CHAPTER 12. WASTES AND EMISSIONS

7855.0630 ENVIRONMENTAL INFORMATION REQUIRED.

Each applicant shall provide environmental data for the proposed facility and for each alternative facility described in response to part 7855.0610. The information in parts 7855.0640 to 7855.0670 relating to construction and operation of each of these facilities shall be provided to the extent that such information is reasonably available to the applicant and applicable to the particular alternative.

7855.0650 WASTES AND EMISSIONS.

The applicant shall provide data on wastes and emissions associated with construction or operation of the facility, including:

A. the types and estimated amounts of solid, liquid, and gaseous radioactive wastes that will be produced by the facility, and the level of radioactivity of each in curies per year;
B. an analysis of human exposure to ionizing radiation attributable to operation of the facility, taking account of the pathways of radioactive releases to humans;
C. the types and estimated amounts of nonradioactive solid and liquid wastes that will be produced;
D. the types and estimated amounts of nonradioactive gaseous and particulate emissions into the air that will occur during full operation from each emission source, and the location and nature of the release point;
E. locations that may be sources of fugitive dust and the nature of each source;
F. the nature and estimated amount of nonradioactive discharges to water, and the locations, routes, and final receiving waters for any discharge points;
G. any area from which runoff may occur, potential sources of contamination in the area, and receiving waters for any runoff;
H. the sources and estimated amounts of heat rejected by the facility; and
I. the maximum noise levels (in decibels, A scale) expected at the property boundary and the expected maximum increase over ambient noise levels.

12.1 RADIOACTIVE WASTES

Minnesota Statute 116C.83, Subdivision 5 – Water standards., establish that the requirements of 116C.76 – Nuclear waste depository release into groundwater., Subdivision 1, clauses (1) to (3), apply to an independent spent fuel storage installation. Such an installation must be operated in accordance with those standards. There will be no radioactive wastes produced or released by operation of the facility. The spent fuel is stored in stainless steel canisters that are sealed closed by multiple weld layers before the canister leaves the reactor building to ensure that no radioactive materials can escape. In addition, the canisters are helium leak-tested to a leak-tight criteria per ANSI N14.5. The outer surface of the canister is completely decontaminated prior to leaving the reactor building to ensure that no residual radioactive contamination can be released to the environment. Therefore, there is no liquid, solid or gaseous radioactive waste associated with the ISFSI and no release to or contamination of the groundwater.

12.2 HUMAN EXPOSURE TO RADIATION DUE TO OPERATION

The spent fuel and all associated radioactive material will be completely contained in stainless steel canisters with welded closures, so that no radioactive material is released from the spent fuel to the environment under both normal and postulated accident conditions (e.g., earthquakes, tornadoes, fires, etc.)[1]. Therefore, there will be no uptake of radioactive material by personnel working onsite or people living nearby by means of inhalation or ingestion, and the soil in the vicinity of the site will not be contaminated by the operation of the ISFSI. Additionally, due to the heavy neutron and gamma shielding provided by the storage overpack design, the spent fuel in the canisters will emit only low levels of radiation into the environment surrounding the site. As discussed below, due to this shielding, and the relatively large distances from the ISFSI to the nearest residences (over 500 meters), radiation doses to the population around the site will be extremely low, and indistinguishable from normal background radiation.

12.2.1 On-site Radiation Doses

While shielding is provided by the design of the transfer and storage casks, spent fuel storage facility personnel will receive some radiation exposure during spent fuel handling, canister loading, closure welding, spent fuel drying, onsite transport operations, and placement and storage of the canisters. The requirements of 10 CFR Part 20 for protecting personnel from radiation exposure and minimizing exposures will be strictly adhered to during all activities related to spent fuel storage. The ISFSI

[1] *Radioactive material* emits *radiation*. No *radioactive material* will escape the sealed canisters, but low levels of *radiation* (primarily gamma rays) are emitted from the external surface.

has a permanent radiation monitoring system to record radiation levels at specific locations within the spent fuel storage facility on a continuous basis. Workers and visitors entering the ISFSI are provided with dosimetry to accurately measure and record radiation dose exposure.

Because additional spent fuel would be stored within the ISFSI, there would be an increase in dose rates and collective doses to MNGP personnel who work near the ISFSI. For all work associated with the ISFSI, Xcel will operate under the conditions and practices of its As Low As Reasonably Achievable ("ALARA") program pursuant to 10 CFR 20.1101(b), which seeks to minimize occupational dose for workers. Regardless of the amount of fuel stored at the ISFSI, Xcel will still have to ensure that each worker's annual exposure is below the regulatory limit in 10 CFR 20.1201 of 0.05 Sv [5 rem] annually.

12.2.2 Off-site Radiation Doses

The Monticello Plant ISFSI currently stores 1,830 spent fuel assemblies in 30 of Transnuclear's NUHOMS 61BT dry shielded canisters (each canister holds 61 spent fuel assemblies), placed in 30 NUHOMS storage modules (overpacks). A calculation was performed to estimate the radiation levels assuming 14 additional NUHOMS modules are loaded to provide the needed storage to allow Monticello to operate until 2040, using fuel representative of the actual fuel in the Monticello spent fuel pool (variables such as initial enrichment, length of time in the reactor, and cooling time). Because all NRC-certified designs must meet the same NRC standards for radiation shielding, it is expected that that calculation would be representative of other designs certified by the NRC. The nearest residence from the ISFSI is 550 meters south-southwest of the site. This calculation showed that the dose rate to the nearest resident would be 0.4 mrem/year when the additional modules were first loaded. This level is indistinguishable from normal background levels; according to the NRC, the annual average dose per person from all natural and man-made sources is about 620 mrems.[2] It also should be noted that, once the spent fuel is located at the site, the dose rate will constantly decrease due to the radioactive decay of the spent fuel.

The NRC defines normal, off-normal, and accident conditions to which storage systems are required to be designed. NUREG-2215, the Standard Review Plan for Spent Fuel Dry Storage Facilities dated April 2020 states in Section 9.4.4 that, "[g]enerally, as discussed below in the review procedures, the applicant evaluates the allowable leakage rate for its radiological consequences and its effect on maintaining an inert atmosphere within the storage container. However, the analyses discussed below are unnecessary

[2] https://www.nrc.gov/about-nrc/radiation/around-us/calculator.html.

for a storage container, including its closure lid, that is designed and tested to be "leaktight" as defined in American National Standards Institute (ANSI) N14.5, 'American National Standard for Leakage Tests on Packages for Shipment of Radioactive Materials.'" The NUHOMS-61BT DSC is designed and tested to meet the "leak tight" criteria of ANSI N14.5-1997. As a result, doses from an accident, as defined by the NRC for the purposes of licensing a storage container, involving the NUHOMS-61BT DSC will be no greater than those calculated for normal conditions described above.

