2.2 Nearby Industrial, Transportation, and Military Facilities

EF3 COL 2.0-5-A

2.2.1 Locations and Routes

The significant manufacturing plants, storage facilities, quarrying operations, and transportation routes within 8 km (5 mi) of Fermi 3 are presented in Figure 2.2-201. There are no chemical plants, refineries, mining operations, drilling operations, active oil or gas wells, military bases, or missile sites within the vicinity of Fermi 3. The Fermi 2 reactor is located approximately 0.42 km (0.26 mi) northeast of the Fermi 3 centerline. The Davis-Besse Nuclear Power Station is located about 42 km (26 mi) south-southeast of the Fermi site. The nearest military facilities are Camp Perry Military Reservation near Port Clinton, Ohio, approximately 48 km (30 mi) southeast and Selfridge Michigan Air National Guard Base about 80 km (50 mi) northeast of Fermi 3.

The western basin of Lake Erie is adjacent to the eastern property boundary of the Fermi site. The Port of Monroe is the closest waterway shipping facility at the mouth of River Raisin approximately 11.2 km (7 mi) southwest. The Port of Toledo is approximately 33.8 km (21 mi) south-southwest and Detroit River is located about 40.2 km (25 mi) north-northeast of Fermi 3. The West Outer Channel and the East Outer Channel connect in Lake Erie approximately 11.2 km (7 mi) northeast of the plant as shown in Figure 2.2-201. The West Outer Channel provides the closest shipping approach in Lake Erie at over 8 km (5 mi) away from Fermi 3.

The nearest major highways are Interstate 75 running generally in a northeast to southwest direction and Interstate 275 connecting from the northwest with a junction of these 2 highways located 6.6 km (4.1 mi) northwest of Fermi 3. U.S. Route 24 runs parallel to Interstate 75 approximately 9.3 km (5.8 mi) northwest of Fermi 3 as shown on Figure 2.2-201. Interstate 75 has heavy commercial traffic since it is a major access route to industries in the Detroit area.

Two railroad companies transport freight in the vicinity of Fermi 3 as shown in Figure 2.2-201. Canadian National Railway operates the closest rail line within 5.6 km (3.5 mi) of Fermi 3, and also provides service to the single spur track onto the site. Norfolk Southern Railway has two parallel rail lines at distances of about 5.6 km (3.5 mi) and 6.1 km (3.8 mi) from Fermi 3 and operates the nearest railroad yard in Monroe

over 9.6 km (6 mi) away. CSX Railway is outside the vicinity at approximately 14.5 km (9 mi) to the northwest.

Figure 2.2-202 shows the locations of nearby airports and air routes. Within the 8 km (5 mi) vicinity, Detroit Edison owns a heliport approximately 1.2 km (0.75 mi) southwest of Fermi 3. Additional airports and air routes in the vicinity include Mills Field Airport (MI53) located about 4.8 km (3 mi) north, Federal Airway V 10-176-188 centerline approximately 8 km (5 mi) north, and Federal Airway V 383 centerline located 8 km (5 mi) west of Fermi 3. The nearest major commercial airport is Detroit Metropolitan Wayne County Airport (DTW) approximately 30.6 km (19 mi) northwest of Fermi 3.

EF3 COL 2.0-5-A

2.2.2 Descriptions

2.2.2.1 Description of Facilities

Industrial facilities which use, store, or transport significant quantities of hazardous materials in the vicinity (8 km [5 mi]) of Fermi 3 are described in Table 2.2-201, including primary function, major products, and number of persons employed. No hazardous materials are manufactured within the 8 km (5 mi) radius around Fermi 3.

2.2.2.2 Description of Products and Materials

Nearby facilities were surveyed and Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Tier II chemical inventory forms were reviewed to identify hazardous materials regularly stored, used, or transported in the vicinity of Fermi 3. Toxic chemicals, flammable materials, explosive substances, and shipment information reported by nearby facilities are summarized in Table 2.2-202.

There are two extractive industries within 8 km (5 mi); however, explosive materials are not stored overnight. For both StoneCo of Michigan's Newport Quarry and Rockwood Quarry LLC, a blasting company truck delivers the required quantity of ammonium nitrate fuel oil (ANFO) only on the days that blasting occurs, the chemicals are mixed with the explosive component only when used for blasting as it goes into the hole, and unused explosives are removed from the quarries by the end of the day.

The lists of onsite chemicals for Fermi 3 and Fermi 2 are shown in Table 2.2-203. Hazardous material shipments and storage in the vicinity of Fermi 3 are described further in Subsection 2.2.3.

2.2.2.3 Description of Pipelines

There are no pipelines carrying potential hazardous materials (e.g., propane, chlorine, toxic chemicals) within 8 km (5 mi) of the site. Even though there are local residential and commercial natural gas distribution pipelines and service lines near the site, there are no large diameter natural gas or oil transmission pipelines in the vicinity of Fermi 3.

2.2.2.4 Description of Waterways

The station water intake structure at Fermi 3 is located inside the water intake bay (groin area) and does not extend out into Lake Erie; see Figure 2.1-203. Additional protection is provided by the designation of all waters and adjacent shoreline of Fermi 2 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 station intake structure is located over 8 km (5 mi) from the West Outer Channel as shown in Figure 2.2-201 (Reference 2.2-201). The depths of the shipping channels that extend from the Port of Monroe and from the Detroit River range between 6.4 m (21 ft) to 8.8 m (29 ft) (Reference 2.2-202, Reference 2.2-203). The types of ships using Lake Erie in these channels include self-propelled vessels (“Lakers”) and integrated tug/barge units ranging in length from 116.7 to 309 m (383 to 1,014 ft) (Reference 2.2-204).

Small amounts of fuel are stored and used near the boat docks at Swan Boat Club and Swan Yacht Basin on Swan Creek about 2.4 km (1.5 mi) north of Fermi 3 and at the Brest Bay Marina approximately 4.8 km (3 mi) southwest. The closest maritime facility is the Port of Monroe located approximately 11.3 km (7 mi) southwest of Fermi 3, where the principal imports and exports are asphalt, asphalt flux, coal, equipment, petroleum coke, and armor stone (Reference 2.2-205). On Lake Erie in general, and likely to be shipped on the West Outer Channel about 8 km (5 mi) east of the site, are Great Lakes fleet vessels such as dry-bulk carriers (84 percent), cement carriers (9 percent) and tankers (7 percent) which transport cargo primarily consisting of iron ore, coal, limestone, cement, salt, sand and gravel, grain, potash, liquid bulk, and general cargo (Reference 2.2-204).

2.2.2.5 Description of Highways

Nearby industries reported receiving shipments of hazardous material primarily by truck. Trucks deliver freight along Interstates 75 and 275 which pass approximately 6.4 km (4 mi) northwest of the plant. The Michigan Department of Transportation, Transportation of Hazardous Materials Department; Michigan State Police; and the Monroe County Emergency Management office do not record the type, amount, or route of materials transported on the highways near Fermi 3. Hazardous materials statistics on highways are not collected or maintained, nor are there plans to conduct transportation commodity flow studies. Petroleum products are delivered to the site from Dixie Highway via Fermi Drive in transport trucks.

2.2.2.6 Description of Railroads

Canadian National Railway operates the closest rail line within 5.6 km (3.5 mi) of Fermi 3, and also provides service to the single spur track onto the site (Figure 2.2-201). The rail spur is used infrequently and primarily for the transportation of non-hazardous heavy items and large equipment. Norfolk Southern Railway has 2 parallel rail lines at distances of about 5.6 km (3.5 mi) and 6.1 km (3.8 mi) from the plant running in a northeast to southwest direction, basically paralleling Interstate 75 (Reference 2.2-206). Details of hazardous material shipments are considered confidential and are not generally released for security reasons.

