

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
DIVISION OF RULEMAKING, ENVIRONMENTAL, AND FINANCIAL SUPPORT

ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED
AMENDMENT OF THE U.S. NUCLEAR REGULATORY COMMISSION
LICENSE NUMBER SNM-2506 FOR THE PRAIRIE ISLAND
INDEPENDENT SPENT FUEL STORAGE INSTALLATION IN
GOODHUE COUNTY, MINNESOTA

DOCKET NUMBER: 72-10

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ABBREVIATIONS AND ACRONYMS

AADT	average annual daily traffic count
ac	acre(s)
ACS	American Community Survey
ALARA	as low as reasonably achievable
AMSL	above mean sea level
APE	area of potential effect
BMP	best management practice
CFR	Code of Federal Regulations
cm	centimeter(s)
CRMP	Cultural Resource Management Plan
dB(A)	A-weighted decibel(s)
DOE	U.S. Department of Energy
DTS	dry transfer system
EA	environmental assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ER	environmental report
ESA	Endangered Species Act
FONSI	finding of no significant impact
FR	<i>Federal Register</i>
FWS	U.S. Fish and Wildlife Service
ft	foot(feet)
GWd/MTU	gigawatt-days per metric ton uranium
GTCC	Greater Than Class C
GWC	Greater –Than – Class C Waste Canister
ha	hectare(s)
in.	inch(es)
IPaC	Information for Planning and Consultation
ISAR	ISFSI safety analysis report
ISFSI	independent spent fuel storage installation
km	kilometer(s)
kW	kilowatt(s)
LAR	License Amendment Request
LC	License Condition
m	meter(s)
mi	mile(s)
MDH	Minnesota Department of Health
MN DNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MW	megawatt(s)
MWD/MTU	megawatt-days per metric tons of uranium
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NSPM	Northern States Power Company, a Minnesota corporation
PI	Prairie Island
PIIC	Prairie Island Indian Community
PINGP	Prairie Island Nuclear Generating Plant
REMP	Radiological Environmental Monitoring Program
ROI	region of influence
SER	Safety Evaluation Report
SHPO	State Historic Preservation Office/Officer
SNM	Special Nuclear Material
TLD	thermoluminescent dosimeter
TN	Transnuclear, Inc.
TN-40	Transnuclear – 40
TN-40HT	Transnuclear – 40HT
U-235	uranium 235

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U.S. NUCLEAR REGULATORY COMMISSION LICENSE NUMBER SNM-2506
FOR THE PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION**

1.0 INTRODUCTION

In 1993, the U.S. Nuclear Regulatory Commission (NRC) issued Northern States Power Company (NSPM), a Minnesota corporation (doing business as Xcel Energy), a 20-year license to receive, possess, store, and transfer the Prairie Island Nuclear Generating Plant (PINGP) spent fuel to the Prairie Island (PI) Independent Spent Fuel Storage Installation (ISFSI). Under the conditions of Special Nuclear Material (SNM) license number SNM-2506, NSPM can store 40 fuel assemblies per cask in up to 48 Transnuclear-40 (TN-40) and Transnuclear-40HT (TN-40HT) casks. The maximum average burnup is 45 gigawatt-days per metric ton uranium (GWd/MTU) for fuel stored in a TN-40 cask and 60 GWd/MTU for fuel stored in a TN-40HT cask (NSPM, 2011a, Section 2.3.2). In support of the license request, the NRC staff also completed an Environmental Assessment (EA) and determined a Finding of No Significant Impact (FONSI) was appropriate (NRC, 1992). In 2009, NRC amended license SNM--2506 at the request of the licensee to allow NSPM to use a modified storage cask design, the TN-40HT, to accommodate the dry storage of fuel with higher enrichment and high burnup fuel. The NRC staff also completed an EA in support of this amendment and determined a FONSI was appropriate (NRC, 2009). In 2015, NRC renewed license SNM-2506 for the PI ISFSI for an additional 40 years. The NRC staff completed an EA in support of this renewal request and determined a FONSI was appropriate (NRC, 2015).

On July 26, 2019, NSPM submitted an application (NSPM, 2019a) to amend license SNM-2506 to increase the amount of spent fuel stored at the PI ISFSI by adding Transnuclear, Inc. (TN) TN-40/TN-40HT storage casks and adding a new storage pad within the existing ISFSI footprint using alternative designs not currently described in the existing PI ISFSI Safety Analysis Report. On August 30, 2019, the NRC staff accepted NSPM's application for a detailed technical review (NRC, 2019a). The NRC staff issued a notice in the *Federal Register (FR)* (84 FR 68491) providing an opportunity to request a hearing and petition for leave to intervene. The NRC did not receive a request for a hearing or a petition for leave to intervene in the proceeding.

In accordance with NRC regulations at Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," that implement the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. § 4321), the NRC staff has prepared this EA. The scope of this NRC staff review is the expansion of the PI ISFSI.

1.1 Proposed Action

License SNM-2506 allows NSPM to store 715.29 tons of equivalent uranium (TeU) in 48 TN-40/TN-40HT storage casks. NSPM is requesting to increase the maximum amount of spent fuel allowed under renewed license SNM-2506 for the PI ISFSI to 1,049.60 TeU of spent fuel assemblies, an equivalent capacity of 64 TN-40HT casks fully loaded with design basis fuel, based on the bounding analysis conducted by NSPM (using 0.41 TeU per fuel assembly). The proposed federal action is to approve the proposed expansion of the PI ISFSI to accommodate up to 16 additional storage casks and construct a new storage pad with a different design within the existing ISFSI fence line. NSPM explained that the proposed amendment does not include

changes to the type or characteristics of the storage cask technology or spent nuclear fuel authorized under license SNM-2506.

1.2 Site Location and Description

The PI ISFSI is located within the city limits of Red Wing in Goodhue County, Minnesota (Section 5, T113N, R15W), approximately 45 kilometers (km) (28 miles [mi]) southeast of the Minneapolis–St. Paul metropolitan area (Figure 1-1). The PI ISFSI is approximately 2.2 hectares (ha) (5.5 acres [ac]) in size and located within PINGP site boundary and exclusion area of approximately 230 ha (578 ac) (Figure 1-2). The ISFSI is located approximately 274.3 meters (m) (900 feet [ft]) southwest of the PINGP Units 1 and 2 (Figure 1-3) (NSPM 2019). The nearest resident, a Prairie Island Indian Community (PIIC) Tribe member, is approximately 0.72 km (0.45 mi) northwest of the PI ISFSI (NSPM, 2019a). The PINGP site boundary is located adjacent to the PIIC Reservation, and the PI ISFSI is located within 548 m (1,798 ft) of the PIIC Reservation (Figure 1-2).

The PI is bordered by the Vermillion and Mississippi Rivers. The PI ISFSI is located in a low island terrace associated with the Mississippi River floodplain. The ground surface near the PINGP site is fairly level to slightly rolling, ranging in elevation from 205.7 to 215.2 m (675 to 706 ft) above mean sea level (AMSL) (NSPM, 2019a). The PI ISFSI pad elevation is 211.7 m (694.5 ft) AMSL (NSPM, 2019a). The surface slopes gradually toward the Mississippi River to the northeast and Vermillion River on the southwest. The normal water level is 205.6 m (674.5 ft) AMSL. The water level is controlled by the U.S. Army Corps of Engineers Lock and Dam 3 located on the Mississippi River. The ground cover consists of prairie grass and brush (NSPM, 2019a).

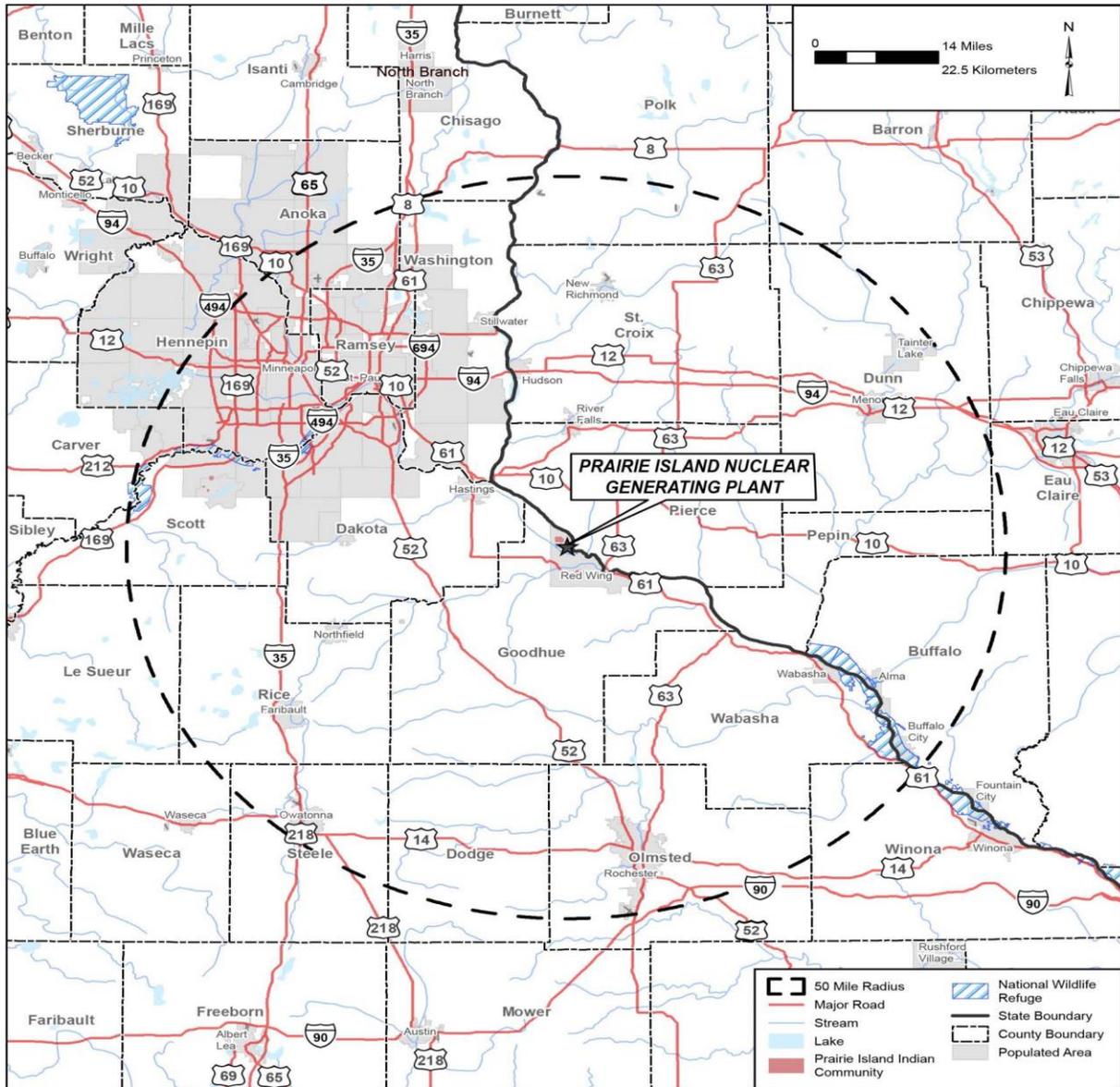


Figure 1-1. The Prairie Island Site and 80 km (50 mi) Region (Modified from NSPM, 2011a)



Figure 1-2. Prairie Island Indian Community and Prairie Island Nuclear Generating Plant Layout (Minnesota Geospatial Information Office, 2010; PIIC, 2014)