For illustrative purposes only, the NRC's "worst case scenario," which is a generic analysis of potential on-site and off-site consequences of accidental releases associated with the operation of an ISFSI, is presented here (NUREG-1140). The accident assumed for the analysis is the removal of the lid of a dry cask containing 24 damaged pressurized water reactor (PWR) spent fuel assemblies. It is assumed that the fuel had been removed from the reactor core 5 years earlier and that 10% of the Kr-85 and 1% of the 1-129 are released. The NUREG-1140 analysis concluded that this postulated worst-case scenario involving an ISFSI has insignificant consequences to the public health and safety. The maximum dose to a member of the public off-site due to an accidental release of radioactive materials under this scenario is calculated to be .003 rem (3 millirem) at 100 meters. Even under this extreme and highly unlikely scenario, the offsite radiation doses will remain well within federal limits.

12.2.3 Radiation Protection Program

A radiation protection program is required at the Monticello spent fuel storage facility. The extensive 10 CFR 20 radiation protection program already in effect for the nuclear power plant has been applied to the ISFSI (per 10 CFR 72.212(b)(6)), to address the specific radiation protection needs of the ISFSI and to follow the requirements of 10 CFR Part 72.126.

The primary goal of the radiation protection program is to minimize exposure to radiation such that the total individual and collective exposure to personnel in all phases of operation and maintenance are kept As Low As Reasonably Achievable (ALARA). This is achieved by integrating ALARA concepts into design, construction, and operation of the facility. Trained personnel develop and implement the radiation protection program and assure that all procedures are followed to meet company and regulatory requirements.

Three basic objectives of the ALARA program are:

1. Protection of Personnel, including surveillance and control over internal and external radiation exposure and maintaining the exposure of all personnel within permissible limits and as low as reasonably achievable (ALARA).
2. Protection of the public, including surveillance and control over all conditions and operations that may affect the health and safety of the public. All activities related to the shipment and storage of spent fuel will be controlled by an environmental radioactivity monitoring plan to ensure off-site doses are ALARA.
3. Protection of the Facility, including monitoring the facility for physical changes that could lead to exposure hazards and determining changes or improvements needed to maintain exposure ALARA.

The radiation protection staff is responsible for and has the appropriate authority to maintain occupational exposures as far below the specified limits as reasonably achievable. Formal reviews are performed periodically to determine how exposures might be reduced. The program ensures that spent fuel storage facility personnel receive sufficient training and that sufficient authority to enforce safe station operation is provided. Modifications to operating and maintenance procedures, as well as spent fuel storage facility equipment and facilities will be made when they will substantially reduce exposures at a reasonable cost. The program will also ensure that adequate equipment and supplies for radiation protection work are provided.

The ALARA program ensures that:

1. An effective ALARA program is administered at the spent fuel storage facility that appropriately integrates management philosophy and NRC regulatory requirements and guidance.
2. Spent fuel storage facility design features, operating procedures and maintenance practices are in accordance with ALARA program guidelines; and that written reviews of the radiation protection program ensure the objectives of the ALARA program are attained.
3. Pertinent industry and research information concerning radiation exposure of personnel are reflected in the design and operation of the facility.
4. Appropriate experience gained during the operation of nuclear power stations relative to in-plant radiation control is factored into revisions of procedures to assure that the procedures continually meet the objectives of the ALARA program.
5. Necessary assistance is provided to ensure that operations, maintenance, and decommissioning activities are planned and accomplished in accordance with ALARA objectives.
6. Trends in spent fuel storage facility personnel and job exposures are analyzed to permit corrective actions to be taken with respect to adverse trends.

Monticello personnel are responsible for ensuring that activities are planned and accomplished in accordance with the objectives of the ALARA program, and ensure that procedures and their revisions are implemented in accordance with the objectives of the ALARA program and ensure compliance with applicable requirements of 10 CFR 72 and 10 CFR 20.

12.2.4 Emergency Plan

The requirements for an emergency plan for the ISFSI are identified in 10 CFR Part 72.32. The emergency plan is prepared in accordance with these regulations and describes the organization, assessment actions, activation of the emergency organization, notification procedures, emergency facilities, training, provisions for maintaining emergency preparedness, and recovery criteria for off-normal and accident conditions.

12.3 NON-RADIOACTIVE SOLID AND LIQUID WASTES

Construction of the expansion facilities will result in generation of non-radiological solid waste. Xcel will need to dispose of the aggregate material excavated to construct the pad and approach pads, and normal construction debris (e.g., trash, waste parts) would likely be generated as a result. Trash would be collected in appropriate, leak-proof waste dumpsters or bins, and disposed of properly offsite by a licensed waste transporter.

Liquid wastes generated during construction may consist of construction equipment fluids, such as gasoline, diesel fuel, and mechanical lubricants, and/or concrete wastes. Chemicals potentially onsite during the construction of the expansion pad will consist of construction equipment fuels and fluids, such as gasoline, diesel fuel, and mechanical lubricants. Construction equipment will be inspected prior to use to ensure all connections and hoses are in working order. Spill response equipment, such as drip pans and absorbents, will be on site in the event of spills or leaks. Any spills or releases will be managed in accordance with the Monticello Plant Spill Prevention, Control, and Countermeasure (SPCC) Plan and with state and federal spill response and reporting regulations. Any onsite fueling that occurs will be attended at all times. Used oils or other equipment liquids will be stored in lidded containers appropriate for the contents and labeled. Where concrete is poured onsite, wash water generated from cleaning any equipment that comes in contact with concrete pours will be contained in a leak-proof container or impervious liner (i.e., a compacted clay liner that does not allow washout to enter ground water) and the liquid allowed to evaporate or be disposed of at an approved location.

Xcel Energy has processes in place to address management of waste produced by construction and operation activities at the facility.

During operations, the new concrete pad and additional storage casks will house spent nuclear fuel in sealed stainless steel canisters. The storage system is completely passive, and no solid or liquid wastes will be generated during its operation aside from minor trash, which will be collected in appropriate, leak-proof waste dumpsters or bins, and be disposed of properly offsite by a licensed waste transporter.

12.4 NON-RADIOACTIVE GASEOUS AND PARTICULATE EMISSIONS

Emissions during construction will be limited to short-duration activities related to operation of construction equipment (e.g., bulldozers, scrapers, front-end loaders, graders, dump trucks, cement trucks, and delivery trucks/trailers). Construction activities are expected to last for six months. These activities will be intermittent and will not result in long lasting effects on air quality in the immediate Project area. During operations, the spent fuel would be moved from the Monticello Plant to the ISFSI facility with the cask transport vehicle in one single loading campaign. As a result, minor vehicle emissions will occur during operation of the ISFSI; however, the ISFSI Project will not generate any stationary air emissions during operation and will not have impacts on air quality.

Dry storage of spent fuel is a passive operation and therefore the operation of the ISFSI will not generate any gaseous or particulate emissions.

12.5 FUGITIVE DUST

Construction of the Project could generate small amounts of dust. Earth-moving equipment such as bulldozers, scrapers, and graders would clear/excavate the area where the concrete pad, approach pads, and asphalt drive would be placed. Concrete and asphalt trucks would then deliver concrete and asphalt to the site, and pumping trucks will place it. Xcel Energy may need to control fugitive dust during construction by applying water to exposed soil areas and covering spoil piles with tarps. Fugitive dust from construction activities will be short in duration and intensity.

