Highly disturbed by fill (spoil piles, concrete, gravel), ditching and multiple access roads
- Vegetation communities with high structural diversity and low species diversity with well-established invasive species populations including common reed *(Phragmites australis)* and reed canary grass *(Phalaris arundinacea)*. Other common vegetation species include eastern cottonwood (*Populus deltoides),* gray-stemmed dogwood *(Cornus racemosa)* and riverbank grape (*Vitis riparia)*
- Water is seasonally present

These three wetlands provide minimal floodflow alteration, sediment/toxicant retention and nutrient removal. Wetlands II and JJ are ditches adjacent to the roadside which contain sparse wetland vegetation. All three wetland areas are dominated by invasive species such as common reed *(Phragmites australis).* These wetlands are of poor quality, limited size and connectivity.

Natural Community Type and Mitigation Ratios

Wetland AA is an emergent marsh dominated by non-native species. It does not represent a Michigan Natural Community but maintains a connection to Lake Erie. The compensation ratio for impacts to this wetland will be 2:1. Wetland II and JJ are located along roadside ditches. They do not represent a Michigan Natural Community and are non-coastal. The compensation ratio for impacts to these areas will be 1.5:1.

2.7.2.2.2 Wetlands L, M, Y, R and T (Figure 2.7-3)

Description, Condition, Functions and Values

Wetland L is a 63.12-acre PFO wetland along the east side of Quarry Lake Road and north of Pointe Aux Peaux Road. Wetland M is a 161.65-acre PEM wetland south of Fermi Drive; east of Quarry Lake Road, and west of Boomerang Road. Wetland Y is a 1.14-acre PFO wetland along the west side of Quarry Lake Road. Wetland R is a 1.97-acre PEM wetland southwest of Long Road in the southeastern portion of the Fermi site. Wetland T is a 5.71-acre PFO wetland also southwest of Long Road in the southeastern portion of the property. Existing manmade berms divide Wetland M from both wetland T and R (Figure 2.7-3).

Wetland L is a relatively large, intact PFO wetland. Vegetation species include silver maple (*Acer saccharinum),* American hornbeam *(Carpinus caroliniana*), American elm *(Ulmus americana),* American basswood *(Tilia americana),* shagbark hickory *(Carya ovata),* green ash (*Fraxinus pennsylvanica*), silky dogwood *(C. amomum*), common buckthorn *(Rhamnus cathartica),* poison ivy (*Toxicodendron radicans),* Virginia creeper *(Parthenocissus quinquefolia),* riverbank grape *(V. riparia*), garlic mustard *(Alliaria petiolata),* Canada anemone *(Anemone canadensis),* aster *(Aster spp.),* yellow rocket (*Barbarea vulgaris),* false nettle (*Boehmeria cylindrica*), sedges (*Carex spp.),* enchanter's nightshade (*Circaea lutetiana*), wild strawberry (*Fragaria virginiana*), white avens (*Geum canadense*), fowl manna grass (*Glyceria striata*), touch-me-not (*Impatiens spp.),* whitegrass (*Leersia Virginica*), moneywort (*Lysimachia nummularia*), common yellow wood sorrel (*Oxalis stricta*), reed canary grass, common reed, jumpseed (*Polygonum virginianum*), Maryland sanicle (*Sanicula marilandica*), goldenrod (*Solidago spp.*) and Canadian white violet (*Viola canadensis*). The species with the greatest cover were silver maple, reed canary grass, jumpseed, moneywort, poison ivy, and whitegrass.

Wetland M is a large coastal marsh directly connected to Lake Erie and includes an expanse of open water with submerged and floating aquatic vegetation [pondweed (*Potamogeton spp.*), common waterweed (*Elodea canadensis*), bladderwort (*Utricularia spp.),* coontail (*Ceratophyllum demersum*), lotus (*Nelumbo spp.*)] surrounded by zones of weak-stemmed and robust emergent vegetation [(cattail (*Typha spp.*), common reed, arrowhead (*Sagittaria spp.*), bulrush (*Scirpus spp.*), American bur-reed (*Sparganium americanum*)] eventually grading into a shrubby edge that becomes Wetland L to the south and west.

Wetland Y is a fragmented early successional PFO wetland with mixed vegetation and a partially open canopy. This wetland includes many of the species listed above for Wetland L with a greater component of invasive and pioneer species such as eastern cottonwood and common reed.

Edge properties of these wetlands differ markedly from interior areas and are similar in character. These wetlands share the following characteristics along the edge:

- Open or partially open tree canopy due to ash die-off

- Significant cover of invasive species including common reed and reed canary grass
- Early successional and edge species such as eastern cottonwood, silky dogwood, buckthorn, American elm saplings, riverbank grape, grasses and sedges
- Disturbance including ditching, dumping (concrete/metal), activity on adjacent access roads, quarry lakes and parking areas.

Wetlands L and M represent intact PFO and PEM wetland habitats that are large, flat and have significant storage potential with dense vegetation and slow water flow. These two wetlands have diverse cover types and conditions ranging from fragmented, highly disturbed shrub-forested edges to an interior coastal marsh with well-established zonation and an intact PFO with a predominance of native vegetation. These wetlands are directly connected to Lake Erie and provide floodflow alteration, sediment/toxicant retention, nutrient removal and wildlife habitat functions. The western edge of Wetlands L and M exhibit vegetation communities and conditions that reflect a high degree of disturbance including invasive species and altered hydrology associated with the adjacent roadway and other human activities. The edges of Wetlands L and M provide a buffer for the interior and less disturbed wetland conditions. Wetland Y is a small, fragmented wetland with similar properties to the western edge of Wetlands L and M including invasive species and altered hydrology. Wetland Y provides marginal wildlife habitat for edge species and limited water storage.

Wetland R is a small patch of PEM wetland dominated by common reed. Wetland T is a young PFO wetland with partially closed canopy and a mix of upland and wetland vegetation communities dominated by invasive and pioneer species including common reed, reed canary grass, riverbank grape, eastern cottonwood, box elder, and poison ivy.

Much of Wetlands R and T are highly disturbed with fill from past residential and agricultural practices, extensive ditching and draining, refuse from past and nearby residential areas, and a predominance of invasive species including common reed and reed canary grass. The forested portions of these wetlands have relatively small trees with the exception of larger eastern cottonwoods. The wetlands are disconnected hydrologically to varying degrees from coastal Wetland M and Lake Erie. The primary function of Wetlands R and T is low quality wildlife habitat and buffer. These wetlands provide early-successional wildlife habitat for edge species and a buffer for Wetland M and Lake Erie.

Natural Community Type and Mitigation Ratio

Wetland L represents a relatively intact, coastal wetland with a vegetation community typical of southern hardwood swamps. Southern hardwood swamp is a Michigan Natural Community that is considered rare and imperiled by MDNRE and the compensation ratio for any impacts will be 5:1.

Wetland M represents the Great Lakes marsh Michigan Natural Community which is considered rare and imperiled by MNDRE. The compensation ratio for impacts to Wetland M will be 5:1.

Wetland Y is a forested wetland with a high level of disturbance and both pioneer and non-native species as the major representatives. The wetland is coastal, but does not represent a Michigan Natural Community. The compensation ratio for impacts to this wetland will be 2:1.

Wetlands R and T are highly disturbed, PEM and early successional forested wetlands that, while connected to the coastal system, are not natural communities. The compensation ratio for impacts to these wetlands will be 2:1.

2.7.2.2.3 Wetland BB/EE/FF (Figure 2.7-4)

Description, Condition, Functions and Values

Wetland BB is an 11.80-acre PFO wetland. Wetland EE (0.77 acres) and Wetland FF (0.39 acres) are PEM linear ditch wetlands running along the eastern and northern edges of Wetland BB. These three wetlands are considered together as Wetland BB/EE/FF as described below (Figure 2.7-4).

Wetland BB/EE/FF is an intact PFO wetland with relatively high diversity. The wetland interior has a closed canopy and open understory dominated by grasses and large woody debris. While there is some hydrological connection via culverts, Wetland BB/EE/FF is fragmented from other wetlands by multiple roads and developed/agricultural areas. Vegetation species include a mix of upland and wetland vegetation such as silver maple, American elm, American basswood, green ash, box elder (*Acer negundo*), silky dogwood, rough-leaved dogwood (*C. drummondii*), common buckthorn, poison ivy, Virginia creeper riverbank grape, garlic mustard, Canada anemone, swamp agrimony (*Agrimonia parviflora*), beggarticks (*Bidens spp.*), false nettle, sedges, enchanter's nightshade (*Circaea lutetiana*), creeping thistle (*Cirsium arvense*), cleavers (*Galium aparine*), wild strawberry, white avens, fowl manna grass, spotted touch-me-not (*I. capensis*), whitegrass, moneywort, horehound (*Lycopus spp.*), common yellow wood sorrel, sensitive fern (*Onoclea sensibilis*), clearweed (*Pilea pumila*), multiflora rose (*Rosa multiflora*), blackberry (*Rubus spp.*), reed canary grass, common reed, jumpseed, Maryland sanicle, stinging nettle, trillium (*Trillium spp.)* and Canadian white violet. The species with the greatest cover were silver maple, reed canary grass, jumpseed, moneywort, poison ivy, and whitegrass.

The edges of Wetland BB/EE/FF are characterized by pioneer and early successional species, invasive species and a greater degree of disturbance than the interior wetland area. Vegetation species include reed canary grass, common reed, sedges, buckthorn, silky dogwood, eastern cottonwood and riverbank grape. These wetlands are immediately adjacent to access roads (paved and gravel).

While there has been notable evidence of past disturbance, Wetland BB/EE/FF represents an intact PFO wetland with dense, diverse vegetation. Both native and invasive vegetation communities are present. The wetland is connected hydrologically with culverts but fragmented from other wetland areas and Lake Erie due to multiple roadways completely surrounding the site. The primary function of Wetland BB/EE/FF is wildlife habitat. The edges of the wetland exhibit vegetation communities and conditions that

reflect a high degree of disturbance, including invasive species and altered hydrology associated with ditching, the adjacent roadway and other human activities. These edge wetlands provide wildlife habitat for edge species and a buffer for the interior and less disturbed wetland conditions of Wetland BB.

Natural Community Type and Mitigation Ratios

Wetland BB, supported by EE and FF as edge and buffer, represents a relatively intact, coastal wetland with vegetation communities typical of southern hardwood swamps. Southern hardwood swamp is a Michigan Natural Community that is considered rare and imperiled by MDNRE and the compensation ratio for any impacts will be 5:1.

2.7.2.2.4 Wetlands A, B, C, D, E (Figure 2.7-5 and Figure 2.7-7)

Description, Condition, Functions and Values

Wetland A is a 1.88-acre PEM wet meadow on the north side of Fermi Drive in between restored prairie grass habitat to the east and west and south of upland and Wetland F. Wetland B is a 0.76-acre PFO wetland along the ditch adjacent to railway and the north edge of Fermi Drive near Wetlands E-North and E-South and C. Wetland C is a 48.18-acre PEM wetland north of Fermi Drive extending north along the west side of Doxy Road and to the northwest boundary of the Fermi site. Wetland D is a 1.37-acre PFO wetland located north of Fermi Drive, west of Doxy Road and is surrounded by Wetlands C and E-North and E-south. Wetland E was delineated as a 4.71-acre PSS wetland north of Fermi Drive in power line right-of-ways with two sections (E-North and E-South) split by Wetland D and bordered to the north by restored prairie grassland habitat. The 2.67-acre portion of Wetland E-North has been brush-hogged leaving a mix of wet meadow and upland old field herbaceous species. These wetlands are shown on Figures 2.7-5 and 2.7-7.

Wetland A is surrounded by a fringe of silky and rough-leaf dogwood, riverbank grape and willow (*Salix spp.*). The herbaceous layer is dominated by reed canary grass with few individuals of other species including sedge, wild carrot (*Daucus carota*), purple coneflower (*Echinacea purpurea*), Canada wild rye (*Elymus canadensis*), annual fleabane (*Erigeron annuus*), cleavers, bedstraw, wild strawberry, white avens, fowl manna grass, black medick (*Medicago lupulina*), wild bergamot (*Monarda fistulosa*), common yellow wood sorrel, witchgrass (*Panicum capillare*), Virginia plantain (*Plantago virginica*), common cinquefoil (*Potentilla simplex*), common selfheal (*Prunella vulgaris*), prairie coneflower (*Ratibida spp.*), blackberry, black-eyed susan (*Rudbeckia hirta*), little bluestem (*Schizachyrium scoparium*), yellow foxtail (*Setaria glauca*), Canada goldenrod (*Solidago canadensis*), indiangrass (*Sorghastrum nutans*), dandelion (*Taraxacum officinale*) and violet (*Viola spp.*). Many of these species are along the fringes and a result of the prairie restoration plantings.

The restored prairie habitat is associated with an existing power line right-of-way that is previously disturbed. The power line right-of-way is periodically mowed to discourage the growth of woody species.

The prairie was planted in 2003 by Detroit Edison with the assistance of a North American Wetland Conservation Act grant managed by Ducks Unlimited and the Natural Resources Conservation Service (NRCS). The area is dominated by big bluestem (*Andropogon gerardii*) and Indiangrass (*Sorghastrum avenaceum*). Broomsedge (*A. virginicus*) is an undesirable and invasive grass that is relatively common in the area and is even abundant in some localities. Other undesirable plants are also present, including purple loosestrife (*Lythrum salicaria*), common reed, teasel (*Dipsacus sylvestris*), and all non-native species.

Wetland B is an early successional forested ditch dominated by Eastern cottonwood and willow species.

Wetland C grades into PSS and PFO wetland areas to the north and south and bound by Doxy Road to the southeast and Bullit Road to the northwest. It is isolated from Lake Erie by access roads but is connected hydrologically through culverts. This wetland has low vegetation species diversity and is dominated by common reed, cattail and reed canary grass.

Wetland D has a partially open canopy. Dominant tree species include silver maple and young and dying green ash. A relatively dense herbaceous understory is dominated by reed canary grass, common reed and wet meadow species such as blue vervain (*Verbena hastata*), sedges, beggarticks and grass species (*Poa spp., Elymus spp.).*

Vegetation diversity is high in Wetland E with a mix of upland and wetland sapling, shrub and herbaceous vegetation. Species include box elder, red maple (*A. rubrum*), green ash, Eastern cottonwood, American elm, silky and rough-leaf dogwood, poison ivy, riverbank grape, swamp agrimony (*Agrimonia parviflora*), quackgrass (*Agropyron repens*), creeping bentgrass (*Agrostis stolonifera*), wild chives (*Allium schoenoprasum*), onion (*Allium spp.*), annual ragweed (*Ambrosia artemisiifolia*), giant ragweed (*A. trifida*), big bluestem, Canada anemone, dogbane (*Apocynum spp.*), white heath aster (*Aster pilosus*), white panicle aster (*A. simplex*), yellow rocket, beggarticks, smooth brome (*Bromus inermis*), Japanese brome (*B. japonicas*), bluejoint grass (*Calamagrostis canadensis*), sedge, ox-eye daisy (*Chrysanthemum leucanthemum*), creeping thistle (*Cirsium arvense*), field thistle (*C. discolor*), wild carrot, rosette grass (*Dichanthelium spp.*), fuller's teasel (*D. fullonum*), purple coneflower, barnyard grass (*Echinochloa crusgalli*), bald spikerush (*Eleocharis erythropoda*), Canada wild rye (*Elymus canadensis*), annual fleabane (*Erigeron annuus*), Philadelphia fleabane (*E. Philadelphicus*), daisy fleabane (*E. strigosus*), late boneset (*Eupatorium serotinum*), spurge (*Euphorbia spp.)*, flattop-fragrant goldenrod (*Euthamia graminifolia*), wild strawberry, bedstraw, wild geranium (*Geranium maculatum*), white avens, fowl manna grass, Dudley's rush (*Juncus dudleyi*), inland rush (*J. interior*), grassleaf rush (*J. marginatus*), lettuce (*Lactuca spp.*), whitegrass, prairie blazing star (*Liatris pycnostachya*), great blue lobelia (*Lobelia siphilitica*), horehound, bugleweed (*Lycopus virginicus*), fringed loosestrife (*Lysimachia ciliata*), moneywort, purple loosestrife, black medick, sweet white clover (*Melilotus alba*), wild mint (*Mentha arvensis*), wild bergamot (*Monarda fistulosa*), sensitive fern, common yellow wood sorrel, witchgrass

(*Panicum capillare*), reed canary grass, common reed, common plantain (*Plantago major*), blackseed plantain (P. rugelii), Virginia plantain (*P. virginica*), Canada bluegrass (*Poa compressa*), Kentucky bluegrass (*P. pratensis*), woodland bluegrass (*P. sylvestris*), sulphur cinquefoil (*Potentilla recta*), common cinquefoil, common selfheal, narrowleaf mountain mint (*Pycnanthemum tenuifolium*), pinnate prairie coneflower (*Ratibida pinnata*), currant (*Ribes spp.*), rose (*Rosa spp.*), blackberry, black-eyed susan, rose pink (*Sabatia angularis*), willow, little bluestem (*Schizachyrium scoparium*), dark green bulrush (*Scirpus atrovirens*), nodding bulrush (*S. pendulus*), yellow foxtail, narrowleaf blue-eyed grass (*Sisyrinchium angustifolium*), Canada goldenrod, Indiangrass, dandelion, moth mullein (*Verbascum blattaria*), blue vervain, Baldwin's ironweed (*Vernonia baldwinii*) and violet. This high species diversity is in part due to the ongoing right-of-way mowing which keeps this area in a perpetual state of early succession and also due to its location at the edge of the prairie restoration plantings.

Natural Community Type and Mitigation Ratio

Wetland A is a small, isolated wetland that does not represent a Michigan Natural Community and is not regulated by MDNRE. No compensation ratio for impacts to this wetland is required.

Wetlands B and D are forested wetlands and are similar in composition. These areas each have a high level of disturbance with mostly pioneer and non-native species. The wetlands are coastal, but do not represent a Michigan Natural Community. The compensation ratio for impacts to these wetlands will be 2:1.

Wetland C represents the Great Lakes marsh Michigan Natural Community which is considered rare and imperiled by MNDRE. The compensation ratio for impacts to these wetlands will be 5:1.

Wetland E is shown represented on the map in two distinct parts, one more northerly (E-North) and one more southerly (E-South). The E-North portion is an emergent marsh/wet meadow that does not represent a Michigan Natural Community and the E-South portion could be either a southern shrub carr or other coastal wetland type. The compensation ratio for impacts to both of these wetlands will be 2:1.

2.7.2.2.5 Areas H and U, South Canal and Wetland KK (Figure 2.7-6)

Description, Condition, Functions and Values

Three waterbodies, referred to as H, U and the South Canal, receive stormwater from onsite surface runoff. Area H is a 1.86-acre open water area along the southeast side of Doxy Road. Area U is a 3.32-acre linear open water area north of Area H and also along the southeast side of Doxy Road. The South Canal is a 1.97-acre PEM linear wetland. Connected to the South Canal adjacent to the west is Wetland KK, a linear 1.62 acres of low quality PFO wetland. These areas are shown on Figure 2.7-6.

Areas H and U are created open water areas with no submerged or floating vegetation. The edges are steep, rocky slopes with a 1 to 2-foot band of sparse vegetation dominated by common reed. Other species observed include purple loosestrife, silky dogwood, and riverbank grape. These areas are

immediately adjacent to parking areas, utility infrastructure, access roads and receive significant human disturbance.

The South Canal/linear wetland is a PEM with typical marsh zonation from open water with submerged and floating vegetation to 10-12 feet of weak-stemmed and robust emergent vegetation along the edges ending in shrub and sapling borders. The width of the emergent vegetation thickens toward the middle and north end of the linear wetland. Vegetation is diverse and includes pondweed, common waterweed, bladderwort, coontail, duckweed (*Lemna spp.*), common reed, arrowhead, American bur-reed, silky dogwood, riverbank grape and American lotus at the southern end near Fermi Drive. The South Canal functions primarily as habitat for fish and wildlife species with connectivity via culvert to two large PEM wetlands (Wetland M and C).

Wetland KK is a highly disturbed, early successional wetland with an open canopy dominated by pioneer and invasive species such as Eastern cottonwood, reed canary grass, blackberry and common reed. Several trees were damaged in a recent storm (June 2010) and downed trees and woodchips from clean-up efforts litter the understory.

Open water areas H and U provide minimal floodflow alteration, sediment/toxicant retention and nutrient removal functions but little, if any, wildlife habitat. Functions provided primarily by the South Canal and to a lesser degree Wetland KK include floodflow alteration, sediment/toxicant retention, nutrient removal, biodiversity and wildlife habitat.

Natural Community Type and Mitigation Ratio

The South Canal, to the east of and adjacent to wetland KK, is connected to Wetland M and Lake Erie. The area is shallow enough to support vegetation zones typical of Great Lakes marsh communities including submerged aquatic, floating-leaved, weak-stemmed and robust emergent vegetation. The Great Lakes marsh Michigan Natural Community is considered rare and imperiled by MNDRE. The compensation ratio for impacts to these wetlands will be 5:1.

The wetland edge along H and U is narrow, steep and dominated by invasive species. The compensation ratio for impacts to wetland edge in H and U will be 1.5:1. The open water areas of H and U are not considered wetland and there is no mitigation proposed for any impacts to these areas.

Wetland KK is a highly disturbed, early successional forested wetland that, while connected to the coastal system, is not a natural community. The compensation ratio for impacts to this wetland will be 2:1.

2.7.2.2.6 Wetland I and F (Figure 2.7-7)

Description, Condition, Functions and Values

Wetland I is a 39.74-acre PFO wetland on the northwest perimeter of the Fermi site immediately east of Bullit Road. Wetland F is a 31.07-acre PFO wetland also on the northwest perimeter of the Fermi site immediately east of Bullit Road and separated from Wetland I by PEM Wetland C (Figure 2.7-7).

Wetland I grades into PEM Wetland C to the west, north and south. Wetland F grades into PEM Wetland C to the east, Wetlands C and E to the south and Wetland A and upland prairie to the west. Vegetation in these two wetlands is diverse, reflecting mixed upland and wetland conditions with hydrological fluctuations and evidence of past disturbance including ditching and soil piles. Species include silver maple, green ash, American elm, hop hornbeam (*Ostrya virginiana*), silky dogwood, rough-leaved dogwood, downy hawthorne (*Crataegus mollis*), honey locust (*Gleditsia triacanthos*), Virginia creeper, poison ivy, riverbank grape, Canadian honeywort (*Cerinthe spp.*), wild carrot, bottle brush grass (*Elymus hystrix*), Virginia wild rye (*E. virginicus*), false nettle, moneywort, sedge, creeping thistle, enchanter's nightshade, swamp agrimony, beggarticks, garlic mustard, giant ragweed (*Ambrosia trifida),* American hogpeanut (*Amphicarpaea bracteata*), heath aster (*A. ericoides*), Spanish needles (*Bidens bipinnata*), bedstraw (*Galium spp.*), wild geranium, white avens, fowl manna grass, Virginia stickseed (*Hackelia virginiana*), prince's feather (*Polygonum orientale*), whitegrass, reed canary grass, common yellow wood sorrel, clearweed, common reed, common plantain (*Plantago major*), Virginia waterleaf (*Hydrophyllum virginianum*), touch-me-not, climbing false buckwheat (*Polygonum scandens*), white vervain (*Verbena urticifolia*), jumpseed (*Polygonum virginianum*), buckthorn, rose, multiflora rose, blackberry, snakeroot (*Sanicula spp.*), stinging nettle, and violet. The species with the greatest cover were silver maple, reed canary grass, jumpseed, moneywort, poison ivy and whitegrass.

Wetlands I and F represent intact PFO wetland habitat. The wetlands are large, flat and have significant storage potential with dense vegetation and slow water flow. There is some diversity in structure and cover ranging from a disturbed, partially open canopy at the edges to a closed canopy interior with a predominance of native vegetation. These wetlands are indirectly connected to Lake Erie and provide floodflow alteration, sediment/toxicant retention, nutrient removal and wildlife habitat functions. The northern edge of Wetlands I and F exhibit vegetation communities and conditions that reflect a high degree of disturbance including invasive species and altered hydrology associated with the adjacent roadway and other human activities. This edge provides a buffer for the interior and less disturbed wetland.

Natural Community Type and Mitigation Ratio

Wetlands I and F represent relatively intact, coastal wetlands with vegetation communities typical of southern hardwood swamps. Southern hardwood swamp is a Michigan Natural Community that is considered rare and imperiled by MDNRE and the compensation ratio for any impacts will be 5:1.

2.7.2.2.8 Wetland W (Figure 2.7-8)

Description, Condition, Functions and Values

Wetland W is a 4.59-acre PEM wetland in the southeast corner of the Fermi site and adjacent and to the west of Wetland X and the Quarry Lakes, east of Critical Path and north of the Nuclear Training Center (Figure 2.7-8).

Wetland W is disturbed and dominated by low species diversity with well-established invasive species populations including common reed and reed canary grass. Wetland W is isolated from other wetlands and provides minimal floodflow alteration, sediment/toxicant retention, nutrient removal and marginal wildlife habitat.

Natural Community Type and Mitigation Ratio

Wetland W is a disturbed PEM wetland and does not represent a Michigan Natural Community. The compensation ratio for impacts to this wetland will be 2:1.

2.7.3 Streams

An intermittent unnamed stream is located offsite and northwest of the Fermi site (Figure 2.2-1). The intermittent stream is part of an agricultural drainage system. The intermittent stream enters the Fermi site via a culvert under Toll Road and connects with Wetland C. Wetland C is a large PEM wetland located north of Fermi Drive extending north along the west side of Doxy Road and to the northwest boundary of the Fermi site. It is isolated from Lake Erie by access roads but is connected hydrologically through culverts. There is not continuous flow from Wetland C.

2.8 Watershed Analysis

As part of the natural resource assessment effort, Detroit Edison conducted a watershed analysis to provide a broader geographic context to guide land use decisions at the Fermi site. The purpose of the watershed assessment is to provide an analysis of land use features of the inland and coastal watersheds associated with the Fermi site and evaluate the connection between natural resources on the Fermi site and site-specific and watershed conservation priorities. The watershed assessment also provides a landscape-level perspective useful in consideration of any land use changes, proposed impacts and proposed compensation strategies.

The Fermi site is in the northern portion of the Ottawa-Stony watershed (OSW), U.S. Geological Survey (USGS) Cataloging Unit and Hydrologic Unit Code (HUC): 04100001. The OSW drains areas to the north and west of Lake Erie and flows directly into the lake (Figure 2.8-1). The Fermi site and the proposed offsite mitigation area are in the lowest reaches of the OSW in the coastal zone of Western Lake Erie in Monroe County (Figure 2.8-2).

The northern portion of the OSW has a drainage basin of approximately 183,000 acres and is dominated by agriculture (55%). Approximately 25% of the OSW land area is in natural cover and approximately 20% is developed (Figure 2.8-1).

As described in NRC RAI TE4.3.1-6, the coastal management zone as defined by MDNRE's Coastal Zone Boundary Maps in Monroe County, Michigan includes 24,514.37 acres of palustrine and lacustrine wetlands and waters. To specifically evaluate natural resources on the Fermi site from a watershed perspective, the coastal management zone was clipped to the shoreline to include palustrine and upland communities within the coastal management zone and exclude all but a tiny fraction of lacustrine habitat along the shoreline. This refines the analysis of community types to those potentially impacted by any proposed activity at the Fermi site. Clipped to the shoreline, the coastal zone of Western Lake Erie in Monroe County (CZM) encompasses approximately 18,700 acres with an almost even division of natural lands (38%), developed lands (38%) and agriculture (24%, Figure 2.8-2).

Since 1970 efforts have been made to protect and restore coastal habitats along the Detroit River and Western Lake Erie. Currently protected lands for conservation and recreation make up approximately 36% of the CZM. This is a dramatic shift in the Detroit River and Western Lake Erie area and is considered one of the most impressive recoveries of habitat in North America. Much of these protected areas are part of the MDNRE management areas and Detroit River International Wildlife Refuge.

Palustrine wetlands comprise 6% of the OSW and 43% of the CZM. The Federal National Wetland Inventory (NWI; Reference 19) was used for Monroe County which covers the entire CZM analysis area and part of OSW. An updated NWI produced by Ducks Unlimited for Wayne (Reference 20) and Washtenaw (Reference 21) Counties was used to provide updated coverage for the remainder of the OSW.

Wetland types vary between the OSW and CZM. The OSW is dominated by vegetated wetlands. Forested wetlands comprise the majority of vegetated wetlands (60%) with the remainder being emergent (24%) and shrub/scrub (15%). In contrast, the CZM has equal proportions of vegetated and non-vegetated wetlands. Emergent wetlands are the dominant type, comprising 71% of the vegetated wetlands with the remaining wetlands being forested (17%) or scrub shrub (11%).

An approximation of historic wetlands for the OSW and the CZM was developed based on soils classified as >80% hydric [soils >80% of a soil map unit classified as hydric by NRCS (Reference 22)] and current mapped wetlands. Former wetlands were defined as areas that are mapped hydric soils (>80% of map unit) but not mapped as wetlands based on the latest wetland maps. The topography and landscape position of the OSW and CZM are ideal for the development of wetlands because the land is very flat and in close proximity to the coast of Lake Erie. Historically, approximately 45% of the land area of the OSW was wetland (Figure 2.8-3). Based on the most recent wetland maps, 6% of the OSW is currently wetland which represents a loss of 86% of wetlands formerly part of the OSW. Historically, 77% of the land area

of the CZM was wetland (Figure 2.8-4). Based on the most recent wetland maps, 43% of the CZM is wetland which constitutes a 44% loss of wetlands in the CZM.

Stream condition in the OSW was evaluated by determining the proportion of waterways that are ditches and the percent of land adjacent to streams that serves as riparian buffer. The waterways in the OSW were characterized using the National Hydrologic Dataset (Reference 23). There are 617 miles of mapped waterways in the OSW. Artificial waterways (canals/ditches) comprise 80% (491 miles) of the total length while streams and rivers comprise 20% of the total length (Figure 2.8-5). Coastal regions typically have extensive ditch networks to drain wetlands primarily for agriculture. Ditches include both natural streams that have been channelized and created ditches through uplands and wetlands. Both types of ditches expedite the flow of water off the land into larger streams and rivers, and ultimately into Lake Erie. In addition to the high percentage of artificial waterways in the surrounding watershed, there is also a high percentage of waterways that lack natural buffers. This was determined by examining the NRCS land use classification (Reference 22) within 150 feet of streams that are mapped on the National Hydrography Dataset layer. The width of buffer that is needed to perform various functions (i.e., pollutant removal, habitat) is highly variable depending on which function is priority and local factors such as soils, topography, types of pollutant, species of interest, and water flow paths. For the purpose of this assessment, a buffer of 150 feet was used to evaluate current conditions and determine general conservation priorities.

Based on natural resource assessments conducted at the Fermi site and trends within the OSW and CZM, the following wetland-based conservation priorities were identified for the Fermi 3 project:

- Protect and enhance existing high quality wetlands especially those that are directly connected to Lake Erie in the CZM and/or part of a larger wetland complex.
- Improve a network of natural land use in the CZM and OSW by increasing the amount of large blocks (>50 acres) of natural lands and buffered streams to support ecosystem functions and services and establish corridors to connect large blocks.
- Restore and enhance wetlands in the CZM to provide wildlife habitat and protect water quality in Lake Erie.
- Restore wetlands and stream buffers in the OSW to re-establish large wetland complexes and riparian connections.

2.9 Historic Properties and Archaeological Resources

Surveys of cultural resources (above-ground and archaeological) were conducted from November 2007 to October 2009 to identify historic resources in and near the Fermi 3 project area and to assess possible Fermi 3 impacts to these resources. Additionally, preliminary investigations were conducted along the

transmission line route from the Fermi 3 project area to the Milan substation in Washtenaw County to identify previously recorded historic resources. The cultural resources investigations for the Fermi 3 project were carried out pursuant to Section 106 of the National Historic Preservation Act (NHPA), as amended (P.L. 89-665, October 15, 1966; 16 U.S.C. 470) and its implementing regulations (36 CFR 800), which require federal agencies to take into account their activities on historic resources that may be impacted as a result of project activities.

The area of potential effect (APE) is defined as "...the geographic area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(d)). In consultation with the State Historic Preservation Office (SHPO), two APEs were delineated for the Fermi 3 project, one for archaeological resources and one for above-ground resources. The APE for archaeological resources encompasses approximately 549 acres, including the construction impact areas. The APE included a series of interconnected roadway grades (60 acres), a stone quarry (48 acres), two spoil disposal zones (11 acres and 12 acres), two previously affected Fermi site locations -- a 37-acre tract and a 172-acre tract -- and a 53-acre tract on the northwest margin of the site. It also included a tentative access road for the meteorological tower site from Pointe Aux Peaux Road. At the determination of the Michigan SHPO, the survey for above-ground resources included an area encompassing the Fermi site and the communities of Estral Beach, Stony Point, and Woodland Beach.

The Fermi 3 site contains no above-ground resources that are listed in the National Register of Historic Places (NRHP) or that have been determined eligible for listing in the NRHP. Fermi 1 has been evaluated and recommended for listing on the NRHP, pending review by the SHPO. It is anticipated that any necessary mitigation will involve archiving Fermi 1 information and not restrict dismantlement following termination of the Fermi 1 license.

The archaeological survey resulted in the identification of seven archaeological sites (four prehistoric, two historic, and one multi-component [prehistoric/historic]) within the Fermi site and vicinity. However, only two sites are within the Fermi 3 site. The five other sites are not on Detroit Edison-owned property. None of these sites is recommended eligible for listing on the NRHP.