2.2.2.7 Description of Airports

Nearby airports, runway descriptions, types of aircraft, number of operations per year, and accident statistics are provided in Table 2.2-204. The Fermi helipad is located approximately 1.2 km (0.75 mi) southwest of the Fermi 3 reactor and is available for emergency MediVac air ambulance service; however, it has not been used in several years. Marshall Field which was located 3.2 km (2 mi) west of the site is now a housing development. Newport Woods Airport (9MI2) is identified from various sources at 4.8 km (3 mi) northwest of the Fermi site; however, field research indicates that this facility is no longer in service.

Mills Field (MI53), a private turf runway, is the only operational airport within 8 km (5 mi) of Fermi 3. The National Transportation Safety Board (NTSB) aviation accident database lists no reported accidents/incidents in the last 40 years at Mills Field. Detroit Metropolitan Wayne County

Airport located 30.6 km (19 mi) to the northwest is the only airport in the region which has annual flight operations greater than the $1000D^2$ criteria (where D = statute mi from the site) per Regulatory Guide 1.206. (Reference 2.2-207 through Reference 2.2-209)

Typically, each federal airway includes the airspace within parallel boundary lines 6.4 km (4 mi) on each side of the center line, for an airway width of 12.9 km (8 mi). Therefore, as shown in Figure 2.2-202, the closest edges of V 383 and V 10-176-188 airways fall within the proximity criteria listed in Regulatory Guide 1.206 and NUREG-0800. Federal Airway V 383 passes 8 km (5 statute mi) west of Fermi 3 oriented in a north-south direction. Federal Airway V 10-176-188 passes 8 km (5 statute mi) north of Fermi 3 oriented in an east-west direction.

Outside the vicinity, Airway V 133 is located approximately 10.46 km (6.5 mi) to the northeast, Airway V 426 runs about 11.26 km (7 mi) to the southwest, Airway V 26 is located approximately 12.1 km (7.5 mi) to the northeast, and Airway V 467 passes over 14.5 km (9 mi) to the west at its closest point.

2.2.2.8 Projections of Industrial Growth

Very limited long-term growth of industrial facilities can be expected in the vicinity, which is predominantly rural, agricultural, and residential. According to the Monroe County Industrial Development Corporation, future plans call mainly for prime agricultural uses and open space in the areas surrounding the Fermi site. The Monroe County Planning Department indicated that some potential sites for industrial development along Interstate 75 had been considered, but the areas are kept agricultural for political reasons. Minimal industrial growth will likely occur at the Frenchtown Business Park (Reference 2.2-210) located approximately 8 km (5 mi) southwest of Fermi 3; however many of these potential businesses may be commercial or retail establishments.

Most of the anticipated industrial growth for facilities using hazardous materials will take place outside the 8 km (5 mi) vicinity near the Port of Monroe about 11.3 km (7 mi) to the southwest, near the Interstate 275/ Telegraph Road intersection area, or in the City of Monroe. The Southeast Michigan Council of Governments (SEMCOG) reports no new major nonresidential development projects for either Frenchtown or Berlin townships. Overall, the region is continuing to experience a decline

in manufacturing and industrial processes that are the most likely candidates to use hazardous materials.

EF3 COL 2.0-6-A

2.2.3 Evaluation of Potential Accidents

The consideration of a variety of potential accidents, and their effects on Fermi 3 or its operation, is included in this section. The types of potential accidents examined include: explosions, flammable vapor clouds (delayed ignition), aircraft hazards, toxic chemicals, fires, collisions with intake structures, and liquid spills near the intake.

2.2.3.1 Determination of Design Basis Events

2.2.3.1.1 Explosions

The nearest highways on which explosive materials could be transported are Interstates 75 and 275, which are a minimum distance of 6.4 km (4 mi) from the Fermi site (Figure 2.2-201). According to RG 1.91, the separation between the interstates and Fermi site is within the safe distance criteria; therefore potential explosions on the interstate are not considered design basis events.

The nearest railway on which explosive materials could be transported is the Canadian National Railway, located a minimum distance of 5.6 km (3.5 mi) from the Fermi site (Figure 2.2-201). According to RG 1.91, the separation between the main railway line and Fermi site is within the safe distance criteria, therefore potential explosions on the railway are not considered design basis events.

The nearest waterway on which explosive materials could be transported is the West Outer Channel, located a minimum distance of 8 km (5 mi) from the Fermi site (Figure 2.2-201). Consistent with RG 1.91, the separation between the waterway and Fermi site is within the safe distance criteria, therefore potential explosions on a barge on the waterway are not considered design basis events.

The nearest storage tank farm for explosive gases is the bulk gas storage facility for the Hydrogen Water Chemistry and General Hydrogen systems. Table 2.2-203 lists the maximum quantity of explosive (hydrogen) liquid/gas stored at this location. The safe separation distance between the hydrogen and oxygen storage area and nearest safety-related structure is calculated using the method based upon EPRI recommended methods in Appendix B of Document No. NP-5283-SR-A,

"Guidelines for Permanent BWR Hydrogen Water Chemistry Installations – 1987 Revision" (Reference 2.2-213). The EPRI method used is based on a reinforced concrete wall at least 0.46 m (1.5 ft) thick, a tensile steel factor between 0.827 MPa (120 psi) and 2.07 MPa (300 psi), and the minimum static lateral load capacities for the tornado intensity region the plant is located in per RG 1.76. To be conservative a tensile steel factor of 0.827 MPa (120 psi) was used. Section 6 of NUREG/CR-2462, "Capacity of Nuclear Power Plant Structures to Resist Blast Loadings" (Reference 2.2-214) states that a conservative static capacity can be based on the required design pressure drop for the tornado intensity region in which the plant is sited. As Fermi 3 is located in Tornado Intensity Region I (as shown in RG 1.76) the minimum static lateral load capacity is 20.7 kPa (3.0 psi) based on the design pressure drop in Figure 7 of NUREG/CR-2462 (Reference 2.2-214). The hydrogen and oxygen storage area will be located a minimum of 229 m (750 ft) from the nearest safety-related structure.

2.2.3.1.2 Flammable Vapor Clouds (Delayed Ignition)

The largest potential effect from the nearby residential and commercial natural gas service pipelines might occur in the form of a natural gas leak and subsequent limited impact explosion. Potential explosions from the pipeline would not pose a danger to the safe operation of the plant, due to the size and location of the pipeline.

The nearest storage tank farm for flammable gases is the bulk gas storage facility for the Hydrogen Water Chemistry and Generator Hydrogen systems. Table 2.2-203 lists the maximum quantities of flammable gas (hydrogen) and gas that supports combustion (oxygen) stored at Fermi site. The safe separation distance between the hydrogen and oxygen storage area and the nearest safety-related structures is 229 m (750 ft). The method used to evaluate the safe separation for hydrogen gas storage is in FSAR Subsection 2.2.3.1.1.

The nearest storage of flammable liquids is 5.5 km (3.4 mi) away where diesel fuel and 300 gallons of gasoline are stored (Table 2.2-202). The next closest storage of flammable liquids is 99,999 lbs of propane, 6.4 km (4 mi) away (Table 2.2-202). 99,999 lbs of propane is also the largest storage volume of flammable liquids (Table 2.2-202). Using the method of RG 1.91 for safe separation distance based on TNT equivalence, and a mass equivalence of 240% for the formation of vapor clouds, the safe

separation distance for the 99,999 lbs of propane is 852.2 m (2,796 ft), and 224.3 m (736 ft) for the 300 gallons of gasoline. The potential explosion of an individual tank containing flammable liquids is well below the limits specified in RG 1.91. The potential formation and detonation of a flammable vapor cloud is not a design basis event due to the size and distance of the tanks.

Table 2.2-203 indicates that one 8,000 gallon underground gasoline storage tank is currently located on the Fermi site. Subsection 2.2.2.5 indicates that the tanker truck refueling access road used is Fermi Drive. Construction of the new Fermi 3 unit will require the underground gasoline storage tank to be moved from the current location. The minimum safe separation storage distance and the nearest Fermi 3 safety-related structure is determined using the method of RG 1.91 for safe separation distance based on TNT equivalence, and a mass equivalence of 240% for the formation of vapor clouds. The minimum safe separation distance is determined using a 10,000 gallon gasoline tanker truck which bounds the storage capacity of the individual underground gasoline storage tank. The underground gasoline storage tank will be located such that the tank and the gasoline tanker truck access area are a minimum of 721.4 m (2367 ft) from the nearest Fermi 3 safety-related structure.