There is presently no dust produced during the operation of the ISFSI, and only minimal fugitive dust is anticipated in future operations. Minor fugitive dust may be produced by the cask transfer vehicle driving on paved road surfaces during the delivery of casks to the site. The additional casks that will be added to the ISFSI are expected to

be loaded in a single transfer campaign. As such, no appreciable dust impacts will occur, and no mitigation will be required during operation.

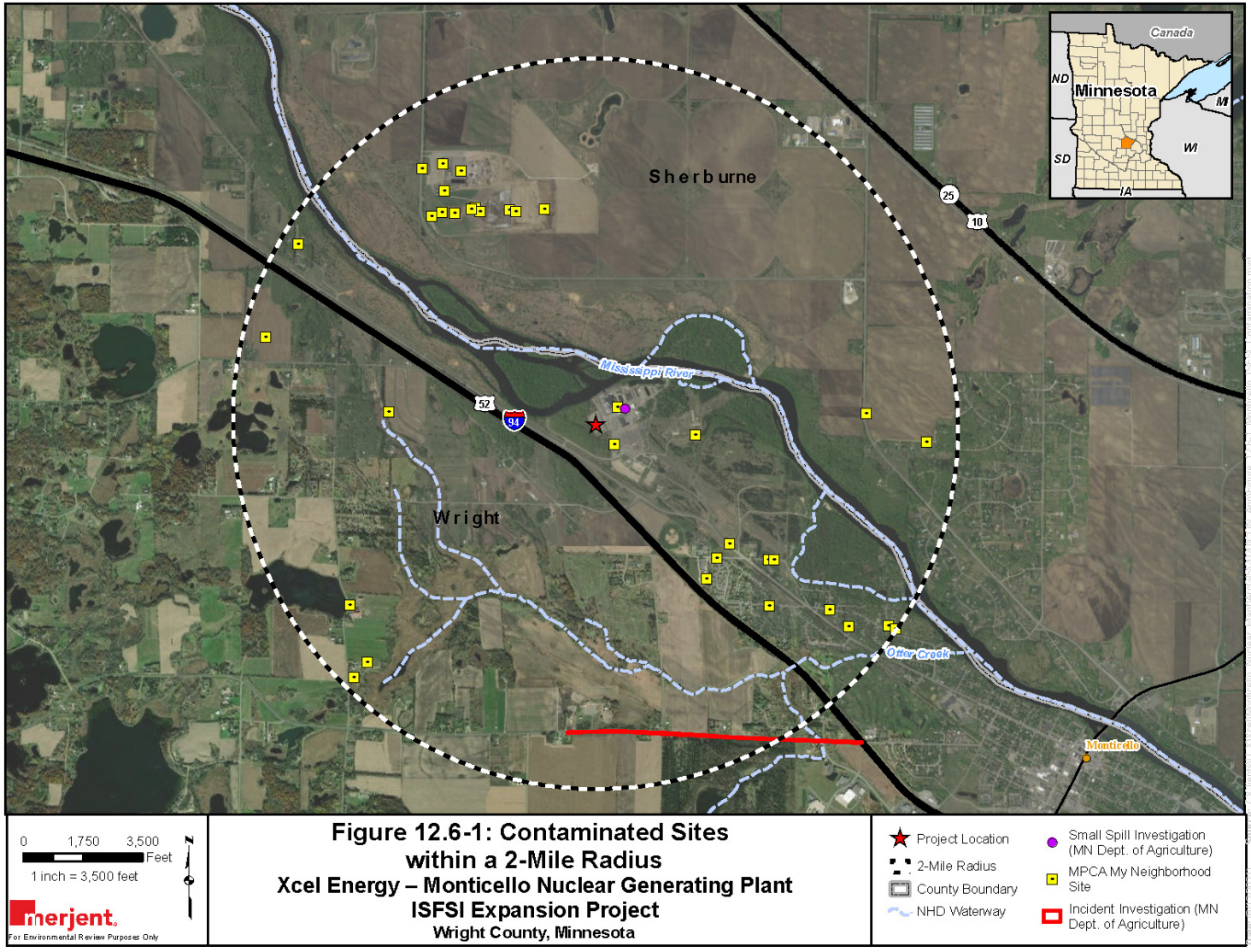
12.6 NON-RADIOACTIVE RUNOFF, POTENTIAL SOURCES OF CONTAMINATION, AND DISCHARGE TO RECEIVING WATERS

The Mississippi River is the closest surface water source and potential receiving water to the ISFSI. As discussed in Section 11.6.1, the Mississippi River is designated as an MPCA 303(d) listed water impaired at this location for fecal coliform, mercury, and polychlorinated biphenyls (PCBs), with a state-wide Total Maximum Daily Limit (TMDL) in place for mercury in fish tissue.[3] Construction of the Project will not contribute to the existing impairment status in this reach of the Mississippi River or a change in discharges to receiving waters.

According to the MPCA's What's in My Neighborhood (WIMN) web-mapper, no existing contamination, or potential environmental hazards, such as soil or ground water contamination, abandoned dumps, closed landfills, existing, or abandoned storage tanks, and hazardous liquid or gas pipelines, are present on or near the Project site (WIMN). Figure 12.6-1 below depicts potentially contaminated sites within 2 miles of the proposed Project location.

[3] U.S. Environmental Protection Agency Waters. 2020. How's My Waterway. https://mywaterway.epa.gov/community/Monticello,%20MN,%20USA/overview.

Figure 12.6-1 Contaminated Sites within a 2-Mile Radius



12.6.1 Stormwater – Construction

As the area of construction will be less than one acre in size, Xcel Energy will not be required to obtain MPCA NPDES/State Disposal System (SDS) permit coverage for stormwater discharges that occur during construction activities. The ISFSI Project would not expose any industrial activities to stormwater. The ISFSI Project would have minimal impacts related to construction stormwater with proper controls. Stormwater impacts that could occur would be managed by Xcel Energy-implemented BMPs.

The existing ISFSI was designed with a slight slope to direct runoff to the perimeter of the ISFSI where existing stormwater collection ditches collect runoff and divert it to existing natural flow routes. These collection ditches ultimately discharge into the Monticello Plant stormwater retention basin located near the southeast corner of the existing ISFSI facility. During construction it is estimated that most stormwater will drain into the surrounding soils, which are highly permeable. Construction BMPs and sediment and erosion control devices will prevent the occurrence of point discharges from the site into any conveyances that could permit sediment or silt-laden runoff into natural flow routes that discharge into the Mississippi River. Perimeter controls, such as silt fence and/or straw wattles, will be installed to ensure sediment or silt-laden runoff does not leave the property. Controls will be installed and maintained in accordance with manufacturer specifications and repaired or replaced if found to be functioning improperly.

12.6.2 Stormwater – Operations

As stated above, the existing ISFSI was designed with a slight slope to direct runoff to the perimeter of the ISFSI where existing stormwater collection ditches collect runoff and divert it to existing natural flow routes. These collection ditches ultimately discharge into the Monticello Plant stormwater retention basin located near the southeast corner of the existing ISFSI facility. The Project would be constructed with the same slopes and no work would need to occur in the collection ditches or retention basin to accommodate the Project.