The natural ground at the Fermi 3 project site generally consists of poorly drained clay loams that are partially inundated or saturated with runoff from the higher ground to the west or from overflow from high water episodes of Lake Erie on the east. This low-lying, marshy environment reduces the overall potential for archaeological sites to be located within the Fermi 3 project area.

Preliminary investigations of the transmission line route from the Sumpter-Post Road junction to the Milan substation, owned by ITC*Transmission*, indicate a moderate to high potential for encountering archaeological resources. The preliminary field view of the built environment along the transmission line route revealed few above-ground resources that meet the minimum age requirement or retain sufficient

integrity for listing on the NRHP. Any further investigations would be conducted by ITC*Transmission* in accordance with applicable regulatory requirements.

A Submerged Site Sensitivity Study (Study) was conducted in 2009 to assess the Fermi 3 project's potential to impact underwater resources within the vicinity of the Fermi site. The Study consisted of identifying previously reported submerged sites and maritime-related resources within the vicinity of the dredging/outfall activity area and developing a predictive model to determine the likelihood of the area to contain cultural resources. The Study did not involve conducting a survey for underwater resources.

The Study included a review of all recorded resources within 3 miles of the Fermi 3 project because of the dynamic nature of the submerged sites and the absence of precise location information for submerged sites. The Study recommended that the Fermi site and vicinity be considered as having a moderate to high sensitivity for containing previously unidentified maritime resources, based on the proximity of known submerged resources in the vicinity, the lack of research on submerged sites within the area, and the shallow-water environment of the project area.

The Study included a search of the files maintained by the Michigan Office of the State Archaeologist (OSA). A review of the Michigan OSA files indicated one previously recorded archaeological site (20MR702) on the Lake Erie shoreline of the existing Fermi site. This site is listed as a prehistoric site of unknown cultural period, and it has not been evaluated for possible listing in the NRHP. No evidence of this site was found during the Fermi 3 archaeological survey conducted between 2007 and 2009.

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Table 2.7-1. Wetland Impacts and Attributes Summary Table (Sheet 1 of 3)

ID	Type	Size (acres)	Jurisdiction	Condition/Primary Function	Guidance Mitigation Ratio
A	PEM wet meadow wetland, located on the north side of Fermi Drive in between restored prairie grass habitat to the east and west, south of upland and Wetland F	1.88	--	Low / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	0:0
B	PFO located along the ditch adjacent to railway and the north edge of Fermi Drive near Wetlands E and C	0.76	MDNRE/USACE	Low / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	2:1
C	PEM Great Lakes Marsh, fragmented from Lake Erie by access roads , but connected hydrologically through culverts	48.18	MDNRE/USACE	Medium (high ecological value) / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	5:1
D	PFO partially open canopy, located north of Fermi Drive, west of Doxy Road and surrounded by Wetlands C and E	1.37	MDNRE/USACE	Medium / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	2:1
E-North	North: PSS emergent marsh/wet meadow, located north of Fermi Drive in power line right-of-ways with two sections split by Wetland D, bordered to the north by restored prairie grassland habitat	2.67	MDNRE/USACE	Medium / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat for both portions of E	2.1
E-South	South: PSS southern shrub carr or other coastal wetland type	2.04			
F	PFO southern hardwood swamp, relatively intact, located immediately east of Bullit Road and separated from Wetland I by PEM Wetland C	31.07	MDNRE/USACE	Medium (high ecological value) / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	5:1
H	PEM edge around a created open water pit located along the southeast side of Doxy Road	0.10	MDNRE	Low / Minimal floodflow alteration, sediment/toxicant retention and nutrient removal	1.5:1

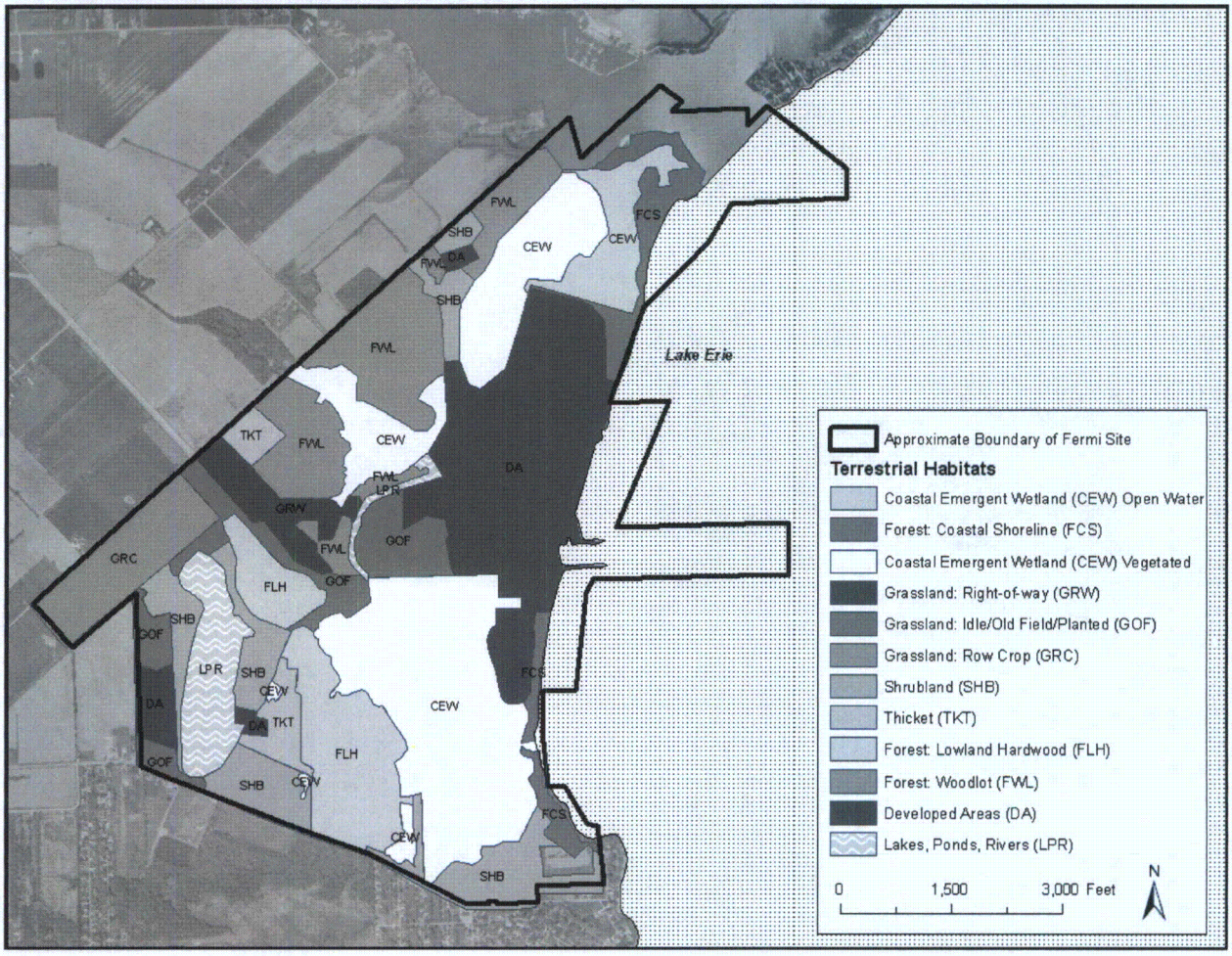
Table 2.7-1. Wetland Impacts and Attributes Summary Table (Sheet 2 of 3)

ID	Type	Size (acres)	Jurisdiction	Condition/Primary Function	Guidance Mitigation Ratio
I	PFO southern hardwood swamp, relatively intact, indirectly connected to Lake Erie, located on the northwest perimeter of the site, east of Bullit Road, provides a buffer for the interior and less disturbed wetland	39.74	MDNRE/USACE	Medium (high ecological value) / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	5:1
L	PFO southern hardwood swamp, large and intact located on the east side of Quarry Lake Road and the north side of Acorn Road	63.12	MDNRE/USACE	High / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	5:1
M	PEM Great Lakes marsh, directly connected to Lake Erie to the east and includes an expanse of open water with submerged and floating aquatic vegetation surrounded by zones of weak-stemmed and robust emergent vegetation eventually grading into a shrubby edge that becomes Wetland L	161.65	MDNRE/USACE	High / Floodflow alteration, sediment, toxicant retention, nutrient removal and wildlife habitat	5:1
O	PFO fragmented early-mid successional with mixed vegetation located west of Wetland N (dredged spoils basin) separated by an access road and east of a narrow beach ridge along Lake Erie	0.72	MDNRE/USACE	Low / Marginal wildlife habitat for edge species and limited water storage	2:1
R	PEM separated from Wetland M by manmade berm and highly disturbed, located southwest of Long Road	1.97	MDNRE/USACE	Low / Floodflow alteration, sediment, toxicant retention, nutrient removal and low quality wildlife habitat and buffer	2:1
T	PFO separated from Wetland M by manmade berms, highly disturbed, located southwest of Long Road	5.71	MDNRE/USACE	Low / Floodflow alteration, sediment, toxicant retention, nutrient removal and low quality wildlife habitat and buffer	2:1
U	PEM edge around a created open water canal located along the east side of Doxy Road	0.15	MDNRE/USACE	Low / Minimal floodflow alteration, sediment/toxicant retention and nutrient removal	1.5:1
Y	PFO fragmented early successional with mixed vegetation and a partially open canopy located between Quarry Lakes and Quarry Lake Road, south of Gator Road	1.14	MDNRE	Low / Marginal wildlife habitat for edge species and limited water storage	2:1

Table 2.7-1. Wetland Impacts and Attributes Summary Table (Sheet 3 of 3)

ID	Type	Size (acres)	Jurisdiction	Condition/Primary Function	Guidance Mitigation Ratio
AA	PEM established spoil area, located NE of Fox Road and south of Wetland L	0.80	MDNRE/USACE	Low / Minimal floodflow alteration, sediment/toxicant retention and nutrient removal	2:1
BB/EE/ FF	PFO southern hardwood swamp, intact with relatively high diversity, fragmented from other wetlands by multiple roads and developed/agricultural areas, EE and FF represent a PEM/mixed edge of the BB/EE/FF wetland area	12.97 (BB 11.80, EE 0.77, FF 0.39)	MDNRE/USACE	High / Wildlife habitat, marginal floodflow alteration, sediment, toxicant retention, and nutrient removal	5:1
II	PEM ditch southwest of Wetland AA and along the south side of Fox Road, contains vegetation communities with high structural diversity and low species diversity with well-established invasive species populations	0.52	MDNRE	Low / Minimal floodflow alteration, sediment/toxicant retention and nutrient removal	1.5:1
JJ	PSS established spoil area, ditch on the north side of Acorn Road and the east side of Quarry Lake Road	1.37	MDNRE	Low / Minimal floodflow alteration, sediment/toxicant retention and nutrient removal	1.5:1
KK	PFO linear wetland, connected to the South Canal adjacent to the west	1.62	MDNRE/USACE	Low / Floodflow alteration, sediment/toxicant retention, nutrient removal, marginal wildlife habitat for edge species	2:1
South Canal	PEM Great Lakes Marsh hydrologically connected to Lake Erie, located north of Fermi Drive, west of Doxy Road and Wetland KK	1.97	MDNRE/USACE	Medium / Fish and wildlife habitat, floodflow alteration, sediment, toxicant retention and nutrient removal	5:1

Figure 2.1-1 Land Uses on the Fermi Site



Source: Reference 1

Figure 2.2-1. Topography of the Fermi Site

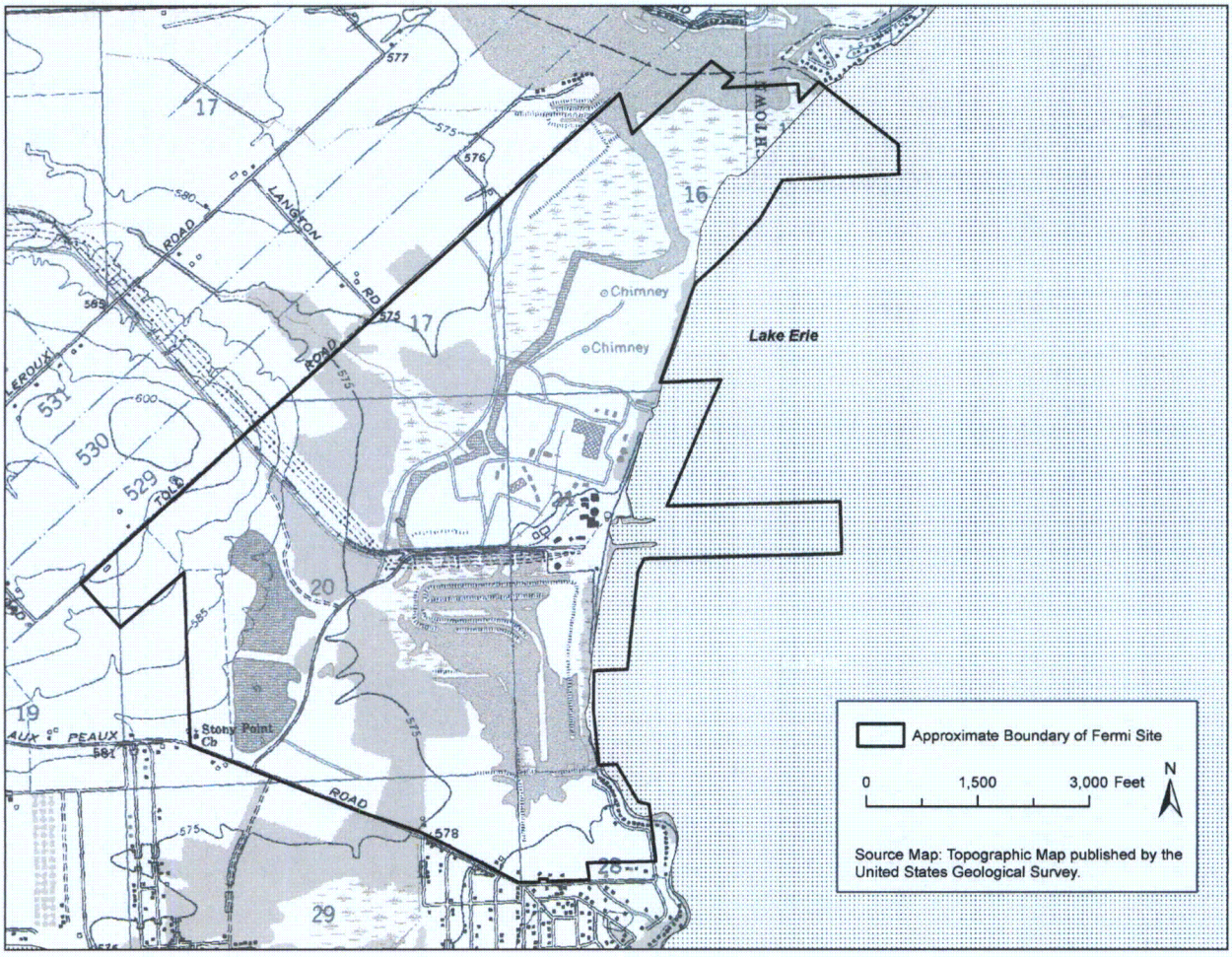
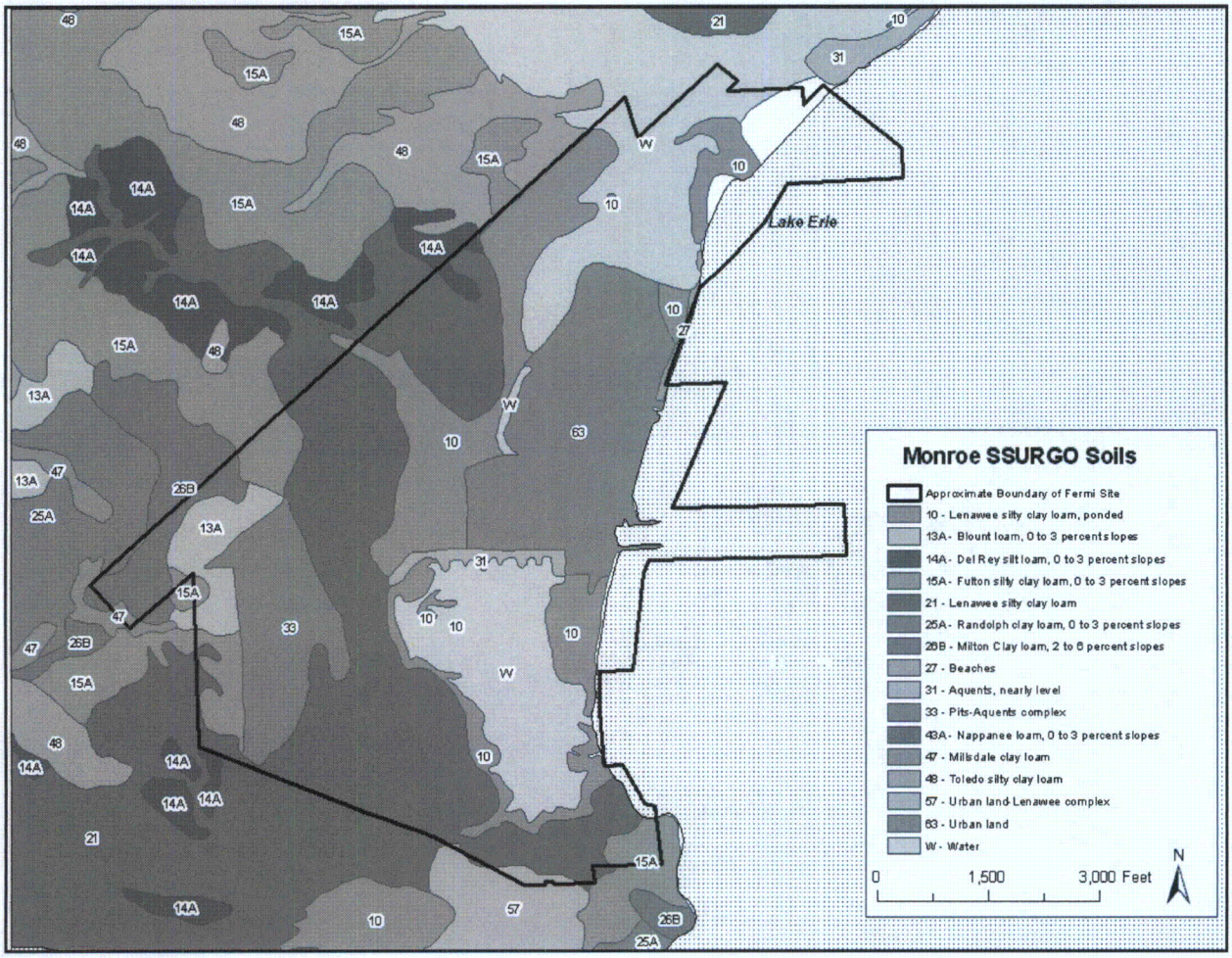


Figure 2.3-1. Soil Types on the Fermi Site



Source: Reference 24

Figure 2.4-1. Observed Locations of American Lotus on the Fermi Site

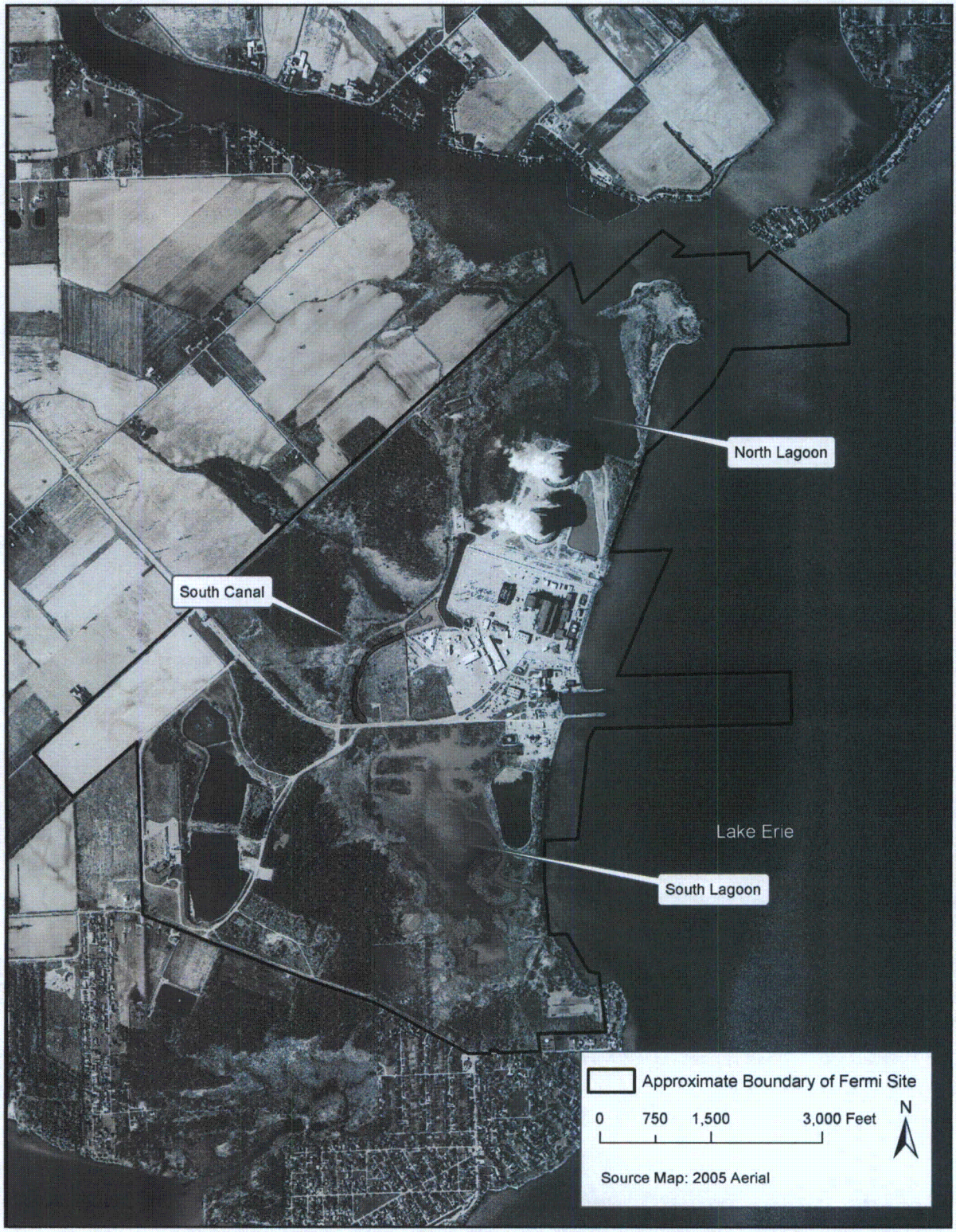


Figure 2.5-1. Boundaries of the Detroit River International Wildlife Refuge, Laguna Beach Unit, Monroe County, MI