2.2.3.1.3 **Aircraft Hazards**

RG 1.206 and NUREG-0800 state that the risks due to aircraft hazards should be sufficiently low. Further, aircraft accidents that could lead to radiological consequences in excess of the exposure guidelines of 10 CFR 50.34 (a) (1) with a probability of occurrence greater than an order of magnitude of 10^{-7} per year should be considered in the design of the plant.

NUREG-0800, Section 3.5.1.6, “Aircraft Hazards,” provides three acceptance criteria for the probability of aircraft accidents to be less than 10^{-7} per year:

A. The plant-to-airport distance D is between 8.0 km (5 mi) and 16.1 km (10 mi), and the projected annual number of operations is less than 500 D^2, or the plant-to-airport distance D is greater than 16.1 km (10 mi), and the projected annual number of operations is less than 1000 D^2

B. The plant is at least 8.0 km (5 mi) from the nearest edge of military training routes, including low-level training routes, except for those associated with usage greater than 1000 flights per year, or where activities (such as practice bombing) may create an unusual stress situation

C. The plant is at least 3.2 km (2 mi) beyond the nearest edge of a Federal airway, holding pattern, or approach pattern

2.2.3.1.3.1 Airports

As shown on Figure 2.2-202, there are four airports within 16 km (10 mi) of Fermi 3. Mills Field Airport is less than 8 km (5 mi) from Fermi 3 and is further evaluated below.

There is one airport outside the 16 km (10 mi) radius which does not meet the acceptance criterion A above - Detroit Metropolitan Wayne County Airport. Table 2.2-204 shows that the Detroit Metropolitan Wayne County Airport is 30.6 km (19 mi) from the Fermi site, accordingly:

$$1000D^2 = 1000(19)^2 = 361{,}000$$

The number of operations per year at the Detroit Metropolitan Wayne Country Airport is 481,435. This value is larger than the $1000D^2$ calculated value based on Section 3.5.1.6, Section III of NUREG-0800.

An evaluation of the probability of an aircraft accident affecting Fermi 3 from the Mills Field Airport or Detroit Metropolitan Wayne County was performed. The probability for an accident from the Detroit Metropolitan Wayne County Airport is less than 10^{-7} per year. The probability of an accident from the Mills Field Airport is slightly in excess of 10^{-7} per year (2.3×10^{-7} accidents per year). This airport is a small turf field consisting of single engine aircraft which poses minimal risk to vital structure damage.

2.2.3.1.3.2 Airways

As described in Subsection 2.2.2.7, there are six airways passing within 16.1 km (10 mi) of the Fermi 3 site. Each airway is 14.7 km (9.2 mi) in width in accordance with 14 CFR 95.1. The distance from Fermi 3 site to the edge of each airway is:

Route	Distance to Centerline	Width	Distance to Edge
V383	8 km (5 mi)	14.7 km (9.2 mi)	0.6 km (0.4 mi)
V10-176-188	8 km (5 mi)	14.7 km (9.2 mi)	0.6 km (0.4 mi)

V133	10.9 km (6.75 mi)	14.7 km (9.2 mi)	3.5 km (2.2 mi)

Route	Distance to Centerline	Width	Distance to Edge
V426	11.3 km (7 mi)	14.7 km (9.2 mi)	3.8 km (2.4 mi)
V26	12.1 km (7.5 mi)	14.7 km (9.2 mi)	4.6 km (2.9 mi)
V467	14.5 km (9 mi)	14.7 km (9.2 mi)	7 km (4.4 mi)

Airways V383 and V10-176-188 pass within 3.2 km (2 mi) of Fermi 3 and are further evaluated below. Section 3.5.1.6, Section III of NUREG-0800 states:

> For situations in which Federal airways or aviation corridors pass through the vicinity of the site, the probability per year of an aircraft crashing into the plant (P_{FA}) should be estimated. This probability will depend on a number of factors, such as the altitude and frequency of the flights, the width of the corridor, and the corresponding distribution of past accidents. P_{FA} is found by using the following equation:
>
> $$P_{FA} = C \times N \times A/w \qquad \text{[Eq. 1]}$$
>
> where:
>
> C = in-flight crash rate per mile for aircraft using airway
> w = width of airway (plus twice the distance from the airway edge to the site when the site is outside the airway) in miles
> N = number of flights per year along the airway
> A = effective area of plant in square miles

This gives a conservative upper bound on aircraft impact probability if care is taken in using values for the individual factors that are meaningful and conservative. From NUREG-0800, for commercial aircraft a value of $C = 4 \times 10^{-10}$ per aircraft mile has been used.

The estimated number of flights per year on V383 is 60,179; the average number of flights per day is 165:

C = 4×10^{-10}
w = 9.2 mi + 2 x (0.4 mi) = 10 mi
N = 60,179
A = 0.0679 sq. mi.

$$P_{FA} = 4 \times 10^{-10} \times 60{,}179 \times (0.0679/10) = 1.6 \times 10^{-7}$$

The number of flights per year on V10-176-188 is bounded by the number of flights on V383, therefore a value of 60,179 is used; the average number of flights per day is 165:

$C = 4 \times 10^{-10}$
$w = 9.2 \text{ mi} + 2 \times (0.4 \text{ mi}) = 10 \text{ mi}$
$N = 60{,}179$
$A = 0.0679 \text{ sq. mi.}$
$P_{FA} = 4 \times 10^{-10} \times 60{,}179 \times (0.0679/10) = 1.6 \times 10^{-7}$

The accident probability is within the NUREG-0800 guidelines on the order of magnitude of 10^{-7} per year for both V383 and V10-176-188. No further analysis or discussion of potential aircraft hazards is necessary.

2.2.3.1.4 Toxic Chemicals

The potential accidental release of toxic chemicals is considered to evaluate the habitability of the main control room. Chemicals require evaluation if they are within 500 m (1640 ft) of the main control room in a quantity of 45.4 kg (100 lbs) or greater, according to RG 1.78. Hazardous or potentially toxic chemicals within 8 km (5 mi) of the site also require evaluation; however, chemicals beyond an 8 km (5 mi) radius of the site do not require analysis. Mobile sources of chemicals within 8 km (5 mi) require analysis if a sufficient frequency of shipments exists.

2.2.3.1.4.1 Onsite Sources of Toxic Chemicals – Fermi 2 & 3

Onsite chemicals are listed in Table 2.2-203, including chemicals at Fermi 2 and Fermi 3. Chemicals that could pose a possible toxic, flammable, or explosive hazard to Fermi 3 are shown in Table 2.2-205. Table 2.2-205 shows that the majority of the chemicals are not toxic. For chemicals with immediately dangerous to life or health (IDLH) values listed in this table, the effects of toxic vapors or gases and their potential for incapacitating the Fermi 3 control room operators are evaluated and the results are presented in Section 6.4.

2.2.3.1.4.2 Offsite Stationary Sources of Toxic Chemicals

Offsite chemicals within an 8 km (5 mi) radius of the Fermi site are listed in Table 2.2-202. Only potentially toxic chemicals require evaluation. For chemicals with immediately dangerous to life or health (IDLH) values listed in this table, the effects of toxic vapors or gases and their potential

for incapacitating the Fermi 3 control room operators are evaluated and the results are presented in Section 6.4.

The nearest location containing potentially toxic or hazardous chemicals is the Berlin Township Water Treatment Plant, 3.4 km (2.1 mi) northwest of Fermi 3. This location contains chlorine; however, no further analysis is required based on RG 1.78. Meijer Distribution also contains several chemicals that were evaluated and screened out using the criteria in RG 1.78 primarily because it is located approximately 6.4 km (4 mi) from the Fermi site.

None of the other nearby facilities identified makes use of significant amounts of toxic chemicals which would be of concern for control room habitability analysis.