Because the site would not introduce any pollutants to stormwater, it is expected that the quality of the stormwater runoff produced during operations would be similar to the existing runoff quality. Stormwater runoff during operations is expected to be relatively unaffected by the installation of the ISFSI Project.

The area impacted by ISFSI Project activities is currently covered in Class 6 gravel, which is considered an impervious surface; therefore, the installation of the concrete pad and loading area and asphalt drive will not increase the impervious nature of the

area. All stormwater runoff from the ISFSI will continue to flow to the stormwater collection ditch surrounding the ISFSI that directs runoff to the retention basin adjacent to the southeast corner of the existing ISFSI that also accepts runoff from plant parking lots. All stormwater from the ISFSI will continue to be directed away from the Mississippi River. As such, no appreciable change in stormwater runoff during operations is anticipated due to the ISFSI Project and no additional stormwater retention capacity is necessary.

12.7 HEAT REJECTION

Dry cask storage systems are passive with no active heat rejection required. By the time they are placed in the casks, the used fuel assemblies have decayed sufficiently such that natural conduction and convection is sufficient to remove the heat generated by the assemblies. Depending on the specific system design, periodic monitoring of air inlets/outlets or temperatures is required.

Current cask designs licensed by the NRC are designed and licensed for heat loading of 20-47 kW per cask. This level of heat generation will have no adverse impact on the local environment.

12.8 NOISE

Construction of the Project will create a temporary source of noise during the proposed six-month construction window. Construction activities associated with the Project will be performed with standard heavy equipment such as track-excavators, backhoes, cranes, bulldozers, dump trucks, and cement trucks with maintained exhaust systems. Sound will also be generated by trucks and other light vehicles traveling in and near areas under construction. The changing number and type of construction equipment at construction sites will result in varying levels of sound.

Analysis of construction equipment sound levels and acoustic usage factors of this type and level of construction activity indicate Lmax levels at 50 feet ranging from 55 dBA to 85 dBA.[4] The 50-foot Lmax sound level for each item of equipment is defined as per Thalheimer, "Construction noise control program and mitigation strategy at the Central Artery/Tunnel Project" Noise Control Eng. J. 48 (5), 2000 Sep-Oct. This maximum level occurs only when the equipment is operating at full power. However, not all

[4] Xcel Application to the Minnesota Public Utilities Commission for a Certificate of Need to Establish an Independent Spent Fuel Storage Installation at the Monticello Generating Plant. January 18, 2005. Docket # E002/CN-05-123. Available online at https://www.lrl.mn.gov/webcontent.

equipment will be operating all the time, and, when operating, will often be in a quieter, low power mode. An "Acoustic Usage Factor" was therefore applied to the maximum sound level to correct the levels for the time the equipment is not operating at full power. An Acoustic Usage Factor of 40%, or -4 dB, was applied to all equipment, thereby reducing the range of Lmax levels at 50 feet to 51 dBA to 81 dBA.

Outdoor sound levels change continually because of the temporal and spatial variations of sound sources. The temporal variation in the resulting sound levels is described by statistical levels in the form Lx, where Lx designates a sound that exceeds the level L for x percent of the sampling duration. Minnesota has established noise pollution rules under Minnesota Administrative Rule 7030: Noise Pollution Control. These rules quantify noise levels over a one-hour period where L10 is the noise level that is exceeded for 10 percent (6 minutes) of the hour, and L50 is the noise level exceeded for 50 percent (30 minutes) of the hour. Stationary limits for residential areas are the most stringent as shown in Table 12.8-1.

Table 12.8-1
Monticello ISFSI Project – Noise Rules for Noise Classification Areas

	Daytime (7AM-10PM) (dBA)		Nighttime (10PM-7AM) (dBA)	
Noise Classification	L10	L50	L10	L50
Area 1 (Residential)	65	60	55	50
Area 2	70	65	70	65
Area 3	80	75	80	75

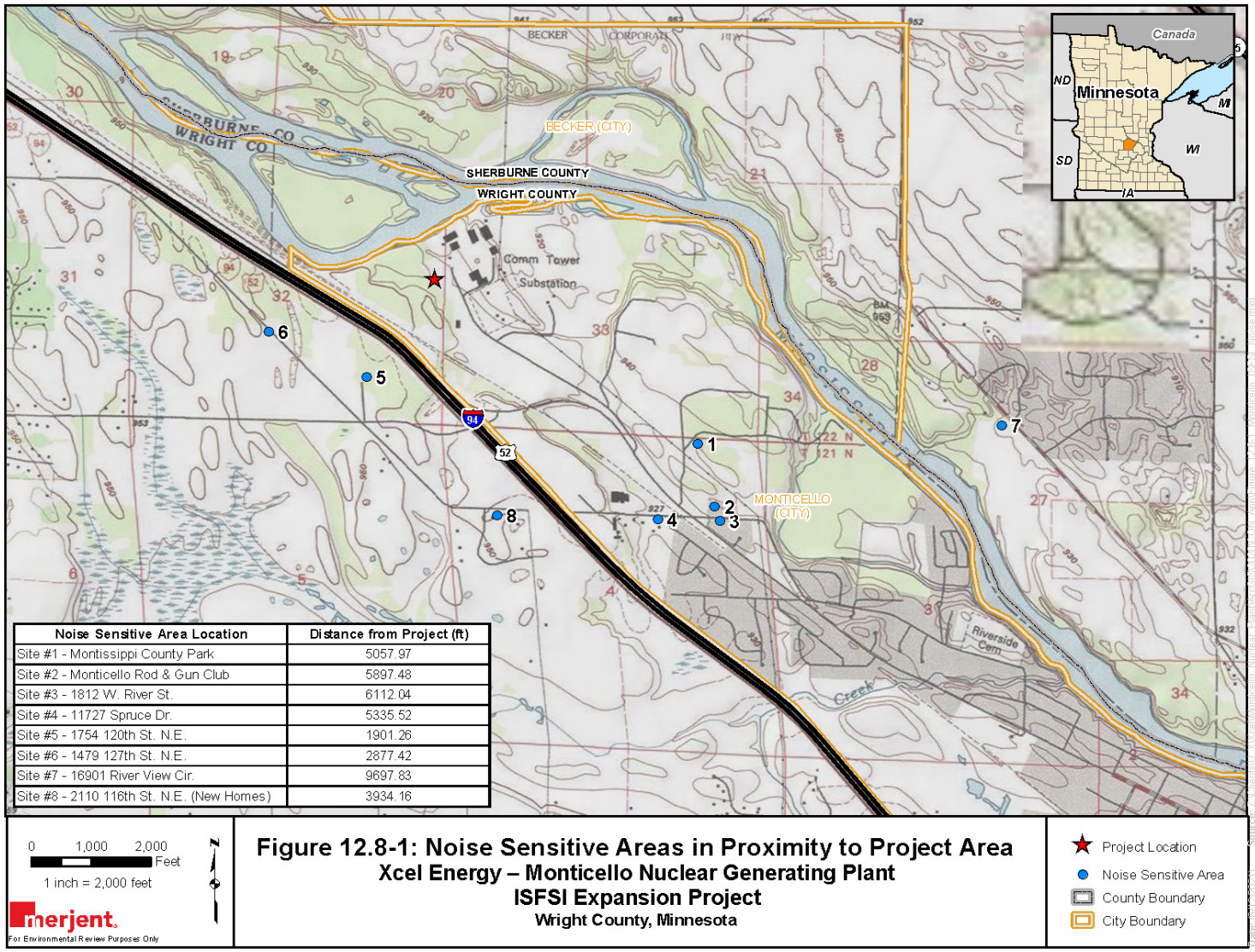
Noise generated during construction of the Project will be greatest in the immediate vicinity of construction activities and will diminish with distance from the work area. The MPCA provides guidance on noise propagation and attenuation in its manual "A Guide to Noise Control in Minnesota." This guidance states that when the distance from a point source is doubled, the sound level decreases by 6 dBA. Similarly, when the sound measured doubles the sound level increases by 3 dBA. Sensitive receptors, or noise-sensitive areas (NSAs), are defined as homes, schools, churches, or any location where people reside or gather. The NSAs nearest to the Project are several residential homes located about 0.5 mile to the southwest across Interstate 94, and Montissippi County Park, about one mile southeast of the proposed ISFSI Project site.