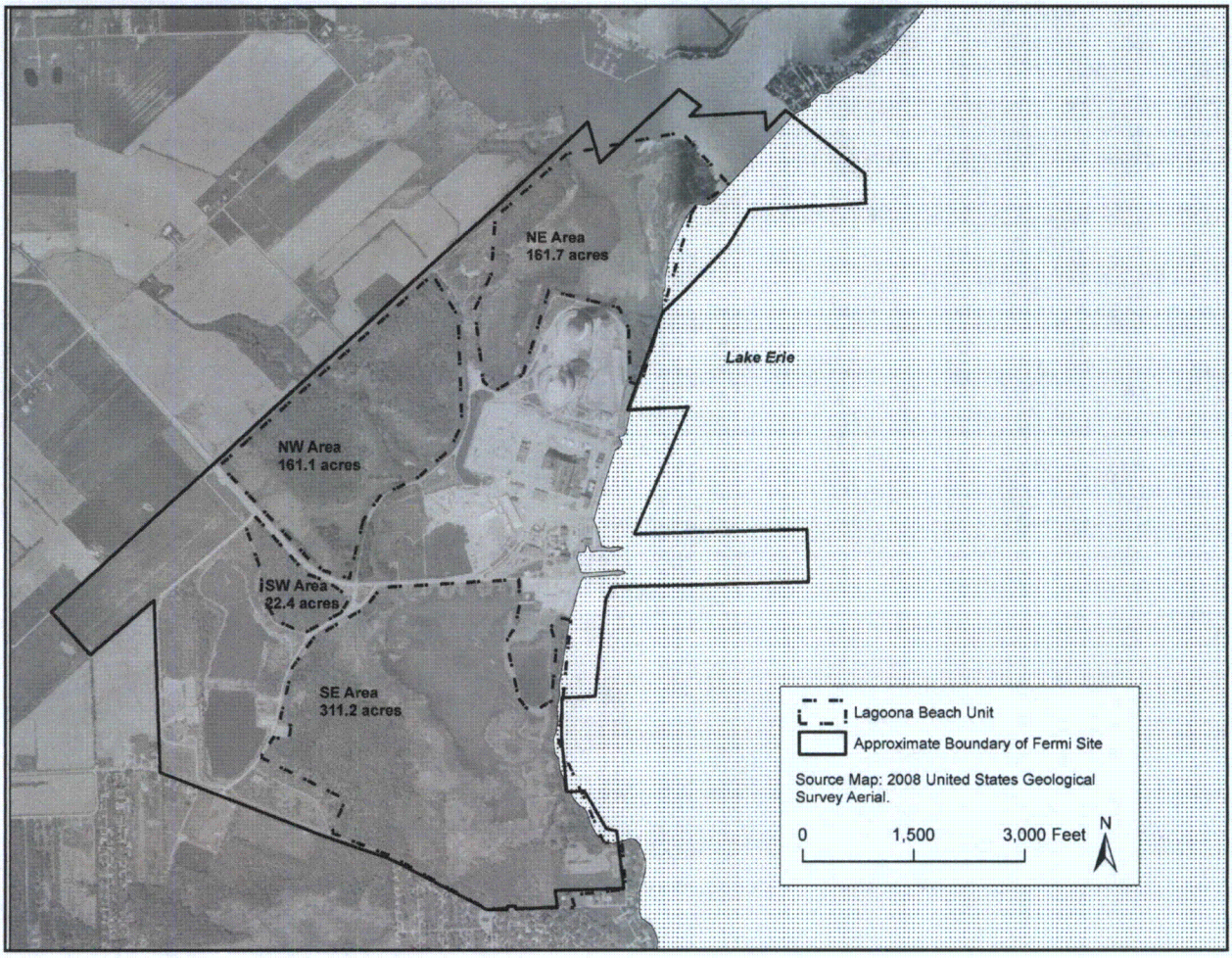


Figure 2.5-2. Aquatic Ecology Survey Sample Locations

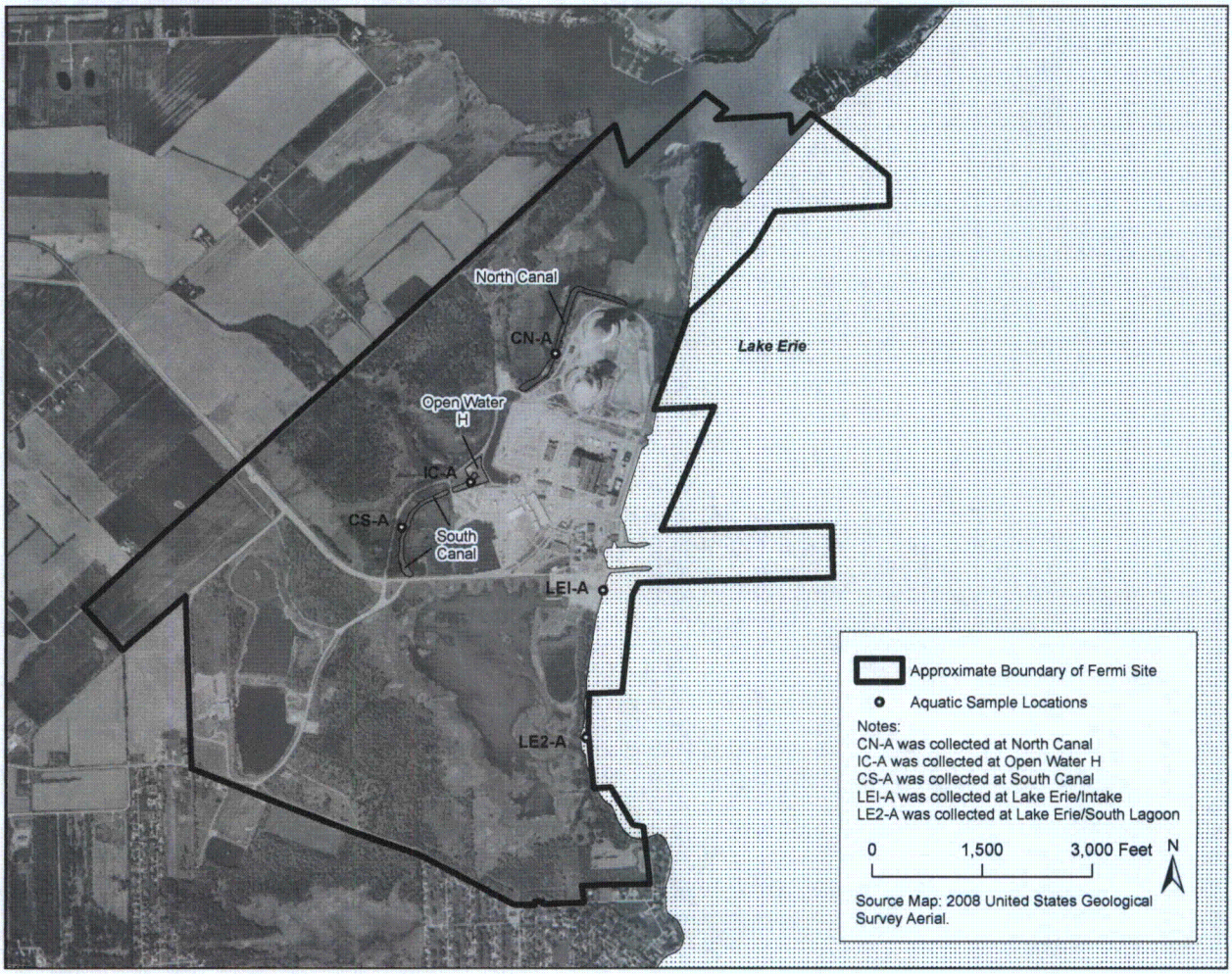


Figure 2.6-1. Existing Culvert Locations

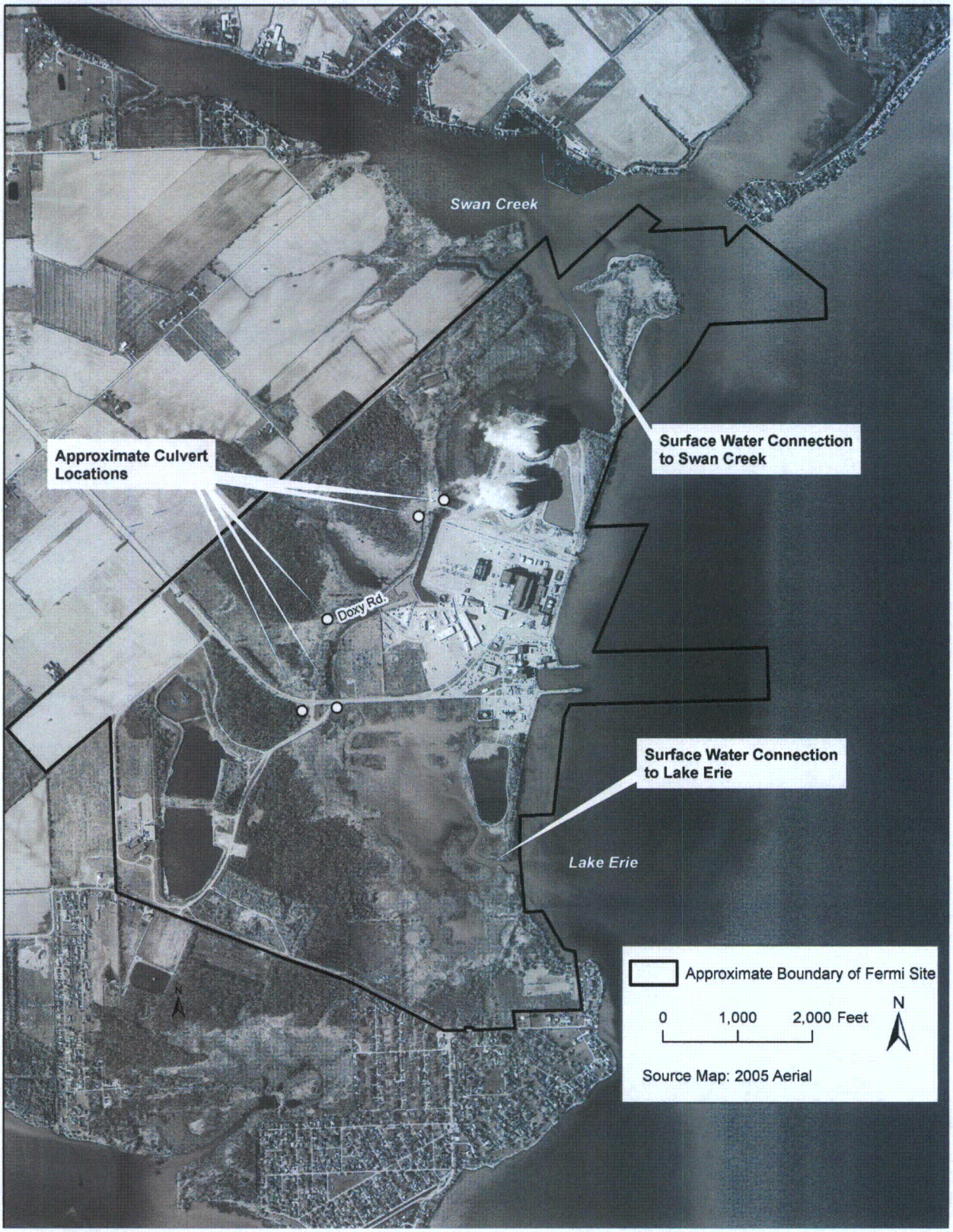


Figure 2.6-2. Aerial Photograph of the Fermi Site Taken in 1981

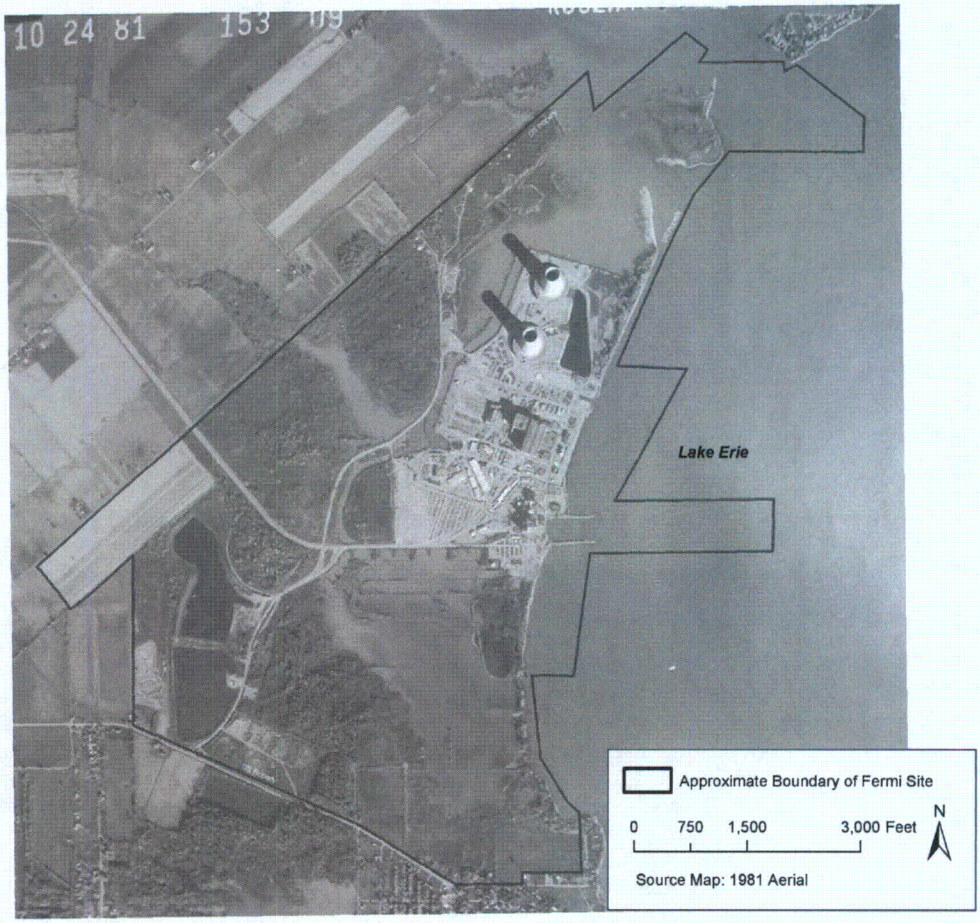


Figure 2.6-3 Fermi 3 Paired Hydrographs

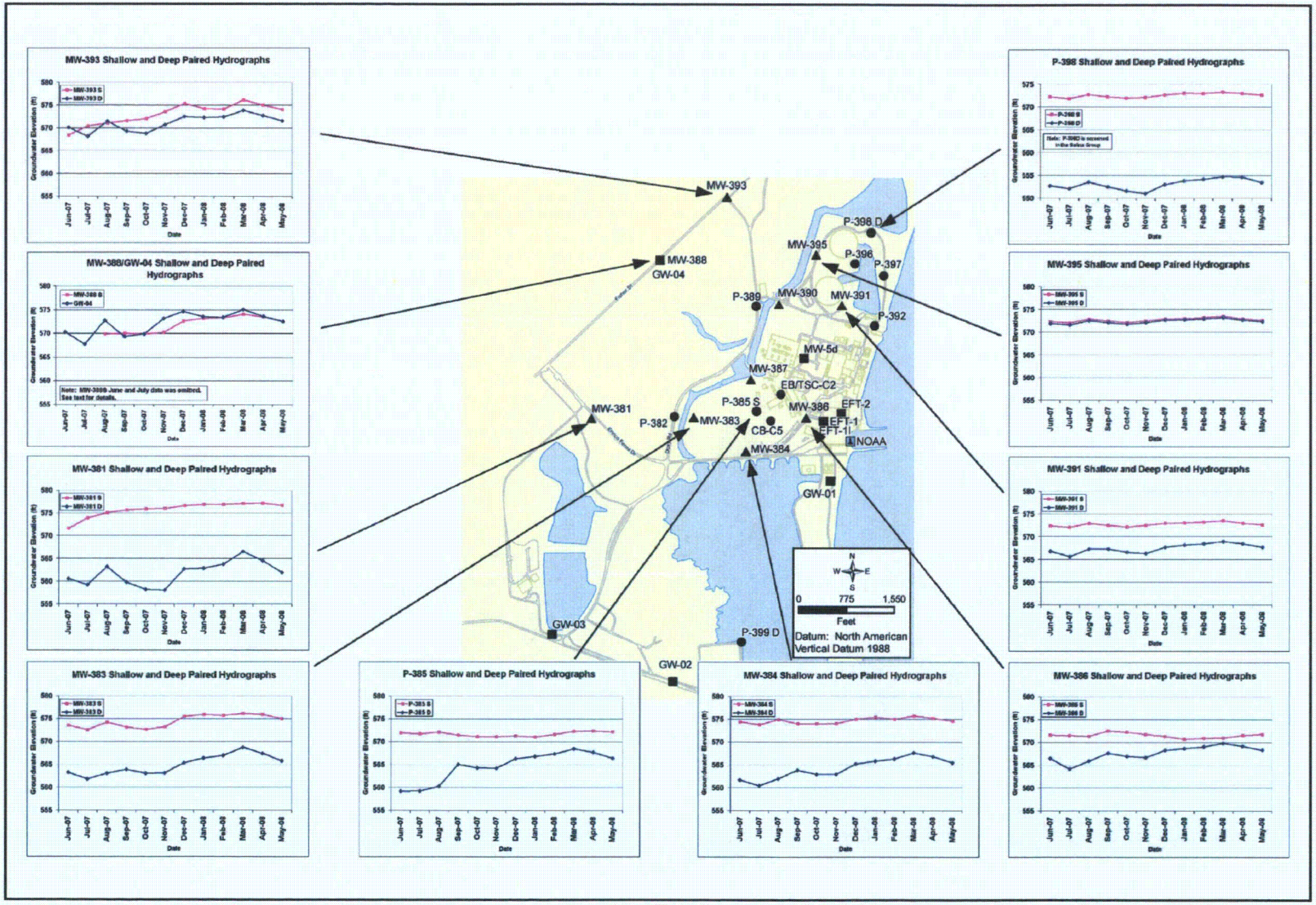


Figure 2.7-1. Fermi Site Wetlands Delineation

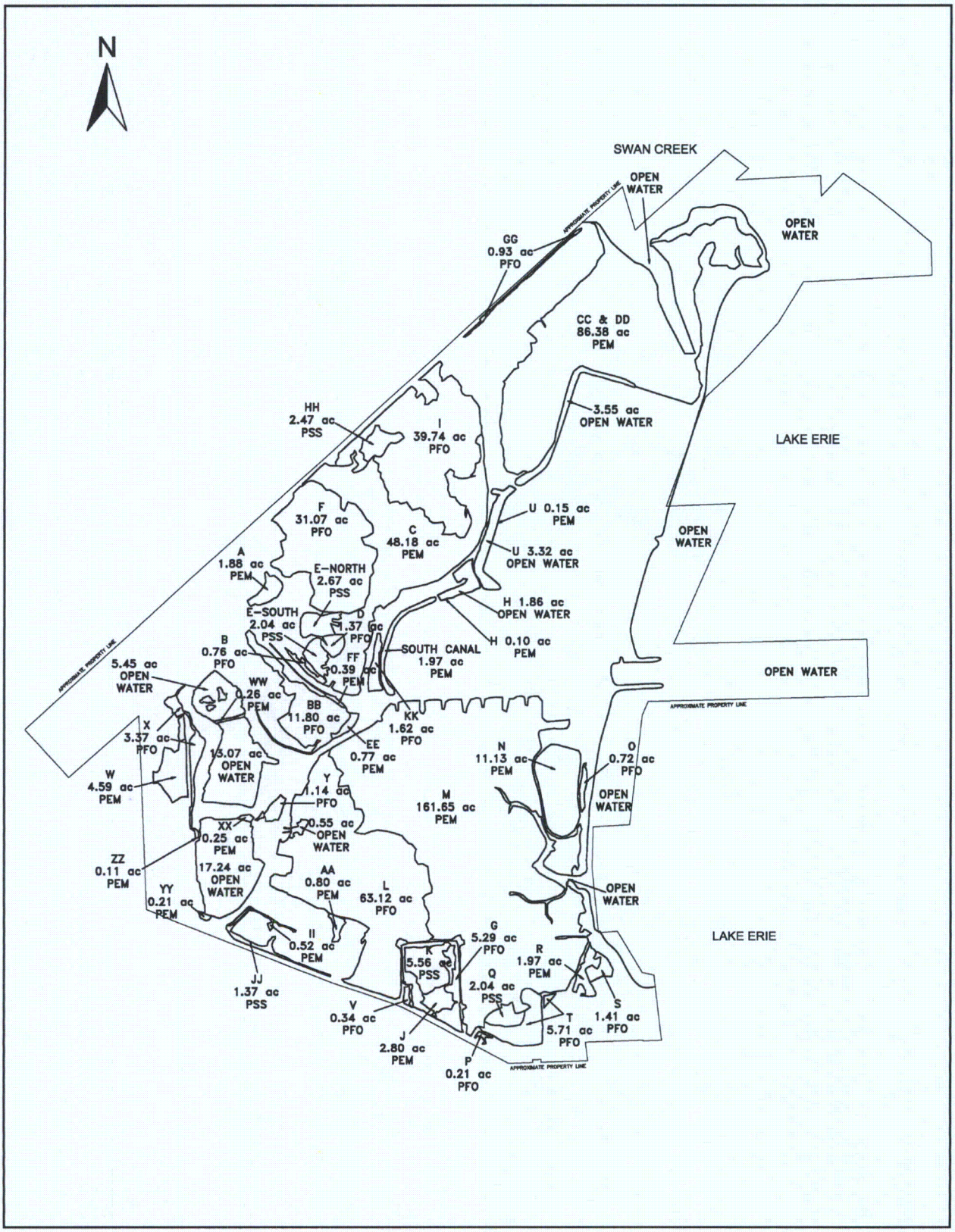


Figure 2.7-2. Wetlands AA, II, and JJ

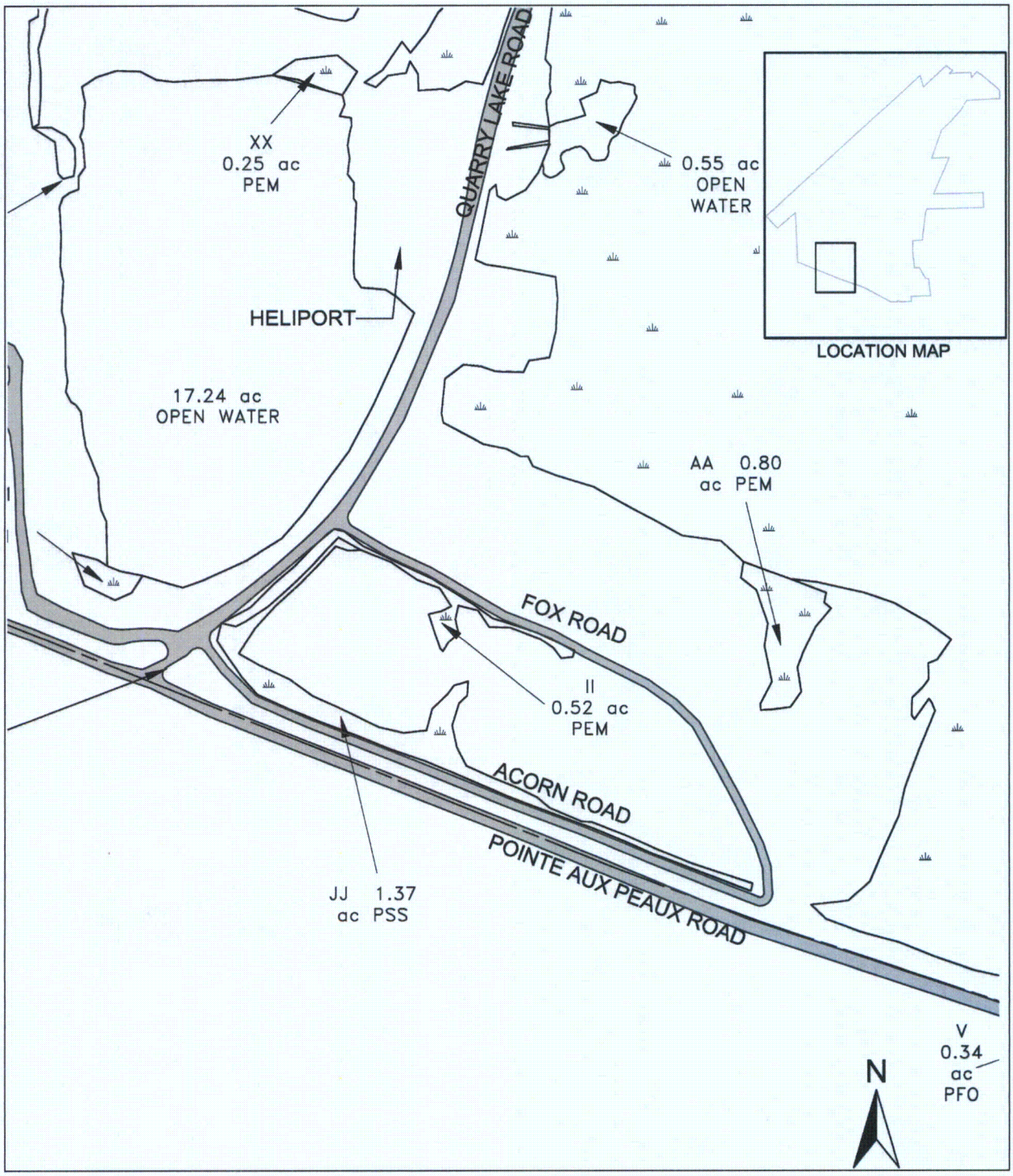


Figure 2.7-3. Wetlands L, M, Y, R and T

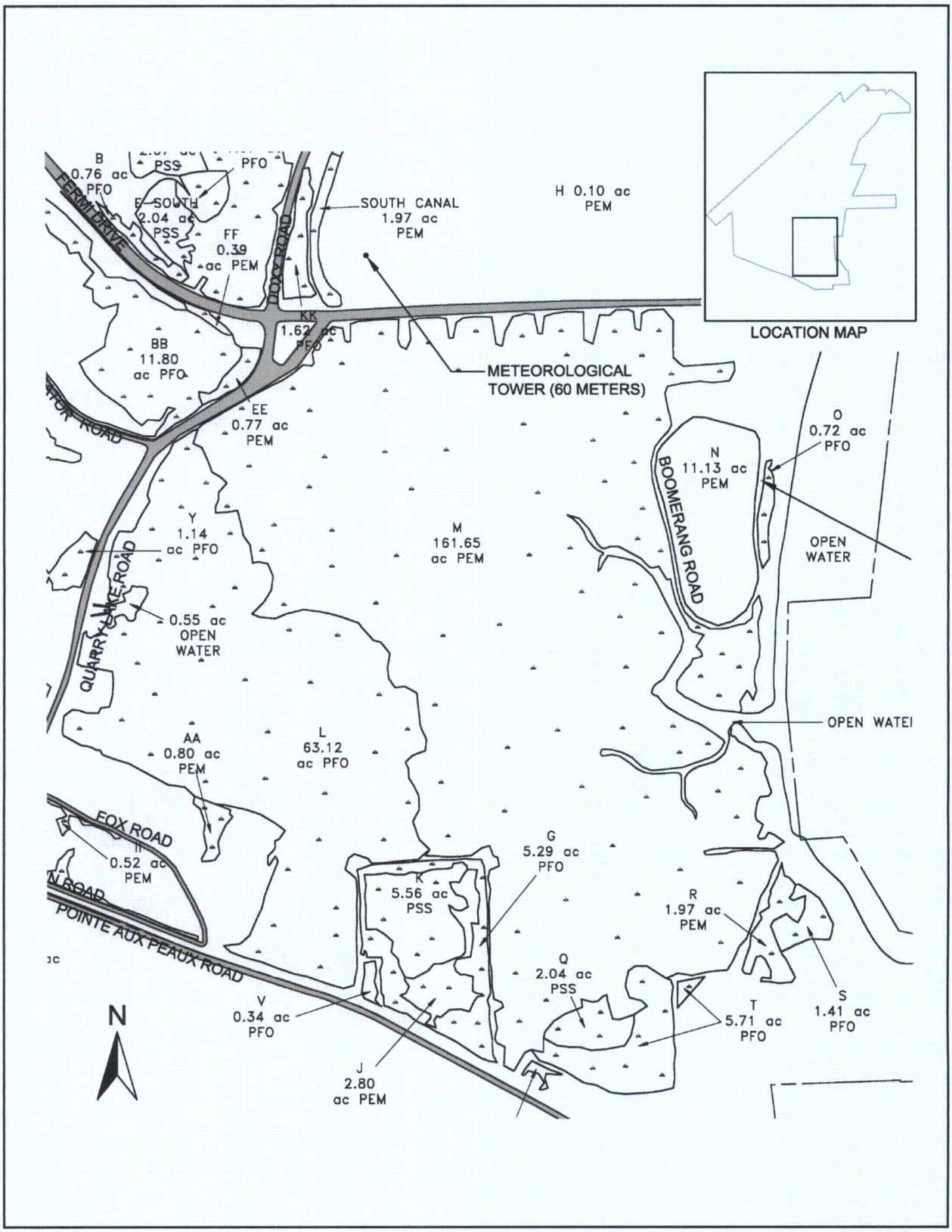


Figure 2.7-4. Wetlands BB, EE, and FF

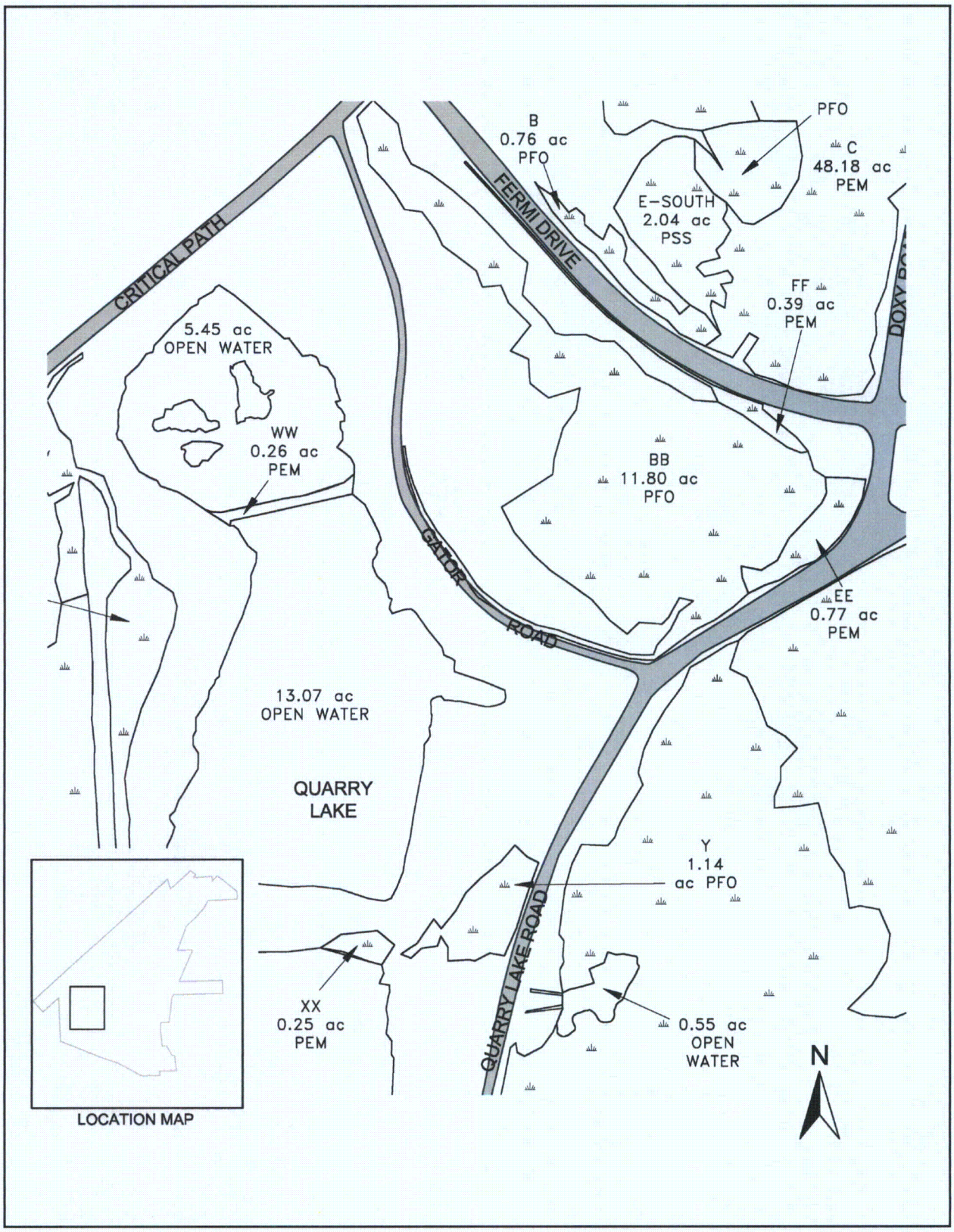


Figure 2.7-5. Wetlands A, B, C, D, and E

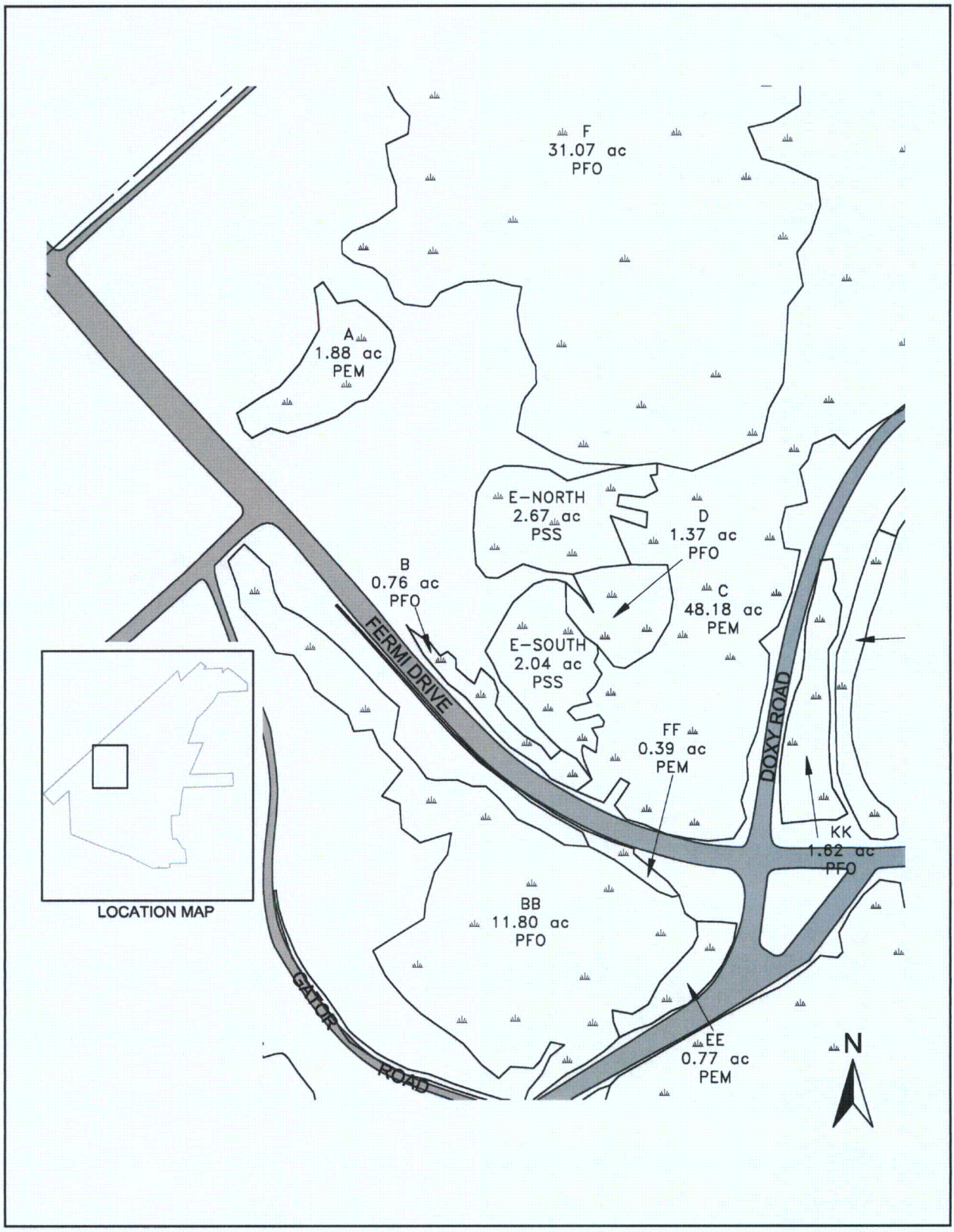


Figure 2.7-6. Areas H and U, South Canal and Wetland KK

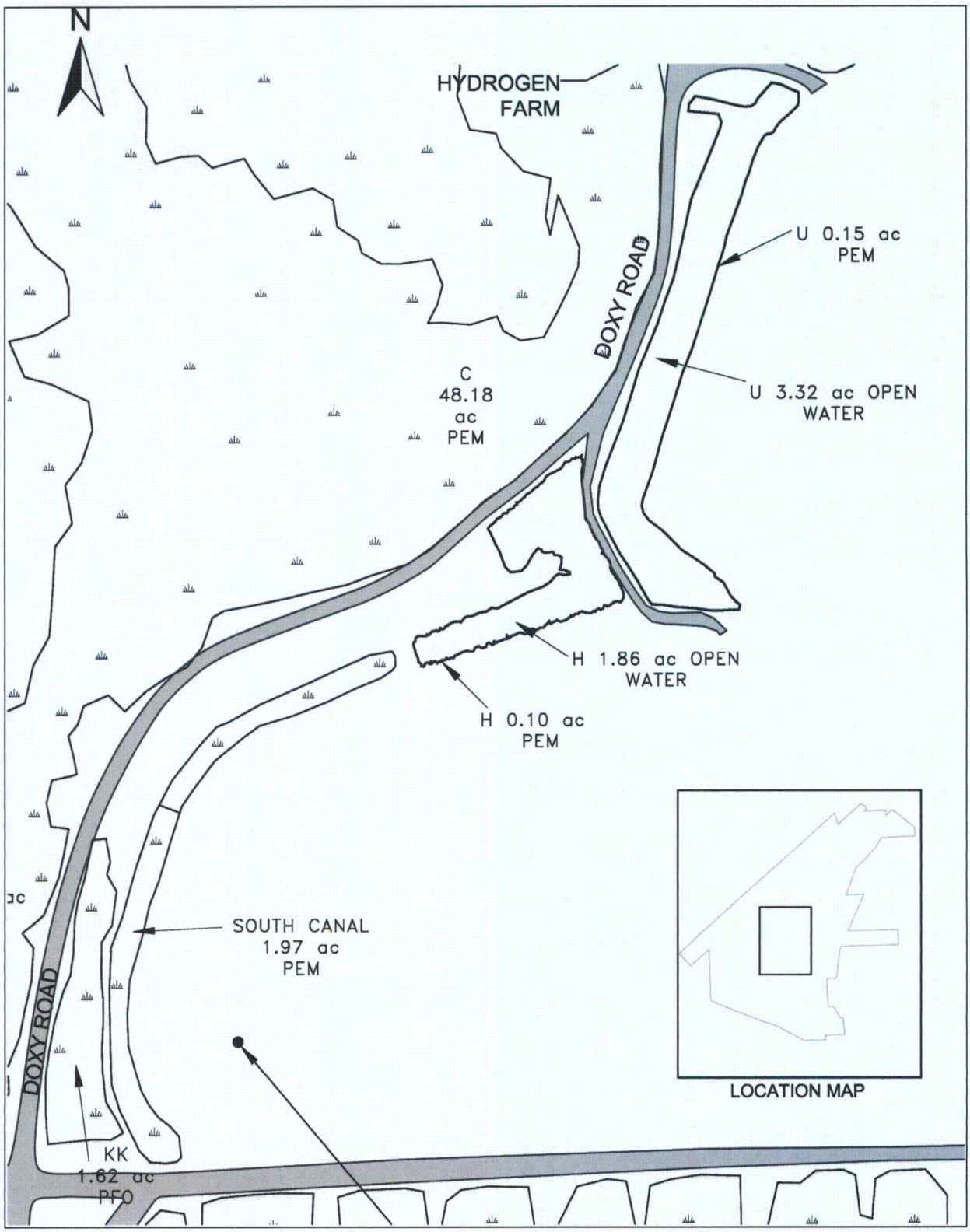


Figure 2.7-7. Wetlands C, I, and F

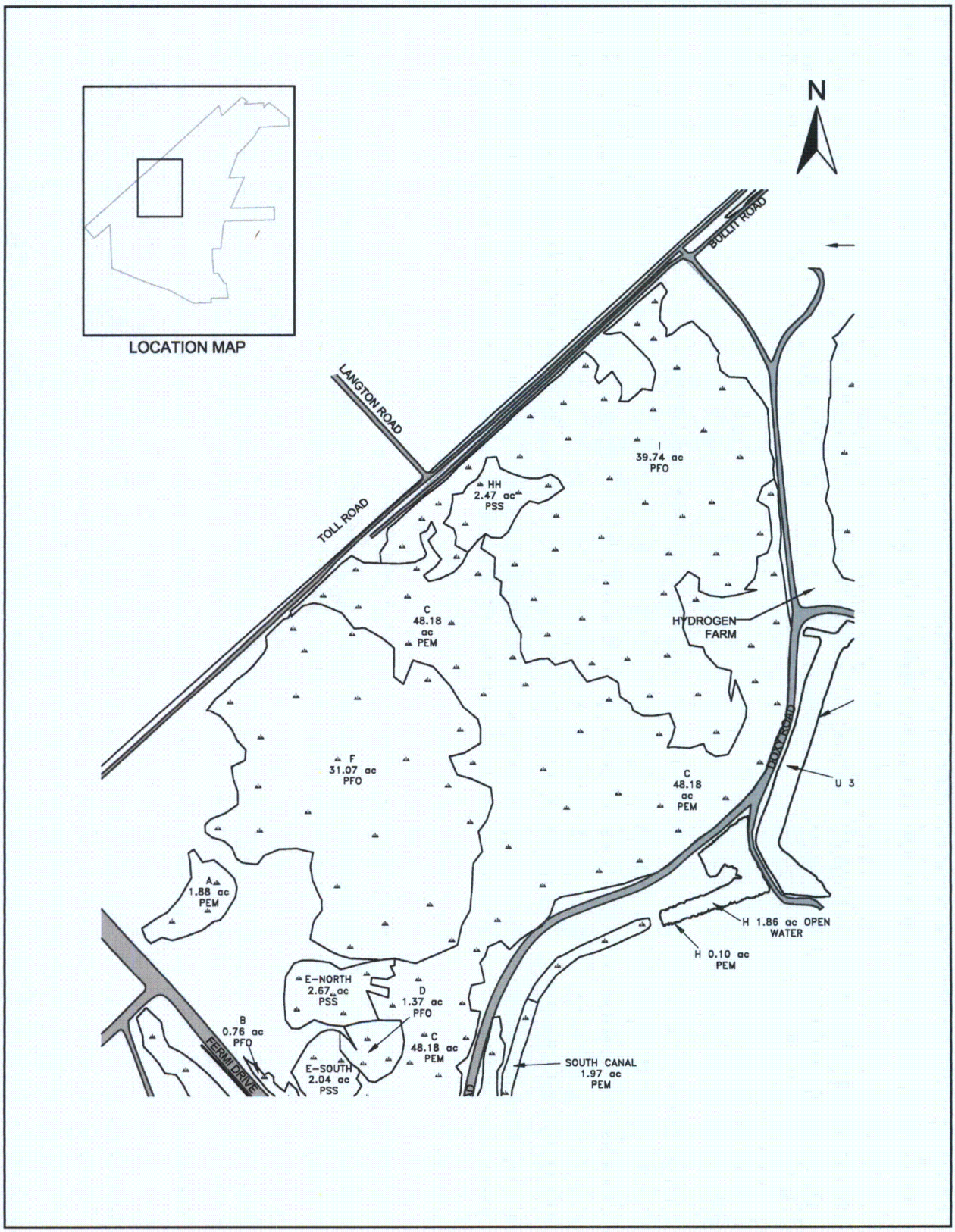


Figure 2.7-8. Wetland W

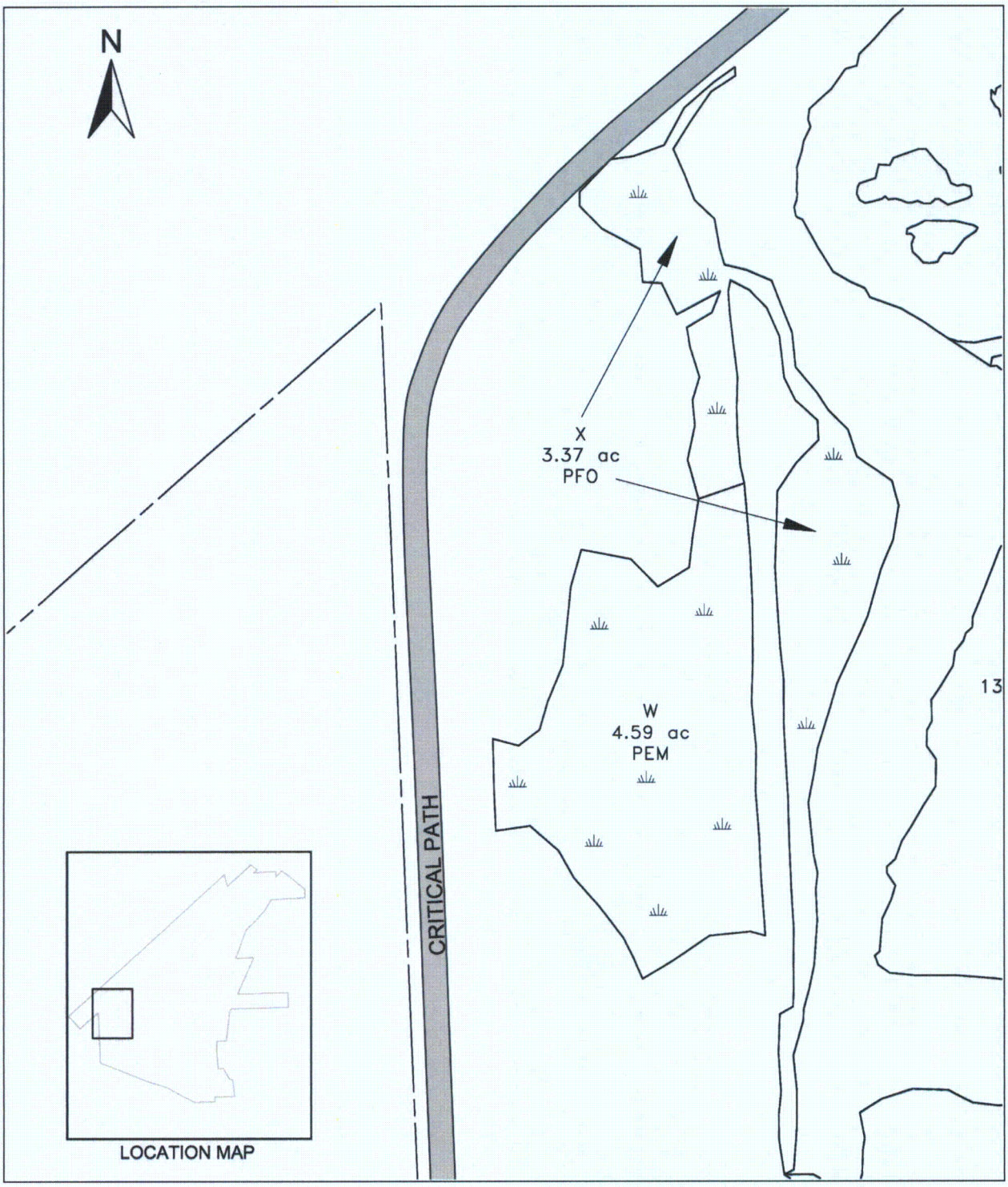
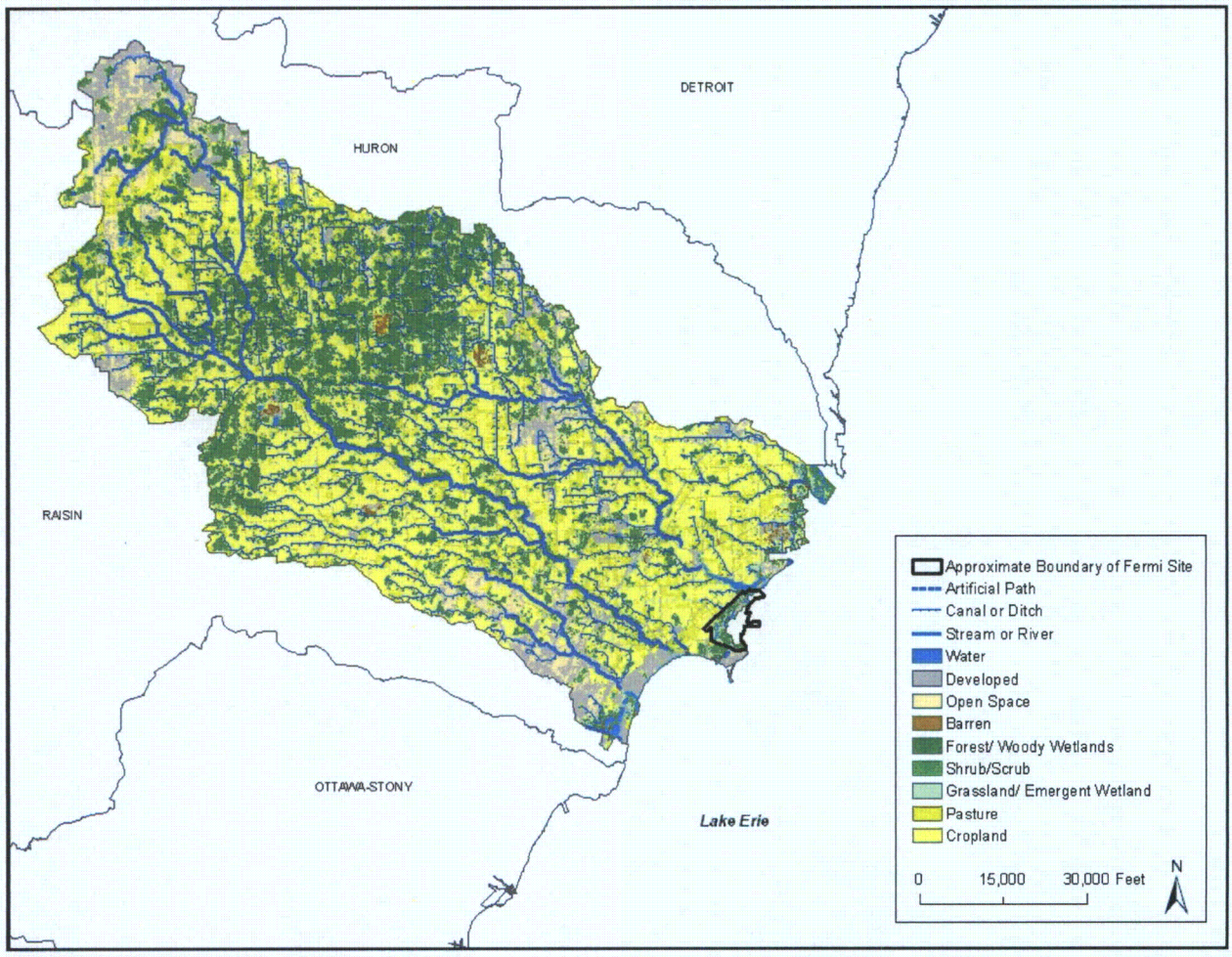
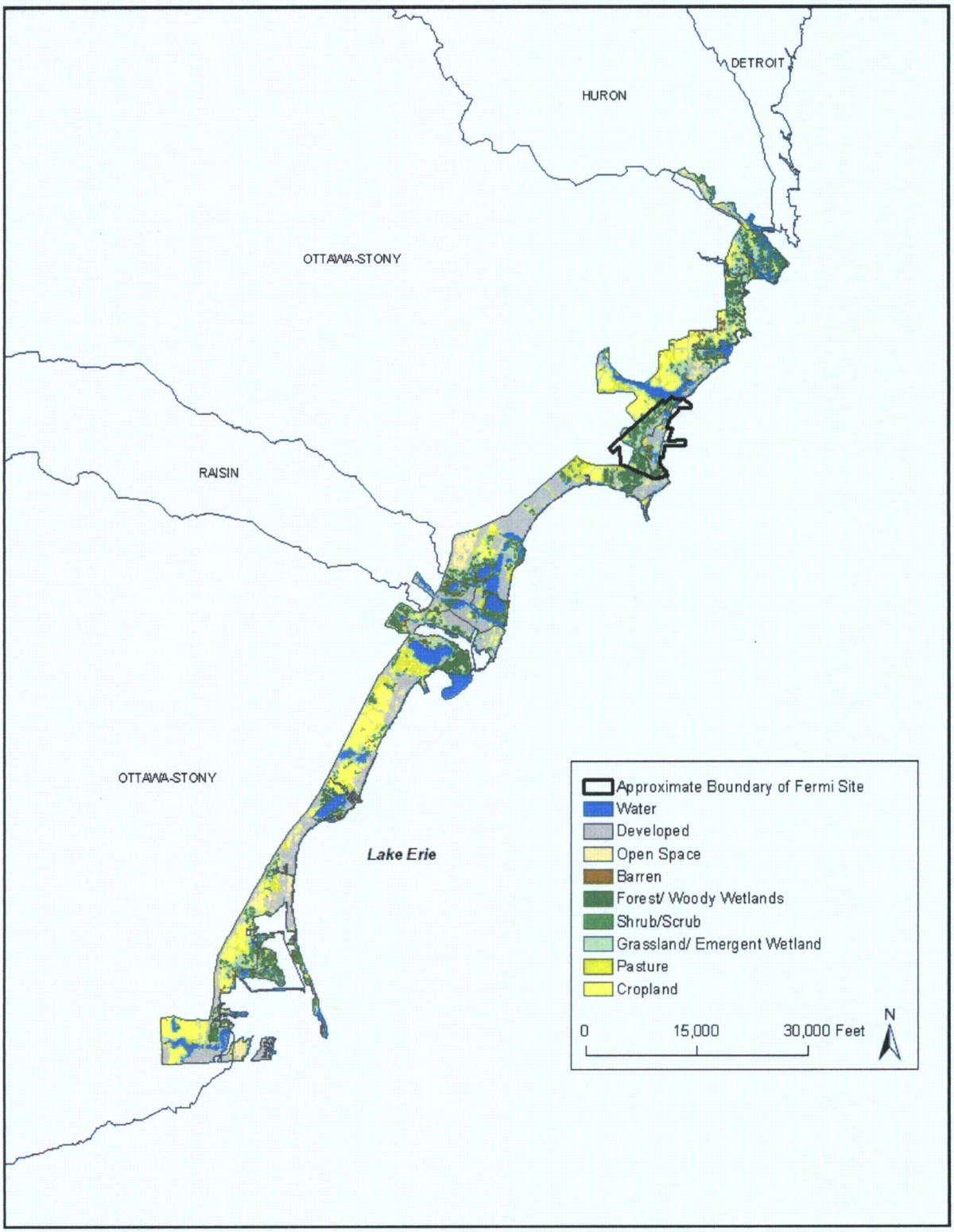


Figure 2.8-1. Ottawa-Stony Watershed Land Use



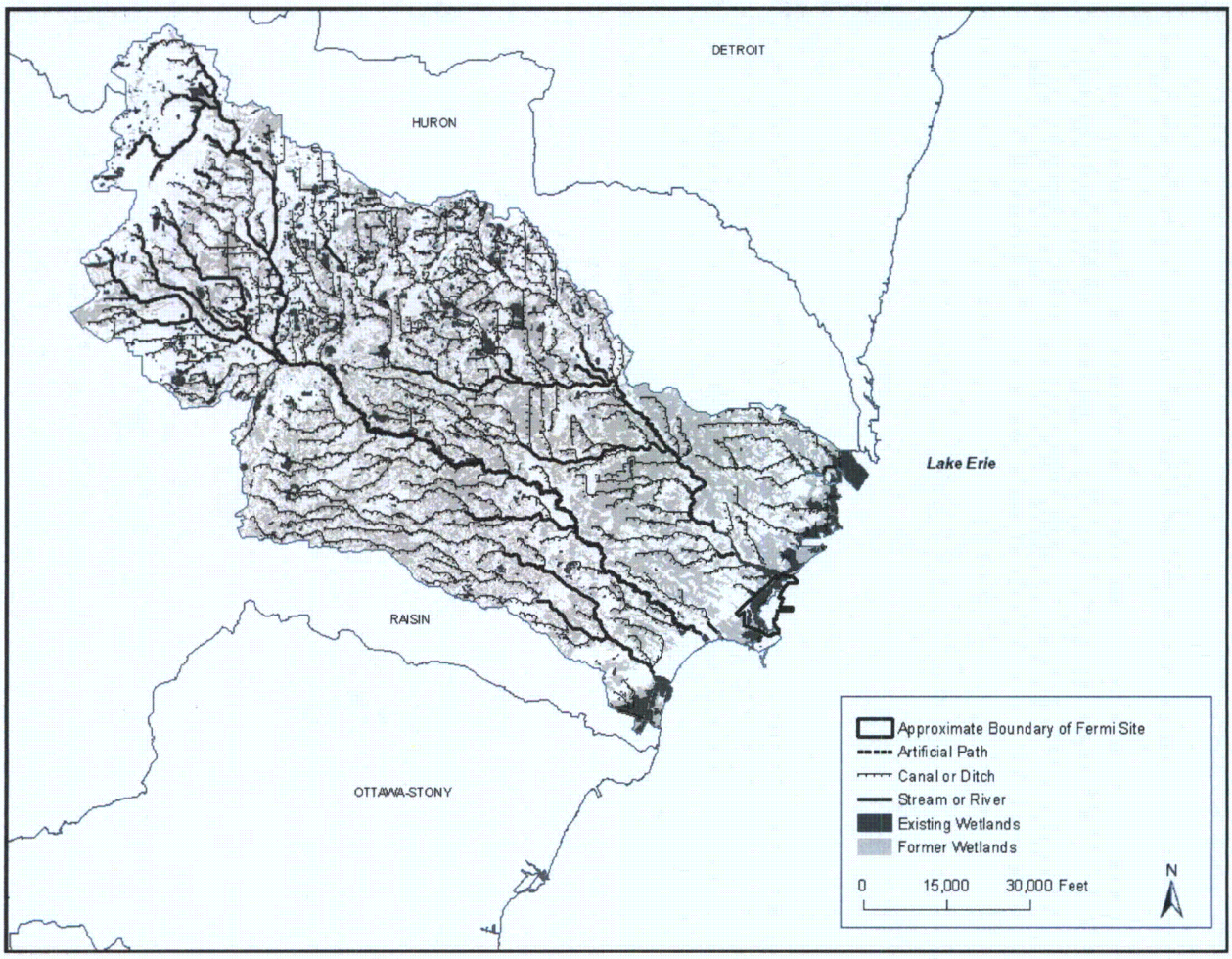
Source: Reference 23 and Reference 25

Figure 2.8-2. Coastal Zone Land Use



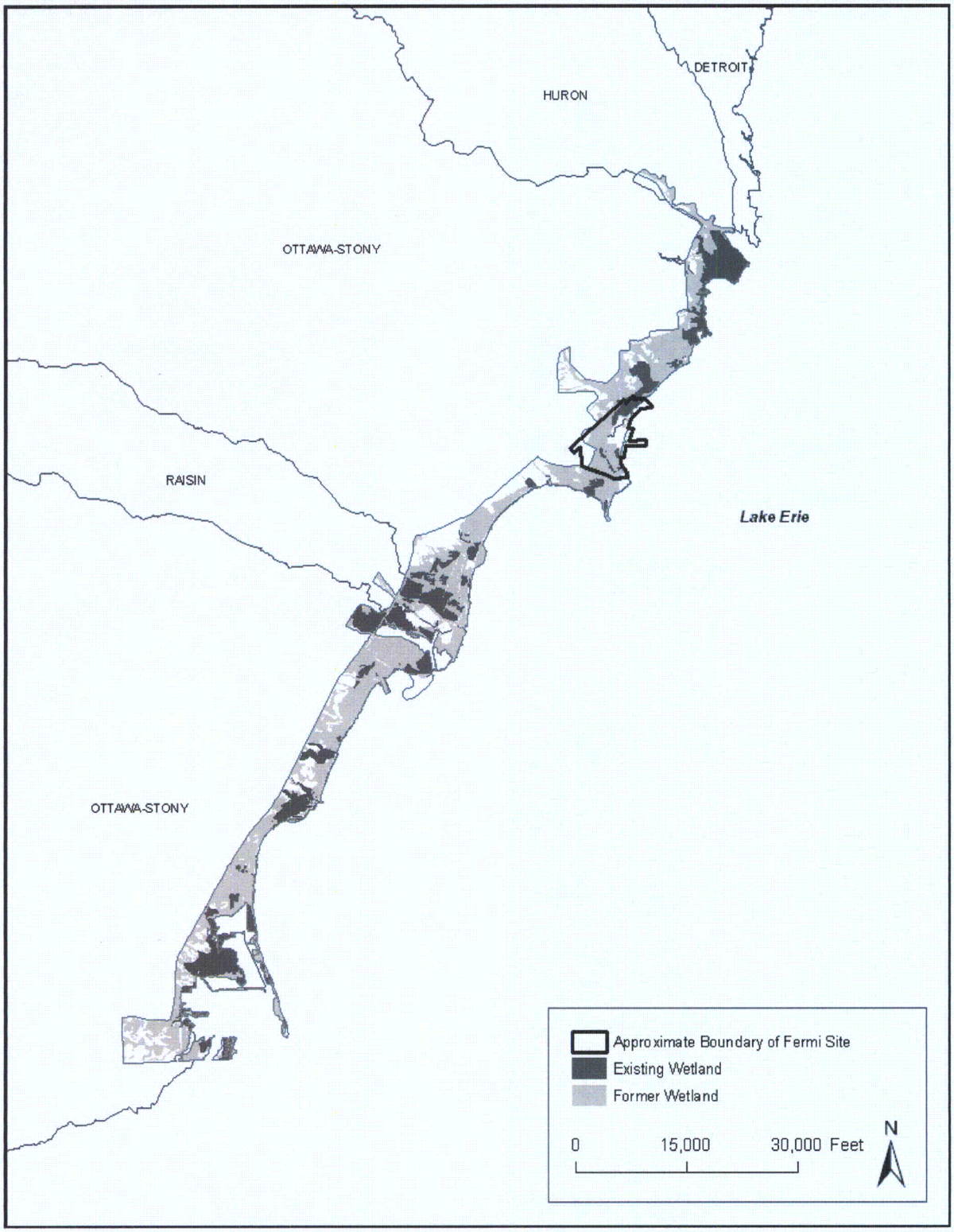
Source: Reference 25 and Reference 26

Figure 2.8-3. Existing and Former Wetlands in the Ottawa-Stony Watershed



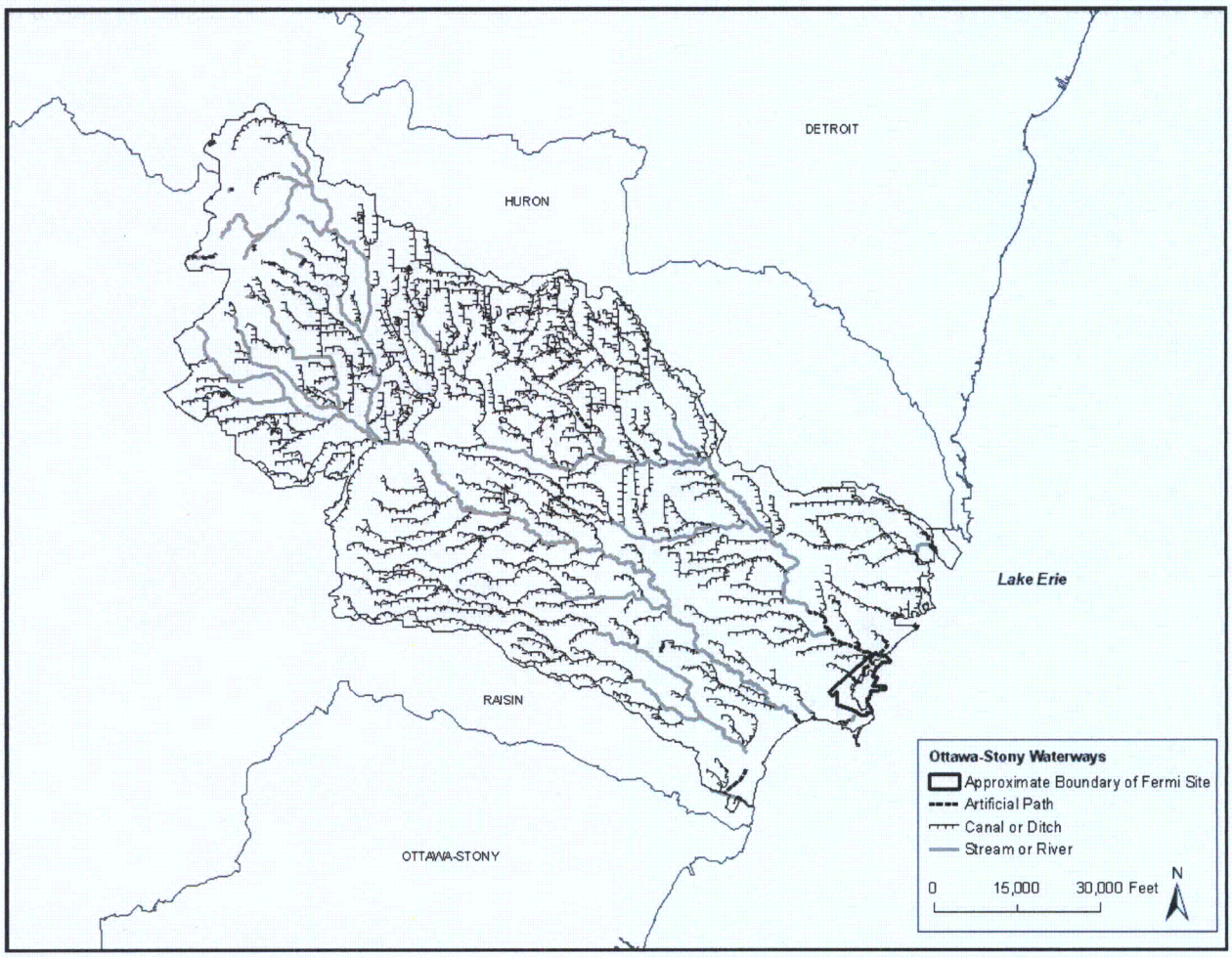
Source: Reference 19 through 21 and Reference 23

Figure 2.8-4. Existing and Former Wetlands in the Coastal Zone



Source: Reference 19 and Reference 26

Figure 2.8-5. Streams and Ditches in the Ottawa-Stony Watershed



Source: Reference 23

3.0 PROJECT DESCRIPTION

The following sections provide a description of the overall construction approach and sequence proposed at the Fermi site and mitigation techniques that will be implemented to minimize the effect on waters and wetlands of the United States. Specific project descriptions for regulated activity areas are included that define the limits of the work area. If applicable, area-specific construction approaches, sequencing and mitigation techniques and the restoration of temporary impacts are also described.

3.1 Overall Construction Approach/Sequence

The overall construction approach and sequencing will be used for the preparation of temporary construction laydown, building and support structure construction, parking areas and infrastructure installation. This will include land clearing (tree and vegetation removal), grubbing where necessary, site grading, backfilling, and compaction. Vegetation and trees will be disposed of onsite in a designated area. Materials suitable for backfill and compaction may be obtained from an offsite source until onsite excavation is underway.

3.2 Overall Mitigation Techniques (Best Management Practices, Erosion and Sediment Control Measures, Restoration of Temporary Impacts)

Detroit Edison successfully implemented a planning process that will avoid, minimize and then compensate for unavoidable, permanent impacts on waters of the U.S., including wetlands, from the construction and operation of Fermi 3. These include using developed and previously disturbed lands where practicable and limiting clearing to the smallest construction footprint possible. Detroit Edison will obtain the necessary authorizations prior to initiating the regulated activities associated with the construction and operation of Fermi 3. Detroit Edison's compliance with permit conditions and implementation of associated plans (e.g., Soil Erosion and Sedimentation Control [SESC] Plan, Storm Water Pollution Prevention Plan [SWPPP], and Compensatory Mitigation Plan) will afford further environmental protection. Figure 3.3-1 shows potential wetland construction impacts.

One purpose of mitigation is to avoid or minimize impacts to jurisdictional wetlands and waters. Mitigation includes:

- minimizing dredging and construction-related turbidity;
- minimizing erosion, chemical releases, and stormwater impacts to water quality and wetland habitat;
- minimizing potential impacts to aquatic species during dredging and construction activities in the water;
- minimizing impacts to the fishery by, for example, scheduling dredging and construction of the intake and discharge structures to avoid fish spawning;

- minimizing impacts to terrestrial habitats and wildlife by, for example, scheduling land clearing and construction to avoid nesting/breeding habitats where practicable;
  - scheduling construction activities in wetlands in the winter when possible to reduce compaction, runoff and vegetation destruction.

A summary of restoration methods for temporary impacts is provided below.

- Best management practices (BMPs) will be implemented during construction, as applicable:
  - Any ground-disturbing activities will be in accordance with permit requirements, including a construction stormwater discharge permit and SESC permit under National Pollutant Discharge Elimination System (NPDES) regulations. The SESC Plan to control erosion and run-off will include: silt fence or curtain installation as applicable, and the placement of straw bales, slope breakers, or other erosion prevention measures, as necessary.
  - Compliance with SWPPP.
  - Protecting existing runoff drains from excessive sedimentation.
  - Using standard stabilization and restoration methods such as re-contouring, mulching, seeding and replanting cleared land; encouraging natural re-vegetation; permanent stabilization using pavement, rock or gravel; and installing temporary or permanent stormwater management and erosion and SESC measures.
  - Site grading and drainage during construction will be designed to avoid erosion and in compliance with the SESC Plan.
  - Run-on flow diversion, stormwater collection ponds, seeding and re-vegetation plans will be used as appropriate.
  - Final stabilization will consist of restoration or re-vegetation at final grade conditions as practical.
- Regular visual inspections of erosion control measures will be conducted to monitor the effectiveness of the control measures and to aid in determining if other mitigation measures are necessary;
- Sediment build up around silt fencing will be removed to prevent fabric tears, undermining and fence failures.
  - Construction barriers will delineate construction zones, to minimize the destruction of vegetation and reduce the potential for erosion and compaction;
  - Vegetation removal will be limited to those areas designated for construction activities.
  - Temporarily disturbed areas will be restored;
  - Exposed spoils piles will be stabilized with cover to minimize run-off;

  - Spill prevention, control, and response measures will be implemented as part of the Pollution Incident Prevention Plan (PIPP) to minimize/eliminate possible spills from construction and/or construction equipment;
  - Inspections of the storage areas will be completed periodically to ensure equipment is not leaking;

- Fugitive dust will be controlled through watering of construction roads;
- Vehicle emissions will be controlled with regular maintenance;
- The following BMPs will be implemented to minimize the impacts of dewatering, dredging, and backfilling, as applicable:
  - Backfilling Open Waters H and U and the South Canal east of current operations, may impact stormwater runoff flowing to the North and South Lagoons, potentially causing a small increase of sediment into Lake Erie. The NPDES Stormwater Construction Permit will be in effect during construction. As part of the NPDES Stormwater Construction Permit, an SESC Plan will be required to be in place. As part of the SESC Plan, actions will be taken to minimize the potential increased sediment. Backfilling Open Waters H and U and the South Canal will have a small impact on Lake Erie sediment loading, and no mitigative measures beyond those described here will be necessary. Backfilling Open Waters H and U and the South Canal are the most significant hydrological alteration of construction of Fermi 3.

    Fermi 2 currently releases stormwater via the North Lagoon to the mouth of Swan Creek. Due to its proximity to the construction site, Swan Creek may experience elevated sedimentation from increased runoff from the backfilled onsite water bodies. Although a small increase in sediment loading into Lake Erie through Swan Creek's discharge is expected as a result of filling in the onsite water bodies, the implementation of the SESC Plan and BMPs will reduce the potential for sediment loading during construction. SESC Plan mitigation measures will be implemented to alleviate the potential for increased sedimentation in Swan Creek and other onsite water bodies.

    Slight increases in stormwater runoff are expected from new impervious areas at Fermi 3. This impact would be minimal due to the relatively small Fermi 3 developed area in the Swan Creek Watershed.

  - Implementing the SESC Plan will limit sedimentation of drainage to Lake Erie;
  - Dewatering will include barriers to minimize the groundwater flow entering the excavation, reducing the amount of water discharged;

- Dewatering will occur at a rate such that that the velocity of the discharged water does not cause scouring of the receiving area;
- Sediment-laden water from cofferdams, trenches and other areas will be pumped through a geotextile material before the water is discharged to a watercourse;
- Rock groins will limit the turbidity to the intake bay during dredging and limit scouring at the intake structure during construction of the intake;
- Spoil collected during dredging will be placed in the existing onsite dredged spoils disposal basin;

Restoration of Temporary Construction Impacts

Most of the regulated activities affecting waters of the U.S. are temporary impacts resulting from Fermi 3 construction. Wetlands temporarily affected by Fermi 3 construction activities will be restored to preconstruction conditions. When construction activities begin, vegetation within the temporarily affected wetlands will be removed, and the top 6 to 12 inches of topsoil will be stripped, stockpiled and covered or seeded.

Upon completion of construction, any impervious surfaces or fill installed for construction within these areas will be removed. The previously stockpiled topsoil will be replaced to their preconstruction contours and elevations and aerated as necessary. Additional topsoil may be required. These areas will be seeded and/or planted with native trees, shrubs, and herbaceous plants similar to those present before construction. An enhanced planting mix may be used in wetlands where the preconstruction vegetation was dominated by undesirable species. The restored wetlands are expected to have an improved plant species composition that should, in turn, provide enhanced wildlife habitat by supplying an improved forage and shelter. Through restoration, preexisting or enhanced functions and values will be restored as much as practical. A final design and mitigation plan will be developed and implemented in conjunction with the wetland permit for the Fermi 3 construction.

Mitigation of Operational Impacts

The Fermi 3 facilities will be designed to minimize operational impacts to waters of the U.S.

- The diffuser design will minimize the size of the thermal mixing zone, both lateral and vertical in extent. The diffuser, as well as localized armoring, will minimize bottom scour and associated turbidity;
- Location and orientation of discharge ports and diffuser design will minimize siltation resulting from turbidity at the diffuser ports;
- Compliance with NPDES permit effluent limits and use of one Lake Erie outfall for Fermi 3 will minimize chemical impacts;

- Impingement, entrapment, or entrainment of aquatic species by the intake system will be minimized by maintaining a low intake velocity; intake screens will be designed with appropriate size mesh and include a trash rack; regular washing of the intake screens will minimize impingement; and locating the Fermi 3 intake near the Fermi 2 intake will reduce the cumulative entrapment.

3.3 Proposed Regulated Activity and Aquatic Resource Impacts

A description of the regulated construction activity that would affect water and wetlands of the U.S. is provided below. The limits of the work area are defined and area-specific construction approaches, sequencing, and mitigation techniques and/or restoration activities not described in Section 3.2 are provided. An overall site layout with proposed impacts is included as Figure 3.3-1. A summary of the proposed impacts is included as Table 3.3-1.

3.3.1 Barge Slip/Water Intake/Discharge Pipe/Fish Return (Figure 3.3-2)

Description/Limits of Work Area

The Fermi plant was issued USACE Permit Number 88-001-040-8 on May 26, 2004. The permit authorizes hydraulic dredging of up to 25,000 cu. yards annually from the Fermi 2 intake area and disposal of dredged material into the onsite Dredged Material Disposal Basin (Reference 1). The MDEQ issued Permit Number 04-58-0009-P to the Fermi site that authorizes hydraulic dredging of the Fermi 2 intake area (Reference 2).

Dredging of a barge slip within the existing Lake Erie intake embayment will be conducted to allow delivery of heavy construction equipment and building materials during Fermi 3 construction and for removal of construction debris. Dredging also will take place at the intake embayment to allow for the addition of a new water intake for Fermi 3, installation of the discharge pipe and diffuser, and access for barge unloading. The location of these structures is shown on Figure 3.3-2.

Barge Docking Facility

Barges will be used to deliver equipment and construction materials for Fermi 3. Barges may be used for the removal of construction debris. Near the northeast corner of the Fermi site in the area of the Fermi 2 cooling towers, there is a former barge slip that was used to offload equipment during Fermi 2 construction. The environment of the former Fermi 2 barge slip and offloading area is cleared gravel with some trees and weedy vegetation along a sandy inlet area with no permanent structures. The Fermi 2 barge slip would require substantial dredging and other preparation work before it could be used as the Fermi 3 barge slip. Also, the Fermi 2 barge slip is located on the opposite side of the Fermi 2 protected area from the Fermi 3 construction site. A key consideration in the construction of Fermi 3 is the requirement to minimize construction impacts to Fermi 2 operations. Therefore, use of the existing barge slip is not practicable and Detroit Edison proposes to construct a barge slip within the existing embayment

where the Fermi 2 water intake structure is located. Construction of the Fermi 3 intake structure, discharge pipe, and barge slip within the existing intake embayment reduces the cumulative area of lake bottom that will be disturbed. Construction would occur at different times, starting with construction and operation of the barge slip.