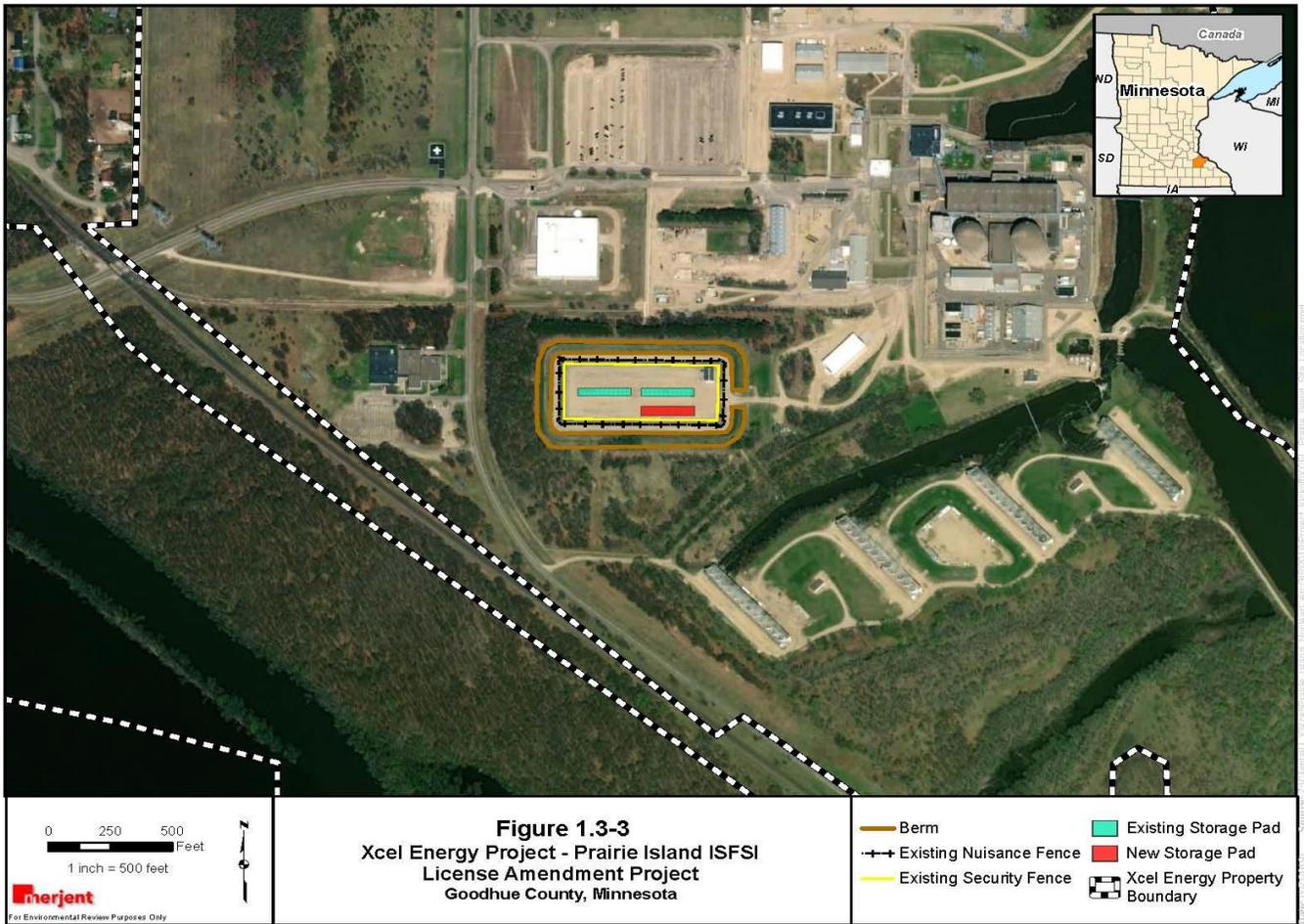


Figure 1-3. Aerial Photo of the PI ISFSI Location (proposed new pad location in red) (NSPM, 2019)

1.2.1 Current ISFSI and Dry Cask Storage Description

The PI ISFSI is licensed to store spent nuclear fuel in the TN-40 and TN-40HT bolted cask design systems. Each TN-40 cask is designed to hold 40 fuel assemblies with an initial enrichment less than or equal to 3.85 percent weight uranium-235 (U-235), average burnup less than or equal to 45,000 megawatt-days per metric ton of uranium (MWD/MTU), minimum cooling time of 10 years, and maximum heat load of 27 kilowatts (kW) (NSPM, 2011a). The TN-40HT cask is designed to hold 40 fuel assemblies with an initial enrichment less than or equal to 5.0 percent weight U-235, assembly average burnup less than or equal to 60,000 MWD/MTU, minimum cooling time of 12 years, and maximum heat load of 32 kW (NSPM, 2011a).

Currently, vertically positioned casks are located on two seismically qualified, reinforced concrete pads (as shown in Figure 1-4 and Figure 1-5). Each pad consists of two parallel rows that can hold 12 casks per row for a total design capacity of 48 casks. After the 2020 load campaign the ISFSI will be near capacity (NSPM, 2019a). The concrete pads are 91 centimeters (cm) (36 inches [in]) thick and provide structural support for the casks; thus, the

pads are classified as safety related. The PI ISFSI pad elevation is 211.7 m (694.5 ft) AMSL (NSPM, 2011a).

The earthen berm surrounds the ISFSI on all sides, except for a narrow roadway. It is constructed of fill material reinforced with geofabric. Erosion control material and natural vegetation give the berm a natural appearance (NSPM, 2011a).

Handling of the fuel, cask loading, and decontamination of the casks take place within the PINGP auxiliary building; thus, there are no fuel handling facilities exclusively for the PI ISFSI (NSPM, 2011a).

Each storage cask consists of the following components:

- basket assembly for support of the fuel assemblies
- containment vessel enclosing basket assembly and fuel
- gamma shield
- neutron shield
- top neutron shield
- pressure monitoring system
- weather cover.



Figure 1-4. Aerial Photo of the PI ISFSI (NSPM, 2019)

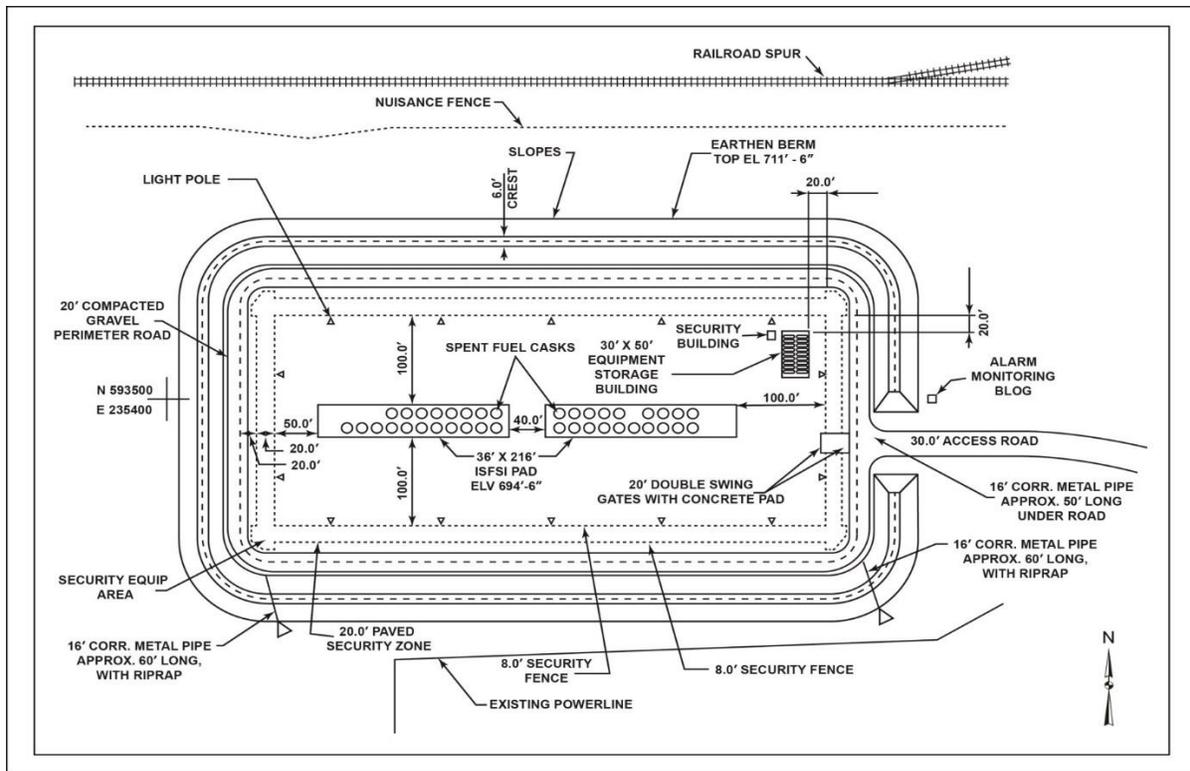


Figure 1-5. PI ISFSI Dry Cask Storage Facility (NRC, 2015)

1.2.2 Proposed Construction and Operations Activities

The two existing ISFSI pads are aligned horizontally in the east-west direction. The proposed location of the new ISFSI pad is directly south of the existing eastern-most ISFSI pad (see Figure 1.3). This new pad would be approximately 216 ft x 40 ft x 3 ft. Installation of the new pad and associated facilities is planned to occur between 2021 and 2022. Construction is anticipated to last 4 weeks. All work to install the new ISFSI pad would occur within the existing ISFSI fence line. Best management practices (BMPs) for erosion control (i.e., silt fences and straw bales) would be used inside ISFSI site fencing (NSPM, 2019a). Operation of the new ISFSI pad would be similar to the existing ISFSI pads. However, the aging management program for the new ISFSI pad and newly placed casks shall commence 20 years after the pad or individual casks are initially placed in operation (NRC, 2020).

1.2.3 Waste Management

Operation of the PI ISFSI generates no gaseous wastes, and there are no ventilation or off-gas systems. In addition, no sanitary sewage is produced (NSPM, 2011a). Maintenance of the cask transport vehicle is performed in the equipment storage building within the PI ISFSI controlled area. These maintenance activities produce small amounts of wastes, such as ethylene glycol (antifreeze) or drips of lubricating fluid, which are cleaned up and disposed of at appropriate facilities. Other wastes generated include small amounts of cleaning and maintenance waste products involved with occasional replacement and recalibration of monitoring instrumentation and application of corrosion-inhibiting coatings on some casks (NSPM, 2011a).

Expansion of the PI ISFSI requires additional permits and approvals from Minnesota Pollution Control Agency (MPCA) and Minnesota Public Utilities Commission (MPUC). National Pollutant Discharge and Elimination System (NPDES) Permit MN0004006 from MPCA authorizes the discharge of stormwater associated with industrial activity from the PINGP and the PI ISFSI. The MPUC approval for additional cask storage was granted in December 2009 for up to 64 casks at the PI ISFSI (MPUC, 2009).

1.3 Purpose and Need for the Proposed Action

The proposed action is to increase the maximum amount of spent fuel that may be possessed and stored at the PI ISFSI. ISFSIs are typically used by operating nuclear power plants that require increased spent fuel storage capability because their spent fuel pools have reached capacity. The PI ISFSI is needed to provide additional spent fuel storage capacity so that the PINGP Units 1 and 2 can continue to operate. Spent fuel assemblies from PINGP Units 1 and 2 not already stored at the PI ISFSI are currently stored onsite in a spent fuel pool. Spent fuel assemblies are moved from the spent fuel pool to a storage cask that is then transported to the PI ISFSI for temporary dry storage. Neither the PINGP spent fuel pool nor the ISFSI has the needed capacity to store all the spent nuclear fuel that PINGP Units 1 and 2 would generate through the end of their license terms (NSPM, 2019a).

1.4 Scope of the Environmental Analysis

The NRC staff has evaluated the potential environmental impacts associated with the proposed action of license amendment of SNM-2506 and alternatives to the proposed action, and has documented the results of the assessment in this EA. The NRC staff performed this review in accordance with the requirements of 10 CFR 51 and staff guidance found in NUREG-1748, “Environmental Review Guidance for Licensing Actions Associated with NMSS [Office of Nuclear Material Safety and Safeguards] Programs” (NRC, 2003).

The following information was reviewed and considered in the development of this EA:

- information contained in NSPM’s License Amendment Application, dated July 25, 2019, which included the environmental report (ER), dated May 8, 2019 (NSPM, 2019a), and
- information contained in previous NRC environmental and safety review documents for the PI ISFSI (NRC, 1992, 1993, 2009, 2010, 2015a).

For the license renewal of the PI operating nuclear reactors and the license renewal of the PI ISFSI the PIIC was a cooperating agency on the NEPA environmental reviews and a consulting party under the Section 106 process of the National Historic Preservation Act (NHPA). During these environmental reviews there was extensive coordination and consultation with the PIIC, which included detailed evaluations of impacts to land use, socioeconomics, environmental justice, and historic and cultural resources. During the ISFSI license renewal, the NRC staff also considered the impacts of the anticipated amendment to expand the storage capacity of the PI ISFSI, as part of the Cumulative Impacts analysis in the 2015 EA (i.e., this proposed license amendment). This proposed amendment is bounded by those analyses (as explained in Chapter 4 of this EA). The NRC, therefore, incorporates by reference the applicable sections of those NEPA reviews developed in coordination and consultation with the PIIC. In completing this environmental review, the NRC staff also coordinated with the PIIC. The NRC staff provided a draft copy of this EA for their review and comment and conducted, by a meeting on April 22, 2020, a discussion of their comments on the draft EA. Revisions to the EA were made to reflect these consultation activities. Additionally, the NRC staff provided a draft copy of this

EA to Minnesota Department of Natural Resources, Minnesota Department of Commerce, Minnesota Department of Health (MDH), Minnesota Pollution Control Agency, Minnesota Environmental Quality Board, and U.S. Environmental Protection Agency (EPA) Region 5. Section 5.0 of this EA lists these State agencies' comments.