As shown below, the highest projected construction-related sound for a nearby residence is 53.6 dBA, which, when combined with ambient noise, results in a projection for total noise of 57.8 dBA. Both the project-related noise and total noise are well-under state daytime limits. Additionally, the greatest calculated increase in noise over ambient levels at a nearby residence due to the project is 2.4 dBA, which is imperceptible by humans. Finally, project construction is expected to last for six

months; therefore, these minimal impacts will be localized and temporary. Construction will not affect nighttime noise levels as it will be limited to daylight hours (7 AM to 10 PM) as defined by Minnesota Administrative Rule 7030.0020.

While additional sensitive receptors are in the vicinity of the Monticello Plant, the NSAs depicted in Figure 12.8-1 and Table 12.8-2 are representative of the greatest project-related impacts due to their proximity to the Project.

Figure 12.8-1 Noise Sensitive Areas in Proximity to Project Area



Noise Sensitive Area Location	Distance from Project (ft)
Site #1 - Montissippi County Park	5057.97
Site #2 - Monticello Rod & Gun Club	5897.48
Site #3 - 1812 W. River St.	6112.04
Site #4 - 11727 Spruce Dr.	5335.52
Site #5 - 1754 120th St. N.E.	1901.26
Site #6 - 1479 127th St. N.E.	2877.42
Site #7 - 16901 River View Cir.	9697.83
Site #8 - 2110 116th St. N.E. (New Homes)	3934.16

0 1,000 2,000 Feet
1 inch = 2,000 feet
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For Environmental Review Purposes Only

Figure 12.8-1: Noise Sensitive Areas in Proximity to Project Area
Xcel Energy – Monticello Nuclear Generating Plant
ISFSI Expansion Project
Wright County, Minnesota

Project Location
Noise Sensitive Area
County Boundary
City Boundary

Table 12.8-2 Monticello ISFSI Project – Summary of NSAs	
NSA Location	Distance from Project (ft)
1754 120th St. N.E.	1,901
1479 127th St. N.E.	2,877
2110 116th St. N.E. (New Homes)	3,934
Montissippi County Park	5,058
11727 W. River St.	5,335
Sportsman's Warehouse	5,897
1812 W. River St.	6,112
16901 River View Cir	9,698

Noise produced by construction vehicles traveling on roads and highways is regulated under Minnesota Administrative Rule 7030.1040. Most roads are exempt from Minnesota's noise rules.

Ambient sound level data was collected in the vicinity of the Monticello Plant in 2004 as shown in Table 12.8-3 below. The purpose of the survey was to document the existing ambient sound levels at the closest residential receptors, to be used in identifying potential noise impacts due to the future construction and operation of the ISFSI Project. The Monticello Plant was operating during the ambient surveys, but the cooling towers were not. There has been no substantial change to the level or quality of noise in the area since the time of this data collection. The daytime L90s varied from 44 to 59 dBA and the nighttime L90s varied from 38 to 52 dBA depending on traffic density and proximity to I-94.

Table 12.8-3
Monticello ISFSI Project – Summary of Measured Ambient L_{90}s

Location	Daytime		Nighttime		L_{dn}	Controlling Noise Sources
	8/11/04	8/12/04	8/11/04	8/12/04	dBa	
#1. Montissippi County Park	47.1	49.9	43.1	N.T.	51	Cars/trucks on I 94
#2. Sportsman's Warehouse	52.4	50.1	43.2	N.T.	52	Cars/trucks on I 94
#3. 1812 W. River St.	51.5	49.6	42.6	49.3	53	Cars/trucks on I 94
#4. 11727 W. River St.	54.5	50.6	44.9	52.1	56	Cars/trucks on I 94
#5. 1754 120th St. N.E.	58.7	52.7	49.9	48.2	57	Cars/trucks on I 94
#6. 1479 127th St. N.E.	52.5	50.9	50.2	49.1	56	Cars/trucks on I 94
#7. 16901 River View Cir	45.6	44.1	41.3	37.6	47	Cars/trucks on I 94

N.T. = not tested

As indicated in Table 12.8-3 the residual daytime and nighttime L_{90}s are mostly controlled by traffic on Interstate 94. The measured sound levels at Locations 4, 5, and 6 were the loudest, as these three locations were the closest to the Interstate 94 highway. Location #7, 16901 River View Circle, was the quietest as this location was the farthest from Interstate 94. The drop in sound level from daytime to nighttime varied from 0.3 to 9.6 dBA. At no time are Monticello Plant activities ever audible at any of the measurement locations.

The predicted sound levels for residences near the proposed ISFSI Project site are shown in Table 12.8-4, which assumes one dump truck, one grader, one water truck and one light truck operating simultaneously.

Table 12.8-4
Monticello ISFSI Project – Summary of Construction Sound Levels and Daytime Ambient L_{90}s at the Proposed Site

Location	Measured Ambient Daytime Sound Levels L_{90}	Sound Level Attributable to Construction (L_{50}) dBA	Estimated Total Daytime Sound Level (L_{50}) dBA	Calc'd Increase Over Existing Sound Level (L_{50}) dBA
#1. Montissippi County Park	48.5	45.2	50.2	1.7
#2. Sportsman's Warehouse	51.2	43.8	52.0	0.7
#3. 1812 W. River St.	50.6	43.5	51.3	0.8
#4. 11727 W. River St.	52.6	44.7	53.2	0.7
#5. 1754 120th St. N.E.	55.7	53.6	57.8	2.1
#6. 1479 127th St. N.E.	51.7	50.1	54.0	2.3
#7. 16901 River View Cir.	44.9	39.5	46.0	1.1
#8. 2110 116th St. N.E. (New Homes)*	52.6	47.4	53.7	1.1

*Assume background noise is similar to that of NSA #4.