2.2.3.1.4.3 Transportation of Toxic Chemicals

The consideration of the transportation of potentially toxic chemicals within an 8 km (5 mi) radius of the Fermi site is required. Evaluation of the transportation of toxic chemicals, within a 8 km (5 mi) radius of the site, is required based on frequency. Frequent shipments are defined as exceeding 10 per year for truck shipments, 30 per year for rail shipments, and 50 per year for barge shipments, per NUREG/CR-2650 (Reference 2.2-211).

Potentially toxic chemicals are transported on the Canadian National Railway lines. Based on the criteria in Reference 2.2-211, potential release of toxic chemicals from railway traffic does not require further analysis.

Transportation of toxic chemicals in the vicinity is not a concern for Fermi 3 control room habitability analysis.

2.2.3.1.5 Fires

Fire and smoke from accidents at nearby homes, industrial facilities, transportation routes, or from area forest or brush fires, do not jeopardize the safe operation of Fermi 3 due to the separation distance of potential fires from Fermi 3. The main control room heating, ventilating, and air-conditioning system is equipped with a standby makeup air filter train consisting of a HEPA filter and charcoal absorber. Any potential heavy smoke problems at the main control room air intakes would not hinder plant safety.

Onsite fuel storage facilities are designed in accordance with applicable fire codes, and plant safety is not jeopardized by fires or smoke in these areas. A detailed description of the fire protection system is presented in Subsection 9.5.1.

2.2.3.1.6 Collisions with Intake Structures

The Fermi 3 intake structure is adjacent to the Fermi 2 intake structure, located on the Lake Erie shoreline within the intake bay. This bay is protected by two rock groins that extend into the lake. The nearest waterway that allows navigation by large ships and barges is approximately 8 km (5 mi) from Fermi 3. The water in the vicinity of the intake structure is very shallow, thus a large ship would not easily reach the intake structure.

In addition, the Fermi 3 intake structure is not a safety-related structure, thus any such collision, however unlikely, would not affect the safe operation or shutdown of Fermi 3.

2.2.3.1.7 Liquid Spills near Intake

There is a potential for hazardous materials in the form of a liquid spill in Lake Erie to enter the circulating water system through the station water system. No liquids hazardous to plant materials or systems are stored at, delivered to, or transported through the intake bay, and an accidental liquid spill in the intake bay is considered very unlikely. As discussed in Subsection 2.2.3.1.1, no shipping lanes pass within 8 km (5 mi) of Fermi 3, therefore waterway traffic unrelated to the plant is not likely to cause a spill near the intake bay. In addition, the Fermi 3 intake structure is not a safety-related structure, thus any liquid spills would not affect the safe operation or shutdown of Fermi 3.

2.2.3.2 Effects of Design Basis Events

The effects of potential design basis events are discussed in Subsection 2.2.3.1. The effects of the potential design basis events on safety-related structures, systems or components are insignificant, as discussed in Subsection 2.2.3.1.

2.2.4 References

2.2-201 National Oceanic and Atmospheric Administration (NOAA), Office of Coast Survey, Great Lakes viewer, http://ocsdata.ncd.noaa.gov/OnLineViewer/GreatLakesViewe

rTable.htm; “West End of Lake Erie, Navigation Chart 14830”, Edition 32, Date 7/01/2007, Update Date 2/2/2008, http://www.charts.noaa.gov/OnLineViewer/14830.shtml , accessed 18 March 2008.

2.2-202 U.S. Army Corps of Engineers, Detroit District, “Monroe Harbor, Michigan (Project Overview)”, http://www.lre.usace.army.mil/_kd/go.cfm?destination=Page&pge_id=2204&dialog=0, accessed November 2007.

2.2-203 U.S. Army Corps of Engineers, Detroit District, “Detroit River, Michigan (Project Overview)”, http://www.lre.usace.army.mil/_kd/go.cfm?destination=Page&pge_id=2165&dialog=0, accessed November 2007.

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2.2-205 Lloyd’s List, “Ports of the World 2007, Volume 3”, Published by Lloyd’s MIU, Port of Monroe, 2006.

2.2-206 Michigan Department of Transportation, “Michigan’s Railroad System, Detroit Area Inset”, http://www.michigan.gov/documents/MDOT_Official_Rail_130897_7.pdf, accessed 23 January 2008

2.2-207 National Transportation Safety Board, NTSB Website, “Aviation Accident Database & Synopses”, accidents in last 40 years for Newport, MI, http://www.ntsb.gov/ntsb, accessed 6 March 2008.

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2.2-209 AirNav: KDTW – Detroit Metropolitan Wayne County Airport, Detroit, Michigan, USA, Website, FAA Information (Effective 10 April 2008), http://www.airnav.com/airport/KDTW, accessed 17 April 2008.

2.2-210 Monroe County Industrial Development Corporation, “Industrial Properties”, http://www.monroecountyidc.com/, accessed 9 October 2007.

2.2-211 NUREG/CR-2650, Allowable Shipment Frequencies for the Transport of Toxic Gases Near Nuclear Power Plants, October 1982.

2.2-212 NFPA 422, Guide for Aircraft Accident/Incident Response Assessment, 2004.

2.2-213 EPRI NP-5283-SR-A, Guidelines for Permanent BWR Hydrogen Water Chemistry Installations - 1987 Revision, 1987.

2.2-214 NUREG/CR-2462, Capacity of Nuclear Power Plant Structures to Resist Blast Loadings, September 1983.

Table 2.2-201 Industrial Facilities Within 8 Km (5 Mi) [EF3 COL 2.0-5-A]

Facility Name	Distance/ Direction	Function	Products	# of Employees
Monroe Water Dept. Wilfred LaPage Raw Water Pump	1.5 km S (0.9 mi S)	Raw Water Pumping Station	Raw Drinking Water (shared intake w/Frenchtown TWP)	NA
Frenchtown Township Water Treatment Plant	3.4 km W-SW (2.1 mi W-SW)	Water Treatment Plant	Potable Water	11
Berlin Township Wastewater Treatment Plant	3.4 km N-NW (2.1 mi N-NW)	Wastewater Treatment Plant	Process sewage	4
StoneCo of Michigan, Newport Quarry	5.5 km N-NE (3.4 mi N-NE)	Quarry	Limestone, Dolomite	7 - 10
Rockwood Quarry, LLC	5.8 km N-NE (3.6 mi N-NE)	Quarry	Limestone	25
Meijer Distribution Inc.	6.4 km NW (4 mi NW)	Food/Clothing Distributor	General Warehousing & Storage	300
TWB Company, LLC	7.2 km W (4.5 mi W)	Motor Vehicle Metal Stamping	Automotive Stampings	250 - 303
Rockwood Landfill	7.2 km NE (4.5 mi NE)	Landfill	Waste Disposal	NA

NA = Not Available

Table 2.2-202 Offsite Hazardous Materials Within 8 Km (5 Mi) (Sheet 1 of 5) [EF3 COL 2.0-5-A]

Distance 1.5 km (0.9 mi) S	Monroe Water Department, Wilfred L. LaPage Raw Water Pump			Shipments	
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Sodium Hypochlorite	Avg 500 lbs Max 12,000 lbs	2 x 6000 gallon tanks, used seasonally May - Oct	Tanker Truck	4 – 6 x/yr	4800 gallons
	(shared intake with Monroe Water Dept above)				
Distance 3.4 km (2.1 mi) WSW	**Frenchtown Township Water Treatment Plant**			**Shipments**	
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Aluminum Sulfate	1,200 – 6,000 gallons (~ 60,000 lbs)	6,000 gallon tank	Truck	8	4,800 gallons
Fluoride (Hydrofluosilicic Acid)	1,250 gallons	1,500 gallon tank	Truck	4	1,250 gallons
Fuel Oil	1,000 gallons	1,000 gallon underground fuel oil storage tank for emergency generator	Truck	NA	NA
LiquidOxygen	3,000 gallons	3,000 gallon tank	Truck	6	3,000 gallons
Sodium Hypochlorite	1,200 – 6,000 gallons max (~ 60,000 lbs)	6,000 gallon tank	Truck	8	4,800 gallons