This EA evaluates all aspects of the proposed action and the affected environment. The NRC staff refers to the detailed resource descriptions in prior environmental review documents that have not changed, including the EA prepared for the original application and for license renewal for the specifically licensed ISFSI (NRC, 1992 and 2015).

1.4.1 Continued Storage of Spent Nuclear Fuel

The NRC's licensing proceedings for nuclear reactors and ISFSIs have historically relied upon a generic determination codified in the NRC's regulations at 10 CFR 51.23 to satisfy the agency's obligations under NEPA with respect to the narrow area of the environmental impacts of onsite storage of spent nuclear fuel (spent fuel) beyond a reactor's licensed life for operation and prior to ultimate disposal (continued storage). The Court of Appeals for the District of Columbia Circuit, in *New York v. NRC*, 681 F.3d 471 (D.C. Cir., 2012), vacated the NRC's 2010 update to that rule and remanded it to the NRC. Thereafter, the Commission determined that the NRC would not issue licenses dependent upon the formerly known Waste Confidence Decision and Temporary Storage Rule until deficiencies identified by the Courts of Appeals were appropriately addressed (NRC, 2012).

On September 19, 2014, the NRC published a revised rule at 10 CFR 51.23, "Environmental Impacts of Continued Storage of Spent Nuclear Fuel Beyond the Licensed Life for Operations of a Reactor" (79 FR 56238). The rule codifies the NRC's generic determinations in NUREG-2157, "*Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel*" regarding the environmental impacts of the continued storage of spent nuclear fuel beyond a reactor's operating license (NRC, 2014a). In Memorandum and Commission Order CLI-14-08, the Commission held that the revised 10 CFR 51.23 and associated NUREG-2157 cured the deficiencies identified by the court in *New York v. NRC*, 681 F.3d 471 (D.C. Cir., 2012), and stated that the rule satisfied the NRC's NEPA obligations with respect to continued storage (NRC, 2014b). The revised rule requires, in 10 CFR 51.23(b), that EAs prepared for future reactor and spent fuel storage facility licensing actions consider the environmental impacts of continued storage, if the impacts of continued storage of spent fuel are relevant to the proposed action. The proposed action, if approved, would increase the maximum amount of spent fuel that can be possessed and stored at the PI ISFSI and, therefore, the impacts of continued storage of spent fuel are relevant to the proposed action. Section 4.13 of this EA provides the NRC staff's consideration of the generic environmental impacts of NUREG-2157 for the proposed PI ISFSI license amendment.

2.0 ALTERNATIVES TO THE PROPOSED ACTION

Two alternative actions were considered, as described below.

2.1 No-Action

The no-action alternative would consist of denial of NSPM's request to expand the PI ISFSI license. If no other storage alternatives for spent fuel were identified, NSPM would need to shut down the PINGP reactors when the spent fuel pool and the ISFSI reached capacity. The licensee would continue to maintain the stored spent fuel at the ISFSI in a safe and secure condition. Although the ISFSI is licensed through 2053, it would not be able to add additional casks of spent fuel. Following the filling of the PINGP spent fuel pool, the PINGP reactors would need to cease operation. Decommissioning of the PINGP reactors and the ISFSI would commence upon receiving NRC approval of the final decommissioning plans in accordance with regulations. Decommissioning of the PI ISFSI would commence upon receiving NRC approval of the final decommissioning plan in accordance with 10 CFR 72.54.

The no-action alternative would not meet the purpose and need of the ISFSI expansion and would provide no environmental advantage. Therefore, the NRC staff concludes that denying the expansion is not a reasonable alternative.

2.2 Shipment of Spent Fuel to an Offsite Facility

Shipment of the spent fuel to a commercial reprocessing facility, a federal repository, or an interim storage facility is not a reasonable alternative, because these facilities are currently not available in the United States. The NRC, however, has received license applications for two private consolidated interim storage facilities. If an interim facility were approved by the NRC, it is possible a facility could become available during the PI ISFSI license period, but not in time to accept spent fuel to prevent closure of the PINGP reactors.

3.0 AFFECTED ENVIRONMENT

The environmental effects of the proposed action could affect the following resource areas: land use; transportation; geology and soils; water resources; threatened and endangered species; climate, meteorology and air quality; demography, socioeconomics, and environmental justice; historic and cultural resources; public and occupational health and safety; visual and scenic resources; and noise—as described in the following sections.

3.1 Land Use

The land area within the ISFSI security fences is approximately 2.3 ha (5.5 ac) and includes the dry storage pad, equipment storage building, and security building. The area within the PI ISFSI fence line is limited to use by NSPM operations. Operational activities include the storage and periodic transfer of filled casks to the PI ISFSI pad and routine inspections and monitoring of the PI ISFSI site. The alarm monitoring building is located outside the earthen berm and north of the access road. Figure 1-2 depicts the general PINGP layout and exclusion zone boundary (NRC, 2015). The developed portion of the PINGP industrial site occupies approximately 24 of the 234 ha (60 of the 578 ac) of land and consists of the ISFSI, power plant structures and associated buildings, maintenance facilities, and parking lots (AEC, 1973).

Prior to construction, the land at PINGP and the PI ISFSI site was used for agriculture. During the construction of PINGP Units 1 and 2, portions of the PI ISFSI area were used for the concrete batch plant and disposal of dredge material collected from the excavation of the PINGP discharge canal (NRC, 2011). Current land use within 8 km (5 mi) around the PINGP is a mixture of commercial, light industrial, residential, municipal, and agricultural land.

A medicinal and culturally important plant study conducted in 2008 and 2009 within the PINGP property boundary provided the PIIC with information that supports land management, restoration, and enhancement efforts on PI. The study identified yarrow, ragweed, big milkweed, lamb's quarter, wild strawberry, sunflower, sweet clover, sand primrose, Virginia creeper, goldenrod, and pennyroyal within the PINGP property boundary, all of which are medicinal and culturally important plant species to the PIIC (NRC, 2011). The PIIC is actively engaged with NSPM regarding land use activities that occur on the PINGP property, and within the PI ISFSI per NSPM's cultural resource management plan (CRMP). The License Amendment Request (LAR) would not modify current land use activities at the PI ISFSI, because all work would occur within the PI ISFSI fence line. Associated operations would remain unchanged under the activities proposed as part of this LAR (NSPM, 2019a).

3.1.1 Prairie Island Indian Community

The PI ISFSI is located immediately adjacent to (south and southeast of) the PIIC Reservation on the ancestral homeland of the Mdewakanton Band of Eastern Dakota. The PIIC owns and operates the Treasure Island Resort and Casino, located approximately 1.6 km (1 mi) northwest of the PI ISFSI. Treasure Island began as a one-room bingo hall in 1984 and has since grown to include a 480-room hotel, nine restaurants and bars, 24-lane bowling alley and arcade, 3,000-seat entertainment and convention center, 137-slip marina, and 95-site recreation vehicle park. The PIIC also owns and operates Dakota Station, a gas station and convenience store. The PI ISFSI is located approximately 1.6 km (1 mi) southeast of the Dakota Station (PIIC, 2013).

The closest occupied offsite residence is approximately 0.72 km (0.45 mi) northwest of the PI ISFSI (NSPM, 2011a). The PIIC's Lower Island residential area, church, clinic, community center, education building, elder center, fitness center, pow-wow grounds, public safety building, softball diamonds, tribal court, tribal government administration building, water treatment facility, and wastewater treatment facility are located within a 1.6 km (1 mi) radius northwest of the PI ISFSI (PIIC, 2013). Certain portions of the undeveloped areas of Prairie Island (both on and off reservation) are used for traditional ceremonies, medicinal plant gathering, prairie restoration, wild rice restoration, hunting, fishing, and other recreational activities (PIIC, 2013).

3.2 Transportation

The PINGP license amendment ER supplement (NSPM, 2019a) states that the proposed action is anticipated to increase traffic volumes slightly during the period of construction to accommodate construction equipment and contractors. NSPM expects that the expansion of the PI ISFSI to accommodate the 64 casks would require 13 additional construction labor workers for a total of 4 weeks and would increase traffic flow by approximately 24 additional truck trips per days on roads leading to the PI ISFSI work site (NRC, 2015). There have been no changes in transportation routes and associated characteristics in the vicinity of the PINGP since the license renewal request was approved.

Sturgeon Lake Road is the only access road from U.S. Highway 61 to the PINGP and the PIIC property. At the time of the PINGP license renewal, the PIIC members had concerns regarding traffic on land that encompasses the tribe's residential area, the casino, and tribal government offices (NRC, 2015). In addition to pedestrian, bicycle, and motorized carts, daily traffic on Sturgeon Lake Road includes approximately 102 tribal government employees and as many as 16,000 Treasure Island Resort and Casino guests and 1,500 Treasure Island employees (NRC, 2011). Traffic counts conducted as recently as 2017 indicated that average annual daily traffic counts (AADTs) were below maximum capacities for the roads leading to PINGP and the PIIC Reservation (MDT, 2019).

The Mississippi River is a major shipping channel that is used for PINGP transportation needs. Barges pass through Lock and Dam 3 to the PINGP barge landing. This mode of transportation was used for the Unit 1 steam generator replacement in 2004 and for the Unit 2 steam generator replacement project in 2013 (NRC, 2011; NSPM, 2013).

3.3 Geology and Soils

The PINGP property is bounded by rocky bluffs and heavily forested slopes that rise to a height of about 91 m (300 ft) above Prairie Island. The PINGP is located on a low island terrace within the Mississippi River floodplain. Sediment in the area consists of sandy alluvial soils and gravel deposited by glacial outwash and river processes. At the PINGP site, the uppermost bedrock is sandstone and part of the Franconia formation. Underneath the Franconia formation are several hundred meters of lower Cambrian and Precambrian sandstone with minor shale horizons. The dominant structural feature in the area is the Precambrian Keweenawan Basin. This basin is separated from a smaller basin in the Twin Cities area by the Afton-Hudson anticline. The PINGP site is located on the west limb of the Red Wing anticline (NRC, 2011).

There are several major faults in the Minnesota–Wisconsin region, but there is no evidence of recent activity along any of the known fault zones in the region (NRC, 1992). The Douglas fault and the Lake Owen fault penetrated Precambrian rocks along the north and south sides of the Keweenawan Basin, respectively. The southern portion of the Lake Owen fault, known as the

Hastings fault, trends southwest. Movements along these faults appear to have been restricted to Precambrian timeframes (about 541 million years to 4.6 billion years ago). In July 2018, NSPM performed four seismic Cone Penetration Test soundings in the area of the ISFSI and planned pad expansion; the testing results indicate that seismic induced settlement was found to be minimal (NSPM, 2019a). Soil types were characterized as loose to very dense sand (NSPM, 2019a).

3.4 Water Resources

3.4.1 Surface Water Hydrology

As discussed in the EA the NRC staff prepared in 2015 for the renewal of the PI ISFSI license, the main bodies of surface water near the PI ISFSI are the Mississippi River, Vermillion River, the Cannon River, and Sturgeon Lake (NSPM, 2019a; NRC, 2015; NSPM, 2011a). Prairie Island is a low-lying island most of which is less than 7.6 m (25 ft) above the Mississippi River. The Vermillion River borders the southwest portion of the PINGP site. The Mississippi and Vermillion rivers converge at the downstream end of Prairie Island (NRC, 2011). The Vermillion and Cannon rivers enter the Mississippi River below Lock and Dam 3 (NRC, 2015). As discussed in Section 1.2 of this EA, the ground surface near the PINGP site varies in elevation from 205.7 to 215.2 m (675 to 706 ft) AMSL (NSPM, 2019a). The PI ISFSI pad elevation is 211.7 m (694.5 ft) AMSL (NSPM, 2019a). The surface slopes gradually toward the Mississippi River to the northeast and Vermillion River on the southwest. The normal water level is 205.6 m (674.5 ft) AMSL. The water level is controlled by the U.S. Army Corps of Engineers Lock and Dam 3 located on the Mississippi River.