The sound levels attributable to construction activities will occur during daylight hours and will be below the MPCA 60 dBA L50 noise guideline as shown in Table 12.8-4 above. The noise level experienced at the nearest NSA will be below the human threshold of noise perception, which is generally about 3 dBA. Therefore, there will be no noise impacts related to construction.

During operations, the spent fuel will be moved from the Monticello Plant to the ISFSI facility with the cask transport vehicle during a single loading campaign. There will be no change in operation activities; therefore, there will be no operational impacts on sound levels at the NSAs due to the proposed Project.

CHAPTER 13. POLLUTION CONTROL AND SAFEGUARDS EQUIPMENT

7855.0630 ENVIRONMENTAL INFORMATION REQUIRED.

Each applicant shall provide environmental data for the proposed facility and for each alternative facility described in response to part 7855.0610. The information in parts 7855.0640 to 7855.0670 relating to construction and operation of each of these facilities shall be provided to the extent that such information is reasonably available to the applicant and applicable to the particular alternative.

7855.0660 POLLUTION CONTROL AND SAFEGUARDS EQUIPMENT.

The applicant shall provide data regarding pollution control and safeguards equipment, including:

A. the provisions that will be made for management of radioactive materials;
B. a description of contingency plans to reduce the effects of an accidental release of radioactive materials;
C. the methods that will be used to recycle or dispose of solid or liquid wastes;
D. the types of emission control devices and dust control measures that will be used;
E. the types of water pollution control equipment and runoff control measures that will be used;
F. the measures that will be taken to prevent spills or leaks of pollutants, or to minimize the effects of spills or leaks on the environment;
G. the methods that will be used to reduce the effects of heat rejected by the facility;
H. any other equipment or measures, including noise control or erosion control, that will be used to reduce the effects of the facility on the environment; and
I. I. the types of environmental monitoring, if any, that are planned for the facility and a description of any relevant environmental monitoring data already collected.

13.1 MANAGEMENT OF RADIOACTIVE MATERIALS

Radioactive materials will be sealed in a steel canister and welded closed prior to being located at the ISFSI. Analyses of normal, off-normal, and accident conditions in spent fuel storage system Safety Analysis Reports have determined that no credible conditions can breach the canister shell or fail the double seal welds at the canister closure. Canisters designed by the major storage system vendors licensed by the NRC are designed and tested to meet the extremely restrictive "leak tight" criteria of ANSI N14.5-1997 (which requires canister leakage rates not exceed 1 E-7 standard cubic centimeters per second (scc/sec)), or the alternative criteria set forth in Interim Staff Guidance (ISG) 18, such that leakage from the canister is not considered credible for normal and accident conditions. The spent fuel canisters are totally seal-welded pressure vessels with no bolted closure or mechanical seals. The canisters' redundant closures are designed to maintain confinement integrity during normal conditions of storage, and off-normal and postulated accident conditions, including earthquake, tornado, missile, drop/tipover of the transfer cask or storage cask. Closure welds are inspected using non-destructive examination techniques to ensure their integrity. No mechanistic failure results in a breach of, and associated leakage of radioactive material from the canister confinement boundary.

A generic analysis of potential on-site and off-site consequences of accidental releases associated with the operation of an ISFSI is contained in NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees". The accident assumed for the analysis was the removal of the lid of a dry cask containing 24 damaged pressurized water reactor (PWR) spent fuel assemblies. It was assumed that the fuel had been removed from the reactor core five years earlier and that 10% of the Kr-85 and 1% of the 1-129 were released.

The NUREG-1140 analysis concluded that this postulated accident involving an ISFSI has insignificant consequences to the public health and safety. The maximum dose to a member of the public off-site due to an accidental release of radioactive materials under this scenario was calculated to be .003 rem at 100 meters. The calculated dose is within the 1 rem effective dose equivalent EPA Protective Action Guideline and the 10 CFR 72.106 limit of 5 rem to the whole body or 50 rem to the maximally exposed organ from any design basis accident.

13.2 CONTINGENCY PLANS IN THE EVENT OF AN ACCIDENTAL RELEASE

An emergency plan is required for the Monticello spent fuel storage facility, in accordance with 10 CFR 72.32(c). The 10 CFR 50.47 emergency plan already in effect

for the Monticello Plant is applied to the ISFSI. The Monticello emergency plan describes the organization, assessment actions, activation of the emergency organization, notification procedures, emergency facilities, training, provisions for maintaining emergency preparedness, and recovery criteria for off-normal and accident conditions.

13.3 METHODS FOR THE RECYCLING OR DISPOSAL OF SOLID OR LIQUID WASTES

Construction of the Project will result in the generation of non-radiological liquid and solid wastes that need to be managed. Liquid wastes generated during construction may consist of construction equipment fluids, such as gasoline, diesel fuel, and mechanical lubricants, and/or concrete wastes. Equipment fluids will be collected and stored in a sealed, labeled container and recycled through a licensed contractor, as needed. Where concrete is poured onsite, wash water generated from cleaning any equipment that comes in contact with concrete pours will be contained in a leak-proof container or impervious liner (i.e., a compacted clay liner that does not allow washout to enter ground water) and the liquid allowed to evaporate or be disposed of at an approved location.

Solid wastes generated during construction will be composed of normal construction debris (e.g., trash, waste parts) and the soil excavated to construct the pad and expansion facilities. Solid wastes will be collected in appropriate, leak-proof waste dumpsters or bins and be disposed of properly offsite by a licensed waste transporter. Erosion control devices, such as silt fence, will be installed around stockpiled soil piles to ensure soils are not washed off site until they can be properly disposed offsite by a licensed hauler. No recyclable debris is anticipated to be generated during construction of the Project. Xcel Energy has existing processes in place at the Monticello Plant to address management of waste produced during both construction and operational activities.

13.4 EMISSION CONTROL DEVICES AND DUST CONTROL MEASURES

13.4.1 Emission Controls

Emissions during construction will consist of typical construction equipment emissions. These are anticipated to be normal emissions from adequately maintained vehicles, as such, no emission control devices in addition to those already in place on the vehicles will be required.

The dry storage of spent fuel is a passive operation. Ambient air is used for natural convective cooling of the fuel canisters. The ISFSI Project will not generate any stationary air emissions during operation and no permitting or control devices will be required.

13.4.2 Fugitive Dust

Construction of the Project could generate small amounts of dust. Earth-moving equipment such as bulldozers, scrapers, and graders would clear/excavate the area where the concrete pad, approach pads, and asphalt drive would be placed. Concrete and asphalt trucks would then deliver concrete and asphalt to the site and pumping trucks would place it. Xcel Energy may need to control fugitive dust by applying water to exposed soil areas and covering spoil piles with tarps. Fugitive dust from construction activities will be short in duration and small in volume.

During operation, fugitive dust may be produced by the cask transfer vehicle driving on paved road surfaces. There will be no change to the existing delivery schedules, which is considered to be a negligible source of fugitive dust, and the additional casks are expected to be loaded in a single transfer campaign. As such, no appreciable dust impacts will occur.