The reactor vessel is the largest single component that could be delivered via barge. It is anticipated that a barge size of 260 feet by 72 feet with a maximum load of 1500 tons would be utilized for delivery of the reactor vessel. A barge of this size would require a draft of no more than 5.5 feet. The existing USACE Permit 88-001-040-8 allows dredging of the intake channel to create a lake bottom elevation of 560.0 feet (1985 International Great Lakes Datum [IGLD] low water datum of 569.2 feet). An elevation of 560.0 feet 1985 IGLD results in a channel that is 9.2 feet deep. Therefore, it is anticipated that dredging (beyond that already performed) would not be required for delivery of the reactor vessel, because the channel depth is 9.2 feet and the required barge draft is 5.5 feet.

The aggregate materials necessary for Fermi 3 construction could also be delivered to the site via barge. The delivery of bulk materials is anticipated to be restricted to a maximum load of 1000 tons, or similar load to limit the maximum draft of the barge to approximately 7 feet. Thus Detroit Edison anticipates that dredging to deepen the channel would not be required because no barge deliveries would require a draft of greater than 7 feet and the current channel depth is 9.2 feet.

Barges will be offloaded using a ramp to the shoreline. Construction below the ordinary high water mark of Lake Erie would include placement of sheet piling (see Figure 3.3-2) necessary to create the vertical face needed to dock and unload the barge. The pilings will be perpendicular to the southern groin to facilitate ingress and egress of the barge. The piling will also be used to transition into the intake structure. Piling will be installed at or landward of the existing shoreline (the need to be perpendicular to the groin necessitates it be installed somewhat to the upland side of the shoreline).

Discharge Pipe

The 48-inch diameter discharge pipe will extend approximately 1340 feet into Lake Erie to avoid recirculation of discharged water through the cooling system. Another consideration in the length of the discharge pipe was to preclude the discharge plume from intruding on environmentally sensitive onsite areas (such as wetlands) during wind-driven rises in Lake Erie water level (seiche events). The pipe from the cooling tower basin to the shoreline will be buried and will enter Lake Erie below the water surface. The pipe discharges through a diffuser. The conceptual design of the multiport diffuser (see Figure 3.3-3) consists of three individual ports spaced evenly over 32.8 feet. Each port will be 16.5 inches in diameter and located 19.7 inches above the lakebed. The ports are assumed to discharge into water approximately 8 feet deep, depending on the time of year and are designed to achieve a desired exit velocity and direction.

The exact method and means of dredging the barge slip and installing the discharge pipe will be determined once a construction contractor is retained. The installation of the discharge pipe is anticipated to require dredging to remove approximately 3300 cu. yards of overburden to create a trench approximately 1340 feet long, 17 feet wide at the top (11 feet average width), and 6 feet deep (see Figure 3.3-4). The discharge pipe is planned to be installed after barge operations supporting construction of Fermi 3 are completed. The route of the pipe will cross some of the area used for the barge slip (Figure 3.3-2). The material removed through mechanical dredging is expected to be used onsite as fill. Turbidity curtains are anticipated during the work to contain suspended sediments. After installation the pipeline trench will be fortified with riprap to prevent scouring. Approximately 1690 cu. yards of heavy riprap and 970 cu. yards of stone would be necessary for the full installation of the discharge pipe.

The current USACE permit allows for dredging from an area 200 feet wide and extending 1100 feet into Lake Erie, to a depth of 9.2 feet below the low water datum elevation of 569.2 feet IGLD 1985 (Reference 1). The existing area of dredging operations is shown on Figures 3.3-5 and 3.3-6. Installation of the Fermi 3 discharge pipe will require dredging a distance of approximately 240 feet beyond the area authorized for maintenance dredging under the existing USACE permit. The additional dredging would result in approximately 0.08 acre of open water impacts.

Maintenance dredging is conducted using a hydraulic dredge with an 8-inch slurry discharge line to the existing 11-acre dredge spoils disposal basin where the spoils settle. Chemical additives (Polyfloc AP1120 and Klaraid PC2700) may be used to assist in the settling of suspended solids from the water column. The clarified water returns to Lake Erie through outfall 013, as authorized under the Fermi 2 NPDES permit (Reference 3), via a weir and valve system at the south end of the basin. Per the existing NPDES permit requirements, prior to returning the clarified water to Lake Erie, the water is tested and must meet permit limits for total suspended solids and pH. In addition, while discharging to Lake Erie, a daily visual observation is performed to ensure the discharge does not contain unnatural turbidity, color, oil films, floating solids, foams, settleable solids, or deposits that are or may become injurious to any designated use. Future treatment of dredge slurry entering the basin is expected to be consistent with the permit conditions, and water effluents from the basin will meet or exceed permit conditions. Maintenance dredging is prohibited between March 31 and June 30.

Intake Structure

The Fermi 3 water intake structure will be built at the location indicated in Figure 3.3-2. The general dimensions and layout of the structure are shown in Figures 3.3-7 and 3.3-8. In order to build this structure a cofferdam will be installed to isolate the construction zone. The cofferdam will span the width separating the groins. The water behind the dam will be pumped back into Lake Erie. Any ingression or rain water which accumulates behind the cofferdam will be pumped to the lake. Heavy excavation equipment will be used to remove materials from the shoreline for the intake structure's foundation.

The top of the cofferdam is estimated to be at elevation 576.0 feet plant datum (574.78 feet NAVD 88). In addition to the cofferdam, sheet piling will be erected and extend an additional 3 feet above the top elevation of the cofferdam. The sheet piling will protect the work area against the wave action of Lake Erie. Removing the cofferdam will require dredging approximately 1100 cu. yards of fill material.

Fish Return

Detroit Edison will design a fish return system that takes into consideration research findings to ensure the highest possible fish survival, but it is premature to design such a system until more of the plant requirements/engineering parameters are established. Figure 3.3-2 depicts a conceptual layout based on a review of the CWA Section 316(b) literature and discussions with environmental staff at operating power plants with fish return systems.

Due to the topography at the Fermi site, gravity flow would not be sufficient to carry the screenwash and fish from the intake pump house to the lake. Water would be pumped through the system. A 24-inch diameter pipe is estimated to be used. The route of the pipe extends south from the intake pumphouse and bends gradually to the east, ultimately emptying into the lake south of the southernmost rock groin.

Detroit Edison would engage the natural resource and regulatory agencies during the design for the fish return system. The fish return system could terminate at the lake's edge. However, it may be preferable for the system to convey fish to a deeper portion of the lake that has better circulation and does not warm up as much in summer. In that case, water and fish would be pumped from the pumphouse to the lake via a pipe that terminates on the lake bottom. That is the scenario depicted in Figure 3.3-2. In either case, the fish return system would terminate in the arm of the lake adjacent to the southernmost rock groin. This would physically separate impinged/returned fish from the intake area, preventing re-impingement, and from the discharge pipe and diffuser, preventing thermal shock. (The potential for thermal shock is low in any case, as the mixing zone/thermal plume is small.) The impacts associated with construction within the lake are anticipated to be similar in both cases.

Construction Approach/Sequence

The proposed dredging would be similar to ongoing operations and maintenance dredging used to maintain the barge slip and the intake embayment in operable condition under the existing USACE permit. Maintenance dredging for the Fermi 2 intake embayment has been performed every 4 years. Approximately 22,000 cu. yards of material are removed from the intake embayment during these activities. The permit allows for removal of up to 25,000 cu. yards of material each year for 5 years. Approximately 200 gallons (roughly 1 cu. yard) per minute of flow from dredge material is anticipated from construction efforts at the location of intake structure. Effects of the dredging activities include increased turbidity, siltation, and temporary loss of benthic habitat and associated biota. Impacts to the biota are expected to be temporary. Adverse effects would cease on completion of dredging. Affected aquatic

systems are expected to revert to pre-construction conditions following construction. The open water impacts are considered temporary.

As described earlier, the dredged materials will be deposited in the permitted dredged spoils disposal basin encircled by Boomerang Road (Wetland N on Figure 2.7-3). The basin has an area of approximately 11 acres and is supported by embankments that are used to retain the dredged spoils. The basin has a weir that allows water to return to Lake Erie while retaining the sediment (Reference 1). The dredged spoils disposal basin discharges through Outfall 013, as authorized under the Fermi 2 NPDES permit (Reference 3). Wetland O is a linear PFO wetland covering 0.72 acre along the east side of the basin. No impacts to this wetland are expected due to construction activities or operation of the dredged spoils disposal basin.

The Fermi site accumulates spoils from periodic dredging activities. Detroit Edison contracts the dredging of the water intake canal on approximately a 4-year cycle. Spoils accumulate in the onsite dredged spoils disposal basin. Additional spoils are generated by yearly cleaning of pump house intakes with approximately 1000 cu. yards of spoils generated every year. Dredged material may either be used onsite as fill or sold for use as topsoil. In the past, dredge material had been removed from the basin periodically and used onsite as fill material under case-by-case approval of the Office of Monroe County Drain Commissioner. Because other dredging projects in the area have been able to sell the dredge material as prime topsoil, Detroit Edison is considering options to sell spoils in the future if they are not needed for onsite fill purposes.

3.3.2 Construction Area 1 (Figure 3.3-9)

The proposed area for disposal of spoils generated during the construction of Fermi 3 is in a 27-acre area (Figure 3.3-9). The excavated material from the power block and circulating water pipe runs will be processed and used as backfill and structural fill for the cooling tower and circulating water pipe run area. An estimated 265,000 cu. yards of excavated material is expected to be excess, and will be used in onsite construction laydown, parking areas and for filling in canals.

The proposed area has historically been used for spoils disposal and is a likely candidate for further disposal activities. Another potential location that has been used in the past for spoils disposal is adjacent to the access road in the northwestern portion of the site (Figure 5.2-2). Transfer of spoils to that area would require use of the access road supporting Fermi 2 operations, which is inconsistent with Detroit Edison's objective to separate the Fermi 3 construction activities from Fermi 2.

The proposed regulated activity is to entirely but temporarily fill three wetlands in the construction spoils disposal area. The following table summarizes the total acreage of each wetland and the proposed impact acreage and square footage for each wetland in Construction Area 1.

Wetland	Type	Total Acreage	Impact Acreage	Impact Square Footage
AA	PEM	0.80	0.80	3.469E04
II	PEM	0.52	0.52	2.261E04
JJ	PSS	1.37	1.37	5.956E04

The temporary loss of these wetlands will result in minimal impact to the overall functions and values of the wetland system at Fermi and in the watershed as a whole because they provide minimal floodflow alteration, sediment/toxicant retention and nutrient removal. Wetlands II and JJ are ditches surrounding the roadside that contain sparse wetland vegetation. The poor quality, limited size and connectivity of these three wetlands to other wetlands, combined with the previous disposal practices support the designation of this area for spoils disposal. All three of these wetlands are located in an established spoil area and share the following properties:

- Highly disturbed by fill (spoil piles, concrete, gravel), ditching and multiple access roads
- Vegetation communities with high structural diversity and low species diversity with well-established invasive species populations
- Seasonal water

Construction will require up to 10 years to complete. The area will be restored to PEM for Wetlands AA and II and PSS for Wetland JJ. The functions and values of these wetlands are expected to be restored and enhanced within 3 to 5 years after construction.

3.3.3 Construction Area 2 (Figure 3.3-10)

An 18-acre temporary construction laydown area is proposed in the southwest corner of the property and includes both wetland and upland communities. The proposed regulated activity is temporarily filling Wetland Y entirely. Wetland Y is 1.14 acres (4.967E04 sq. feet) of the proposed 18 acres of laydown area (Figure 3.3-10). The proposed temporary laydown area will be used for the placement of support structures and buildings that will be used during Fermi 3 construction activities.

Wetland Y is a fragmented early successional PFO wetland with mixed vegetation and a partially open canopy. It has a high level of disturbance with both pioneer and non-native species present. The temporary impact of Wetland Y is expected to result in minor impacts to the overall functions and values of the wetland system at Fermi and the watershed as a whole. Wetland Y provides marginal wildlife habitat for edge species and limited water storage. The proposed activity will restrict surface hydrology and route rainwater to the lower adjacent areas, including the Quarry Lakes to the west, and the PFO Wetland L on the eastern side of the road. Although a coastal wetland, Wetland Y does not represent a Michigan Natural Community.

Construction will require up to 10 years to complete. Following construction, Wetland Y will be restored to PFO. A portion of the functions and values of this wetland will be restored within 3 to 5 years after construction and will be fully restored in 10 to 20 years.

3.3.4 Construction Area 3 (Figure 3.3-11)

The 20.5-acre construction area north of Fermi Drive will be the location of the Fermi 3 switchyard, and will be used temporarily for construction laydown and support structures and buildings. It will require rerouting the existing transmission lines. The Fermi 2 345-kV and 120-kV transmission lines traverse the site northwest to southeast, bisecting Wetland E into a north and south portion.

This area includes both wetland and upland communities. The proposed regulated activity is temporarily filling PFO Wetlands B and D, PSS Wetland E-South and E-North and PEM Wetland C: 12.97 acres of the total 20.5 acres of laydown area (Figure 3.3-11). The following table summarizes the total acreage of each wetland and the proposed impact acreage and square footage for each wetland in Construction Area 3.

Wetland	Type	Total Acreage	Impact Acreage	Impact Square Footage
B	PFO	0.76	0.76	3.309E04
C	PEM – Great Lakes marsh	48.18	6.93	3.018E05
D	PFO	1.37	1.37	5.957E04
E-North E-South	PSS PSS southern shrub carr	2.67 2.04	1.87 2.04	8.142E04 8.890E04

This staging, modular fabrication, and assembly area will be subject to heavy machinery staging, equipment hauling, materials handling and delivery. The Fermi 3 switchyard will be located north of Fermi Drive and east of Toll Road, permanently impacting an upland prairie restoration area and nonjurisdictional Wetland A.

Wetlands B and D have a high level of disturbance with both pioneer and non-native species present. Both are coastal wetlands; however neither represents a Michigan Natural Community. Wetland C is a Great Lakes marsh fragmented from Lake Erie by access roads but connected hydrologically through culverts. As a result, the wetland has high ecological value. Wetland E-North is an emergent marsh/wet meadow and scrub shrub mix that does not represent a Michigan Natural Community. Wetland E-South is likely a southern shrub carr. Both portions of E have high species diversity due to transmission line ROW maintenance. These wetlands primarily provide floodflow alteration, sediment retention, toxicant retention, nutrient removal and wildlife habitat.

The short-term impact to wetlands B, D, E-South and portions of C and E-North is expected to result in minor impacts on the overall functions and values of the wetland system at Fermi and the watershed as a whole. Construction will require up to 10 years to complete after which the area will be restored to the pre-impact wetland types. The functions and values of Wetland C, E-North and E-South will be restored within 3 to 5 years and partially restored for Wetlands B and D. The functions and values of Wetlands B and D will be fully restored in 10 to 20 years.

3.3.5 Construction Area 4 (Figure 3.3-12)

The 11.5-acre area east and south of Critical Path Road will be used temporarily for Fermi 3 construction laydown and includes both wetland and upland communities.

The proposed regulated activity is temporarily filling the entire 4.59 acres (2.001E05 sq. feet) of PEM Wetland W, in the primarily upland 11.5 acre temporary laydown area (Figure 3.3-12). Wetland W is a wet meadow dominated by invasive species. This activity will result in minimal and short-term impact to the overall functions and values of the wetland system at Fermi and the watershed as a whole. Wetland W is isolated from other wetlands and provides minimal floodflow alteration, sediment/toxicant retention, nutrient removal and marginal wildlife habitat.

Construction will require up to 10 years to complete. Wetland W will be restored to a wet meadow with enhanced functions and values reestablished within 3 to 5 years after construction.

3.3.6 Warehouse, PAP/VIB and Parking Garage (Figure 3.3-13)

Approximately 7 acres east of Wetland C, south of the northernmost canal and west of the Fermi 2 operating facility is proposed to support permanent structures including the Fermi 2/Fermi 3 Warehouse, PAP/VIB and parking garage.

Open Water H is an isolated pond. Based on aquatic surveys completed in 2008 (Section 2.5.2), this pond was characterized by relatively low numbers and diversity of fish. Collections in 2008 were dominated by common sunfish and gizzard shad. Dewatering/filling this waterbody will not impact any rare, unusual, or special-status fish species and, by virtue of its hydrological isolation, will have no impact on fish communities of nearby waterbodies or Lake Erie. Open Water U was not sampled but because of culverts to the north (Figure 2.6-1) it is assumed to contain an assemblage of fish that is a subset of those in the North Canal. The North Canal was characterized by high numbers and high measures of species richness in 2008 and 2009, due presumably to its connection with Swan Creek and Lake Erie. North Canal collections were dominated by common sunfish (e.g., bluegill and pumpkinseed), gizzard shad, and notropids (shiners/minnows). Almost all of the fish lost as a result of dewatering/filling Open Water U would be representatives of species that are common to ubiquitous in Swan Creek and Lake Erie and prolific, maturing early and producing large numbers of young. Some would leave the affected area via connections to the North Canal. Any impact to Swan Creek and Lake Erie would be very small.

Wetland C is a large Great Lakes marsh fragmented from Lake Erie by access roads but connected hydrologically to Lake Erie through culverts to Open Water U and the South Canal (Figure 2.6-1). The edge of Wetland C, where permanent impacts are proposed, exhibits vegetation communities and conditions that reflect a high degree of disturbance including invasive species and altered hydrology associated with the adjacent roadway and other human activities.

The proposed regulated activity is permanently filling 2.24 acres (9.747E04 sq. feet) of PEM Wetland C. The wetland impact to H is 0.10 acres (4223 sq. feet) and to U is 0.15 acres (6477 sq. feet). The wetland impact represents a total of 2.49 acres of the total 7 acres of construction impacts (Figure 3.3-13).

Open Water H and U will be dewatered using standard dewatering practices. The isolated Open Water H will be dewatered to Open Water U. Once dewatered, H will serve as a dredge spoils basin. Sediments will be allowed to settle out in the basin. The water in the basin will be conveyed through an outfall structure to Wetland C. Soil erosion and sedimentation control measures will be in place prior to the discharge to prevent siltation. After dewatering, the depression will be backfilled and compacted.

To accommodate the parking garage and PAP/VIB footprint, a portion of Wetland C will require excavating wetland soils, backfilling and compacting. Sheet piling will be installed on the west side of the construction footprint to minimize impacts to Wetland C and eliminate the need for additional excavation and fill material necessary for slope stabilization.

The Fermi 2 outfalls that currently discharge to Open Water U will be directed to culverts to the North Canal to Lake Erie. A concrete junction box at the north end of Open Water U will maintain the hydrologic connection between Wetland C and the North Canal to Lake Erie (Figure 3.3-13). New culverts through this connection will be installed with an earthen bottom to promote benthic habitat. After culvert installation, the remaining area will be backfilled and compacted. Final grade will be in accordance with the final construction grading plan for Fermi 3. Filling these areas will result in the loss of aquatic communities and aquatic organisms that currently reside in these areas. These include the loss of fringing wetland habitats, aquatic vegetation, fish and benthic species as well as reptile and amphibians. The long term impacts of Open Water areas H and U and the small roadside area of Wetland C will result in minimal disturbances to the functions and value of the wetland system at Fermi and the watershed as a whole. The edge of Wetland C along Doxy Road, and Open Waters H and U provide minimal floodflow alteration, sediment/toxicant retention, nutrient removal, and wildlife habitat.

3.3.7 Cooling Tower (Figure 3.3-14)

The proposed location for the cooling tower is entirely within upland; however, the construction footprint is expected to impact the adjacent aquatic resources, South Canal and Wetland KK. The South Canal is a 1.97 acre PEM Great Lakes marsh with typical marsh zonation. South Canal is hydraulically connected to Lake Erie through a culvert under Fermi Drive to Wetland M and also to Wetland C through a culvert

under Doxy Road. Wetland KK is a 1.62 acre highly disturbed PFO wetland. It contains early successional species with an open canopy. A storm in June 2010 damaged or downed several trees in the wetland.

The proposed regulated activity includes permanently filling the entire 1.62 acres (7.062E04 sq. feet) of PFO Wetland KK and 1.17-acres (5.093E04 sq. feet) of PEM South Canal, totaling 2.79 acres of impact (Figure 3.3-14). The southern portion of the South Canal will be filled during construction of the new cooling tower. South Canal fish collections in 2008-2009 were dominated by goldfish and common carp, both invasives that are considered nuisance species or "rough fish" by many fisheries managers. Small numbers of common sunfish were also collected here. Given that no rare, unusual, or special-status species are found in the South Canal and the fish that are present are largely invasive species with no recreational or commercial value, impacts from cooling tower construction are considered negligible.

Site preparation activities include dismantling the current meteorological tower, transplantation of American lotus (*Nelumbo lutea*) from the South Canal and removal of vegetation in the impact areas. To maintain the hydraulic connection to Lake Erie and Wetland C, two arch shaped steel-reinforced concrete culverts will be installed in parallel. These will have an earthen bottom to promote habitat for benthic organisms and will be installed for a length of approximately 880 feet, maintaining connection to the northern portion of the South Canal (Figure 3.3-15). The culverts are sized to allow stormwater from upstream areas to be transported to Lake Erie. Likewise, the culverts will maintain the function of the existing canal to allow wind-driven Lake Erie water to be transported through the canals and into adjacent wetlands. Slight increases in stormwater runoff are expected from new impervious areas at Fermi 3. Implementation of the SESC Plan will prevent sediment loading during construction.

These long-term impacts will result in a decrease in functions provided primarily by the South Canal and, to a lesser extent, by Wetland KK. Currently, these wetlands provide floodflow alteration, sediment/toxicant retention, nutrient removal, biodiversity and wildlife habitat. These impacts will not have a significant effect on the functions and values provided by the larger, more intact wetland systems on the property; and the earthen culvert has been designed to maintain the biodiversity, fish and wildlife habitat function between the wetland onsite and Lake Erie.

3.3.8 New Operations Access Road (Figure 3.3-16)

Toll Road at Fermi Drive to approximately 230 feet north of Langton Road is owned and maintained by the Monroe County Road Commission (MCRC). The remainder of Toll Road along the Fermi property boundary is privately owned. A new operations access road is proposed that will parallel the western property boundary. The access road will utilize the MCRC right-of-way, cross an intermittent stream and then transition along a slight angle to the east onto Fermi property. The transition will be at the location of the privately owned portion of Toll Road. The proposed road will turn east, onto existing Bullit Road and

continue through the site to the proposed parking garage and warehouse via the route shown on Figure 3.3-16.

The road has been designed to include two 12-foot lanes, 8 feet of shoulder, 17 feet of drainage to the west and 11 feet of drainage to the east and into the property. The road design includes sediment traps that will reduce erosion and stormwater runoff to the adjacent wetlands. The following SESC and BMPs will be implemented specifically for road construction:

- Concrete or hot mix asphalt paving
- Ditching
- Restoration
- Appropriate signage installations
- Culvert installation/construction
- Designation and implementation of material storage locations
- Designation and coordination of worker vehicles/parking

The proposed regulated activity includes long-term impacts to 0.42 acres (1.836E04 sq. feet) of PFO Wetland I, a rare and imperiled southern hardwood swamp (Figure 3.3-17). Wetland I is a 39.74 acre PFO wetland on the northwest perimeter of the Fermi property immediately east of Bullit Road. Wetland I grades into PEM Wetland C to the west and south. Vegetation is diverse, reflecting mixed upland and wetland conditions with hydrological fluctuations and evidence of past disturbance including ditching and soil piles.

Wetland I represents an intact PFO wetland habitat. The wetland is large, flat and has significant storage potential with dense vegetation and slow water flow. There is some diversity in structure and cover ranging from a disturbed, partially open canopy at the edges to a closed canopy interior with a predominance of native vegetation. This wetland is indirectly connected to Lake Erie and provides floodflow alteration, sediment/toxicant retention, nutrient removal and wildlife habitat. The northern edge of Wetland I, where permanent impacts are proposed, exhibits vegetation communities and conditions that reflect a high degree of disturbance including invasive species and altered hydrology associated with the adjacent roadway and other human activities. This edge provides a buffer for the interior and less disturbed wetland conditions and edge impacts could result in minor impacts to overall wetland function to the wetland system on the Fermi site and the watershed as a whole.

3.3.9. Onsite Transmission (Figure 3.3-18)

Transmission lines currently cross the site north of Fermi Drive. To accommodate the Fermi 2 and Fermi 3 transmission needs and avoid construction equipment clearance issues in the area north of Fermi Drive, the transmission lines have been proposed to be rerouted. The new onsite transmission lines will begin at the northeast corner of Fermi Drive and Toll Road, just east of the proposed Fermi 3 switchyard.

The line will continue north on the east side of Toll Road and turn northeast/east toward the power block via the route shown on Figure 3.3-18. The transmission lines will cross over Wetlands F and C and require the installation of towers in Wetland C. The proposed transmission plan includes placing the Fermi 3 and Fermi 2 lines on common towers to reduce the overall impacts of the transmission rerouting. The placement of the Fermi 3 switchyard location in Construction Area 3 is based on rerouting and alignment with the existing transmission corridor to the site.

The proposed regulated activity requires long-term impacts to 0.24 acres (1.037E04 sq. feet) of Wetland C, a rare and imperiled Great Lakes marsh, to accommodate the tower footprints for eight transmission towers. Because the onsite transmission of electricity would consist of elevated lines, permanent impacts would occur only within the footprint required for support structures. Excavation and pile driving / drilling would be required for transmission tower foundations

An additional 2.29 acres of temporary and short-term impacts are estimated in Wetland C for the installation of the support structure, and two access roads to install and maintain the towers. Construction work mats, or bog mats are expected to be used within a 20-foot wide easement. The following table summarizes the acreage and square footage for each of the temporary impacts in Wetland C.

Temporary Impact Location	Impact Acreage	Impact Square Footage
Doxy Road Access	0.35	1.512E04
Toll Road Access	0.34	1.493E04
Tower footprint	1.60	6.963E04

Vegetation clearance of 50 feet on either side of the transmission towers along a length of approximately 700 feet will be required for the transmission lines parallel and east of Toll Road over Wetland F. As a result of the vegetation clearance, PFO Wetland F will convert from a forested wetland to an emergent wetland. Wetland F is a rare and imperiled southern hardwood swamp. The long term impact to Wetland F is 1.53 acres (6.657E04 sq. feet).

The edge of Wetland C, on the west side of Doxy Road is tree-lined. Tree clearing is necessary where the elevated transmission line exits Wetland C at Doxy Road. Silt fencing will be installed in the area as depicted on Figure 3.3-18 to minimize impacts to the wetland. Because Wetland C is a PEM, there will not be a conversion of wetland types and therefore compensation is not required for this tree clearing activity.

The additional 1.60 acres of temporary impact to Wetland C and long term impacts to Wetland F are due to the following:

- Provisions for installation of the transmission line structures and stringing the lines. This includes providing area for drilling equipment work locations for trucks and cranes, laydown areas for equipment and supplies, etc.
- Provisions for access of equipment and personnel to the work locations.
- Provisions for trimming and clearing activities.

The construction period to install the towers and wires is expected to be up to 3 months. Impacts to wetland plant communities consist of plant damage, compaction of wetland soils and short-term reductions in productivity.

Structures and access ways would be sited, to the extent practical, to avoid and minimize impacts to wetlands and streams. Construction impacts associated with transmission line crossings are associated with clearing activities and potential runoff and sedimentation. Tree cutting will occur along the transmission line right of way east of Toll Road. Bog mats will be laid in the wetland to facilitate access by construction equipment. Bog mats will be removed upon completion of the tower construction and installation of the lines and are considered a temporary impact that will minimize soil compaction and vegetation damage. To further reduce impacts to vegetation and soil, balloon tires will be used on equipment and the construction activities can be completed during the winter. Restoration is expected to occur within the following growing season.

3.4 Proposed Wetland, Stream, and Water Impacts

Potential wetland impacts include 12.86 acres of Great Lakes marsh, 1.95 acres of southern hardwood swamp, 3.91 acres of southern shrub carr, 0.80 acres of coastal emergent wetland, 7.24 acres of other emergent wetland, 4.89 acres of other forested wetland and 1.37 acres of other scrub shrub wetland. This total wetland acreage includes 1.88 acres of nonjurisdictional emergent wetland impacts (Wetland A) and activities associated with the rerouting of onsite transmission lines affecting 2.29 acres of Great Lakes marsh (Wetland C) for a brief period of time. A summary of the proposed Fermi site impacts is provided in Table 3.3-1.

3.5 Mitigation for Wetland and Stream Impacts

Because of the Fermi site's location in the coastal zone of Lake Erie, any activity onsite will have the greatest local effects (either positive or negative) on coastal resources and Lake Erie itself. Detroit Edison recognizes the value of coastal wetland habitat along Lake Erie. Several investigations of wetlands were conducted at the site and landscape level assessments were performed within the watershed and coastal zone to determine the location, quantity and quality of existing wetlands onsite and their significance in the Monroe County coastal zone of Lake Erie. Information was then used in

conjunction with communication and feedback from regulatory agencies and conservation organizations to guide avoidance, minimization and mitigation strategies associated with design of Fermi 3. These strategies resulted in a significant reduction in proposed impacts to wetlands and their associated functions and values.

Since the first design iteration for Fermi 3, impacts to over a hundred acres of wetland considered rare and imperiled and of high ecological value have been avoided including Great Lakes marsh and southern hardwood swamp. The majority of remaining unavoidable wetland impacts have been restricted to areas that are highly disturbed, fragmented and are not considered natural communities. Mitigation actions proposed as compensation for these impacts have been designed to replace and exceed the quantity and quality of these wetland areas. In general, proposed compensation will exceed regulatory requirements for spatial mitigation and specifically address conservation priorities determined by a watershed assessment including protection, restoration and enhancement of rare and imperiled coastal wetlands, large blocks of natural area, and increased connectivity with ongoing conservation lands and initiatives. The conceptual mitigation strategy in Appendix C describes this information in greater detail.

In response to the rarity of forested wetlands and the length of time it takes to restore these systems, Detroit Edison's unavoidable impacts to southern hardwood swamps were reduced to 1.95 acres with a compensation strategy that will result in the restoration of approximately 54 acres of forested wetlands immediately adjacent to Lake Erie. As stated, unavoidable impacts were restricted to non-forested, low quality wetlands to the greatest extent possible. However, compensation is still proposed at an average ratio of 5:1; a ratio generally associated with impacts to high quality, intact wetland systems. Additional mitigation is proposed in the form of enhancement of Great Lakes marsh at a ratio 23:1. This strategy proposes compensation above and beyond guidance ratios to satisfy regulatory mitigation requirements and also in support of Detroit Edison's corporate environmental stewardship initiatives and ongoing partnership with USFWS and other conservation entities.

Once the proposed compensation actions have been implemented, an additional 390 acres of rare and imperiled wetland habitat will be restored, enhanced and permanently protected in the coastal zone of Lake Erie in Monroe County. This will result in a net positive benefit to the coastal zone in terms of quantity and quality of wetland, protected area and associated watershed functions including improved water quality outflow into Lake Erie, floodflow alteration and wildlife habitat. In addition to compensatory mitigation, any wetland areas with temporary impacts will be restored to wetland habitat that will exceed the original quality, functions and values that were temporarily lost during construction of Fermi 3. This includes an additional 21.39 acres of improved wetland habitat that will be restored after temporary impacts to Construction Area 1 through 4:

- 6.93 acres of Great Lakes marsh (Wetland C)
- 3.91 acres of southern shrub carr (Wetlands E-North and E-South)

- 3.27 of PFO wetland (Wetlands B, D and Y)
- 0.80 acres of coastal PEM (Wetland AA)
- 5.11 acres of PEM wetland (Wetlands W and II)
- 1.37 acres of PSS wetland (Wetland JJ)

References

1. Department of the Army, Detroit District Corps of Engineers, Engineering and Technical Services, Regulatory Office, Permit Number 88-001-040-8 issued to Detroit Edison, May 26, 2004.

2. Michigan Department of Environmental Quality, Permit Number 04-58-0009-P, Part 325, Great Lakes Submerged Lands, issued to Detroit Edison on July 21, 2004.

3. Michigan Department of Environmental Quality, "National Pollutant Discharge Elimination System (NPDES) Permit – Detroit Edison Company Fermi 2 Power Plant, Permit No. MI0037028," 2005, available online at http://www.epa.gov/npdescan/MI0037028FS.pdf.