Lock and Dam 3, which created Sturgeon Lake and controls the flow and level of the Mississippi River near PINGP and Sturgeon Lake, is located approximately 1.6 km (1.0 mi) downstream from the site (NSPM, 2019a). Typically, discharge from Lock and Dam 3 tends to be at its peak in the spring and summer (NSPM, 2019a).

There are no major withdrawals of river water used for the supply of city water for at least 483 km (300 mi) downstream from the PINGP site. However, there are minor withdrawals of river water for irrigation purposes (the nearest being by the City of Red Wing). In addition, the expansion of the ISFSI (construction of the ISFSI pad or maintenance of additional casks) would not require water resources (NSPM, 2019a).

NSPM calculated the probable maximum flood to reach a level of 214.4 m (703.6 ft) AMSL with water velocity of 1.9 m per second (6.2 ft per second), and wave action to a maximum level of 215.4 m (706.7 ft) AMSL (NSPM, 2011b).

Operation of the PI ISFSI does not result in discharges to surface waters other than stormwater runoff currently permitted under the NPDES permit for the PINGP (NSPM, 2019a).

3.4.2 Groundwater Hydrology

The ISFSI site is located on an island terrace within the Mississippi River floodplain. The aquifers near the site consist of the alluvial aquifer (water table) and the underlying bedrock (confined) aquifers (NSPM, 2019a). The groundwater table near PINGP is generally within 1.5 to 6.1 m (5 to 20 ft) of ground surface and slopes to the southwest (NSPM, 2019a).

Generally, wells in the alluvial material near the PINGP site are less than 30.5 m (100 ft) in depth. The PI alluvial aquifer is recharged from and discharges to surface waters, and is recharged through direct precipitation, floodwaters, snowmelt, and from underlying aquifers (NSPM, 2019a). NSPM draws groundwater for potable and industrial use from nine wells installed within the alluvial aquifer (NSPM, 2019a). Operation of the PI ISFSI does not result in discharges to groundwater (NSPM, 2019a).

3.5 Threatened and Endangered Species

Under Section 7 of the Endangered Species Act (ESA) of 1973, prior to taking a proposed action, a federal agency must determine whether (1) endangered and threatened species or their critical habitats are known to be in the vicinity of the proposed action and if so, whether (2) the proposed federal action may affect listed species or critical habitats.

In the ER supplement submitted for the license amendment, NSPM provided a list of special status species within an 8 km (5 mi) radius of the PI ISFSI (NSPM, 2019a).

The NRC staff contacted the Minnesota-Wisconsin Ecological Services Field Office of the Fish and Wildlife Service (FWS) regarding the potential effects that the proposed action could have on the ecology, particularly on endangered and threatened species (NRC, 2019b). The FWS indicated that because the proposed license amendment would involve construction on previously disturbed land, which would not be a suitable habitat for threatened, endangered, or special status species, formal consultation with the FWS would not be needed. The details of this consultation are provided in Section 5.2 of this EA. The NRC staff visited the FWS Information for Planning and Consultation (IPaC) website and completed its online project review process. The review process generated a list of threatened or endangered species (FWS, 2019). No critical habitat was identified at the PI ISFSI site.

3.6 Climate, Meteorology, and Air Quality

Prairie Island is located in southeast Minnesota on the border of Minnesota and Wisconsin. The island's climate is mostly influenced by the eastward storm systems that move across the northern United States, which can cause extreme seasonal temperature changes. However, because the island is located in the Upper Mississippi River system, the site experiences a more moderate climate than other areas at the same latitude. Monthly temperatures in the local area can range from -16.3°C (2.6°F) in January to 27.6°C (81.7°F) in July (MRCC, 2019). The local mean annual precipitation of 84.9 cm (33.43.) occurs mainly from June through August (MRCC, 2019). Snowfall contributes to annual precipitation at about 124.5 cm (49 in.) per year (MRCC, 2019). Tornadoes generally occur from March through November; historically and statistically, June is the month of greatest tornado frequency and July is not far behind (MN DNR, 2019).

In response to the MDH's comment on the importance of including a discussion on future climate conditions, the NRC staff located a report on the MDH website dated August 2018, "Planning for Climate & Health Impacts in Southeast Minnesota" (MNDH, 2018). The MDH report states that more than 50 years of Minnesota storm data show an increase in both the number and strength of weather-related natural disasters. The MDH expects these conditions to continue well into the future. The report states that by mid-century, much warmer winters, more severe summer heat waves, a higher frequency of very heavy rain events, and a higher frequency of late growing season drought conditions are expected in Minnesota. Extreme rainfall events are expected to increase the probability of disaster-level flooding. However, the

MDH expects that by mid-century heavy downpours will be separated by longer dry spells, with dry spells occurring late in the growing season. Over the past century, the Midwest has not experienced a significant change in drought duration. However, the report predicts the average number of days without precipitation will increase in the future. These leading Minnesota climate experts state with moderate-to-high confidence that drought severity, coverage, and duration are likely to increase in the state (MNDH, 2018).

Under the Clean Air Act, the EPA has established National Ambient Air Quality Standards for six criteria pollutants: nitrogen dioxide, sulfur dioxide, carbon monoxide, lead, ozone, and particulate matter. Goodhue County continues to be an attainment area for all criteria pollutants in the Southeast Minnesota–La Crosse (Wisconsin) Interstate Air Quality Control Region, which means that the minimum standards established for each air quality criteria pollutant are being met (40 CFR 81.66) (NSPM, 2019a).

PINGP has some stationary emissions sources, which include an oil-fired boiler and diesel-fired engines for emergency power, pump cooling water, and fire-fighting systems. PINGP operates under a Synthetic Minor Operating Permit from the MPCA. Although there will be some air emissions from mobile sources related to PI ISFSI expansion construction and operation, there are no air emissions from the operation of the PI ISFSI. NSPM expects to use earthmoving equipment for PI ISFSI expansion activities and plans to control fugitive dust by wetting exposed soil areas and covering stockpiles. There would be a small increase in vehicular traffic due to construction, but this would be limited to the estimated 4-week construction period (NSPM, 2019a).

3.7 Demography, Socioeconomics, and Environmental Justice

The communities around the PI ISFSI are predominantly rural and include the City of Red Wing. The center of the PI ISFSI is located approximately 0.72 km (0.45 mi) southeast of the nearest resident on the PIIC Reservation. PIIC members are descendants of the Mdewakanton Band of Eastern Dakota, also known as the Mississippi or Minnesota Sioux. The PIIC has approximately 1050 enrolled members (PIIC, 2019); with approximately 325 members currently residing on tribal land (PIIC, 2013).

The NRC staff defined the socioeconomic region of influence (ROI) as the area in which PINGP Units 1 and 2 and PI ISFSI employees and their families reside, spend their income, and use their benefits, thereby affecting economic conditions in the region. The socioeconomic ROI consists of Goodhue and Dakota Counties in Minnesota, and Pierce County in Wisconsin. Approximately 83 percent of PINGP employees, including ISFSI workers, reside in the three-county ROI (NRC, 2011).

Using data from the 2017 American Community Survey (USCB, 2019), Table 3.1 presents the ethnicity and race breakdown and median income level for the City of Red Wing, each of the ROI counties, the state of Minnesota, and the state of Wisconsin. The NRC's 2015 EA (NRC, 2015) for the PI ISFSI license renewal provides a detailed description of the demographic and economic characteristics for the ROI. Although the demographics and socioeconomic characteristics have not changed significantly since the publication of the 2015 EA, changes in population since the Census was conducted in 2010 include an increase of 0.5 percent, 6.7 percent, and 3.7 percent for Goodhue County, Dakota County, and Pierce County, respectively, and a decrease of 0.3 percent for the City of Red Wing, Minnesota (USCB, 2019).

Table 3-1. Demographic Profile of the Population in the Region of Influence (Data from U.S. Census Bureau, American Community Survey [ACS] for 2017)

	City of Red Wing, MN	Goodhue County, MN	Dakota County, MN	Pierce County, WI	State of Minnesota	State of Wisconsin
Total Population	16,414	46,403	425,423	42,555	5,611,179	5,822,434
Race and Hispanic Origin (Percent of Total Population)						
White	89.5%	94.5%	84.1%	95.8%	84.1%	87.1%
Black or African American	2.3%	1.4%	7%	0.9%	6.8%	6.7%
Asian	0.8%	0.7%	5.2%	1.3%	5.1%	3.0%
American Indian and Alaskan Native	2.2%	1.5%	0.6%	0.5%	1.4%	1.2%
Native Hawaiian and Other Pacific Islander	<0.1%	0.1%	0.1%	<0.1%	0.1%	0.1%
Persons reporting two or more races	3.7%	1.7%	2.9%	1.5%	2.5%	2.0%
Persons of Hispanic or Latino origin	5.5%	3.5%	7.4%	2.1%	5.5%	6.9%
White persons not Hispanic	86.7%	91.8%	77.7%	94%	79.5%	81.1%
Income and Poverty						
Median Household Income (in 2018 dollars)	\$53,154	\$64,765	\$83,288	\$72,111	\$68,411	\$59,209
Per capita income in past 12 months (in 2018 dollars)	\$30,583	\$33,400	\$40,441	\$32,525	\$36,245	\$32,018
Persons in poverty, %	14.0	7.1	6.3	8.5	9.6	11.0

These estimates show that median household income and per capita income were highest in Dakota County, Minnesota, and that the median household income in both Dakota County, Minnesota, and Pierce County, Wisconsin, were higher than the statewide averages. The percentage of residents living below the poverty level, for all three counties, is less than the respective state averages. However, for the City of Red Wing and Goodhue County, Minnesota, the median household income is below the state average and the percentage of Red Wing residents living below the poverty level is higher than the state average.

If either of the two criteria discussed below was met for a census block group, that census block group was considered an environmental justice population of interest:

- the minority or low-income population that resides in the block group exceeds 50 percent of the total population for that census block group, or
- the percentage of the minority or low-income population in the census block group is at least 20 percentage points greater than the same minority or low-income population's percentage in the respective state or county.

The analysis indicates that census block groups within the ROI do not have significant percentages of minority populations, nor do they have significant percentages of low-income households. Notwithstanding, the potential lack of a census block group meeting the above criteria cannot be construed as evidence of there being no disproportionately high and adverse impacts. Based on the evaluations in previous NRC environmental reviews for the PI ISFSI and PINGP, the American Indian and Alaskan Native minority population is identified as an environmental justice population of interest.

With respect to employment, and as stated in the NRC 2015 EA, the largest employer in Goodhue County is the PIIC; it has more than 1,500 employees at its Treasure Island Resort and Casino and government offices (NRC, 2011). Educational services, health care, and social services represent the largest sector of employment within the ROI, followed by manufacturing and retail trade sectors.

3.8 Historic and Cultural Resources

Section 106 of the NHPA of 1966, as amended, requires that the NRC staff take into account the effects of the proposed licensing amendment (undertaking) on historic properties. The area of potential effect (APE) for this proposed action is limited to the PI ISFSI site and access road from the PINGP auxiliary building to the ISFSI. A number of archaeological surveys and other resource investigations have been performed within and near the PINGP property on Prairie Island during the past 125 years. A summary of archaeological investigations, along with a list of the known and reported historic and cultural resources through 2009, are provided in the PINGP license renewal Supplemental Environmental Impact Statement (SEIS) (NRC, 2011, Section 2.2.9) and the 2015 PI ISFSI license renewal EA (NRC, 2015, Table 3-6).

During the 2011 license renewal review for PINGP Units 1 and 2, NSPM entered into a settlement agreement with the PIIC wherein NSPM committed to revising existing procedures, establishing a training program for site personnel, conducting a Phase I reconnaissance field survey of previously disturbed areas and a Phase I field study of areas of known archaeological sites to delineate their boundaries, developing and implementing a CRMP, conducting botanical surveys to identify culturally and medicinally important species on the PINGP site, and consulting with a qualified archaeologist prior to conducting any ground-disturbing activity in any areas designated as undisturbed or described as potentially containing archaeological resources.