13.5 WATER POLLUTION CONTROL EQUIPMENT AND RUNOFF CONTROL MEASURES

As the area of construction will be less than one acre in size, Xcel Energy will not be required to obtain MPCA National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit coverage for stormwater discharges that occur during construction activities. However, Xcel Energy will employ BMPs and erosion and sediment controls to ensure contaminated stormwater runoff does not leave the property.

Potential pollution that could result from construction activities will be related to sediment or oil and gas residue from onsite construction equipment. Erosion and sediment controls will be installed around the perimeter of ground-disturbing activities and at the bottom of soil piles to ensure sediment and potential pollutants are not washed from the site. Examples of such controls include silt fences and/or straw wattles. All controls will be installed and maintained in accordance with manufacturer specifications. The existing ISFSI was designed with a slight slope to direct runoff into ditches located along the perimeter of the facility. These ditches convey water to existing natural flow routes and to the Monticello Plant stormwater basin.

The additional ISFSI capacity will not have any discharges to water during operation and therefore will not require any water pollution control equipment. Runoff will continue to be directed toward natural flow routes around the ISFSI facility. Since the ISFSI Project will not add any wastes to stormwater, it is expected that the quality of the runoff will be similar to the existing runoff quality and impacts are not anticipated.

13.6 SPILL AND LEAK PREVENTION MEASURES

During construction of the Project, spill equipment such as booms, absorbents, and drip pans will be onsite in the event of a spill or leak of construction equipment fluids. Any spills/leaks will be cleaned up immediately and in accordance with local, state, and federal regulations. Large volume spills or leaks are not anticipated to occur during the construction of the new storage facility.

The storage system will be a welded closed canister so no leaks of any radioactive materials will occur during ISFSI operations. The Project will not require restrooms or any other liquid or wastewater-generating processes that could involve a spill or leak. There will be no liquid-containing drums or tanks located at the ISFSI. Therefore, no additional spill or leak prevention measures are required.

13.7 HEAT REJECTION REDUCTION METHODS

Current NUHOMS 61BT canisters are designed and licensed to reject up to 31 kw of heat generated by the spent fuel. As discussed in Section 12.7 the heat load for existing designs ranges from 20-47 kw per canister. Magnitudes of this level of heat will not adversely affect the surrounding environment and no heat rejection reduction methods will be applied to the facility.

13.8 OTHER EQUIPMENT OR MEASURES TO REDUCE EFFECTS OF FACILITY ON THE ENVIRONMENT

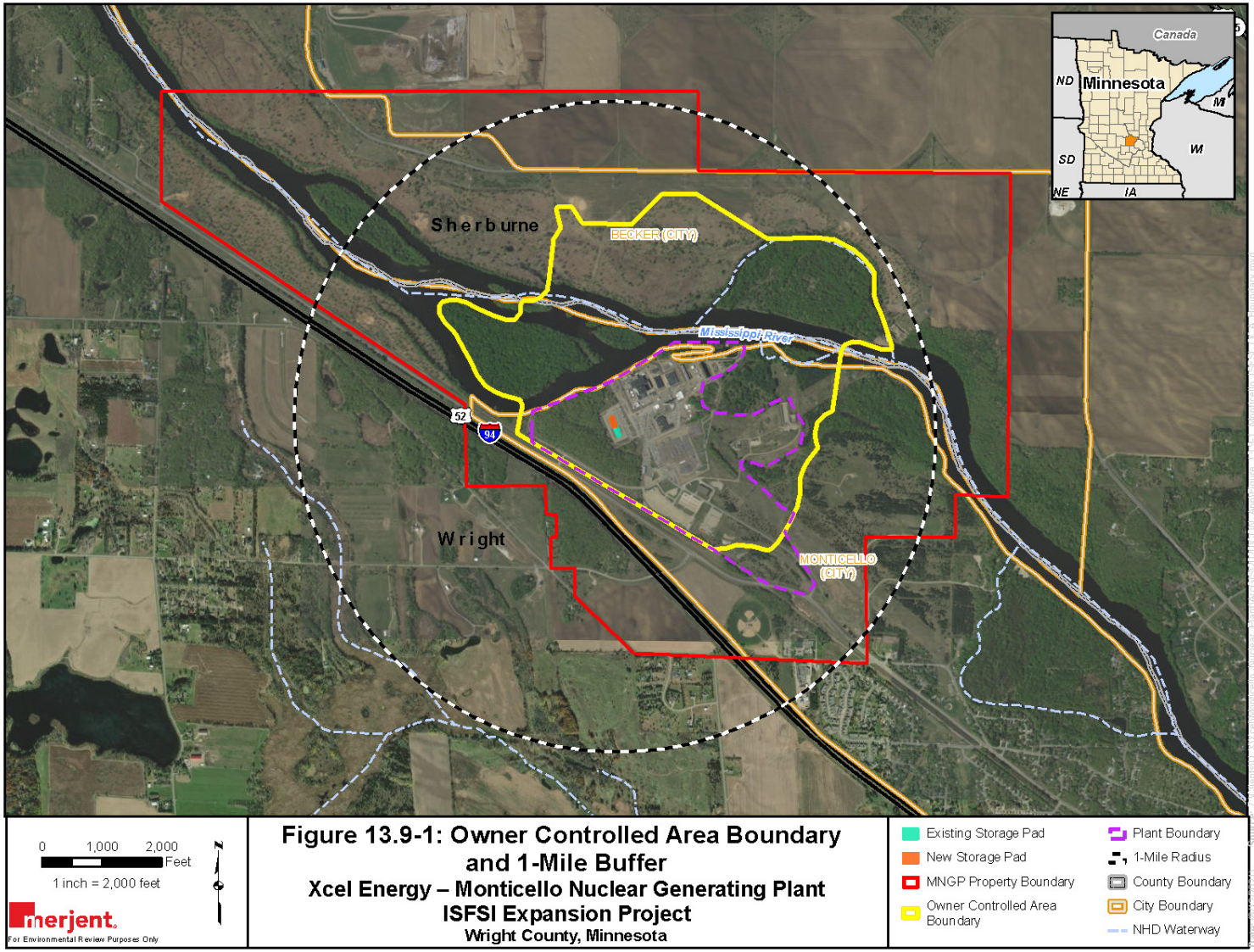
Construction of the additional concrete pad will have negligible effect on the environment due to its location within a previously disturbed area, resulting in a lesser degree of disturbance as construction of the original ISFSI facility. Operation of the ISFSI facility will neither increase nor decrease any non-radiological effects on the environment. As such, no additional equipment or measures will be required to reduce or mitigate potential impacts on the environment.