Table 2.2-202 Offsite Hazardous Materials Within 8 Km (5 Mi) (Sheet 2 of 5) [EF3 COL 2.0-5-A]

Distance 3.4 km (2.1 mi) NNW	Berlin Township Wastewater Treatment Plant		Shipments		
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Chlorine	800 – 1,000 lbs	150 lb cylinders	Truck	10	600 lbs (4 cylinders max)
Diesel Fuel	300 gallons	300 gallon tank	Truck	NA	NA
Ferric Acid	5,000 gallons	6,000 gallon tank	Truck	2	5,000 gallons

Table 2.2-202 Offsite Hazardous Materials Within 8 Km (5 Mi) (Sheet 3 of 5) [EF3 COL 2.0-5-A]

Distance 5.5 km (3.4 mi) NNE	Stone Co of Michigan, Newport Quarry		Shipments		
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Ammonium Nitrate Fuel Oil (ANFO)	20,000 lbs mixed with explosive component only when used for blasting as it goes into the hole.	No onsite storage, blasting company trucks for daily use.	Truck	72 per year (2X / week April 1 – Dec 20th)	20,000 lbs
Acetylene		Small cylinders	Truck	NA	NA
Antifreeze	55 gallons	One 55 gallon drum	Truck	NA	55 gallons
Diesel Fuel #001	15,000 gallons	One 15,000 gallon, vertical above ground tank	Truck	NA	15,000 gallons
Mobile Diesel Fuel Tank #007	70 gallons	One 70 gallon, vertical – trailer mounted tank	Truck	NA	70 gallons
Gasoline #002	300 gallons	One 300 gallon, horizontal above ground tank	Truck	NA	300 gallons
Engine Oil #004 10 W Oil #005 Gear Oil #006 Gear Oil drums	1,185 gallons	One 330 gallon tank; One 330 gallon tank; One 250 gallon tank; Five 55 gallon drums	Truck	NA	330 gallons
Used Oil #003	300 gallons	One 300 gallon tank	Truck	NA	300 gallons
Oxygen & Propane	NA	Small cylinders	Truck	NA	NA

Table 2.2-202 Offsite Hazardous Materials Within 8 Km (5 Mi) (Sheet 4 of 5) [EF3 COL 2.0-5-A]

Distance 5.8 km (3.6 mi) NNE	Rockwood Quarry LLC		Shipments		
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Ammonium Nitrate Fuel Oil (ANFO)	Use between 10,000 - 25,000 lbs daily 3 times per week; mixed with explosive component only when used for blasting as it goes into the hole.	No onsite storage, trucked for daily use. (Go through about 250,000 gallons per year.)	Bulk Tanker Truck	156	25,000 lbs
Diesel Fuel	~ 8,000 gallons	One 10,000 gallon tank & two 1,000 gallon tanks usually about 60% full	Truck	130 2 – 3 x/week	10,000 gallons

Distance 6.4 km (4 mi) NW	Meijer Distribution Inc.		Shipments		
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Anhydrous Ammonia	About 22,000 lbs as refrigerant	NA	NA	NA	NA
Kerosene	10,000 – 99,999 lbs	NA	NA	NA	NA
Propane	10,000 – 99,999 lbs	NA	NA	NA	NA
Sulfuric Acid	10,000 – 99,999 lbs	NA	NA	NA	NA

Table 2.2-202 Offsite Hazardous Materials Within 8 Km (5 Mi) (Sheet 5 of 5) [EF3 COL 2.0-5-A]

Distance 7.2 km (4.5 mi) W	TWB Company, LLC		Shipments		
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Argon	7,000 lbs	NA	NA	NA	NA
Helium	1,300 lbs	NA	NA	NA	NA
Marathon No 1 Fuel Oil Dyed	2,100 lbs	NA	NA	NA	NA
Misc Raw Oils	10,000 lbs	NA	NA	NA	NA
Used Oil / Water	21,250 lbs	NA	NA	NA	NA
Propane	4,500 lbs	NA	NA	NA	NA

Distance 7.2 km (4.5 mi) NE	Rockwood Landfill		Shipments		
Material Name (CAS #)	**Amount on Premises (Max Daily Amount in Pounds)**	**Largest Container**	**Mode (by Truck, Rail, River Barge)**	**# per Year / Frequency**	**Max Quantity (largest shipment)**
Diesel Fuel	1,000 – 9,999 lbs	NA	NA	NA	NA
Propane	1,000 – 9,999 lbs	NA	NA	NA	NA

NA = Not Available

Table 2.2-203 Fermi Onsite Chemical Storage Locations and Quantities (Sheet 1 of 5) [EF3 COL 2.0-5-A]

Chemical/Material (Formula/Trade/State)	Location (1)	No. x Quantity
	Fermi 3 Chemicals	
NALCO® 8357, Scale Inhibitor/Dispersant	Adjacent to Cooling Tower and/or Adjacent to Water Intake Structure	750 gallons
Carbon Dioxide, cryogenic	CO2 Storage Area outside the Turbine Building	1 x 800 gallon tank
Diesel Fuel	East of Electrical Building / Technical Support Center	2 x 215,400 gallon tanks
	Ancillary Diesel Building Ancillary Diesel Building	2 x 15,000 gallon storage tank 2 x 400 gallon day tank
Disodium Phosphate (0.18% Solution)	Auxiliary Boiler Building	1 x 555 gallon tank
Hydrogen, cryogenic	West of North Doxy Road	1 x 18,000 gallon tank
Nitrogen, cryogenic	West of North Doxy Road	1 x 6000 gallon tank
Oxygen, cryogenic	West of North Doxy Road	1 x 9000 gallon tank
Sodium Bisulfite, dehalogenation	Adjacent to Cooling Tower	1 x 500 gallon tank
Sodium Hypochlorite, biocide	Adjacent to Cooling Tower and/or Adjacent to Water Intake Structure	7500 gallons
Sodium Sulfite (2.2% Solution)	Auxiliary Boiler Building	1 × 555 gallon tank
Trisodium Phosphate (0.72% Solution)	Auxiliary Boiler Building	1 x 555 gallon tank
NALCO® 2513, Sodium Silicate Corrosion Inhibitor	Adjacent to Cooling Tower and/or Adjacent to Water Intake Structure	1250 gallons
	Fermi 2 Chemicals	
Caustics (20%)	Warehouse B	1 – 15 gallon drum
Cooking Oil	Northwest of NOC Parking Lot	250 gallons
Ethylene Glycol	Each Cooling Tower	178 gallons (356 gallons 50/50 mixture) on each tower, 1,370 gallons total

Table 2.2-203 Fermi Onsite Chemical Storage Locations and Quantities (Sheet 2 of 5) [EF3 COL 2.0-5-A]

Chemical/Material (Formula/Trade/State)	Location (1)	No. x Quantity
	Fermi 2 Chemicals (Continued)	
Fuel Oil / #2 Diesel Fuel	Southwest of Fermi 1 adjacent to South Lagoon;	845,970 gallons
	In RHR Complex;	168,000 (4 tanks at 42,000 gallons)
	In RHR Complex;	2,200 (4 tanks at 550 gallons)
	North of Auxiliary Boiler House;	159,000 gallons
	Adjacent to Holding Pond;	6,000 gallons
	Southwest of 120 Kv Mat;	3,000 gallons (5 tanks at 600 gallons)
	South side of NOC Building (West of back entrance);	500 gallons
	North side of GSW Pump House;	275 gallons
Gasoline (underground storage tank)	Adjacent to Holding Pond (tank to be relocated to a safe separation distance from Unit 3)	1 x 8,000 gallon tank
Hazardous Waste Accumulation/Storage Areas	Building H	15,000 gallons
	Fermi 1	Approximately 1,000 ft^3
Hydrogen (gas), Compressed	Southside Turbine Building	214,000 scf in 10 containers
Hydrogen (liquid), Cryogenic	Doxy Road, Gate 5	20,000 gallons (administratively controlled to <10,000 pounds)
Insulation Oil	Outside GSW Pump House, OSB (across from CST & CRT tanks), Turbine Building (across from AIB Building), Outside Circ Water Pump House, and Reactor Building;	5 x 70 gallon tanks
	Spare Transformer Storage Facility	ELIN = 22,670 gallons
	GTOC Parking Lot	GE = 26,000
Lubrication Oil	Peaker Pad;	6,800 gallons (4 units at 1,700 gallons)
	Outside Control House;	280 gallons (4 transformers at 70 gallons);
	Inside the protected area	105,000 gallons