To identify historic and cultural resources within the PI ISFSI footprint and boundary, NSPM hired Westwood Professional Services, Inc., to conduct a Phase I archaeological survey (Sather, 2010; NRC, 2011, pp. 4–39). The survey report can be found in Appendix E, Attachment A, in NSPM's 2011 license renewal application for the PI ISFSI (NSPM, 2011a). The survey was conducted in November 2010 and was designed to evaluate the depth of previous ground disturbance within the ISFSI facility and determine whether any archaeological deposits were present within potentially undisturbed buried soil. Eight test pits were excavated along the ISFSI perimeter road located between the PI ISFSI and the earthen berm to an

average depth of 1.8 m (6 ft) below the surface (NSPM, 2011a). All eight test pits were positioned outside the security fences for the cask storage area. No cultural materials were recovered from any of the eight test excavations. The consulting archaeologists determined that seven of the eight exposed soil profiles contained significantly disturbed soils from past construction activities (Sather, 2010; NSPM, 2011a).

In anticipation of expected future ISFSI expansion activities and as part of the agreement to resolve cultural resources contentions adjudicated by the Atomic Safety and Licensing Board Panel, NSPM hired Westwood Professional Services, Inc. to conduct a Phase I archaeological survey to evaluate whether any archaeological deposits were present within the PI ISFSI boundary (NSPM, 2014). Westwood Professional Services, Inc. conducted the survey in September 2014 (NSPM, 2014). The PIIC, NRC staff, and NSPM representatives observed the survey activities. The PIIC had an opportunity to review the archaeological survey work plan, provide comments, and monitor the ground-disturbing activities (e.g., shovel tests).

NSPM's contractor excavated 15 shovel tests (10 were within the proposed footprint for anticipated new pad and the remaining five were within areas that were, at the time, proposed for a turn-around area and new cask transport storage facility (NSPM, 2019a)). NSPM, however, explained that the turn-around and cask transport storage facility will not be constructed (NSPM, 2019a). In addition, NSPM's contractor excavated six soil cores to examine the potential for the presence of buried paleosols. The draft survey report was provided to the PIIC and the State Historic Preservation Officer (SHPO) for review and comment. No cultural materials were recovered from any of the test excavations and borings, and the consulting archaeologists interpreted all eight exposed soil profiles as evidence of the soils having been significantly disturbed by past construction activities (NSPM, 2014). No archaeological properties were found and no evidence of paleosols was identified. The survey report also concluded that no additional archaeological investigations were warranted within the studied area (NSPM, 2019a).

In addition, as part of this license amendment to increase the ISFSI's storage capacity, the licensee's archaeologist compared the proposed area of disturbance for this action to the area evaluated during the 2014 archaeological investigations. It was determined that the proposed area had already been surveyed in 2014. For these reasons, no additional archaeological investigations were necessary (NSPM, 2019a). The information developed from the archaeological investigations, in the consultations between the PIIC and the NRC staff, and in discussions between the PIIC and NSPM was documented in the "Settlement Agreement Between the Prairie Island Indian Community and Northern States Power Company (Settlement Agreement)."¹ In addition, the Settlement Agreement memorializes NSMP's commitment to conduct further subsurface surveys, if further expansion of the ISFSI (up to 98 casks) is undertaken (NSPM & PIIC, 2015).

The NRC staff contacted the Minnesota SHPO (NRC, 2019c; NRC, 2020) and 27 Native American Tribes (NRC, 2019d). A record of these consultations is presented in Section 5.0 of this EA.

An earthen berm and trees surround the PI ISFSI, preventing its visibility from offsite roadways, including roadways on the PIIC Reservation (NRC, 2015). The earthen berm is constructed of

¹ Joint Motion for approval of Settlement Agreement Between the Prairie Island Indian Community and Northern States Power Company, (ADAMS Accession No. ML10544A518)

fill material reinforced with geofabric. Erosion control material and natural vegetation give the berm a natural appearance (NSPM, 2011a).

3.9 Public and Occupational Health and Safety

The Atomic Energy Act requires the NRC to promulgate, inspect, and enforce standards that provide an adequate level of protection for public health and safety and the environment. The NRC has established multiple layers of radiation protection limits to protect the public against potential health risks from exposure to effluent discharges from nuclear facility operations. ISFSIs in the United States are licensed by the NRC and must comply with NRC regulations and conditions specified in the license in order to operate. The licensees are required to comply with 10 CFR 20, Subpart C, "Occupational Dose Limits for Adults"; 10 CFR 20, Subpart D, "Radiation Dose Limits for Individual Members of the Public"; and 10 CFR 72.104, "Criteria for Radioactive Materials in Effluents and Direct Radiation from an ISFSI or MRS."

NSPM performs routine monitoring activities. These activities include implementation of the Radiological Environmental Monitoring Program (REMP) for PINGP Units 1 and 2 and the PI ISFSI. The REMP for the PI ISFSI is conducted in accordance with the PI ISFSI license SNM-2506, ISFSI Technical Specification 5.2, Appendix A. The NRC 2015 EA (NRC, 2015, Sections 1.3.4 and 3.11) provides additional details regarding the monitoring programs implemented for the PI ISFSI. Ambient gamma radiation is monitored at the PI ISFSI using 20 thermoluminescent dosimeters (TLDs), which are replaced and measured quarterly. Gamma radiation is emitted from spent fuel in dry casks to the sky and then scattered back to the ground (known as "skyshine") outside the earthen berm. Twelve TLDs are located inside of the berm and eight dosimeters are located outside of the berm (NSPM, 2018). Two TLDs are located between the ISFSI and the PIIC. The results of the 2018 REMP for the PI ISFSI show that the mean dose rates averaged 185.6 mR/91 days inside the ISFSI earthen berm and 24.1 mR/91 days outside the ISFSI earthen berm. In 2018, NSPM placed four additional casks on the ISFSI pad (NSPM, 2018). Ambient radiation levels measured outside the earthen berm show a slight increase compared to other offsite dose rates around the plant. The cumulative average of the two special PIIC TLDs measured 16.1 and 16.0 mR/91 days (NSPM, 2018). NSPM concluded there was no indication of spent fuel storage effect on offsite ambient gamma radiation (NSPM, 2018).

NUREG-0713, *Occupational Radiation Exposure at NRC Licensed Facilities*, Volume 39 (NRC, 2019e), summarizes the occupational exposure data maintained in the NRC Radiation Exposure Information and Reporting System database, compiled from the 2017 annual reports submitted by NRC licensees subject to the reporting requirements in 10 CFR 20.2206, including NSPM. The review of the data associated with PINGP indicates exposure to workers associated with the PINGP, including the PI ISFSI, is below the regulatory limits in 10 CFR 20.1201.

As discussed in the NRC 2015 EA, risks to occupational health and safety include exposure to industrial hazards. Industrial hazards for the PI ISFSI are typical of similar industrial facilities and include accidents, minor cuts, moving heavy objects, working outside, and working with heavy equipment during cask transfer operations (NRC, 2015). Cask surface temperature can also be considered a nonradiological hazard (NSPM, 2019).

3.10 Visual and Scenic Resources

The major natural landscape feature near the affected area of the PI ISFSI is the Mississippi River. The turbine building and reactor containment structures dominate the man-made industrial landscape of the PINGP site. Because the ISFSI is located inside the protected area boundary and surrounded by an earthen berm and trees, recreational visitors are unable to see the ISFSI from onsite or offsite roads (NSPM, 2019a). In addition, the NRC staff previously observed that the view of the ISFSI from the PIIC Reservation roadways outside of the PINGP property is obstructed by the earthen berm and forested areas immediately north, west, and south of the ISFSI (NRC, 2015).

3.11 Noise

As was discussed in the 2015 EA, the PI ISFSI generates no noise other than that related to occasional vehicle traffic to and from the site during routine maintenance activities and cask transfers (NSPM, 2011a). The major source of noise from the PINGP site is the operation of Units 1 and 2, including the mechanical-draft cooling towers, turbines, large pumps, and cooling water system motors (NRC, 2011). Minnesota noise standards (Minnesota Rule 7030.0040, Subpart 2) stipulate that the daytime sound levels are not to exceed 60 decibels [dB(A)] for more than 50 percent of the time (MPUC, 2009). Noise measurements previously collected on Sturgeon Lake Road, just north of the PINGP property boundary, indicated noise levels ranging from 43 to 46 dB(A) (as measured in the casino parking lot) and from 32 to 36 dB(A) at the east end of Sturgeon Lake Road (MPUC, 2009).

4.0 ENVIRONMENTAL IMPACTS

The NRC staff reviewed the licensee's ER, collected information from federal and state agencies, and evaluated the environmental impacts of the proposed action on the various resources of the affected environment. The NRC staff used the guidelines outlined in NUREG-1748 (NRC, 2003) in its evaluation of the environmental impacts from the proposed action on each resource. The NRC staff assessed whether the impact on resource areas from the proposed action is "significant" or "not significant" (NRC, 2019f).

4.1 Land Use

Approval of the proposed action would result in the expansion of the PI ISFSI to accommodate up to 16 additional casks and construct a new storage pad within the existing ISFSI fence line. Although construction activities would occur, they would be limited to the ISFSI footprint in an area that is highly disturbed and was the subject of a Phase I archaeological survey that did not identify cultural materials in any of the test excavations and borings (NSPM, 2014). Other ongoing activities include routine monitoring and maintenance and are expected to continue through the 40-year license period. The proposed action would not result in new land use. For these reasons, the NRC staff concludes that the impact on land use from the proposed action is not significant.

4.2 Transportation

As stated in Section 3.2 of the PINGP license amendment ER supplement (NSPM, 2019a), the proposed action is anticipated to increase traffic volumes slightly during the period of construction to accommodate construction equipment and contractors. There could be small and short-term increases in traffic volume within the ROI (i.e., Goodhue and Dakota Counties, Minnesota, and Pierce County, Wisconsin) as a result of the proposed action. In addition, approval of the proposed action would not result in any expansion of the existing ISFSI footprint and would result in a small change in operations (NSPM, 2019a). In its ER, NSPM stated that the expansion would require 13 additional construction labor workers for a total of 4 weeks and would increase traffic flow by approximately 24 additional truck trips per day on roads leading to the PI ISFSI work site (NRC, 2015).

Due to the short timeframe and relatively small scope of the expansion, there would be no noticeable environmental impact beyond what is currently being experienced. Therefore, the NRC staff concludes that the potential impact from the proposed action on transportation is not significant.

4.3 Geology and Soils

The NRC staff does not expect the expansion of the PI ISFSI to impact the subsurface geology. Although the proposed action would result in localized land disturbance, the area within the ISFSI fence or APE is already highly disturbed. In addition, the depth of disturbance would not extend beyond the previously disturbed soil. Therefore, the NRC staff concludes that the impact on geology and soils from the proposed action is not significant.

4.4 Water Resources

NSPM explained that construction of the new pad or maintenance of the additional casks, if the NRC approves the license amendment to increase the maximum amount of spent fuel stored at the PI ISFSI, would not require water resources (NSPM, 2019a). In addition, the PI ISFSI does not use, consume, or otherwise generate liquid effluents during normal operations. NSPM does not expect surface water discharges from the PI ISFSI other than stormwater runoff currently permitted under the PINGP NPDES permit. Operation of the PI ISFSI does not result in discharges to groundwater (NSPM, 2019a). Water consumption at the PI ISFSI is not anticipated to change, because existing operational and maintenance procedures would continue. During spent fuel loading, water for cask decontamination is used within the confines of the PINGP power plant and would fall within the scope of potential water impacts the NRC has previously assessed for reactor operations. The NRC staff determined that overall surface water and groundwater impacts associated with continued PINGP operations would be SMALL (NRC, 2011). As defined in NUREG 1748, small environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

The proposed action consists of the construction of a new pad and, thus, could result in ground disturbance, which could contribute to sediment runoff and stormwater pollution. NSPM will implement erosion control measures that would consist of BMPs such as silt fences and straw bales to minimize surface drainage off the ISFSI site as required by the MPCA (NSPM, 2019a). NSPM does not anticipate that a Stormwater Pollution Prevention Plan would be required because the expected disturbed area would be less than 0.4 ha (1 ac) (NSPM, 2019a).

As discussed in Section 3.4 of this EA, NSPM calculated that the probable maximum flood is estimated to reach a level of 214.4 m (703.6 ft) AMSL, with a water velocity of 1.9 m per second (6.2 ft per second), and wave action to a maximum level of 215.4 m (706.7 ft) AMSL (NSPM, 2011b). The casks are designed to withstand the forces created by the probable maximum flood without damage to cask integrity, cask seals, or without overturning the casks. The height of the cask seals will be above the level of the probable maximum flood and associated wave action. No fuel damage or criticality is postulated to occur as a result of flooding. NSPM concluded that the probable maximum flood would not result in a release of radioactive materials. This conclusion is applicable to both TN-40 and TN-40HT casks (NSPM, 2011b, Sections 8.2.3 and A2.8.3; NSPM, 2011a, Section E.4.4.2.3).