Table 3.3-1. Summary of Wetland Impacts (Sheet 1 of 2)

Impact Type	Wetland ID	Proposed Impacts	
		Acres	Square Feet
Emergent marsh wetland			
Great Lakes marsh (rare and imperiled)	C	9.40	4.096E05
	C[a]	2.29	9.968E04
	South Canal	1.17	5.093E04
	Total	12.86	5.603E05
Palustrine emergent (coastal)	AA	0.80	3.469E04
Palustrine emergent (other)	A[b]	1.88	8.188E04
	W	4.59	2.001E05
	II	0.52	2.261E04
	H	0.10	4223
	U	0.15	6477
	Total	7.24	3.153E05
Total emergent marsh		20.90	9.102E05
Forested wetland			
Southern hardwood swamp (rare/imperiled)	I	0.42	1.836E04
	F	1.53	6.657E04
	Total	1.95	8.493E04
Palustrine forested (coastal and other)	B	0.76	3.309E04
	D	1.37	5.957E04
	Y	1.14	4.967E04
	KK	1.62	7.062E04
	Total	4.89	2.129E05
Total forested wetland		6.84	2.979E05
Shrub scrub wetland			
Southern shrub carr (coastal)	E-North	1.87	8.142E04
	E-South	2.04	8.890E04
	Total	3.91	1.703E05
Palustrine scrub shrub (other)	JJ	1.37	5.956E04
Total shrub scrub wetland		5.28	2.299E05
Total Wetland Impacts		33.01	1.438E06

Table 3.3-1. Summary of Wetland Impacts (Sheet 2 of 2)

Impact Type	Wetland ID	Proposed Impacts	
		Acres	Square Feet
Open water	H	1.86	8.120E04
	U	3.32	1.445E05
	Lake Erie	0.08	3600
	Total[c]	5.26	2.293E05

[a]Temporary impacts to Wetland C (laydown area around the transmission towers and access) are included in the impacts to Great Lakes marsh. Because of the limited duration of the impact, mitigation is not proposed for this acreage.

[b]Wetland A is included in the impacts to emergent wetland. Because Wetland A is unregulated, mitigation is not proposed for this acreage.

[c]Mitigation is not proposed for open water impacts.

Figure 3.3-1. Potential Wetlands Construction Impacts

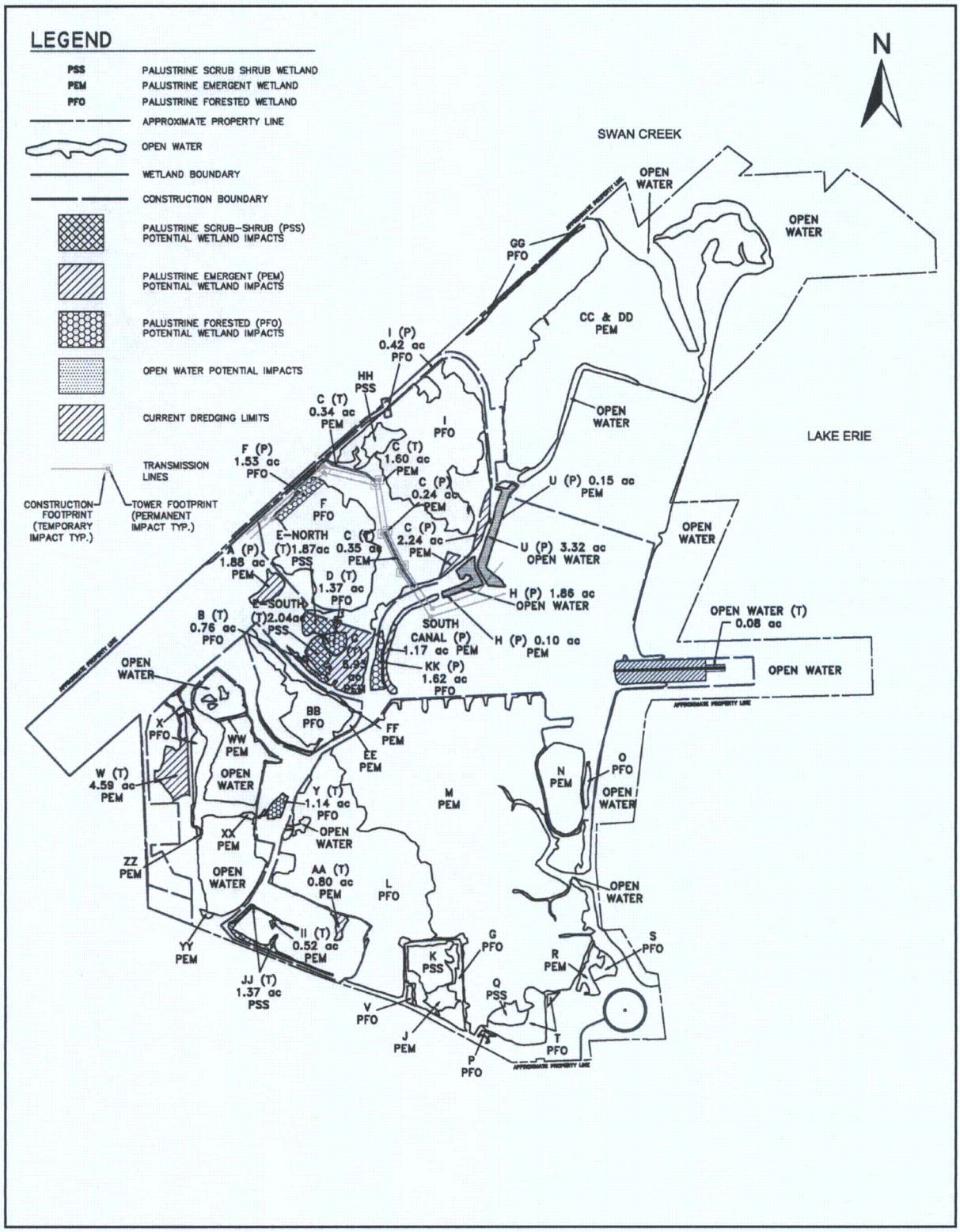


Figure 3.3-2. Location of Intake Structure/Discharge Pipe/Fish Return/Barge Slip

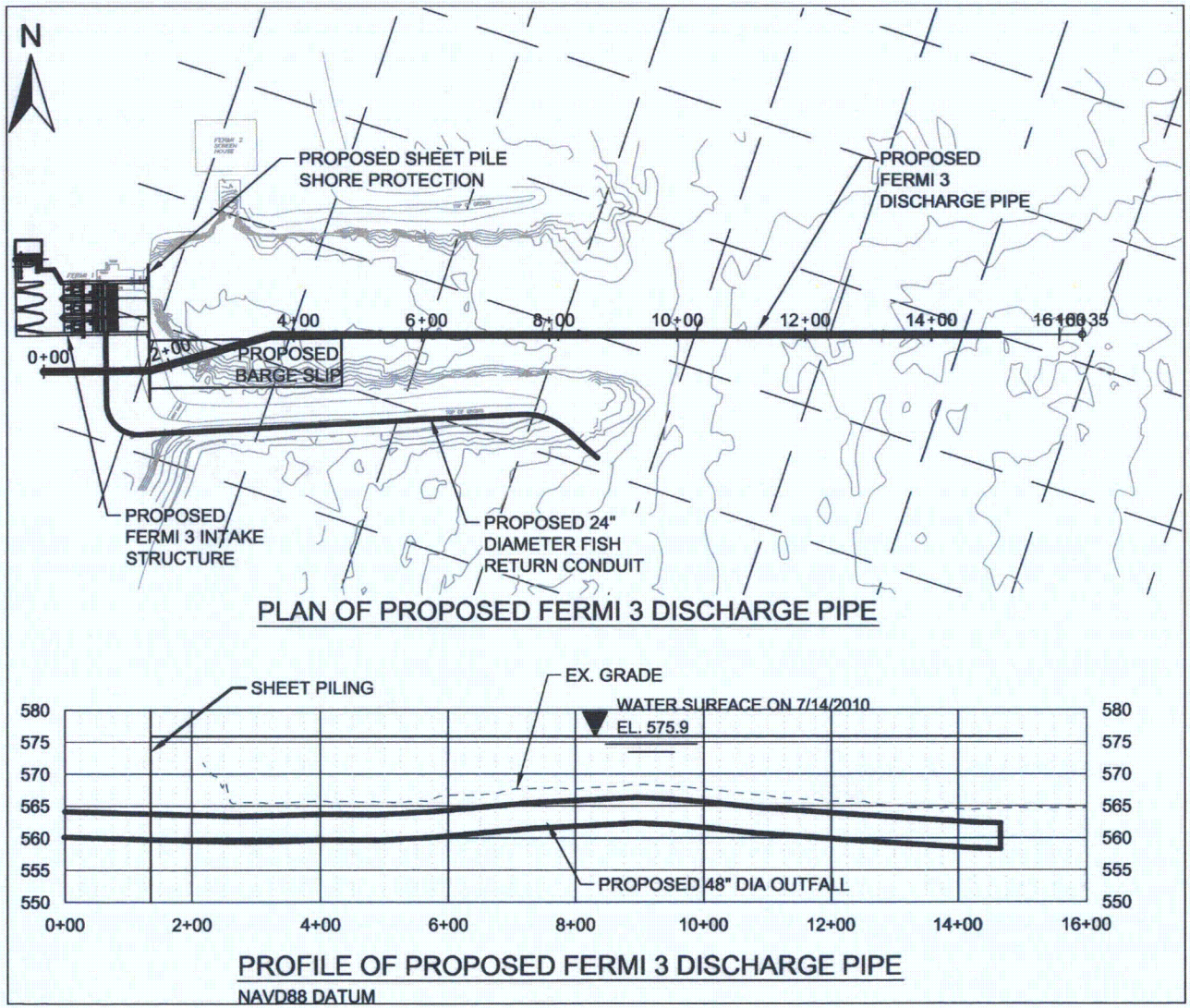


Figure 3.3-3. Outfall Diffuser Arrangement

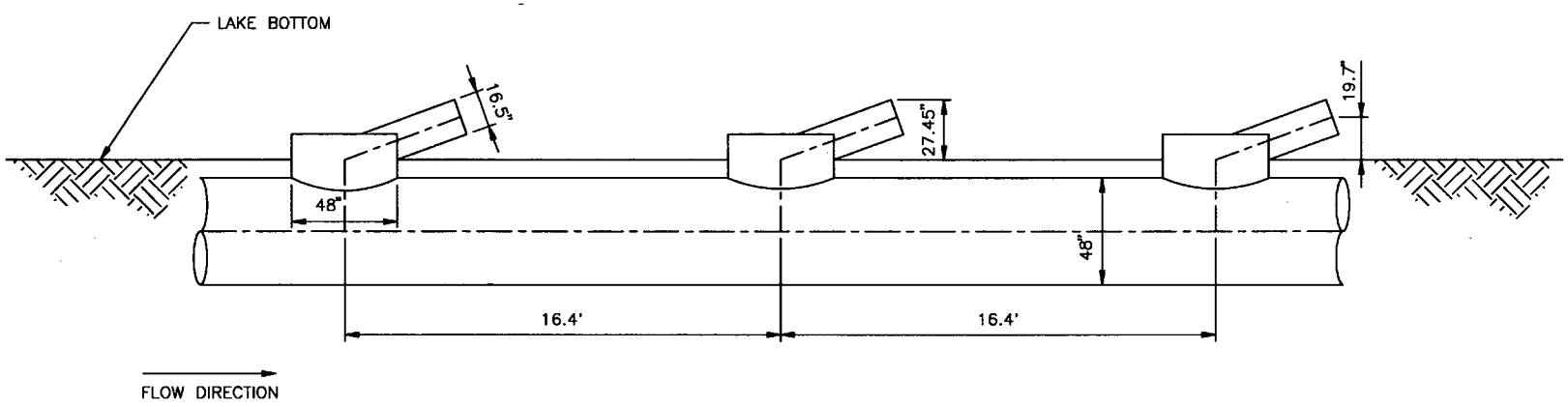


Figure 3.3-4. Discharge Pipe Dredging Cross Section

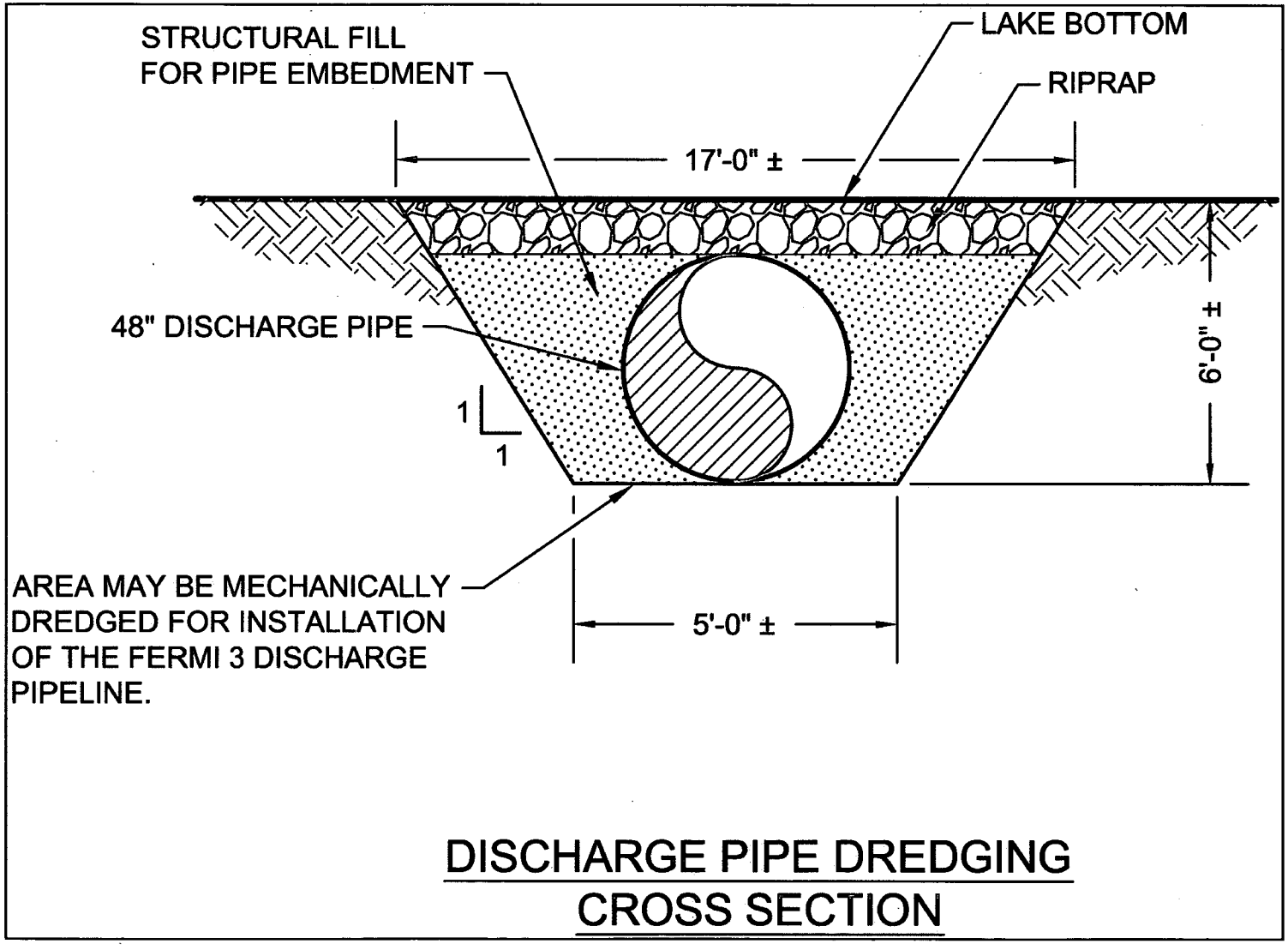


Figure 3.3-5. Existing Intake Canal Plan View

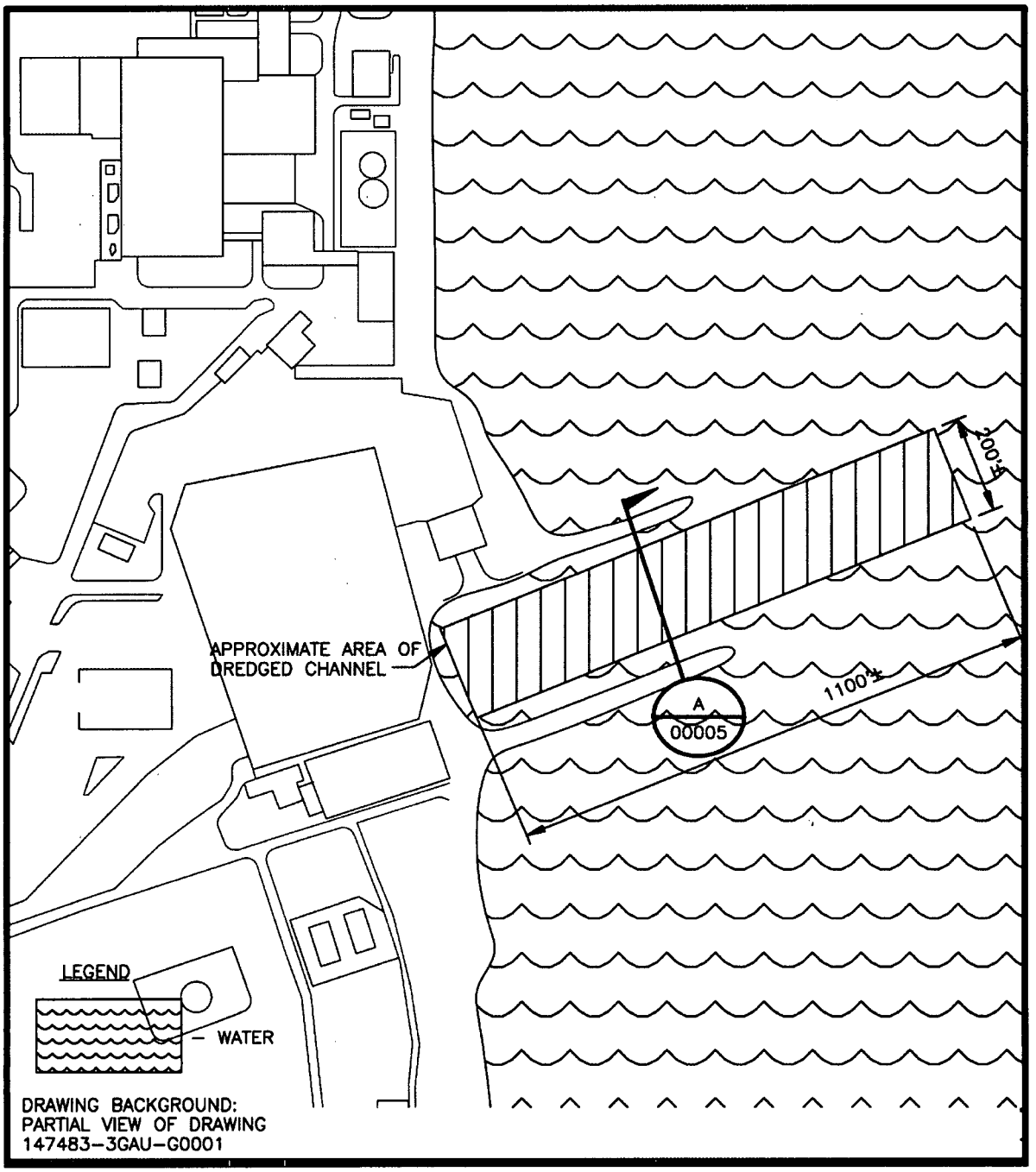
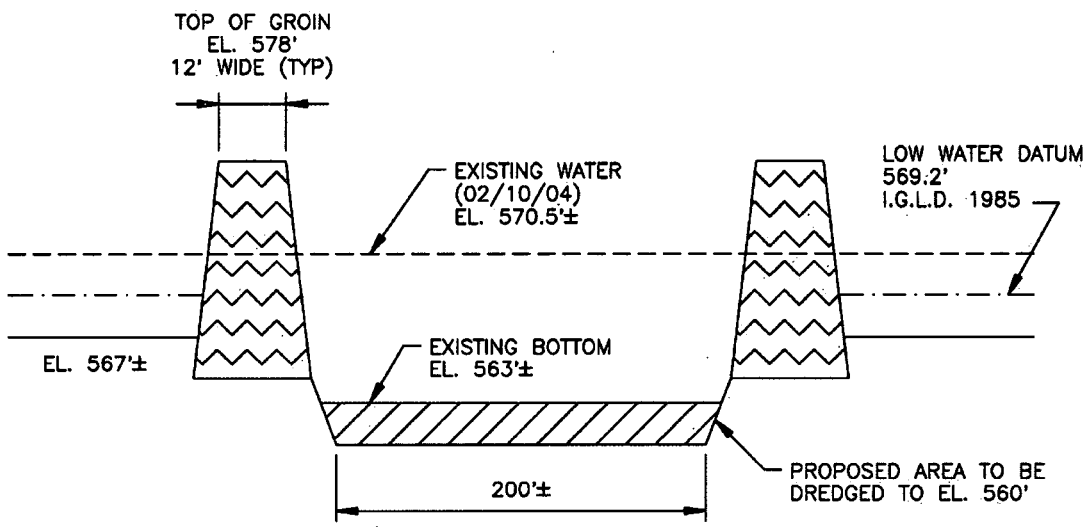


Figure 3.3-6. Existing Intake Canal Cross Section



NOTES:

1. FERMI INTAKE CANAL MAINTENANCE
   BY: DETROIT EDISON COMPANY
   LAKE ERIE, FRENCHTOWN TOWNSHIP
   MONROE COUNTY, MICHIGAN.
2. ALL DIMENSIONS SHOWN ARE 1985 I.G.L.D. (INTERNATIONAL GREAT LAKES DATUM)
3. TOTAL OF 25,000± CUBIC YARDS (ANNUALLY) OF DREDGED MATERIAL TO BE REMOVED BY HYDRAULIC DREDGE AND PLACED IN STATE AND FEDERAL APPROVED ON-SITE DREDGE DISPOSAL BASIN, (100,000 CU. YDS. CAPACITY).
4. APPROXIMATE LENGTH OF DREDGED CHANNEL IS 1,100 FEET.

SECTION A
SEE DWG DS-00004

SECTION REFERENCED FROM:
DEPARTMENT OF THE ARMY
PERMIT NO. 88-001-040-8/04-58-9
SHEET 3 OF 5.

Figure 3.3-7. Fermi 3 Station Water Intake Structure (Plan View)

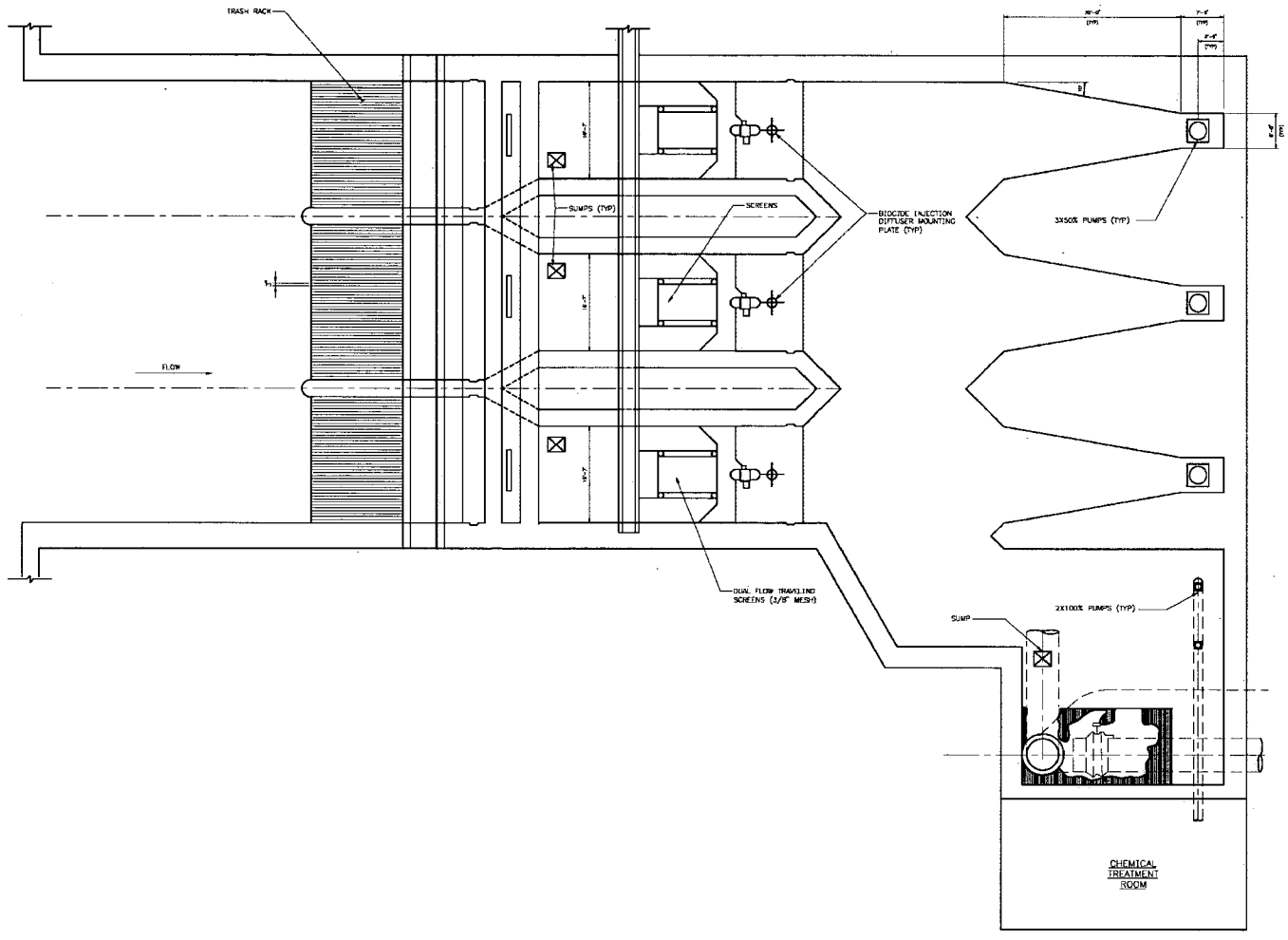


Figure 3.3-8. Fermi 3 Station Water Intake Structure (Elevation View)