Table 2.2-203 Fermi Onsite Chemical Storage Locations and Quantities (Sheet 3 of 5) [EF3 COL 2.0-5-A]

Chemical/Material (Formula/Trade/State)	Location (1)	No. x Quantity
	Fermi 2 Chemicals (Continued)	
Miscellaneous; incl: Elemental Sodium (neutralization process ongoing), Asbestos-friable (removal of majority complete by end of 2000, Varsol, Isopropyl Alcohol, Paints	Fermi 1 Warehouse C	Sodium: ~270 as of 4/1/06 Asbestos: ~1,000 ft^3 as of 4/1/06 Various sizes (1-55 gallon drums)
Mixed Waste Storage Areas	Onsite Storage Facility – Bay 1	16,500 gallons
	Fermi 1	Approximately 500 ft^3
Mobilgard 450	In RHR Complex	1,100 (4 tanks at 275 gallons)
Muratic (Hydrochloric) Acid	Fermi 1	825 gallons (in 55 gallon drums)
Nitrogen, Compressed, Cryogenic	Westside Reactor Building	6,000 gallon tank
Nitrogen, Compressed, Refrigerated	Doxy Road, Gate 5	1,459 gallons in a 5,000 gallon tank
	West of Fermi 1	1,370 gallons
Oxygen, Compressed, Cryogenic	Doxy Road, Gate 5	9,000 gallon tank
Pesticides/Herbicides	Building 27 (by Warehouse H) – Temporarily stored, used promptly	~145 gallons
Phosphonic Acid (Betz BL5400)	Circ Water Pump House	1 x 5,000 gallon tank
Propane Gas (Liquid)	Various locations outside the protected area	20 tanks, various standard sizes, Total storage 18,550 gallons
Propylene Glycol	Peaker Pad	CTG 11-1: 700 gallons CTG 11-2: 300 gallons CTG 11-3: 300 gallons CTG 11-4: 300 gallons

Table 2.2-203 Fermi Onsite Chemical Storage Locations and Quantities (Sheet 4 of 5) [EF3 COL 2.0-5-A]

Chemical/Material (Formula/Trade/State)	Location (1)	No. x Quantity
	Fermi 2 Chemicals (Continued)	
Shell Diala AX in transformers	Outside of west wall of Turbine Building;	#2A – 26,650 gallons
		#2B – 26,350 gallons
		#64 –7,205 gallons
		#65 – 14,060 gallons
	Outside of Circ Water Pumphouse;	#66 –7,226 gallons
		#69 – 10,027 gallons
		#72J - 340 gallons
	Outside of Gen Svc Water Pump	#68 -7,205 gallons
		#72K -190 gallons
	East of Water Treatment Plant;	~25 gallons
	Northeast corner of TAC Building, West of GTOC Building, West of Reactor Building (substa 3), North of Radwaste Building (substa 4), and NW corner of Reactor Bld (subst 5);	5 x 355 gallons
	Peaker Pad, West of OBA #72W & #72G, East of PAP #72T, S corner of Building 45, at Mat 345 kV Yard House Svc Transformer #1 & #2;	7 x 370 gallons
	Peaker Pad;	185 gallons
	120 kV Mat Transformer;	CTG 11 - 5,790 gallons
		#61 – 4,489 gallons
		#62 – 4,390 gallons
		#01 - 7,890 gallons
	120 kV Mat Breaker;	GH – 4,350 gallons
		GK – 3,075 gallons
	120 kV Mat EF1 System Svc	2 x 585 gallons (voltage reg & #72G
	Radwaste Building Roof;	#65L - 1,704 gallons (voltage reg)
	O/S Auxiliary Boiler House;	100 gallons

Table 2.2-203 Fermi Onsite Chemical Storage Locations and Quantities (Sheet 5 of 5) [EF3 COL 2.0-5-A]

Chemical/Material (Formula/Trade/State)	Location (1)	No. x Quantity
	Fermi 2 Chemicals (Continued)	
Shell Diala AX in transformers (continued)	345 kV Mat Current Transf.	1,050 gallons (5 transformers at 210 gallons – CF, CM, CT, DF & DM)
	SW corner of NOC training center & SW corner of NOC	2 x 400 gallons
Shell Rarus 427	345 kV Mat Air Compressor Breaker	12.5 gallons (5 breakers at 2.5 gal)
Shell Turbo 32	In Turbine Building	3 x 15,000 gallon tanks
Sodium Bisulfite Solution	Circ Water Pump House	1 x 1,500 gallon tank
Sodium Hypochlorite	Circ Water Pump House	1 x 8,000 gallon tank
	Gen Svc Water Pump House	1 x 2,000 gal (8,000 gallon capacity)
Sulfuric Acid	Delivery Truck	5,000 gallon tanker
	Warehouse B	15 gallon carboy
Trisodium Phosphate (dry form)	Auxiliary Boiler	1 x 300 pounds (in 100 pound bags)
Various Chemistry Chemicals; incl: 1,1,1 &1,1,2 Tri-chloroethane	Various Locations; Warehouses & Labs	Varies
Various Compressed Gases	Warehouse B & various plant areas	~300 cylinders
Various Cryogenic Gases	Warehouse B	9 cylinders
Various New Oils	Warehouse C	36,000 ft^3
Waste Oil	In Turbine Building	2,000 gallons

(1) Many of the chemicals and combustibles are transient whereby locations and quantities may vary.

Table 2.2-204 Airports Near Fermi 3 (Sheet 1 of 2) [EF3 COL 2.0-5-A]

Airport Name (FAA Identifier) Distance/Direction	Length / Orientation of Runways	Types of Aircraft	# of Operations Per Year	Accident Statistics
Mills Field Airport (MI53) 5.1 km (3.2 mi) N	732 x 20 m (2400 x 65 ft) Turf Runway 9/27	3 Aircraft based: 3 Single engine airplanes	200 avg 75% local 25% transient	No records found in NTSB database
Carls Airport (78MI) 9.7 km (6 mi) NNW	696 x 30 m (2285 x 100 ft) Turf Runway 18/36	Not Reported 1 Privately Owned Turf runway General Aviation	840 avg 100% transient	N/A - Ops not greater than 500d[2]
Wickenheiser Airport (W87) 11.3 km (7 mi) NW	785 x 18 m (2575 x 60 ft) Turf Runway 18/36 585 x 18 m (1920 x 60 ft) Turf Runway 9/27	3 Aircraft based: 3 Single engine airplanes	300 avg 50% local 50% transient general aviation	N/A - Ops not greater than 500d[2]
Custer Airport (TTF) 14.5 km (9 mi) W	1523 x 30 m (4997 x 100 ft) Runway 3/21: Heading 027/207	39 Aircraft based: 32 Single engine airplanes 7 Multi-engine planes	22,630 avg 50% local 50% transient	N/A - Ops not greater than 500d[2]
Gross Ile Municipal Airport (ONZ) 17.7 km (11 mi) NNE	1477 x 30 m (4846 x 100 ft) Runway 4/22 1349 x 23 m (4425 x 75 ft) Runway 17/35	88 Aircraft based: 76 Single engine 9 Multi engine 1 Helicopters 2 Ultralights	52,925 avg 60% local 40% transient	N/A – Ops not greater than 1000d[2]
Erie Aerodrome (M84) 29 km (18 mi) SW	814 x 27 m (2670 x 90 ft) Turf Runway 18/36	4 Aircraft based: 2 Single engine 2 Ultralights	300 avg 50% local 50% transient	N/A – Ops not greater than 1000d[2]