The NRC staff reviewed NSPM's analysis and findings (NSPM, 2011a, NSPM, 2011b) as part of its license renewal review, and determined that no release of radioactive materials is expected from flooding activity (NRC, 2010). The NRC staff concluded with reasonable assurance that the effects of direct radiation from bounding design basis accidents will be below the regulatory limits in 10 CFR 72.106(b) (NRC, 2010). In addition, in 2015 the NRC staff considered the impacts from then-anticipated expansion of the PI ISFSI to store up to 98 spent fuel storage casks in the cumulative impacts analysis of the NRC's NEPA environmental review of the PI ISFSI license renewal (NRC, 2015). In the cumulative impacts analysis, the NRC staff concluded that, with the mitigation measures proposed by NSPM, the potential impacts on water resources from expansion activities would not make a significant incremental contribution to cumulative impacts (NRC, 2015). Therefore, the NRC staff concludes that the impact on water resources from the proposed license amendment is not significant.

4.5 Threatened and Endangered Species

The proposed expansion of the PI ISFSI would involve land-disturbing activities, but those activities would occur within the existing ISFSI security fence. The area inside the ISFSI fence does not provide a suitable habitat for many species of wildlife, and other species either do not have access to the ISFSI because of the fence or the nature of the enclosed habitat does not meet their needs. Construction would be temporary and routine operation of the ISFSI is largely passive; activities include inspections and maintenance (NSPM, 2019a). The NRC staff evaluated this expansion in the 2015 EA Cumulative Effects section and determined that an ISFSI expansion that occurs within the existing ISFSI security fences and berm, regardless of the number of casks to be accommodated, would not adversely affect threatened and endangered species and would not have a significant impact on aquatic and terrestrial resources (NRC, 2015).

In November 2019, NRC staff used the FWS online tool IPaC, which is a project planning tool that streamlines the FWS environmental review process (FWS, 2019). As a result of using IPaC, a species list was generated that identified federally threatened, endangered, proposed, and candidate species that may occur within the action area that is likely to be affected by the proposed PI expansion project. The list also includes any designated and proposed critical habitat that overlaps with the action area. Five threatened, endangered, or candidate species were identified as potentially being in the proposed project area: the Northern Long-eared Bat (mammal); the Higgins Eye, Sheepnose Mussel and Snuffbox Mussel (clams); the Prairie Bush-clover (flowering plant); and 16 migratory bird species. No critical habitats were identified within the PI project area.

In December 2019, the NRC staff contacted the Minnesota-Wisconsin Ecological Services Field Office of the FWS regarding the potential effects the proposed action could have on the ecology, particularly on endangered and threatened species (NRC, 2019b). The FWS indicated that based on the project description and given that the proposed license amendment would involve construction on previously disturbed land that would not be a suitable habitat for threatened, endangered, or special status species, formal consultation with the FWS would not be needed.

Therefore, the NRC staff concludes that the proposed action is not likely to adversely affect federally listed threatened and endangered species, nor state-identified rare species or species of special concern.

4.6 Climate, Meteorology, and Air Quality

Under the proposed action, the licensee anticipates temporary emissions from construction equipment, such as bulldozers, scrapers, backhoes, and graders. NSPM plans to control fugitive dust related to PI ISFSI expansion by wetting exposed soil areas and covering stockpiles (NSPM, 2019a). As was previously evaluated in the 2015 EA, the potential impacts on air quality from PI ISFSI expansion activities would not be significant. As such, the NRC staff concludes that the potential impact on climatology, meteorology, and air quality due to the proposed action is not significant.

4.7 Demography and Socioeconomics

As stated in the NRC 2015 EA, the NRC recognizes that the PIIC is located closer to the PINGP and PI ISFSI than any other population group in the United States and the PIIC has invested

financial resources in this geographic area to assure the safety and security of its members (NRC, 2015).

Direct employment, taxes, and services would not be expected to change as a result of the proposed action. NSPM, in the 2019 ER supplement, acknowledged the socioeconomic concerns raised by the PIIC during the PI ISFSI license renewal process. NSPM will continue to actively engage the PIIC regarding activities that occur on the PINGP property and within the PI ISFSI (NSPM, 2019).

The proposed action is anticipated to require 13 temporary workers hired for 4 weeks during construction. No additional permanent employees would be required for operations and maintenance. Therefore, the impact of providing additional housing and public services within the ROI would not be significant, and the change in the local economy would not be noticeable. Therefore, the NRC staff does not expect any direct or indirect socioeconomic impacts and concludes that the demography and socioeconomic impact from the proposed action is not significant.

4.8 Historic and Cultural Resources

As discussed in Section 3.8, in anticipation of a future ISFSI expansion and as part of the settlement agreement (NSPM & PIIC, 2015) to resolve PI ISFSI license renewal contentions related to historic and cultural resource, NSPM hired Westwood Professional Services, Inc. to conduct a Phase I archaeological survey to evaluate whether any archaeological deposits were present within the PI ISFSI boundary in 2014 (NSPM, 2014). The PIIC, NRC staff, and NSPM representatives observed the survey activities. The PIIC was able to monitor the ground-disturbing activities (e.g., shovel tests), review the archaeological survey work plan and provide comments and review the final report. No archaeological properties were found and no evidence of paleosols was identified. The survey report also concluded that no additional archaeological investigations were warranted within the studied area (NSPM, 2019a). In addition, as part of this license amendment to increase the ISFSI's capacity, the licensee's archaeologist reviewed and compared findings for the area proposed to be disturbed with those of the 2014 archaeological investigations and determined that the proposed area was already surveyed, and no additional archaeological investigations are necessary (NSPM, 2019a).

An earthen berm and trees surround the PI ISFSI, preventing its visibility from offsite roadways, including roadways on the PIIC Reservation (NRC, 2015). These will also minimize the visibility of the ground-disturbing activities occurring during the proposed expansion from outside of the site footprint. The earthen berm is constructed of fill material reinforced with geofabric. Erosion control material and natural vegetation give the berm a natural appearance (NSPM, 2011a).

Based on previous NRC environmental reviews (as described in Chapter 1 and Section 3.8 of this EA), surveys completed by the licensee, and information provided by the SHPO and the PIIC, there are no known historic or cultural properties within the PI ISFSI APE. Accordingly, consistent with 36 CFR 800.4(d)(1), the NRC staff determined that no historic properties are present. The NRC staff provided its determination and basis to the PIIC and SHPO for review and concurrence. The PIIC responded on January 17, 2020, that they are in agreement with the NRC staff's determination that no historic properties are present (PIIC, 2020). The MN SHPO responded on August 8, 2020, that they concur with the NRC's finding that no historic properties will be affected by the federal undertaking, as it is currently (SHPO, 2020b).

NSPM has committed to following their CRMP for all ground-disturbing activities on the PINGP site, including those at the ISFSI (NSPM, 2019b). The CRMP includes requirements for notification and consultation with a variety of federal, state, tribal, and local agencies and entities depending on the nature and scope of planned activities (NSPM, 2019a). Although there could be an inadvertent discovery, it is expected that abiding by CRMP commitments would mitigate any impact on historic and cultural resources if identified in the PI ISFSI during expansion activities. In addition, the Settlement Agreement memorializes NSPM's commitment to conduct further subsurface surveys, if further expansion of the ISFSI (up to 98 casks) is undertaken. Based on the protections afforded by the CRMP, NSPM commitment in the Settlement Agreement, and information obtained from archaeological investigations, the NRC staff concludes that historic or cultural properties would not be adversely affected by the proposed action and, therefore would not result in a significant impact.

4.9 Public and Occupational Health and Safety

4.9.1 Nonradiological Impacts

In the NRC's 2015 EA for the PI ISFSI license renewal, the NRC staff concluded that the potential nonradiological impacts from continued operation and maintenance activities would not be significant. NSPM explained that no changes are expected with respect to operation and maintenance activities because of the expansion of the ISFSI's storage capacity. Construction of the new pad, however, would result in generation of nonradiological waste that would need to be managed (soil excavation and construction debris generation). NSPM has programs in place to manage nonradiological waste generated from construction and operations. Therefore, the NRC staff concludes that nonradiological impacts from the proposed action would not be significant.

4.9.2 Radiological Impacts

Radiological impacts from the proposed action would result from the storage of spent fuel in the ISFSI. Operations involving the storage of spent fuel would include decontamination of the exterior surfaces of the casks, which are also surveyed to assure that (1) radioactive contamination meets technical specifications prior to transfer to the ISFSI, and (2) the casks are not opened at the PI ISFSI (NSPM, 2019a). Accordingly, the source of radiation exposure from the ISFSI would be direct and scattered neutron and gamma radiation emanating from the spent fuel stored inside each dry cask.

4.9.2.1 Occupational Dose

NSPM maintains a radiation protection program for the PI ISFSI in accordance with 10 CFR 20 and 72 to assure that radiation doses are as low as is reasonably achievable (ALARA). The dry casks in the PI ISFSI are heavily shielded and decontaminated prior to being transferred to the ISFSI pad. Compliance with the regulatory requirements in 10 CFR 20 and 72, including radiological monitoring in accordance with the REMP, also assures occupational health and safety. Workers at the PINGP involved in PI ISFSI operations would incur the highest occupational dose because of their proximity to the casks (NSPM, 2019). Operations and maintenance activities, however, would not change and, for example, additional people would not be required for PI ISFSI walkdowns and tasks such as repairs would not be affected (NSPM, 2019). Notwithstanding, NSPM explained that there would be an increase in dose rates and collective doses to plant personnel because of the 16 additional casks that would be placed in the ISFSI.

NSPM's ISFSI safety analysis report (ISAR) discusses the collective dose to workers from the loading, transport, and emplacement of a single cask in the PI ISFSI based on the 48 TN-40HT casks currently placed in the ISFSI. NSPM estimated the collective dose to be 3.117 person-rem. NSPM, however, determined that the construction and placement of a new ISFSI pad and the estimated time required to transfer a cask and place the cask in the ISFSI, which is not expected to change, would have no effect on dose rates (NSPM, 2019). In addition, NSPM has calculated the design basis annual exposure for surveillance and maintenance activities in its ISAR. The associated annual collective dose for surveillance and maintenance activities was 4.470 person-rem. Similarly, NSPM does not anticipate effects on surveillance and maintenance dose rates from maintenance and surveillance activities (e.g., additional people would not be required for walkdowns, and tasks for individual casks like repairs would not be affected) (NSPM, 2019). Therefore, NSPM concluded that the estimates for occupational exposures for cask loading, transport, and emplacement, and annual exposures for design basis PI ISFSI maintenance operations would not change with the storage of up to 64 casks in the PI ISFSI.

NSPM also calculated the dose received by plant personnel, not working on PI ISFSI operations, that can be attributed to the PI ISFSI with up to 64 casks stored. Plant personnel considered in this estimate consist of the normal workforce, contractor personnel, and increased staffing required during outages (NSPM, 2019). The estimated dose does not take credit for shielding of personnel by buildings or in the plant yard (NSPM, 2019). NSPM considered staffing levels at various site locations along with the distance from the center of the PI ISFSI. NSPM determined that the plant personnel location collective dose would increase from 12.88 person-rem total exposure to 18.6 person-rem total exposure.

NSPM is required to conduct authorized operational, inspection, and maintenance activities in accordance with the occupational dose limits specified in 10 CFR 20.1201 and to have and follow a radiation protection program consistent with 10 CFR 20.1101. The total exposure to plant personnel calculated by NSPM is below regulatory limits. Therefore, the NRC staff concludes that radiological impacts on PINGP workers from the proposed action would not be significant.

4.9.2.2 *Dose to the Public*

NSPM performed an analysis to evaluate the radiation dose impact of adding spent fuel equivalent to 16 TN-40HT casks to the new southeast PI ISFSI pad. The purpose and scope of this calculation was to determine the total normal operation radiation dose at the nearest site boundary and to the nearest resident when including the dose from the existing 48 casks, the dose from the 16-cask expansion, and the dose from non-ISFSI-related operation of the PINGP.