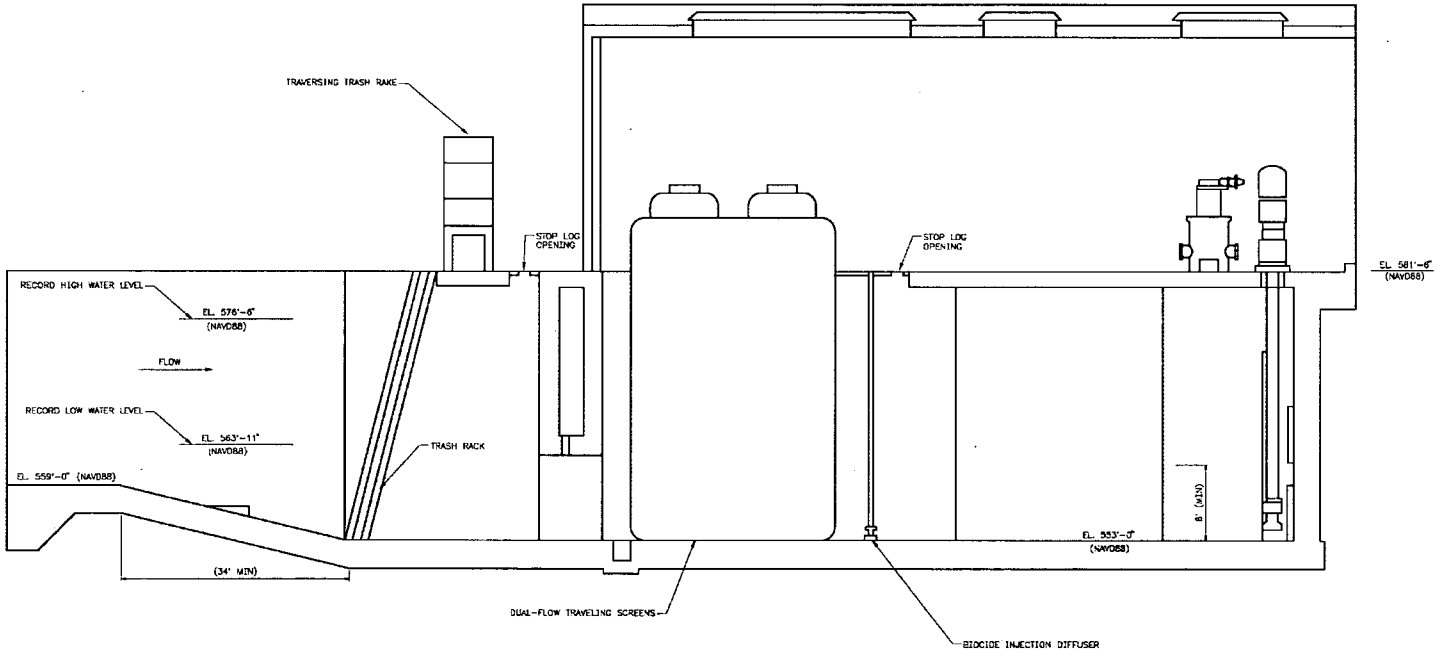


Figure 3.3-9. Construction Area 1 Impact

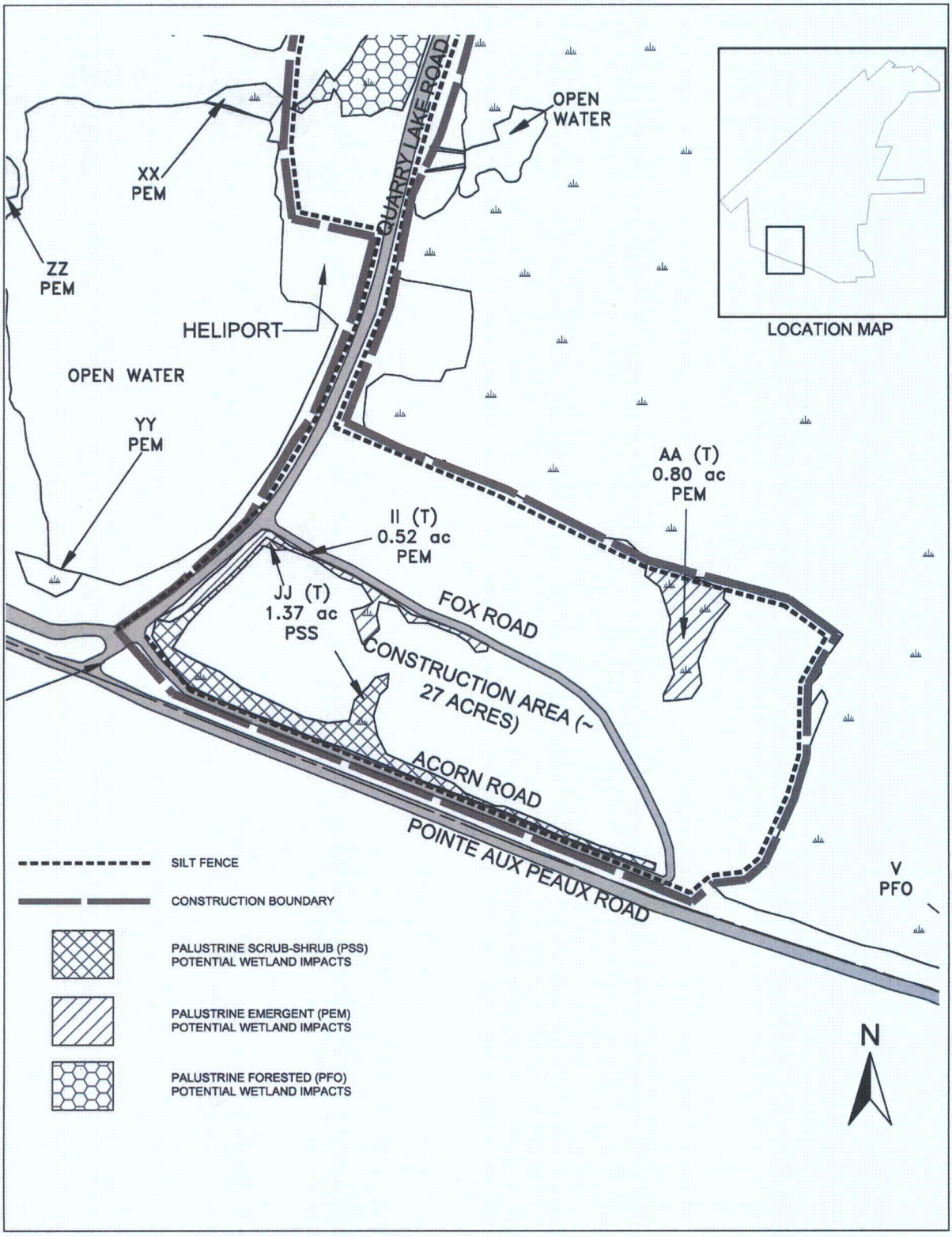


Figure 3.3-10. Construction Area 2 Impact

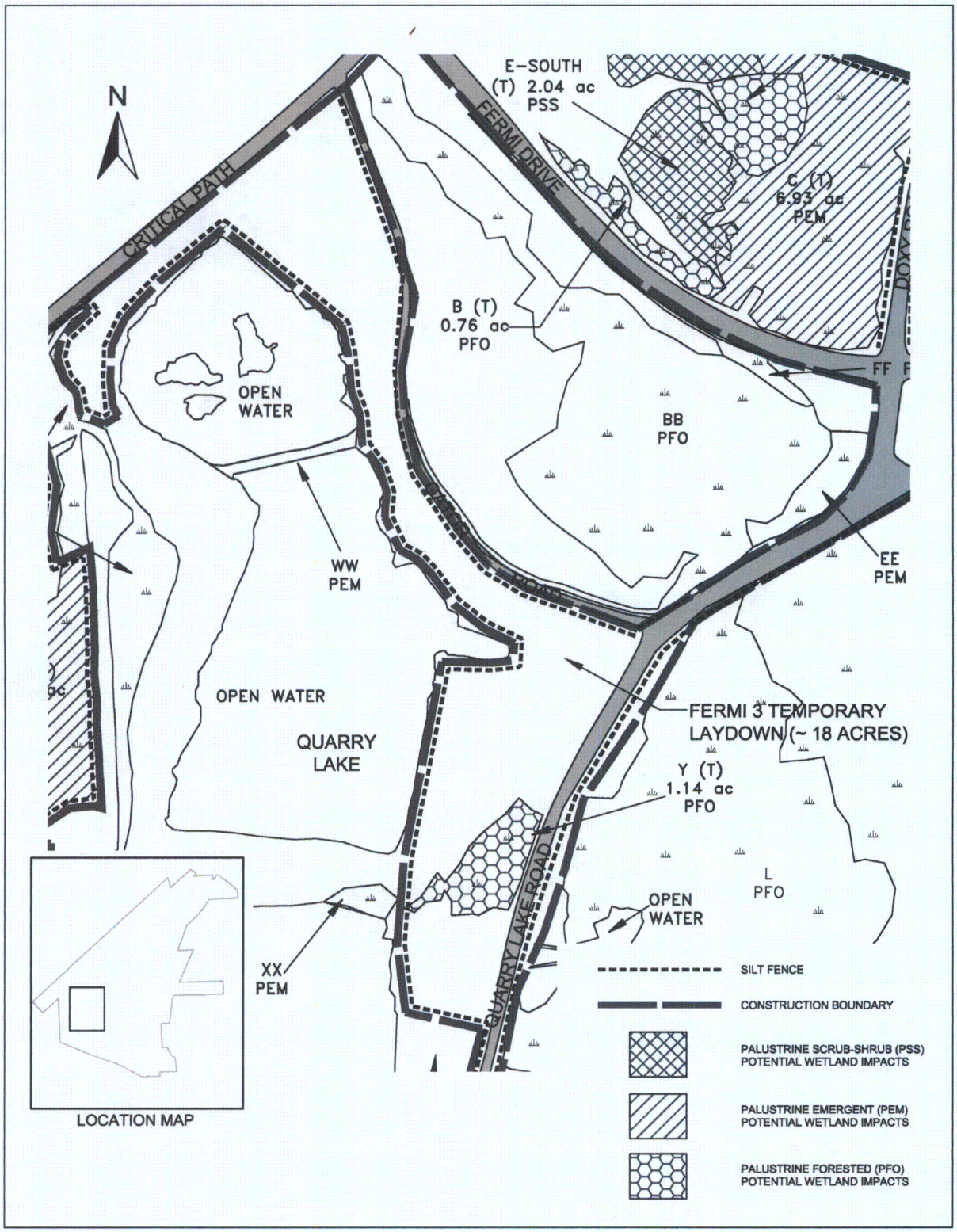


Figure 3.3-11. Construction Area 3 Impact

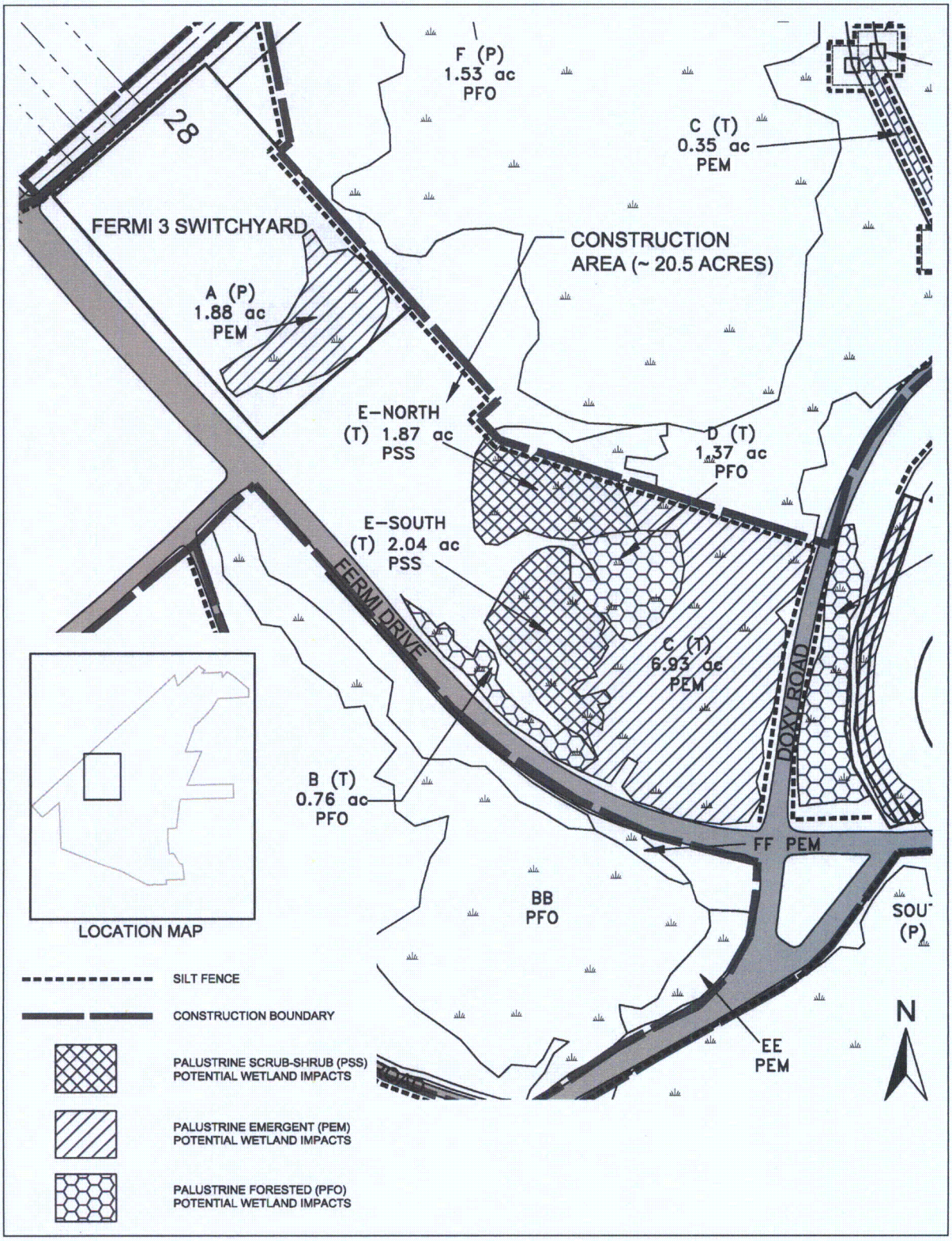


Figure 3.3-12. Construction Area 4 Impact

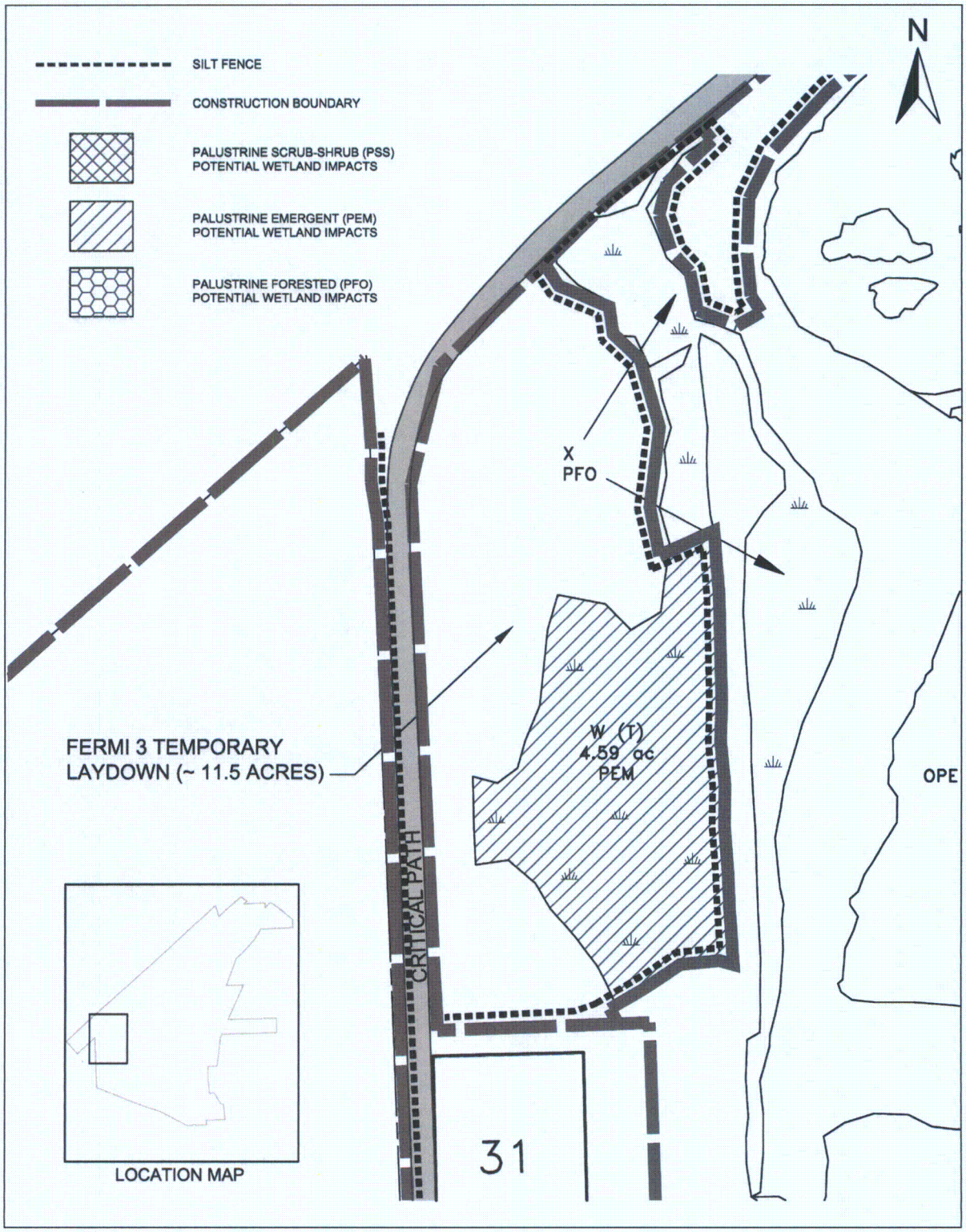


Figure 3.3-13. Warehouse, PAP/VIB and Parking Garage Impact

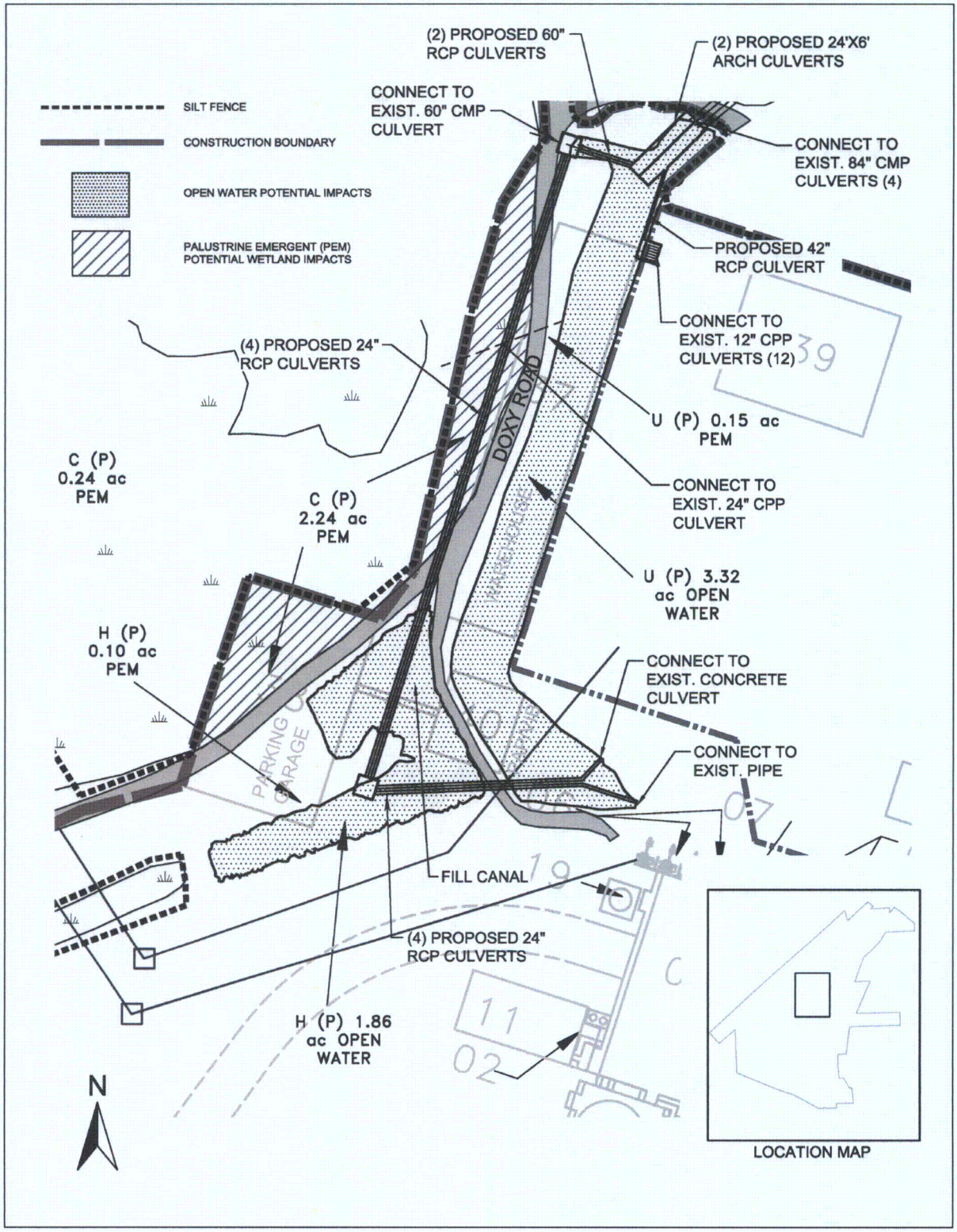


Figure 3.3-14. Cooling Tower Impact

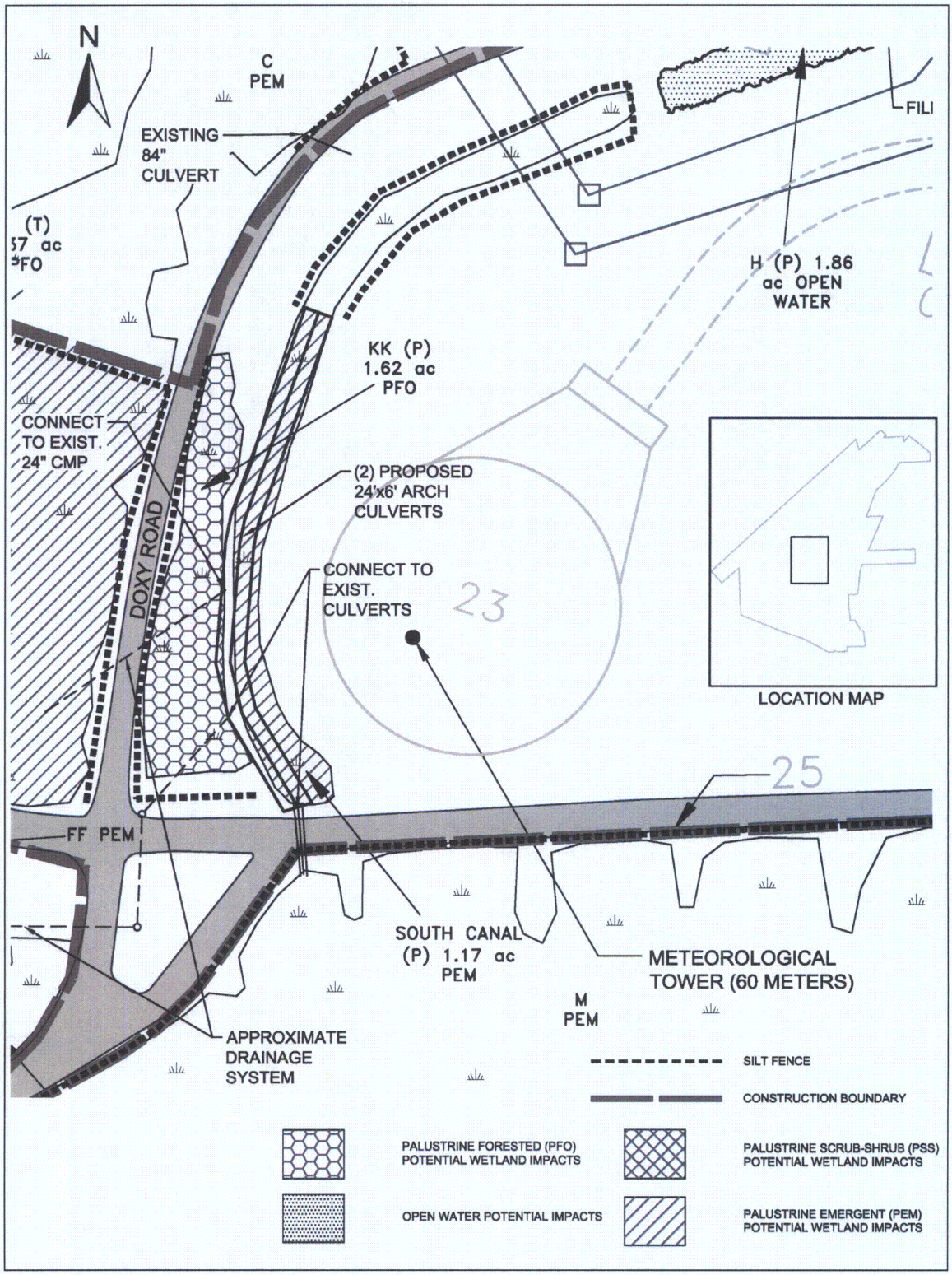


Figure 3.3-15. South Canal Culvert Cross Section

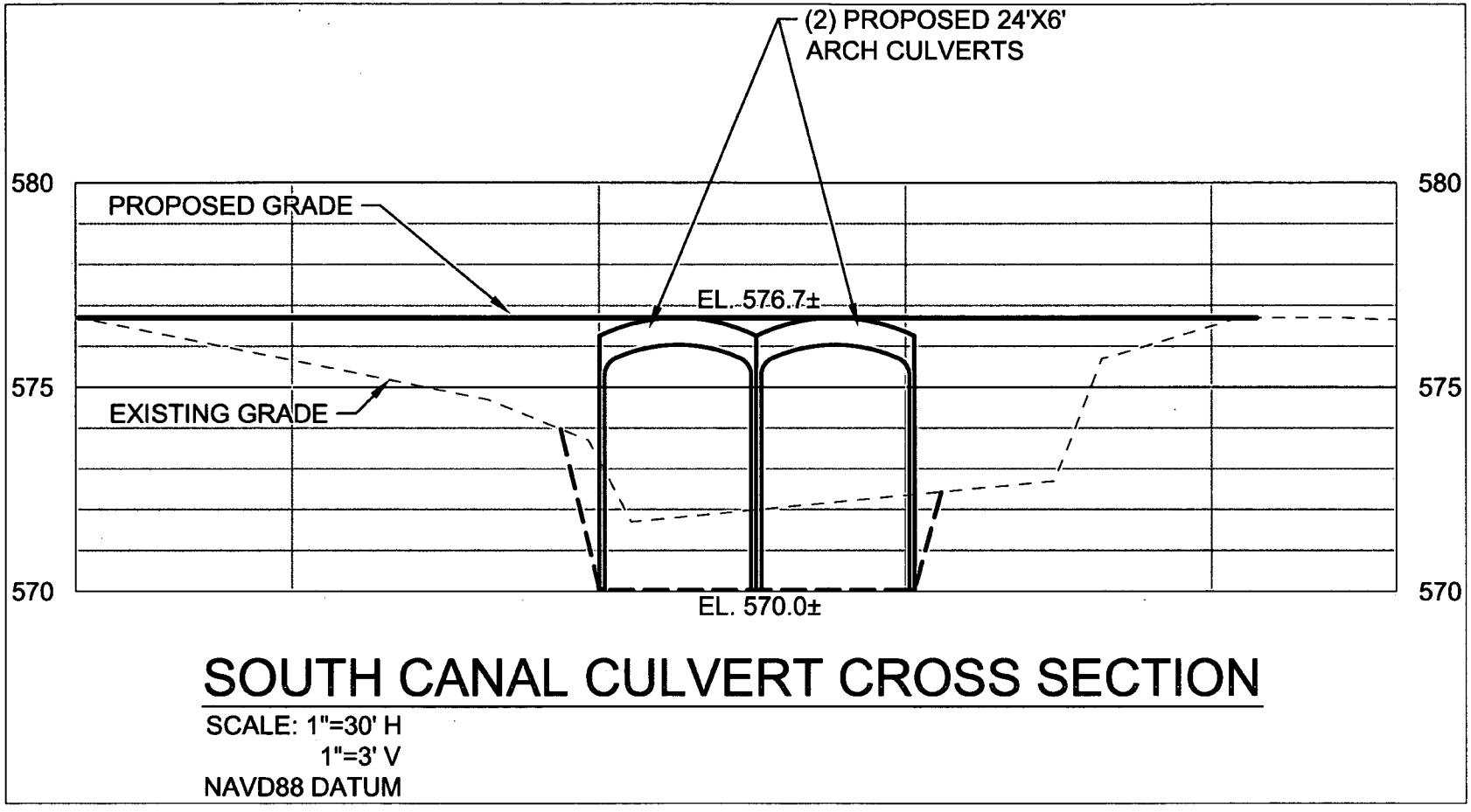


Figure 3.3-16. New Operations Access Road Design

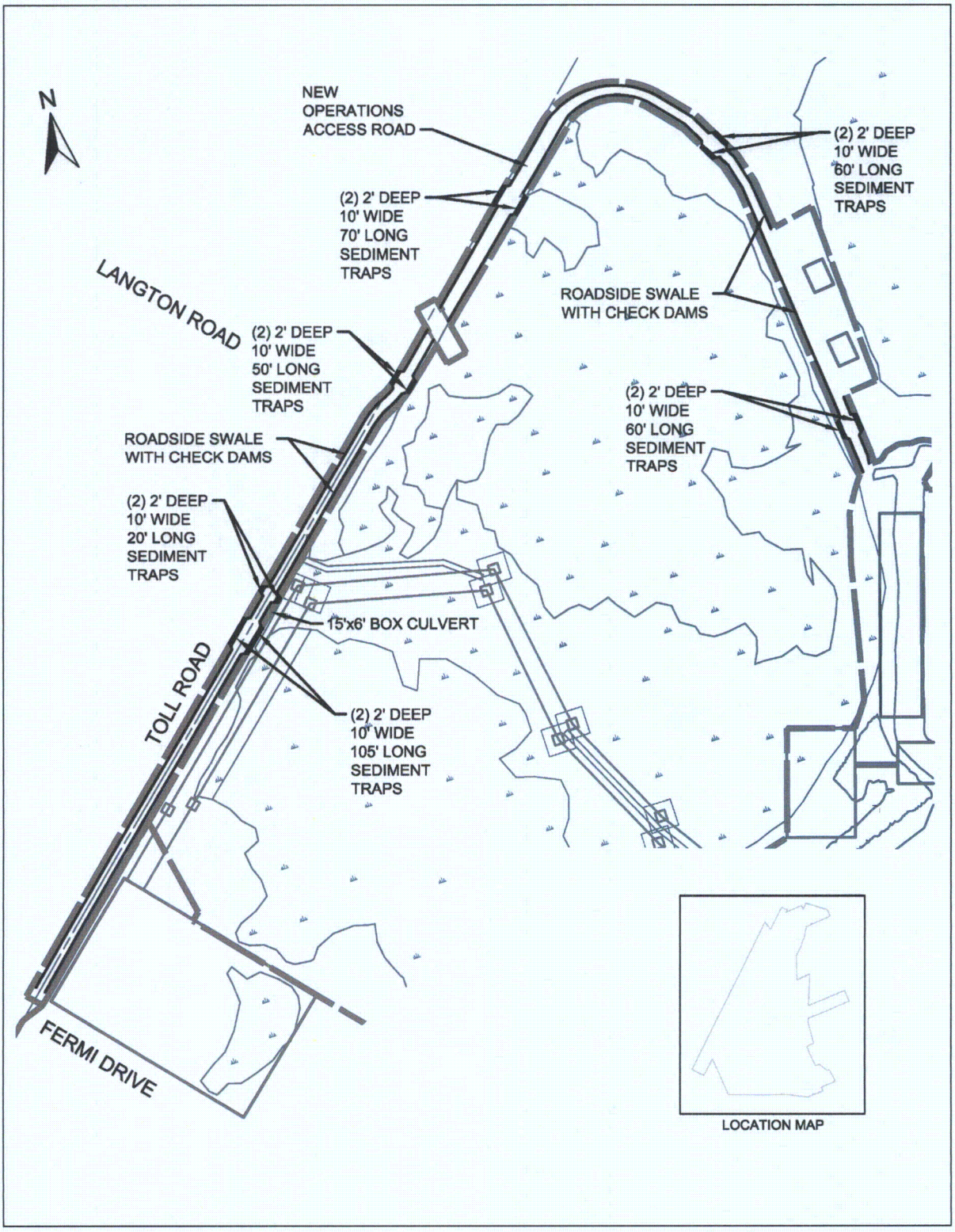


Figure 3.3-17. New Operations Access Road Impact

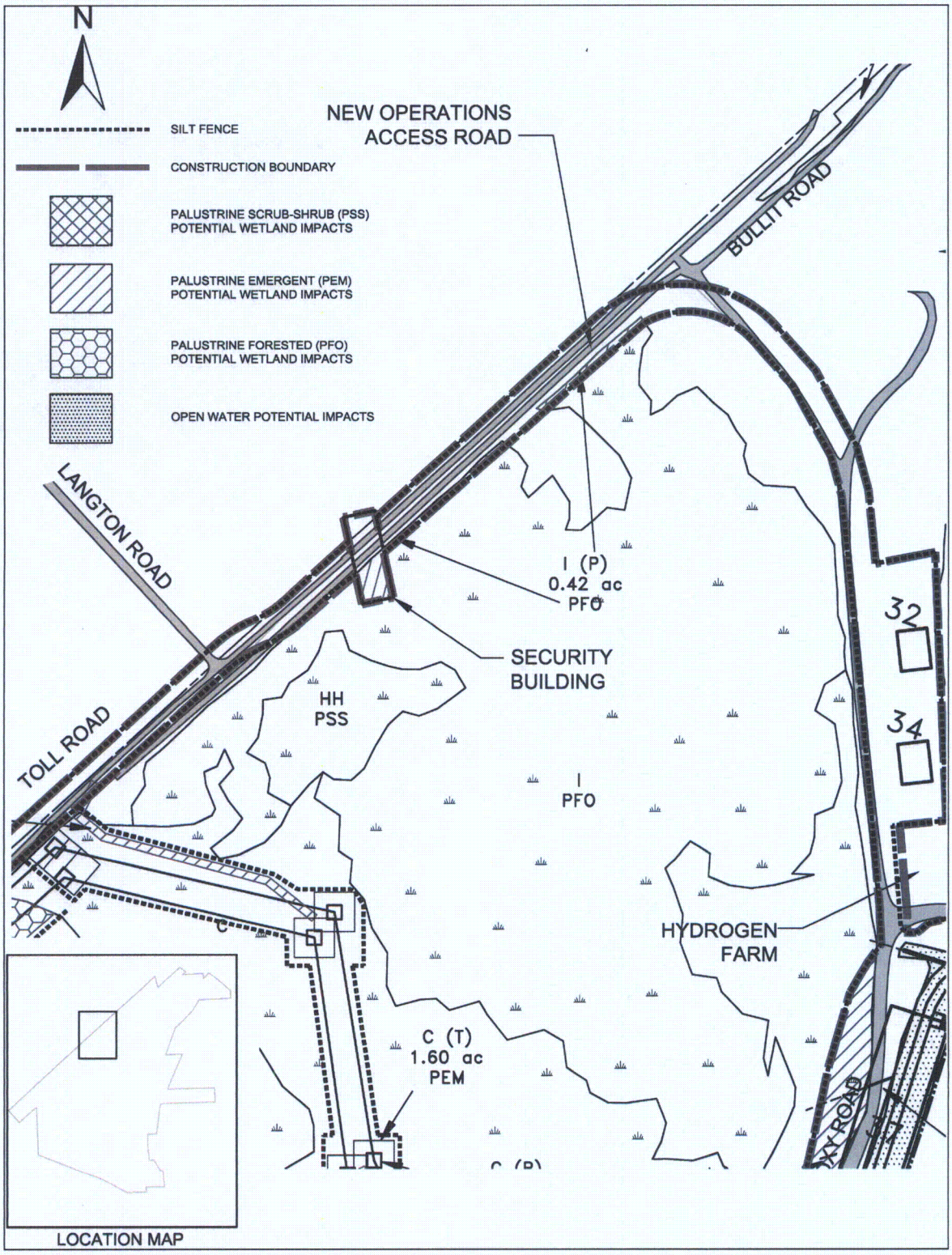
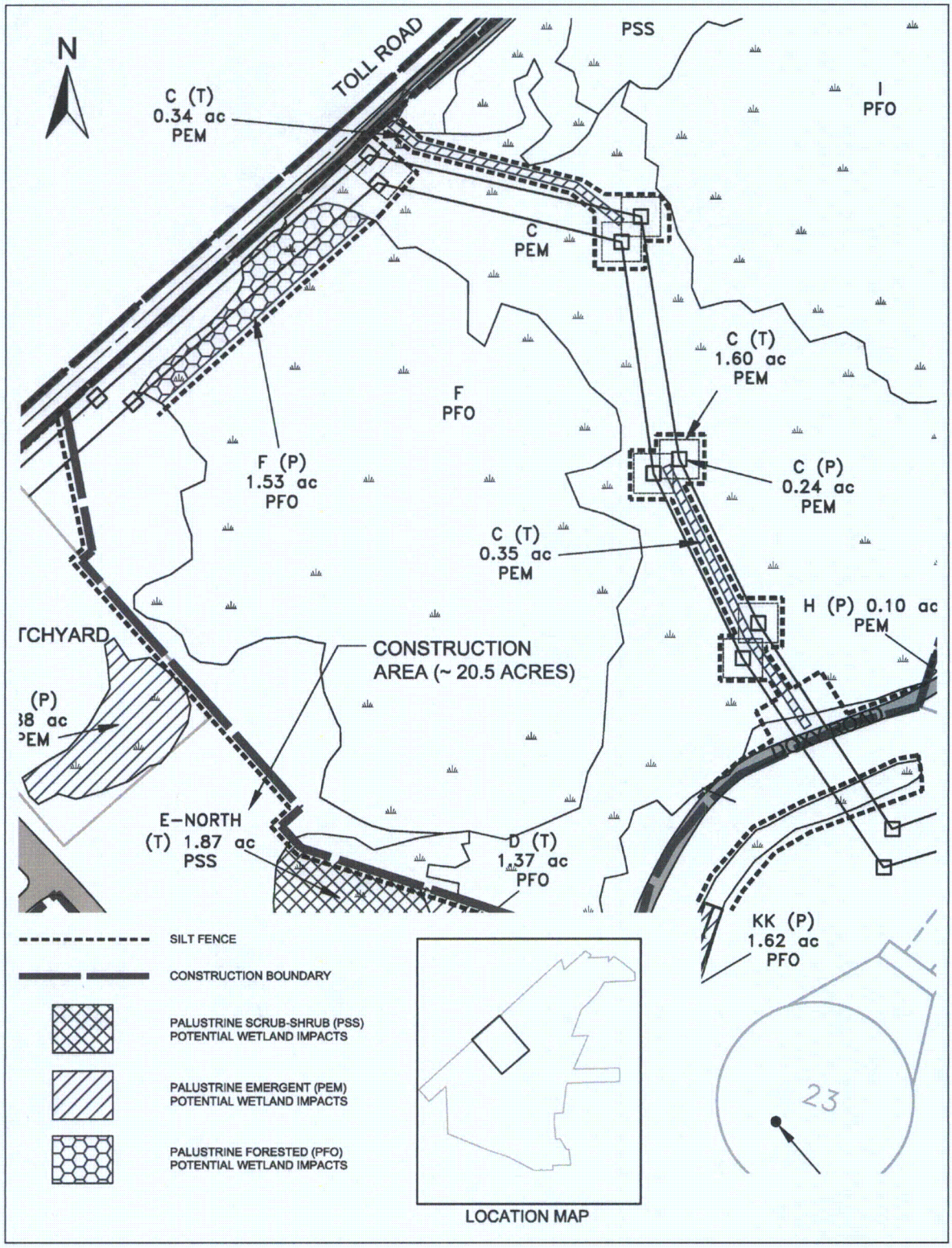


Figure 3.3-18. Onsite Transmission Impact



4.0 PUBLIC INTEREST REVIEW

The public interest review is part of both federal and state permitting. In federal permitting, according to 33 CFR 320.4(a), a factor important in determining whether or not to issue a permit is an evaluation of the probable impacts, including cumulative impacts, and a project's intended relationship to overall public interest. According to these regulations, a permit will be granted unless the district engineer determines that it will be contrary to the public interest. A summary of the potential benefits and impacts of the proposed Fermi 3 project and proposed mitigation measures is provided below.