Table 2.2-204 Airports Near Fermi 3 (Sheet 2 of 2) [EF3 COL 2.0-5-A]

Airport Name (FAA Identifier) Distance/Direction	Length / Orientation of Runways	Types of Aircraft	# of Operations Per Year	Accident Statistics
Detroit Metropolitan Wayne County Airport (DTW) 30.6 km (19 mi) NNW 6 runways: 4 concrete & 2 asphalt	3659 x 61 m (12,003 x 200 ft) Runway 4R/22L 3048 x 46 m (10,001 x 150 ft) Runway 3R/21L 3048 x 46 m (10,000 x 150 ft) Runway 4L/22R 2654 x 61 m (8708 x 200 ft) Runway 9L/27R 2591 x 61 m (8501 x 200 ft) Runway 3L/21R 2591 x 46 m (8500 x 150 ft) Runway 9R/27L	14 Aircraft based: 3 Single engine 3 Multi engine 7 Jet airplanes 1 Helicopter	481,435 avg 60% commercial 37% air taxi 3% transient <1% military	NTSB database shows 18 accidents in last 30 years and 23 accidents in last 40 years
Willow Run Airport (YIP) 38.6 km (24 mi) NW	2294 x 46 m (7526 x 150 ft) Runway 5R/23L 2223 x 49 m 7294 x 160 ft) Runway 9L/27R 1985 x 49 m (6511 x 160 ft) Runway 9R/27L 1924 x 49 m (6312 x 160 ft) Runway 14/32 1827 x 49 m (5995 x 160 ft) Runway 5L/23R	395 Aircraft based: 152 Single engine 90 Multi-engine 145 Jet airplanes 8 Helicopters	122,275 avg 42% local 40% transient 14% air taxi 4% commercial <1% military	N/A – Ops not greater than 1000d[2]

SOURCE: Reference 2.2-207 through Reference 2.2-209

Table 2.2-205 Fermi Onsite Chemicals Evaluation (Sheet 1 of 3) [EF3 COL 2.0-6-A]

Chemical/Material (Formula/Trade/State)	Toxicity Limit (IDLH)	Flammable/ Explosive?	Vapor Pressure	Disposition
Fermi 3 Chemicals				
Carbon Dioxide, cryogenic	40,000 ppm	No / No	830 psi @ 68°F	Toxic analysis performed and found to have no impact on Fermi 3 main control room (MCR) habitability.
Diesel Fuel	None established	Yes (Varies) / No	< 0.100 mmHg	No further analysis required.(1)
Disodium Phosphate (0.18% Solution)	None established	No / No	NA	No further analysis required.
Hydrogen, cryogenic	None established; asphyxiant	Yes (4 to 75%) / Yes	29.030 psi @ –418°F	Toxic analysis (asphyxiation) performed and found to have no impact to Fermi 3 MCR habitability. Explosion analysis safe separation distance is provided as discussed in 2.2.3.1.1.
Nitrogen, cryogenic	None established; asphyxiant	No / No	65.820 psi @ –294°F	Toxicity (asphyxiation) analysis in Section 6.4. No other analysis required.
Oxygen, cryogenic	None established	No / No	36.260 psi @ –280°F	Toxic analysis performed and found to have no impact to Fermi 3 MCR habitability. No other analysis required.
Sodium Bisulfite, dehalogenation	None established	No / No	NA	No further analysis required.
Sodium Hypochlorite (15%), biocide	10ppm	No / No	17.5 mmHg @ 68°F	Toxic analysis performed and found to have no impact to Fermi 3 MCR habitability.
NALCO® 2513, Corrosion Inhibitor Sodium Silicate	None established	No/No	NA	No further analysis required
NALCO® 8357 Scale Inhibitor/Dispersant	None established	No/No	NA	No further analysis required

Table 2.2-205 Fermi Onsite Chemicals Evaluation (Sheet 2 of 3) [EF3 COL 2.0-6-A]

Chemical/Material (Formula/Trade/State)	Toxicity Limit (IDLH)	Flammable/ Explosive?	Vapor Pressure	Disposition
Fermi 3 Chemicals (Continued)				
Sodium Sulfite (2.2% Solution)	None Established	No / No	17.535 mmHg @ 93.6°F	No further analysis required.
Trisodium Phosphate (0.72% Solution)	None established	No / No	Not required	No further analysis required.
Fermi 2 Chemicals				
Ethylene Glycol	None established	No / No	0.06 mmHg @ 68°F	No further analysis required.
Fuel Oil / #2 Diesel Fuel	None established	Yes (Varies) / No	< 0.100 mmHg	No further analysis required.(1)
Gasoline (underground storage tank)	None established	Yes / Yes	38 – 300 mmHg	
Hydrogen (gas), Compressed	None established; asphyxiant	Yes (4 to 75%) / Yes	29.030 psi @ –418°F	Toxic analysis (asphyxiation) performed and found to have no impact to Fermi 3 MCR habitability. Explosion analysis safe separation distance is provided as discussed in 2.2.3.1.1.
Hydrogen (liquid), Cryogenic	None established; asphyxiant	Yes (4 to 75%) / Yes	29.030 psi @ –418°F	Toxic analysis (asphyxiation) performed and found to have no impact to Fermi 3 MCR habitability. Explosion analysis safe separation distance is provided as discussed in 2.2.3.1.1.
Lubrication Oil	None established	No / No	< 0.100 mmHg	No further analysis required.
Muratic (Hydrochloric) Acid	50 ppm (IDLH)	No / No	190 mmHg @ 77°F	No further analysis required.
Nitrogen, Compressed, Cryogenic	None established; asphyxiant	No / No	65.820 psi @ –294°F	Toxic analysis performed and found to have no impact to Fermi 3 main control room (MCR) habitability.

Table 2.2-205 Fermi Onsite Chemicals Evaluation (Sheet 3 of 3) [EF3 COL 2.0-6-A]

Chemical/Material (Formula/Trade/State)	Toxicity Limit (IDLH)	Flammable/ Explosive?	Vapor Pressure	Disposition
Fermi 2 Chemicals (Continued)				
Nitrogen, Compressed, Refrigerated	None established; asphyxiant	No / No	65.820 psi @ –294°F	Toxicity (asphyxiation) analysis in Section 6.4. No other analysis required.
Oxygen, Compressed, Cryogenic	None established	No / No	36.260 psi @ –280°F	Toxic analysis performed and found to have no impact to Fermi 3 MCR habitability. No other analysis required.
Phosphonic Acid (Betz BL5400)	1000 mg/m^3 as phosphoric acid	No / No	23.8 mmHg @ 25°C	No further analysis required.
Propane Gas (Liquid)	2100 ppm (IDLH)	Yes / Yes	6178 mmHg @ 70°F	Toxic analysis performed and found to have no impact to Fermi 3 MCR habitability.
Propylene Glycol	None established	No / No	0.07 mmHg @ 72°F	No further analysis required.
Sodium Bisulfite Solution (38%)	None established	No / No	NA	No further analysis required.
Sodium Hypochlorite	10 ppm	No / No	17.5 mmHg @ 68°F	Toxic analysis performed and found to have no impact to Fermi 3 MCR habitability.
Sulfuric Acid	15 mg/m^3 (IDLH)	No / No	1 mmHg @ 295°F	No further analysis required.
Trisodium Phosphate (dry form)	None established	No / No	Not required	No further analysis required.

(1) A fluid with an extremely low vapor pressure will not explode per NFPA 422 (Reference 2.2-212) which states that the vapor space in tanks storing low vapor pressure liquids is normally too lean to burn. The vapor pressure of diesel fuel is low enough such that the vapor concentration above the liquid (0.36%) is significantly lower than the LFL (1.3%). As a result the air-gas mixture is expected to be too lean to ignite and/or explode. Similarly, kerosene grade fuel ordinarily has a low tendency to vaporize, and, in a closed tank, the fuel vapor and air mixture can be too lean to burn.