The estimated annual dose to the nearest resident calculated by NSPM from the 48 TN-40HT casks, planned effluent discharges (from the PINGP Units 1 and 2 operations), and the proposed 16 TN-40HT casks is 4.34 mrem/yr (NSPM, 2019). The estimated dose rate at the site boundary calculated by NSPM from the 48 TN-40HT casks, the proposed 16 TN-40HT casks, and other sources of radiation from the PINGP site is 0.45 mrem/hr (NSPM, 2019). Further, NSPM calculated the total dose to the offsite population (assuming the entire population was located at the residence of highest exposure; i.e., 0.72 km [0.45 mi] northwest of the PI ISFSI). In addition, NSPM considered the transient population (persons employed at and visitors to the Treasure Island Resort and Casino [i.e., population located at 1.29km (0.8 mi) from the PI ISFSI]. NSPM, thus, revised its calculations for the offsite population for up to 64 TN-40HT casks from 2.21 person-rem to 3.96 person-rem [collective exposure within 3.22km (2

mi)]. At 0.72 km (0.45 mi) (nearest resident), the total annual dose rate would increase from 2.20 mrem/yr to 3.69 mrem/yr for up to 64 TN-40HT casks. These estimates are below the regulatory requirements of 25 mrem/yr set forth in 10 CFR 72.104(a), of 25mrem/yr in 40 CFR 190.10(a), and of 100 mrem/yr in 10 CFR 20.1301(a). Dose to members of the public would be further limited by the distance to the PINGP site boundary and would therefore not exceed the regulatory limits of 2 mrem/hr for external sources in 10 CFR 20.1301(a)(2) for individual members of the public. For these reasons, the NRC staff concludes that the potential radiological impacts on members of the public because of the proposed action would not be significant.

4.9.2.3 *Accidents*

NSPM evaluated the potential radiological impacts resulting from a suite of postulated accidents in its ISAR for the PI ISFSI. Section 72.70(c)(6) of 10 CFR requires NSPM to update the ISAR every 24 months from the date of issuance of the license. ISAR Sections 8 and A8 (NSPM, 2017) and the PI ISFSI license renewal application (NSPM, 2011a, Section E4.4.2) discuss the accident analyses for the TN-40 and TN-40HT casks. As part of the license renewal application for the PI ISFSI, the NRC staff evaluated the public dose estimates provided in the ISAR for the TN-40 and TN-40HT casks and determined that, for the license renewal application, there was reasonable assurance that the effects of direct radiation from the postulated accidents would be below the regulatory limits in 10 CFR 72.106(b) (NRC, 2010a).

NSPM explained that the proposed expansion of the ISFSI's storage capacity (new pad and associated structures) would not modify the accident analyses presented for the TN-40 or TN-40HT casks discussed in its 2011 license renewal application (NSPM, 2019). In its 2015 EA for the ISFSI license renewal application, the NRC staff evaluated the cumulative impacts from construction and operation of up to 98 casks during a potential future expansion of the ISFSI's storage capacity. The NRC staff concluded that dose consequences are not expected and the accident dose rates for the accident scenarios analyzed in the NSPM's 2011 ISFSI license renewal application, for both the TN-40 and TN-40HT casks, are below the 10 CFR 72.106 regulatory limits. Therefore, the NRC staff concludes that the environmental risk of these accident scenarios would not be significant.

4.10 Visual and Scenic

Scenic quality is affected by surface disturbances and facilities at the PI ISFSI, which contrast with the natural environment. While surface disturbance would occur during expansion activities, an earthen berm and trees surround the PI ISFSI, preventing visibility of the installation from offsite roadways. Additionally, the scope of the proposed action is expected to be short, approximately 4 weeks in duration. Based on this lack of visibility and the short duration of changes in scenic quality, the NRC staff determines that the impact of the proposed action is not significant.

4.11 Noise

Approval of the proposed action would result in short-term construction in the vicinity of the existing ISFSI footprint, thus generating construction-type noises for about a 4-week period. By design, the PI ISFSI is cooled by a passive cooling system that has no moving parts that generate noise. Therefore, noise typically associated with the ISFSI is not audible. The earthen berm around the ISFSI mutes noise generated by the transport vehicle during cask transfer

activities (NRC, 2015). Therefore, the impact from noise-generating activities as a result of the proposed action is not significant.

4.12 Environmental Justice

Environmental justice refers to the federal policy established in 1994 by Executive Order (EO) 12898 (59 FR 7629) that directs federal agencies to identify and address disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority or low-income populations. The NRC published its Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (69 FR 52040) in August 2004. As explained in the Policy Statement the NRC strives to meet the goals of EO 12898 as part of its NEPA review process.

The environmental justice analysis assesses the potential for disproportionately high and adverse human health or environmental effects on minority and low-income populations that could result from proposed ISFSI storage capacity expansion. Consistent with the NRC's Policy Statement (69 FR 52040) and guidance in NUREG-1748 (NRC, 2003), affected populations are defined as minority and low-income populations within a 6.4 km (4 mi) radius of PI ISFSI. Data on minority and low-income individuals are usually collected and analyzed at the census tract or census block group level (NRC, 2003).

The NRC staff used data from the 2017 American Community Survey (USCB, 2019). Table 3.1 presents the ethnicity and race breakdown and median income level for the City of Red Wing, each of the ROI counties, the state of Minnesota, and the state of Wisconsin. Additionally, and consistent with the EJ analysis carried out in the 2015 license renewal EA, the NRC staff looked at the census data for tract 802, block group 6, which contains the PINGP and PIIC Reservation. For tract 802, block group 6, the total population is 1,183 and total minority population is 223 or about 18.9 percent of the total population, and 84.3 percent of minority residents are American Indian and Native Alaskan. The minority population of Goodhue County is 7.6 percent, which is 11.3 percentage points higher than the total minority population in tract 802, block group 6 at 18.9 percent., American Indians and Native Alaskans make up 15.9 percent of the population of tract 802, block group 6; however, these groups make up only 0.96 percent of the population of Goodhue County.

Although minority or low-income populations were not identified the NRC staff considered the environmental justice evaluation conducted as part of the 2015 ISFSI license renewal EA and the 2011 PINGP license renewal SEIS, where the NRC staff identified the American Indian and Alaskan Native minority populations as environmental justice populations of interest. In addition, the NRC staff consulted with the PIIC during both, the PINGP license renewal SEIS and ISFSI license renewal, and during this ISFSI expansion EA. The NRC staff has, therefore, identified the American Indian and Alaskan Native minority populations as environmental justice populations of interest in this EA.

The NRC staff recognizes the PIIC's special expertise in the areas of historic and cultural resources, socioeconomics, land use, and environmental justice. The PIIC was a cooperating agency in the preparation of the PI ISFSI license renewal EA and the associated environmental justice assessment considered the information provided by the PIIC. During the NRC staff's review of NSPM's PI ISFSI license renewal application in 2015, the NRC staff evaluated the cumulative impacts from a potential ISFSI expansion to accommodate up to 98 casks. The NRC staff concluded then that there would be no disproportionately high and adverse impacts on minority or low-income populations from the continued operation of PI ISFSI during the

license renewal term (NRC, 2015). Furthermore, the 2015 PI ISFSI license renewal EA discussed the exposure from up to 98 casks, including the operation of PINGP Units 1 and 2, and explained that it would not exceed NRC regulatory limits (MPUC, 2009a; NRC, 2009). Additionally, the NRC staff found, as part of its review of the PI ISFSI license renewal request, no environmental pathway that would physiologically affect minority or low-income populations differently than other segments of the general population, if the PI ISFSI were expanded. The NRC staff acknowledged that potential impacts of construction activities from ISFSI expansion (up to 98 casks) could include temporary and small increases in traffic volume from trucks and commuter vehicles, and short-term construction noise. However, in the 2015 PI ISFSI license renewal EA, the NRC staff explained that both the distance from the site and the earthen berm would mitigate potential physical impacts of construction on water, noise, and air. Furthermore, the NRC staff concluded that these impacts would be minimal for all offsite populations, including the minority and low-income populations closest to the site (NRC, 2015).

In the 2015 EA, the NRC staff also explained that NSPM is required under the CRMP to notify and consult with a variety of federal, state, tribal, and local agencies and entities depending on the nature and scope of planned activities and applicable laws and regulations. NSPM agreed to maintain and implement its CRMP as long as the NSPM owns or controls the PINGP site. As discussed in the 2015 PI ISFSI license renewal EA, implementation of the NSPM's CRMP, which NSPM has committed to follow, would minimize potential impacts on historic and cultural resources (NRC, 2015).

After considering the cumulative impact evaluation in the NRC's 2015 PI ISFSI license renewal EA relative to the currently proposed PI ISFSI storage expansion, the NRC staff finds that the cumulative impacts analysis conducted in 2015 is conservative. Therefore, the NRC staff concludes that there would be no disproportionately high and adverse cumulative human health and environmental impacts on minority or low-income populations living in the area if the PI ISFSI storage expansion license amendment is approved.

4.13 Cumulative Impacts

The Council on Environmental Quality regulations implementing NEPA define cumulative effects as "the impact on the environment which results from the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). The NRC staff evaluated whether cumulative environmental impacts could result from the incremental impact of the proposed action when added to the past, present, or reasonably foreseeable future actions in the area. The analysis considers potential impacts through the end of the current license term. The geographic area over which past, present, and future actions would occur is dependent on the type of action considered and consistent with the affected area described for each resource in Chapter 3 of this EA. Actions considered in this cumulative impact include the operation of PINGP Units 1 and 2.

As discussed above, the NRC staff determined that impacts for all resource areas from the proposed action, including fuel removal in accordance with the settlement agreement, would not be significant. This is due to the passive nature of the ISFSI, which is designed to minimize radiological doses to workers and members of the public. In addition, NSPM's REMP assesses the impact of PINGP and the PI ISFSI on the environment. As part of the PI ISFSI Technical Specifications, NSPM conducts quarterly monitoring of the PI ISFSI radiation levels collected from 12 TLDs installed along the controlled access fence inside the berm and 8 TLDs along the outside of the berm. NSPM also performs routine monitoring activities and implements

associated measures to assure the safety of workers, the public, and the environment (NSPM, 2019a). Operational activities at the PI ISFSI currently include routine inspection and monitoring, which would not be affected by the proposed expansion of the PI ISFSI's storage capacity. Compliance with the regulatory dose requirements in 10 CFR 20 and 72 during the ISFSI expansion would not result in significant radiological impacts on the public and workers. Therefore, the NRC staff concludes that the proposed expansion of the PI ISFSI storage capacity would not significantly contribute to potential cumulative impacts when added to the past, present, or reasonably foreseeable future actions in the area.

4.14 Continued Storage of Spent Nuclear Fuel

As discussed in Section 1.4.1 of this EA, Section 51.23(b) of 10 CFR requires that the NRC consider the environmental impacts of continued storage, if the impacts of continued storage of spent fuel are relevant to the proposed action. The analysis below documents the required consideration of the environmental impacts of continued storage, as determined in NUREG-2157, for the proposed expansion of the storage capacity of the PI ISFSI.

On September 19, 2014, the NRC published a revised rule at 10 CFR 51.23, "Environmental Impacts of Continued Storage of Spent Nuclear Fuel Beyond the Licensed Life for Operations of a Reactor" (79 FR 56238). The rule codified the NRC's generic determinations in NUREG-2157 (NRC, 2014) regarding the environmental impacts of the continued storage of spent nuclear fuel beyond a reactor's operating license. The NRC concluded in NUREG-2157 that the potential impacts of spent fuel storage at the reactor site in both a spent fuel pool and in an at-reactor ISFSI would be SMALL during the short-term timeframe (60 years beyond the licensed life of a reactor) (see NUREG-2157, Section 4.20). However, for the longer timeframes (an additional 100 years after the short-term timeframe and indefinite timeframe) for at-reactor storage, and for all timeframes for away-from-reactor storage, the analysis in NUREG-2157 has determined a range of potential impacts that are greater than SMALL in some resource areas (see NUREG-2157, Sections 4.20 and 5.20, respectively). The analysis in NUREG-2157 also presents an assessment of cumulative impacts for continued storage with ranges of potential impacts for most resource areas (see NUREG-2157, Section 6.5). These ranges reflect uncertainties that are inherent in analyzing environmental impacts on some resource areas over long timeframes. As explained in NUREG-2157 (Appendix D, page D-96), those uncertainties exist regardless of whether the impacts are analyzed generically or site-specifically. Appendix B of NUREG-2157 discusses the feasibility of the safe storage of spent fuel. The assessment concluded that a deep geologic repository is technically feasible and that a reasonable timeframe for its development is approximately 25 to 35 years.