13.9 ENVIRONMENTAL MONITORING

13.9.1 Radiation Monitoring System

According to 10 CFR 72.126(b), radiological alarm systems must be provided in accessible work areas as appropriate to warn operating personnel of radiation and airborne radioactive material concentrations above a given setpoint and of concentrations of radioactive material in effluents above control limits. However, section 9.4.2 of NUREG 2215, the NRC's Standard Review Plan for Spent Fuel Dry Storage Systems and Facilities, indicates that the NRC has accepted that storage confinement systems of acceptable design and construction that are sealed by welding do not require closure monitoring. Additionally, because significant airborne radioactivity releases are precluded by the canister design in which the closures are sealed by welding and by the storage system vendor's canister design and testing criteria that conforms in ANSI N14.5 1997 as "leak tight", monitoring for a potential radiation release is not required. NUREG 2215, section 9.4.4, n. 1. According to 10 CFR 72.126(c)(2), areas containing radioactive materials must be provided with systems for measuring the direct radiation levels in and around these areas. Adequate radiological monitoring will be provided by portable survey instruments during canister handling and for other activities. Thermo-luminescent Dosimeters (TLDs) will be mounted at fixed locations on the security fence that surrounds the ISFSI, as well as on the nearest Owner Controlled Area boundary fence(s) (Figure 13.9-1) to monitor cumulative direct radiation levels over predetermined time intervals as part of the environmental monitoring program. The TLDs should be read on a quarterly frequency to provide a record of ISFSI boundary dose. Personnel entering the ISFSI radiation restricted area will be provided with dosimetry to accurately measure, record, and report exposure on an individual basis.

Figure 13.9-1 Owner Controlled Boundary Area and 1-Mile Buffer



13.9.2 Temperature Monitoring

Temperature monitoring of the storage systems will be conducted in accordance with vendor Technical Specification requirements to ensure that temperatures do not exceed material limits. The modules include a temperature monitoring system consisting of two thermocouples embedded in the storage module. The temperature monitoring system is connected to an electronic data collection system at the ISFSI.

CHAPTER 14. ESTIMATES OF INDUCED DEVELOPMENT

7855.0630 ENVIRONMENTAL INFORMATION REQUIRED.

Each applicant shall provide environmental data for the proposed facility and for each alternative facility described in response to part 7855.0610. The information in parts 7855.0640 to 7855.0670 relating to construction and operation of each of these facilities shall be provided to the extent that such information is reasonably available to the applicant and applicable to the particular alternative.

7855.0670 ESTIMATES OF INDUCED DEVELOPMENT.

The applicant shall provide estimates of induced developments, including:

A. the types and amounts of vehicular traffic that will be generated by the facility due to construction activity and, later, to operational needs;
B. the work forces required for construction and for operation of the facility;
C. the extent to which the facility will create or add to the need for expanded utility or public services, including high voltage transmission lines, access roads, and the like;
D. the amount of water that will be appropriated and the amount that will be consumed by the facility, the expected source of the water, and the uses for the water;
E. the amount of agricultural land, including pastureland, that will be removed from agricultural use if the facility were constructed, and known circumstances associated with the facility that could lead to reduced productivity of surrounding agricultural land; and
F. the number of people that will have to relocate if the facility were constructed.

14.1 VEHICULAR TRAFFIC DURING CONSTRUCTION AND OPERATION

No parking spaces are currently located at the ISFSI, nor will any be added as adequate parking exists at the adjacent Monticello Plant parking lots. The equipment that will be employed during construction will include bulldozers, scrapers, front end loaders, graders, dump trucks, cement trucks, delivery trucks, and various small support vehicles.

The Project will involve constructing one concrete storage pad and two concrete approach pads, as well as an asphalt drive. Assuming an average of 3 feet of concrete fill, the total volume of fill is expected to be about 67,500 cubic feet, or about 2,500 cubic yards, which is roughly equivalent to the area disturbed for the first pad.[1] The smallest truck (end dump) has a volume of 10 cubic yards compared to the larger, belly dump truck with a volume of 20 cubic yards. As the site is less than one acre in size, it is assumed the smaller truck will be used. At 10 cubic yards per trip, the total number of truck trips will be 250 total trips. Assuming a minimum of three trucks per hour, depending on the location of the gravel pit, about 10 days will be required to bring fill to the site. It is estimated that the number of truck trips needed to supply the volume of concrete and asphalt needed to complete the pad will be similar to that of the fill trucks.

Water will be used to provide dust control during construction of the ISFSI Project. Dust control activities are estimated to use no more than one to two truckloads per day over a two-month period during earthwork activities. Should construction occur during winter, the use of water trucks will decrease dramatically as water is rarely, if ever, needed as a dust control measure during frozen ground conditions.

During the six-month construction period, a total of 40 construction workers are estimated with a peak at any one time of 12 workers and an average of eight workers. Additional traffic will be generated from truck deliveries and commuting workers. It is estimated that construction activities and deliveries will add an average of seven trips each day and commuting will add up to 16 trips (two per round trip) each day. Alternative transportation methods in the area that could be used by construction personnel are limited and would not likely be used. Construction activities will be conducted during daytime hours.

[1] Minnesota Department of Commerce. 2006. Final Environmental Impact Statement to Establish an Independent Spent Fuel Storage Installation at the Monticello Generating Plant. Docket No. E002/CN-05-123. March 20, 2005.

With a peak construction force of 12 workers, the peak hour traffic generated during the morning and evening commuting hours will be 12 vehicles. During peak construction activity (between the morning and evening commuting hours), it is estimated that the peak hour traffic generated due to deliveries will be three trucks. The addition of 12 vehicles on local roadways during construction activities will not create any traffic impacts.

Traffic during regular ISFSI operations will be unchanged from current levels. No additional personnel, thus no additional traffic, will result from the ISFSI Project.

14.2 WORK FORCE DURING CONSTRUCTION AND OPERATION

During the six-month construction period, a total of 40 construction workers are estimated with a peak at any one time of 12 workers and an average of eight workers.

No full-time staff will be required at the ISFSI facility during operation beyond current plant personnel.

14.3 IMPACTS TO UTILITIES AND PUBLIC SERVICES

The only electrical demand will be for the ongoing operation of existing ISFSI lighting and security systems, which currently use about 100 KVA of electricity. No new light fixtures or security systems will be installed. The Project will not require additional use of existing utilities or public services or impede the public's use of utilities or public services.

14.4 WATER USAGE DURING CONSTRUCTION AND OPERATION

If water use is required during Project construction, such as for dust control, water would be obtained from existing on-site wells or municipal sources and used to fill water trucks. Water trucks typically hold about 7,500 gallons of water. The dust control activities are estimated to use no more than from one to two truckloads per day over a six-month period during earthwork activities. Assuming two trucks are required daily, then 15,000 gallons could be used per day. Over a six-month period (40 workdays) a total of 600,000 gallons could be used; however, the actual total volume of water is expected to be much less. Additionally, should construction occur during winter, the use of water trucks will decrease dramatically as water is rarely, if ever, needed as a dust control measure during frozen ground conditions.

Operation of the Project will not involve the installation or abandonment of any water wells, connection to or changes in any public water supply, or the appropriation of any ground or surface water. If water use is required during Project operation, such as for dust control, water would be obtained from on-site wells or municipal sources. Therefore, there will be minimal to no impacts related to water appropriation.

14.5 IMPACTS ON AGRICULTURAL LANDS

Because the Project will be constructed entirely on Monticello Plant property on a previously disturbed site, there will be no impacts to agricultural lands.

14.6 RELOCATION IMPACTS

Because the Project will be constructed entirely on Monticello Plant property on a previously disturbed site, no relocation of public or private persons or property will be required, and no additional public infrastructure will be needed to complete the expansion. As such, there will be no impacts on the local population.