Figure 2.2-201 Industries and Transportation Routes Within 8 Km (5 Mi) [EF3 COL 2.0-5-A]

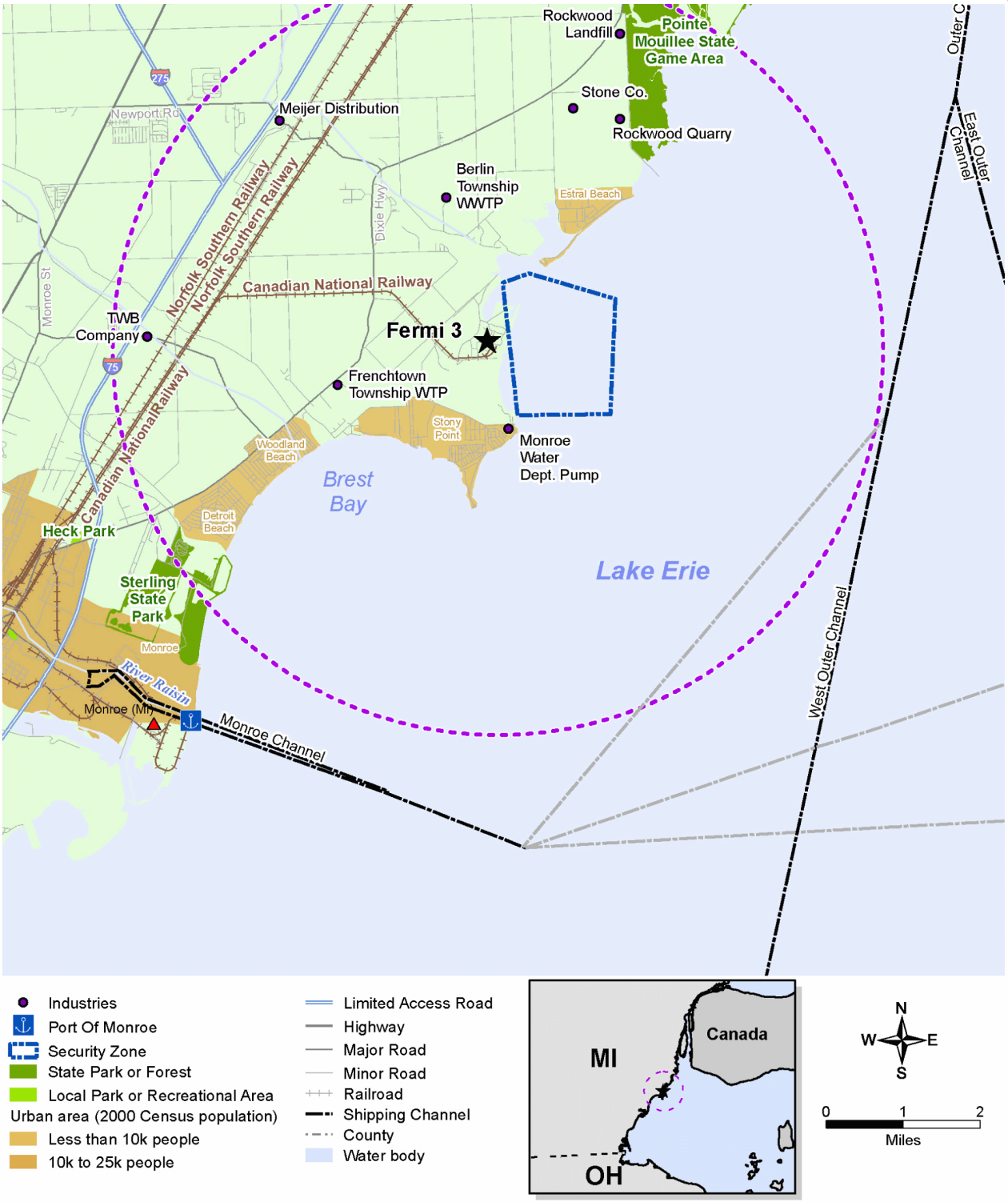
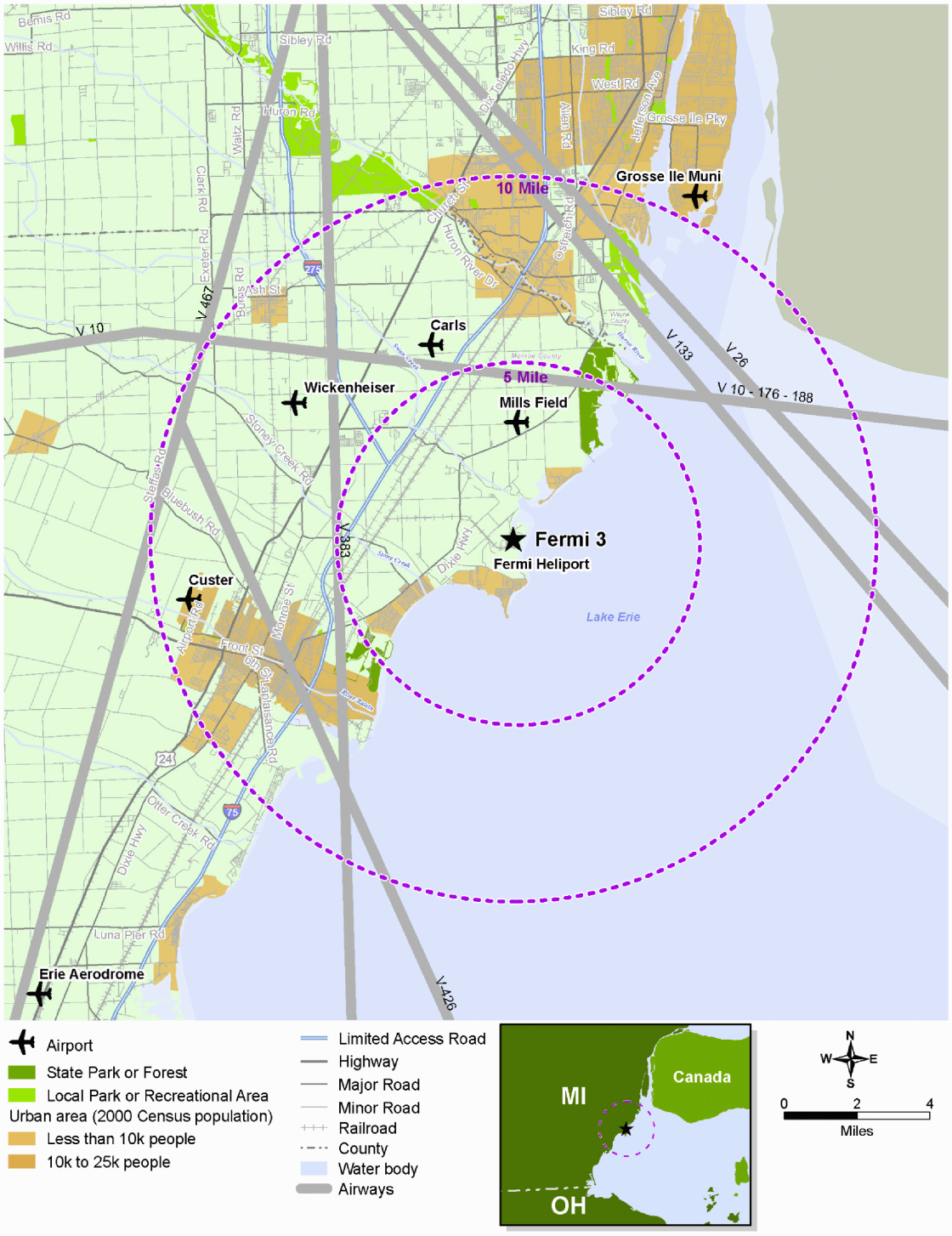
Figure 2.2-202 Nearby Airports and Aviation Routes [EF3 COL 2.0-5-A]