4.1 Benefits of Proposed Development

Construction and operation of the Fermi 3 generating facility would provide reliable, affordable power to address Michigan's expected future baseload electric demand. The construction and operation of Fermi 3 would produce secure, dependable, electrical energy that will help Michigan move towards meeting its projected need for power, create jobs, and generate tax revenues that contribute to the local and regional economies. Additional benefits include the reduction of air pollutant emissions and greenhouse gases relative to fossil-fuel generated power. The public benefits that will result from the proposed Fermi 3 project include the following:

- The states of Michigan and Ohio and the counties surrounding Fermi 3 would experience an increase in the amount of taxes collected from labor, services, construction materials and supplies purchased for the project. An estimated $19.1 million in property taxes, $1.2 million in direct sales taxes, and $4.5 million in indirect sales taxes would be generated annually over the operating life of the plant. The increased tax revenue will support improvement to public infrastructure and social services. The increased revenue will spur future growth and development.
- The construction of the Fermi 3 project is expected to directly create approximately 2900 jobs (peak) and $627.5 million in direct earnings within the region. Eighty-five percent of the construction workers are projected to be from the existing workforce in the primary impact area.
- The operation of Fermi 3 will require approximately 900 workers, which is an incremental increase in 640 direct permanent jobs within the region for at least 40 operating years. Over the first 30 years of Fermi 3 operations, the direct earnings for Fermi 3 staff would exceed $2.0 billion (2008 dollars).
- Fermi 3 will provide an annual average 12 million MWh of total power generation. The additional generation from Fermi 3 will help maintain system reliability by increasing the availability of baseload power.
- The operation of Fermi 3 will enhance electrical reliability, dampen the potential for fuel price volatility, and reduce the exposure to supply and price risk associated with reliance on any fuel source.

- The construction and operation of Fermi 3 will produce less air pollutant emissions and greenhouse gases since nuclear reactors produce relatively small levels of pollutant air emissions when compared to the principal viable energy alternatives, coal and natural gas.
- Energy generation from Fermi 3 represents a potential for reducing the foreign trade deficit and enhancing the nation's energy security by way of decreased reliance on imported natural gas and other fuels.
- The operation of Fermi 3 will offset the rate of depletion of the nation's finite fossil fuel supplies.

4.2 Summary of Public Interest Factors

The public interest factors listed in 33 CFR Part 320.4(a)(1) are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish & wildlife values, flood hazard, floodplain values, land use, navigation, recreation, shore erosion and accretion, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the people.

4.2.1 Public Interest Factors Eliminated from Detailed Analysis

The Fermi 3 project will have little or no impact on fourteen of the public interest factors. This section briefly summarizes each of the factors eliminated from detailed analysis.

4.2.1.1 Aesthetics

Aesthetic impacts are limited due to the public's general inability to access the Fermi site. The construction of Fermi 3 will occur in the heart of the Fermi site, and most of the activity will not be visible from beyond the site. The primary exceptions are the temporary increase in traffic volume, particularly during the peak construction months, plus the cooling tower that will be approximately 600 feet tall and will become visible from beyond the site as construction proceeds; therefore, impacting the visual aesthetics of the area. Once construction is complete, the aesthetic and visual impacts associated with construction will recede, with the cooling tower the only Fermi 3 facility remaining visible from offsite. Thus, the impacts on aesthetics from construction are expected to be minor, short-term negative impacts.

The Fermi 3 project is not expected to transform the viewscape of the area. The Fermi site will remain an area characterized by its use for power generation. Fermi 3 construction would be consistent with similar types of structures found currently on the Fermi site. Construction of Fermi 3 is not expected to encourage unplanned and incompatible human access or to destroy vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area as viewed by the public because there is no public access to the site. The Fermi 3 project will include construction of structures that extend offshore and the discharge of dredged or fill materials. The construction of offshore structures (e.g., intake structure, outfall structure, and barge facility) and the discharge of dredged or fill material (e.g., discharge of dredged material onsite) will result in localized impacts on the Fermi site's general

aesthetics and the aesthetics of the onsite aquatic ecosystem. However, because of the localized nature of the impacts and the public's lack of access to the Fermi site, construction of offshore structures and the discharge of dredged or fill material is not expected to result in aesthetic impairments or obstructions to the public.

Standard noise control measures for construction equipment, such as the use of silencers on diesel powered equipment exhausts, are expected to be employed to limit the noise emissions from Fermi 3 construction. Additionally, administrative measures will be employed to mitigate construction noise impacts. These administrative measures include limiting the types of construction activities during nighttime and weekend hours, notifying all affected neighbors of planned activities, and establishing a construction noise monitoring program. The overall noise impacts on the surrounding areas (including effects on people and buildings) due to Fermi 3 construction activities will be temporary and are expected to be minor.

4.2.1.2 Flood Hazard and Floodplain Values

The Fermi site and Fermi 3 project activities are located in an area where water levels are largely under control of the Great Lakes and Lake Erie. The volume of water in Lake Erie and connected Great Lakes is so vast that the Fermi 3 project and similar projects would not induce any measurable change in the system's water level. Any change would be indiscernible and trivial when compared to weather-related impacts. No impacts on flood hazards and floodplain values are expected.

4.2.1.3 Land Use

The construction of Fermi 3 will comply with Monroe County and Frenchtown Township land use plans and policies and will comply with county zoning regulations and their specified uses. Monroe County land use planning documents, including the 1985 Comprehensive Plan, emphasize retaining agricultural land uses and preserving existing farmland while encouraging a strong economy. Development of the Fermi site has been consistent with county planning goals, leaving large portions of natural wetland areas onsite intact while developing a power plant that provides economic and environmental benefits to the county and surrounding communities.

4.2.1.4 Navigation

The West Outer Channel and the East Outer Channel are federal navigation channels that connect in Lake Erie approximately 7 miles northeast of the Fermi site. The West Outer Channel provides the closest shipping approach in Lake Erie, but is more than 5 miles from the Fermi site. Should dredging be required for barge deliveries for Fermi 3, there would be no impacts to navigation, since the dredging would likely be limited to the immediate vicinity of the intake groins or possibly waterward of the tip of the groins, depending on the current lake bathymetry. The dredging would not interfere with the West Outer Channel.

The waters and adjacent shoreline of Fermi 2 are designated as a security zone, as set forth in 33 CFR 165.915. Entry into this zone is prohibited unless authorized by the U.S. Coast Guard. The Fermi 2 exclusion area boundary (EAB) extends a radius of 915 meters from the center line of Fermi 2. The Fermi 3 EAB will extend 2928 feet from the center line of Fermi 3. The EAB radius extends into Lake Erie.

The water portion of Fermi 2 and Fermi 3 EABs in Lake Erie is controlled through security surveillance, use of the public address (PA) system to warn boaters, and placement of buoys which identify the area as restricted. Flyers providing information to boaters regarding the Fermi security zone and restricted area are posted at nearby marinas and bait shops. The Lake Erie shoreline on the plant site is unsuitable for beach activities, inaccessible to the public from the land side, and posted as private property. Due to poor fishing and the shallowness of Lake Erie in this area, the public rarely attempts to approach the Fermi site from the lake or use the Fermi shoreline area.

There is no recreational or commercial boat traffic immediately offshore of the Fermi site due to the security zone. The proposed Fermi 3 construction activities (e.g., dredging to install the discharge pipeline) will take place within the security zone. Thus, there will be no impacts to navigation.

4.2.1.5 Recreation

Detroit Edison does not allow public access to Fermi site for recreational purposes. Water-related recreational activities are not permitted on the Fermi site or within the security zone extending into Lake Erie. The proposed construction activities would not impact public recreation because there are no opportunities for public recreation on the Fermi site or within the Fermi security zone.

4.2.1.6 Shore Erosion and Accretion

Because of the lack of shoreline-related activities, the proposed construction activities associated with Fermi 3 are unlikely to cause notable accretion or erosion issues along adjacent shoreline areas. If the Fermi 3 construction activities have any impact on shore erosion or accretion, those impacts are expected to be minor and short term. Fermi 3 operations are not expected to affect the current rate of erosion or accretion experienced by the Fermi site and adjacent properties.

4.2.1.7 Water Supply and Conservation

There are no indicators of inadequate water supply availability at the Fermi site or competition with other potential users for water supply needs. The Fermi 3 project is not expected to limit the availability of water to satisfy potential water needs of other users. Given Lake Erie's vast size, Fermi 3's modest surface water withdrawals will have no impact on the availability of lake water for consumptive use. Fermi 3 construction will include dewatering of foundation excavations. Groundwater wells located near the Fermi site could fall within the area of influence of the dewatering. The maximum water level decline of offsite wells associated with temporary construction dewatering will be less than the typical annual potentiometric head variation. Accordingly, the impact on nearby wells due to dewatering will be minimal,

and does not warrant mitigation. Groundwater levels will be monitored during construction. If local well users are affected during Fermi 3 construction, Detroit Edison will ensure that appropriate mitigation measures are implemented.

4.2.1.8 Water Quality

Construction and operations of Fermi 3 would result in sediment and chemical releases. Best management practices, sediment and erosion control measures, and other mitigation techniques such as those described in Section 3.2 would be implemented to limit the impacts to water quality. No major or permanent degradation of water quality is expected from the proposed Fermi 3 construction and long-term operations. There are no water intakes in the area that are likely to be affected and no anticipated impacts on any drinking water aquifer. The Fermi 3 project will comply with state and federal water quality standards and will not contribute to any significant adverse effects on aquatic life or ecosystem diversity, productivity, or stability.

4.2.1.9 Energy Needs

As noted in Section 4.1, the Fermi 3 project will provide additional baseload capacity, diversify energy sources, promote stability, reduce reliance on fossil fuels, and increase energy security. With an average annual electrical energy generation of 12 million MWh, Fermi 3 will help address the future baseload generation needs in the region. Fermi 3 construction will require some consumption of energy, but that demand will not impact the level of energy resources in the region. The operational impacts of Fermi 3 on energy needs are major, long-term, and positive.

4.2.1.10 Economics

As noted in Section 4.1, the socioeconomic impacts of the Fermi 3 project will be positive and will likely be significant in the areas of employment, income generation, and tax benefits. The principal benefit of construction and operation of a new unit would be the production of electrical energy and the economic productivity of the site. The jobs created by the construction and operation of the new facility would represent a substantial stimulus to the local economy. In addition, tax revenues from the facility would benefit Monroe County, the region, and the State of Michigan.

4.2.1.11 Safety

The Final Safety Analysis Report for the Fermi 3 project, contained in Part 2 of the COL application, provides an evaluation of the facility for conformance with the acceptance criteria contained in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants LWR Edition" (Reference 1). That safety anaylsis report documents how the Fermi 3 project will comply with the Commission's regulations and guidance. The Fermi 3 plant will be constructed and operated in accordance with required codes, specifications, and regulations. Accordingly, impacts on public safety from Fermi 3 construction and operations are not expected. Emergency, medical, fire, law enforcement,

and other offsite response support to the Fermi site would be performed in accordance with agreements established in the Fermi Emergency Plan, contained in Part 5 of the COL application.

Workers relocating to the primary impact area counties (Monroe, Wayne, and Lucas counties) could potentially create a slight increase in demand for safety services, such as police, fire, ambulance, and hospital services. However, given the projected small increase in the percentage of households in all counties arising from Fermi 3 construction or operation, and given that these additions are well within the long-term historical growth rate of housing and population growth for the area, the additional households will represent a minimal increase in the demand for police, ambulance, or hospital services in the primary impact area.

4.2.1.12 Food and Fiber Production

The food production of the aquatic ecosystem at the Fermi site is primarily characterized by the commercial and recreational fishing taking place in Lake Erie. There is no indication that subsistence fishing occurs on or near the site. Commercial and recreational fishing are limited to areas outside the security zone. Potential impacts to commercially and recreationally important fish species are expected to be minimal because of the limited presence of these species in the vicinity of the Fermi site.

The rectangular parcel in the west-southwest corner of the Fermi site is proposed to be used for temporary construction laydown and parking. Portions of this area are prime farmland. This area would be used to store construction materials during the construction phase of the project and provide for vehicle parking during construction. Most of the prime farmland in the agricultural field is located toward the southwestern portion of the field. The use of the prime farmland will be temporary and this land would revert to agricultural use after Fermi 3 construction ends. The vicinity of the Fermi site includes approximately 30,400 acres of cultivated crops, pasture, and hay fields. The 60-acre field represents 0.2 percent of the agricultural acreage in the vicinity. Therefore, irreversible conversion of unique agricultural lands onsite by Fermi 3 construction would be minimal.

4.2.1.13 Mineral Needs

Detroit Edison owns 99.93 percent of the mineral rights to the Fermi site. The MDNR owns the remaining 0.07 percent of mineral rights in the far southeast corner of the Fermi site near the proposed meteorological tower site. No mineral production currently exists at the Fermi site, nor is any anticipated in the future. An onsite quarry, now known as the Quarry Lakes, was used to supply foundation material for Fermi 1 and Fermi 2 and is no longer used for quarrying materials. Construction of Fermi 3 will not affect mineral rights in areas not directly owned by Detroit Edison. The construction will not have any impact on mineral resources at the Fermi site.

4.2.1.14 Property Ownership

Detroit Edison possesses the required interests in the Fermi site for construction of Fermi 3. The construction of Fermi 3 is a reasonable private use of the Fermi site and is consistent with the site's current use for power generation. Therefore, the construction of Fermi 3 is not expected to affect ownership.

The offsite transmission corridors are, and will remain, under ITC*Transmission* ownership. Transmission corridors are zoned for the conveyance of electrical energy, which is consistent with the intended use. Therefore, construction of the transmission lines associated with Fermi 3 is not expected to affect ownership.

4.2.2 Public Interest Factors Analysis

The conservation and ecology, wetlands, fish and wildlife, and historic properties and archaeological resources public interest factors received detailed consideration. A summary of each of these factors and how it relates to development of Fermi 3 is provided in the sections that follow.

4.2.2.1 Conservation and Overall Ecology

4.2.2.1.1 Important Habitat

The NRC's "Standard Review Plan for Environmental Reviews for Nuclear Power Plants" (NUREG-1555, Reference 2) defines important aquatic habitats as (1) sanctuaries, refuges, or preserves potentially affected by plant construction or operation; (2) habitats identified by State and Federal agencies as unique, rare, or of priority for protection that may be adversely affected by plant construction or operation; (3) wetlands, floodplains, or other aquatic resources specifically protected by State and Federal regulations or Executive orders; and (4) areas identified as "critical habitat" for species listed as threatened and endangered by the USFWS. The only important aquatic habitat identified for the Fermi site is the Detroit River International Wildlife Refuge (DRIWR).

The Lagoona Beach Unit of the DRIWR occupies 656 acres of the 1260 acre Fermi site. The U.S. Fish and Wildlife Service (USFWS) manages the DRIWR and has published a Comprehensive Conservation Plan for the refuge (Reference 3). The Comprehensive Conservation Plan states that there are several options for acquisition of land for the refuge other than outright purchase of land. One of these alternative methods, a cooperative agreement, was used to create the Lagoona Beach Unit of the DRIWR on Fermi property. Detroit Edison has a 2003 Cooperative Agreement with the USFWS for the onsite portion of the DRIWR that allows Detroit Edison and the USFWS to share management of the refuge areas, but that allows Detroit Edison to retain ownership and control of those areas. The agreement allows Detroit Edison to withdraw from or revise the agreement at any time. Detroit Edison expects to revise the agreement to reflect the approximately 637 acres expected to be available for refuge use after construction of Fermi 3. This revision in the size of the Lagoona Beach Unit of the DRIWR is consistent

with the 2003 Cooperative Agreement, the Comprehensive Conservation Plan, and land acquisition procedures for the refuge. Even though Fermi 3 will reduce the acreage that can be included in the DRIWR, Fermi 3 construction would be compatible with the plans and agreements governing the DRIWR.

New construction for Fermi 3 would have an impact in the forest and wetland areas that are part of the DRIWR. The DRIWR Lagoona Beach Unit is located entirely within the Fermi property. Portions of the Lagoona Beach Unit would be cleared for construction of several facilities and construction areas associated with Fermi 3 and the relocation of the Fermi 2 parking and warehouse area. The Fermi 3 construction impact area includes approximately 45 acres, or about 7 percent of the Lagoona Beach Unit; 19 acres would be permanent impacts and 26 acres temporary impacts. The agreement between Detroit Edison and the USFWS that established the wildlife refuge allows for modifications to the agreement (such as Fermi 3) by either party at any time (Reference 4). The construction impacts of reducing the effective area of the DRIWR are principally land-use impacts, which are discussed above. The importance of DRIWR as an ecological habitat is principally due to it being a wetlands area. Accordingly, the construction impacts are bounded by the overall wetlands impacts, as discussed in Section 4.2.2.2. The final wetland mitigation plan will be developed in cooperation with local, state, and federal conservation agencies and organizations and will be consistent with existing conservation/watershed plans and conservation priorities established by these organizations.

4.2.2.1.2 Coastal Zone

The Coastal Zone Management Act authorizes states like Michigan to develop Coastal Zone Management Plans to protect and ensure the reasonable use of coastal areas. The Fermi site and part of the vicinity are in the coastal zone. A coastal zone consistency determination from the Michigan Department of Environmental Quality (MDEQ) will be obtained for Fermi 3 construction work in conjunction with other permits and authorizations from MDEQ. Construction of Fermi 3 would impact a very small portion of the coastal zone in Monroe County and the surrounding areas, and many of the impacted areas would be restored and revegetated after construction. Therefore, construction impacts on the Lake Erie coastal zone are expected to be short-term and minor, and no mitigation measures are needed.

4.2.2.1.3 Fish Spawning or Cover Areas

Potential impacts from construction activities at the Fermi site to commercially and recreationally important fish species are minimal due to limited presence of these species within the site. Incidental impacts may occur indirectly due to interference with fish migration and spawning and (less likely) due to fish mortality from accidental chemical spills. However, such events are unlikely to occur due to implementation of the appropriate spill prevention measures detailed in the Pollution Incident Prevention Plan (PIPP). Consequently, impacts to commercially and recreationally important Lake Erie fish species are expected to be minimal.

While it is not expected that migratory movement would be physically blocked during construction, increased turbidity could act to inhibit migratory cues in some fish species. Contaminants in construction effluents can also act as chemical barriers inhibiting fish migratory behavior. With the implementation of construction runoff and spill control measures detailed in the PIPP, it is unlikely that such contaminants would be present at levels that would significantly impact fish migration behavior, at least on a long-term basis.

4.2.2.2 Wetlands

Onsite Wetlands

Unavoidable impacts to 33.01 acres of wetland and 5.26 acres of open water habitat are anticipated within the construction impact areas on the Fermi property. This acreage includes 20.90 acres of emergent marsh, 6.84 acres of forested wetland, 5.28 acres of scrub-shrub wetland, and 5.26 acres of open water. Of this acreage, approximately 23.75 acres (62 percent) would be subject to temporary impacts that would be restored following construction. The construction impacts are projected to be moderate. The restoration of wetland areas that do not require long-term use for Fermi 3 operations along with the preservation of remaining wetlands on the Fermi site will serve to mitigate these impacts. In addition, Detroit Edison will prepare a plan for mitigating construction impacts to wetlands that will be submitted to the MDNRE and USACE in conjunction with future permit applications. A conceptual mitigation strategy is provided in Appendix C.

As part of the natural resource assessment effort, Detroit Edison conducted a watershed analysis to provide a broader geographic context to guide land use decisions at the Fermi site. That analysis is described in Section 2.8. The watershed assessment provides an analysis of land use features of the Ottawa-Stony watershed (OSW, Figure 2.8-1) and the coastal management zone (CZM, Figure 2.8-2) of Western Lake Erie in Monroe County. The results of the watershed assessment helps put into context natural resource impacts associated with Fermi 3 and provides guidance for the avoidance, minimization and mitigation strategy. An analysis of the status and trends of wetlands, streams and protected areas within OSW and CZM provides the necessary landscape level perspective to evaluate site specific impacts and compensation.

Because of the Fermi site's location in the lowest reaches of the OSW (in the CZM), the proposed Fermi 3 activities will have the greatest potential effects (either positive or negative) on coastal resources and Lake Erie itself. Based on the watershed assessment in the CZM, approximately 77 percent of the land area in the coastal zone was historically wetland. Based on the most recent wetland maps, 43 percent of the coastal zone in Monroe County is wetland which constitutes a 44 percent loss. The rate of wetland loss has decreased dramatically. Since the 1970s there has been an ongoing effort to protect and restore coastal habitats along the Detroit River and Western Lake Erie and land set aside for conservation and recreation, much of which is coastal wetland habitat (over 8,000 acres), currently make up approximately

36 percent of the coastal zone of Monroe County. Unavoidable impacts to wetlands associated with Fermi 3 will result in a relatively small reduction in coastal wetland acreage in Monroe County (33.01 acres impacted on the Fermi site versus more than 8,000 acres of wetlands in the coastal zone of Monroe County; approximately a 0.40 percent reduction). Existing wetlands and protected areas provide ecological resilience which buffers the impact of wetland loss within the coastal zone.

Detroit Edison recognizes the value of coastal wetland habitat along Lake Erie. Based on natural resource assessments, watershed assessments, and conservation priorities discussed in Section 2.8, avoidance and minimization strategies were employed that have significantly reduced impacts to wetland communities of high ecological value. Unavoidable impacts were restricted to low quality wetland areas to the greatest extent possible. Compensation is proposed at an average ratio of 5:1; a ratio generally associated with impacts to high quality, intact wetland systems. Additional mitigation is proposed in the form of enhancement of Great Lakes marsh at a ratio 23:1. Detroit Edison proposes compensation beyond guidance ratios to satisfy regulatory mitigation requirements and also in support of Detroit Edison's corporate environmental stewardship initiatives and ongoing partnership with USFWS and other conservation entities. Natural resource investigative, avoidance, and minimization measures in association with compensatory mitigation design are intended to address watershed conservation priorities, focusing on the prevention of wetland habitat fragmentation and improvements to connectivity of coastal wetland habitat in Monroe County.

Transmission Corridor Streams and Wetlands

Transmission corridor construction activities includes the installation of three new transmission lines in an assumed 300-foot wide corridor 29.4 miles long between the Fermi site and the Milan Substation, located near Milan, MI. The three Fermi 3 345-kV lines will run in a common corridor with Fermi 2 transmission lines, extending to a point just east of I-75. From the intersection of this Fermi site corridor and I-75, the three Fermi-Milan lines will run west and north for approximately 12 miles in a corridor shared with other non-Fermi lines in an assumed 300-foot-wide right-of-way in which the vegetation has been managed to control tall woody vegetation. The western 10.8 miles of the corridor is currently undeveloped, and no transmission infrastructure exists. Where vegetation is present, the maintenance has been minimal, except to control tall woody vegetation. It is assumed that the Milan Substation may expand from its current size of 350 by 500 feet to an area of approximately 1,000 by 1,000 feet to accommodate the new transmission lines to Fermi 3.

Construction impacts to aquatic resources along the eastern 18.6 miles of the transmission corridor are expected to be minimal, since the reconfiguration of existing conductors would largely allow for the use of existing infrastructure to create the new lines, and access for installing additional lines is good (as the plant life has been managed to exclude tall woody vegetation). Existing aquatic habitats in this portion of the corridor will be spanned and best management practices will be used to protect aquatic habitats

crossed by the new lines. This includes, but is not limited to, the use of silt fencing, hay bales, and similar practices to ensure the protection of aquatic habitats in close proximity to construction activity.

The western 10.8 miles of the transmission corridor is undeveloped. The creeks and ditches occurring in the western corridor are mostly narrow and could be avoided by using tower spans of 700-900 feet. Numerous roads in the vicinity are expected to provide sufficient access to this region of the corridor without the need for construction of new access roads.

No wetlands will be impacted in the eastern section of the corridor, because towers to accommodate new lines are already present. No wetlands are present at the Milan Substation site. The western section could require the placement of towers in wetlands that are longer than 900 feet and cannot be spanned. A relatively small area of wetland, approximately 0.5 acre, would be disturbed during installation of transmission towers. Impacts to wetlands from the construction of the transmission system are therefore considered minimal. Any necessary mitigation would be determined by ITC*Transmission* in consultation with responsible regulatory agencies, including the USACE, at the time permit applications are submitted.

4.2.2.3 Fish and Wildlife

General ecological environmental impacts are described in the response in the "Conservation and Overall Ecology" section. The Fish and Wildlife section has been limited, to the extent practicable, to a discussion of threatened or endangered species. The construction and operations impacts of interest for USACE-regulated activities would be those occurring on the shoreline, in the water of Lake Erie, and those in or adjacent to wetlands. Wetlands could occur either on site or in transmission line corridors.

4.2.2.3.1 Construction Impacts

There are no federally protected threatened or endangered species subject to impact from Fermi 3 construction. However, as described in Section 2.5.1, species that are listed by MDNR, with some potential for impact, are the American lotus and the Eastern fox snake.

Terrestrial Species

Bald Eagle

None of the previously observed bald eagle (*Haliaeetus leucocephalus*) nests were observed on the Fermi site as of January 2011. Formerly listed as an endangered species, the bald eagle nationwide (except in parts of Arizona) was federally de-listed in 2007, but continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. MDNR eagle management guidelines impose activity restrictions within a one-quarter mile radius of active nests from mid-March to the end of June, if young are in the nest. These guidelines suggest a radius of 660 feet around the nest during the breeding season. The restricted area is imposed because bald eagles are extremely sensitive

to human activity during the first 12 weeks of the breeding season. Applicable state and federal guidelines relating to activity restrictions will be adhered to during Fermi 3 construction.

American Lotus

The American lotus (a Michigan threatened species) is a wetland plant common in moderately shallow areas of the South and North Lagoons and the South Canal. Although the species reaches a northern limit of its distribution in southeast Michigan, healthy populations are scattered throughout this portion of the state. American lotus grows from thick and creeping underground tubers that make it impossible to determine how many plants are actually present in a given area. The plants, however, are hardy and relatively easy to transplant.

Construction activities are not expected to affect the North or South Lagoons, therefore, no American lotus in these areas should be affected. American lotus occurring in the South Canal will be affected by the filling of the portion of the canal adjacent to the Fermi 3 cooling tower area. MDNRE endangered species specialists have indicated that plants expected to be impacted by Fermi 3 construction activities should be transplanted to other areas on the Fermi site or possibly offsite to minimize adverse impact. Detroit Edison intends to engage in further consultation with the MDNRE in developing a mitigation strategy that will ensure that the impact to this species are minor.

Eastern Fox Snake

The Eastern fox snake (*Elaphe Gloydi)* is state threatened. During 2008, while wetland surveys were being conducted, two fox snakes were observed on two separate occasions. In addtion, fifteen separate sightings were made by Detroit Edison employees between 1990 and 2007 with 1-6 snakes identified on each occasion. In addition to minimizing wetland impacts, the fox snake's primary habitat, Detroit Edison has developed a draft mitigation plan which will be implemented to minimize the project's impact to the species. It included redesigning the site layout to minimize impacts, employee education and briefings, capture and release of snakes prior to land disturbance, and stop-work procedures in the event a snake is discovered.

Aquatic Species

The construction of the Fermi 3 intake structure, the barge slip, and discharge line to Lake Erie will require (1) temporary construction dredging and operational maintenance dredging of the existing water intake bay and (2) construction of the intake structure and associated components. Construction of the intake structure and barge facility will benefit from ongoing maintenance dredging of the area between the groins. No dredging in addition to that which is routinely completed is anticipated for installation of those structures. Construction of the discharge pipeline will extend approximately 240 feet beyond the area routinely dredged for Fermi 2 maintenance. Therefore, construction of the above structures will result in a minimal permanent loss of benthic habitat associated with the intake structure. Impacts to other general

aquatic species associated with the station water intake structure are considered to be short-term and minimal.

Transmission Corridor Construction

No Federal or State protected species or designated critical habitat listed by the USFWS will be impacted along transmission lines.

4.2.2.3.2 Operations Impacts

Cooling Water Intake

Potential impacts to aquatic ecosystems associated with the operation of the Fermi 3 intake structure and cooling water systems are entrapment, impingement, and entrainment. No threatened or endangered species were documented in the 1991-1992 (Reference 5) or the 2008-2009 (Reference 6) impingement and entrainment studies conducted at the Fermi site. Accordingly, the impact of the Fermi 3 intake on federally listed threatened and endangered species is expected to be minimal, and no mitigation measures, other than a well designed intake structure, are needed.

The brindled madtom (*Noturus miurus*) is listed as a state species of concern. Although no confirmed occurrences of the brindled madtom have been noted within the intake bay, it has been documented as having potential to occur at the Fermi site. Habitat associated with the brindled madtom has not been identified in or adjacent to the intake bay, therefore limiting the likelihood for impacts resulting from the cooling system. Accordingly, the impact of the Fermi 3 intake on state-listed threatened and endangered species is expected to be minimal, and no mitigating measures are needed.

Cooling Water Discharge

The use of a cooling tower for Fermi 3 represents Best Available Technology under Phase I of Section 316(b) of the Clean Water Act and also acts to greatly reduce the thermal loading to Lake Erie. Discharge of cooling tower blowdown constitutes the thermal discharge to Lake Erie from Fermi 3. A high-rate effluent diffuser will be used to maximize mixing and minimize the area of thermal mixing zone impacts on ambient water temperature. However, because listed species are not expected in the vicinity of the discharge, impacts to threatened or endangered aquatic species are expected to be minimal.

Cooling Tower Impacts

The cooling tower can affect the terrestrial and aquatic environment primarily through deposition of dissolved solids from cooling tower drift. The maximum predicted annual salt deposition rate is 0.01 $kg/km^2/mo$ and is principally to offshore areas to the northeast. This value is several orders of magnitude less than levels known to be damaging to plants. Additionally, monitoring results from a sample of nuclear plants, in conjunction with the literature review and information provided by the natural resource agency and agricultural agencies in all states with nuclear power plants, have revealed no instances

where cooling tower operation has resulted in measurable degradation of the health of natural plant communities.

The risk of soil salinization from cooling towers is generally considered to be low (NUREG-1555, Section 5.3.3.2, Reference 2). Soil salinization is of most concern in arid areas (deserts) where salts could accumulate in soils over long time intervals. The Fermi site is not located in an arid area. Accordingly the impacts from salt deposition are anticipated to be minimal, and no mitigation is required.

Two species listed as State-threatened are known to occur on the Fermi site: one animal (Eastern fox snake) and one plant (the American lotus). Animal species are typically less impacted by salt deposition or plume shadowing than plant species. Given the minimal impact on vegetation, impacts to the Eastern fox snake are also expected to be minimal.

Transmission Corridor Operation

Minimal impacts to wetlands and floodplains are anticipated from the operation of the new transmission lines or Milan Substation. Areas within the corridor that have the potential to regenerate in forest vegetation are expected to be periodically cleared of woody vegetation for line safety clearance. Access to these areas for maintenance would likely be on foot or by the use of matting for vehicle equipment, so as not to disturb the soil. There should be only selected and occasional pesticide or herbicide use in specific areas where needed in the corridor. It is expected that the use of such chemicals in the right-of-way would be minimized to the greatest extent possible in wetland areas. Because there are no listed species expected in the transmission corridors, impacts are considered minimal.

4.2.2.4 Historic Properties and Archaeological Resources

As discussed in Section 2.9, archaeological surveys were conducted in support of the Fermi 3 project. The surveys resulted in the identification of two sites that are located within the Fermi 3 site. Neither of the sites is located near Fermi 3 construction areas.

No above-ground resources within the Fermi 3 project area have been assessed as to National Register of Historic Places (NRHP) eligibility; therefore, the construction activities would have no impact on resources that are listed in the NRHP or that have been determined eligible for listing in the NRHP. Fermi 1 has been evaluated and recommended for consideration for listing on the NRHP, pending review by the Michigan State Historic Preservation Office. It is anticipated that any necessary mitigation will involve archiving Fermi 1 information and not restrict dismantlement following termination of the Fermi 1 license.

Fermi 3 construction activities will include installing the discharge pipeline. The pipeline will extend approximately 240 feet beyond the area of the Fermi 2 intake embayment subject to routine operations and maintenance dredging. Detroit Edison has conducted an investigation into the archaeological resources which could be impacted as a result of the construction of the Fermi 3 discharge line. There are no known archaeological resources within the planned path of the discharge line. Athough the Fermi 3

offshore project area has been extensively disturbed by previous activities and natural events, there is considered to be a moderate to high sensitivity for unidentified maritime resources. However, due to the dynamic and turbulent nature of the shallow-water near shore environment typical of the Great Lakes and present within the project area, any potentially significant maritime resources that may be present within the project area may exhibit degraded integrity.

Detroit Edison has developed a cultural resource management plan and corporate procedures to address protection of known historic and archaeological resources and the discovery of artifacts and cultural features during construction activities. Newly discovered archaeological sites located in the construction area of Fermi 3 would be managed in accordance with the provisions of the license.

Fermi 3 operations that would impact above-ground resources are limited to noise-related and visual impacts. The Fermi site currently houses Fermi 2, which currently produces indirect effects in the form of ambient noise and visual impacts associated with two cooling towers. Because these impacts currently exist, and have existed for at least three decades, any additional impacts associated with Fermi 3 operation would not introduce any elements that are substantively different from those that already exist.

Offsite Transmission Corridors

Preliminary investigations of the transmission line route from the Sumpter-Post Road junction to the Milan Substation indicate a moderate to high potential for encountering archaeological resources. The preliminary field view of the built environment along the transmission line route revealed few above-ground resources that meet the minimum age requirement or retain sufficient integrity for listing on the NRHP. Any further investigations would be conducted by ITC*Transmission* in accordance with applicable regulatory requirements.

References

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5. Lawler, Matusky, & Skelly Engineers, Fish Entrainment and Impingement Study (October 1991-September 1992), Fermi Power Plant, February 1993.

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