In this EA, the NRC staff determined that impacts from the proposed expansion of the PI ISFSI storage would not be significant for all environmental resource areas. This is due to the passive nature of the ISFSI in that it emits no gaseous or liquid effluents during operation. Also, the ISFSI is designed to minimize radiological doses to workers and members of the public. Thus, the potential impacts of at-reactor continued storage during the short-term timeframe are consistent with the evaluation of the environmental impacts for the proposed, as documented in this EA.

The analysis in NUREG-2157 (NRC, 2014) however, evaluated the potential impacts of continued storage if the fuel is not disposed of by the end of the short-term timeframe. During the long-term and indefinite timeframes, the analysis in NUREG-2157 determined that impacts on all resource areas would be SMALL, except for historic and cultural resources and nonradioactive waste management. The analysis in NUREG-2157 recognized that

ground-disturbing activities occurred during initial construction of the nuclear power plant and, thus, the land within and immediately surrounding the power block has been extensively disturbed. The analysis in NUREG-2157 also explained that if construction activities occur within the previously disturbed areas or there are no historic or cultural resources present, then impacts would likely be SMALL. However, if these construction activities occur in less-developed or less-disturbed portions of a power plant site outside of the power block with historic and cultural resources present, then impacts on historic and cultural resources could be greater than SMALL (see NUREG-2157, Sections 4.12.2 and 4.12.3). In Section 3.8 of this EA, the NRC staff concluded that there would be no potential impacts on historic and cultural resources as a result of the proposed action because no historic and cultural resources were identified within the APE. As discussed in NUREG-2157, given the minimal size of an ISFSI and the large land areas at nuclear power plant sites, licensees should be able to locate these facilities away from historic and cultural resources. Potential adverse effects on historic properties or on historic and cultural resources could also be minimized through development of agreements and implementation of the licensee's CRMP to protect known historic and cultural resources and address inadvertent discoveries during construction and replacement of these facilities.

However, the analysis in NUREG-2157 recognized that it may not be possible to avoid adverse effects on historic properties under NHPA or impacts on historic and cultural resources under NEPA and, therefore, concluded that impacts would be SMALL to LARGE (see NUREG-2157, Section 4.12.2). As defined in NUREG 1748, large environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

NRC also concluded in NUREG-2157 that the impacts of nonradioactive waste management in the indefinite timeframe would be SMALL to MODERATE, and the higher impacts potentially would occur if the waste from repeated replacement of the ISFSI and other construction activities exceeds local landfill capacity (see NUREG-2157, Section 4.15). As defined in NUREG 1748, moderate environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource. Although the NRC concluded that nonradioactive waste disposal would not be destabilizing (or LARGE), the range reflects uncertainty regarding whether the volume of nonradioactive waste from continued storage would contribute to noticeable waste management impacts over the indefinite timeframe when considered in context of the overall local volume of nonradioactive waste.

As previously discussed, the NRC found in NUREG-2157 (NRC, 2014) that disposal of the spent fuel is most likely to occur by the end of the short-term timeframe. Therefore, disposal during the long-term timeframe is less likely, and the scenario depicted in the indefinite timeframe—continuing to store spent nuclear fuel indefinitely—is highly unlikely. As a result, the most likely impacts of the continued storage of spent fuel are those considered in the short-term timeframe. In the unlikely event that fuel remains onsite into the long-term and indefinite timeframes, the associated impact ranges in NUREG-2157 reflect the accordingly greater uncertainties regarding the potential impacts over these very long periods of time. The NRC staff finds that the impact determinations for at-reactor storage from NUREG-2157 do not change the staff's assessment of the potential environmental impacts from the proposed expansion of the PI ISFSI storage capacity.

5.0 AGENCIES AND PERSONS CONSULTED

The NRC staff consulted with other agencies regarding the proposed action in accordance with NUREG-1748 (NRC, 2003). These consultations were undertaken to (1) assure that the requirements of Section 7 of the ESA of 1973 and Section 106 of the NHPA of 1966, as amended, were met, and (2) provide the designated federal and state liaison agencies the opportunity to comment on the proposed action. The NRC staff also contacted the City of Red Wing and the Minnesota Department of Natural Resources (MN DNR), Division of Ecological Resources, both via letters dated December 17, 2019, (NRC, 2019g, 2019h) requesting information about the proposed action.

5.1 National Historic Preservation Act

The NHPA was enacted to create a national historic preservation program, including the National Register of Historic Places and the Advisory Council on Historic Preservation. Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties. NHPA implementing regulations at 36 CFR 800, "Protection of Historic Properties," define an undertaking as "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license, or approval." Therefore, the NRC's approval of this proposed LAR constitutes a federal undertaking. Following review of NSPM identification and evaluation efforts the NRC staff determined the proposed LAR does not have the potential to affect historic properties because there are no historic properties present.

The NRC staff contacted the Minnesota (MN) SHPO by letter dated December 17, 2019 (NRC, 2019c). The MN SHPO responded by letter dated January 24, 2020, (MN SHPO, 2020a) indicating that they needed project details clarified before concurring with a no affects determination. The NRC staff called the MN SHPO to discuss the needed clarification. An additional letter was sent on May 28, 2020, (NRC, 2020) following consultation with the PIIC and notification of regional Native American Tribes, as requested by the MN SHPO. The MN SHPO responded on August 8, 2020 and concurred with the NRC's finding that no historic properties will be affected by the federal undertaking, as it is currently defined (MN SHPO, 2020b). The NRC staff also notified the PIIC, as well as 26 Native American Tribes (Yankton Sioux Tribe; Winnebago Tribe; White Earth Nation of Minnesota Chippewa; Upper Sioux; Turtle Mountain Band of Chippewa; Three Affiliated Tribes; St. Croix Chippewa Indians of Wisconsin; Standing Rock Sioux Tribe; Spirit Lake Tribe of Fort Totten; Sisseton-Wahpeton Oyate; Santee Sioux Tribe of Nebraska; Rosebud Sioux Tribe; Shakopee Mdewakanton Sioux; Bois Forte Band of Chippewa; Cheyenne River Sioux Tribe; Crow Creek Sioux Tribe; Flandreau-Santee Sioux Tribe; Fond Du Lac Band of Lake Superior Chippewa; Grand Portage Band of Lake Superior Chippewa; Ho-Chunk; Leech Lake Band of Ojibwe; Lower Brule Sioux Tribe; Lower Sioux Indian Community; Mille Lac Band Ojibwe; Oglala Sioux Tribe; Red Lake Band of Chippewa Indians) by letters on December 19, 2019 (NRC, 2019d). A letter dated January 28, 2020, was received from the Shakopee Mdewakanton Sioux Community, who concurred that "the proposed ISFSI (expansion) does not have the potential to cause effects to historic or cultural properties in the immediate area of the proposed site" (Shakopee Mdewakanton Sioux, 2020).

A letter dated January 17, 2020, was received from the PIIC, who stated that they “are in agreement with NRC staff’s determination that the proposed PI ISFSI expansion does not have the potential to cause effects to historic or cultural properties in the immediate area of the proposed ISFSI expansion.” (PIIC, 2020). The NRC staff coordinated a review for the draft EA with the PIIC. On April 22, 2020, the PIIC tribal representative and NRC staff held a writing session via WebEx to discuss PIIC comments on the draft EA. During the meeting, comments and changes to the draft EA were discussed and drafted, and are incorporated into this EA.

5.2 The Endangered Species Act

Under Section 7 of the ESA and through its implementing regulations (50 CFR 402, Subpart B), prior to taking a proposed action, a federal agency must determine whether (1) endangered and threatened species or their critical habitats are known to be in the vicinity of the proposed action. and, if so, whether (2) the proposed federal action may affect listed species or critical habitats. If the proposed action may affect listed species or critical habitats, the federal agency is required to consult with the FWS and/or the U.S. National Marine Fisheries Service. The FWS has instituted a process that streamlines their environmental review process. The FWS implemented a web-based project planning tool, called IPaC. The IPaC tool provides information to federal agencies, state agencies, and the public to assist in the assessment of how proposed federal activities may affect sensitive natural resources, and when appropriate, suggests ways to address these impacts. After a federal agency uses the IPaC website process, the local FWS office issues a letter to assist the agency’s evaluation of the project’s potential impacts on threatened and endangered species and critical habitats within the project area. A project-specific official species list is attached to the letter. The project-specific list identifies the species and critical habitats that should be considered under ESA Section 7.

The NRC staff used the FWS’s IPaC website to obtain an official species list for the PI ISFSI area (FWS, 2019). Table 5-1 lists species that may be present in the area of the proposed action.

Table 5-1. Listed Species that May Be Present in the Area of the PINGP

	Name	Status
Mammals	Northern Long-eared Bat	Threatened
Clams	Higgins Eye	Endangered
	Sheepnose Mussel	Endangered
	Snuffbox Mussel	Endangered
Flowering Plants	Prairie Bush-clover	Threatened
Critical habitats	NONE	

The NRC staff, with the assistance of the IPaC project planning tool, determined that listed species and/or critical habitat would not be adversely affected by the proposed action. Although, the NRC’s approval of the proposed action would result in new construction activities and land disturbance, the area is part of an already disturbed industrial area and no threatened and endangered species are known to inhabit the area, nor is any critical habitat present. In December 2019, the NRC staff reached out to the Minnesota-Wisconsin Ecological Services Field Office of the FWS regarding the potential effects that the proposed action could have on the ecology, particularly on endangered and threatened species (NRC, 2019b). A representative from the FWS said that, based on the project description and given that the

proposed license amendment would involve construction on previously disturbed land that would not be a suitable habitat for threatened, endangered, or special status species, formal consultation with the FWS would not be needed. The FWS's representative went on to say that based on information gathered from IPaC, the NRC staff are in a position to make a no effects determination without concurrence from the FWS (NRC, 2019b). Therefore, the NRC staff concludes that the proposed action will have no effect on listed species or habitat.

5.3 Minnesota State Agencies and the Environmental Protection Agency's Review and Comments

The NRC staff provided a copy of the draft EA and draft FONSI to the MDH for review and comment. At the request of the Minnesota Environmental Quality Board, Minnesota Department of Commerce, MPCA, MN DNR, and the EPA Region 5, the NRC staff also provided them a copy of the draft EA and draft FONSI for review and comment.

A representative from EPA Region 5 responded via email that the EPA had no comments on the draft EA (EPA, 2020). Similarly, a representative from the MPCA responded via letter that the MPCA had no comments on the draft EA (MPCA, 2020).

A joint comment letter from the MDC and MDH provided comments concerning the information used to identify environmental justice populations of interest (MN Department of Commerce and MN Department of Health, 2020). In response to these comments, the NRC staff updated Section 4.12 of the EA to include additional U.S. Census data published in the 2017 American Community Survey (USCB, 2019) used to identify environmental justice populations of interest, and clarified the information was considered consistent with the NRC's policy statement on the treatment of environmental justice matters (69 FR 52040).

The MN DNR raised questions about the potential for large-scale flooding, the "evaluation of important long-term safety structures such as these containment sites located so close to the Mississippi River," and the characteristics of the earthen berm that surrounds the ISFSI. The MN DNR recommended further consideration on these topics (MN DNR, 2020). The NRC staff updated Sections 3.4 and 4.4 of the EA by incorporating and referencing the NRC's previous safety evaluation report discussing the NSPM's evaluations of accidents and events (NRC, 2010) and NSPM's PI ISFSI license renewal application and safety analysis report, Rev. 4 (NSPM, 2011a, NSPM, 2011b, respectively).

In addition to considering environmental effects of federal actions, the NRC staff conducts a safety review of proposed licensing actions. The NRC's safety review examines the proposed location, design, and operations of the ISFSI to determine compliance with NRC's regulations. The safety review analyzes the detailed characteristics of the site to identify and evaluate natural phenomena (e.g., earthquakes, storms, etc.) and man-made hazards (from activities at the site or at nearby industrial or commercial operations), which are likely to occur. The NRC staff is currently completing its safety evaluation report on the proposed PI ISFSI expansion.

6.0 CONCLUSION AND FINDING OF NO SIGNIFICANT IMPACT

Based on its review of the proposed action, in accordance with the requirements of 10 CFR 51, the NRC staff has determined that amendment of NRC license SNM-2506, authorizing expansion of the PI ISFSI to accommodate an additional 16 casks, would not significantly affect the quality of the human environment. In its LAR, NSPM commits to following their CRMP during all ground-disturbing expansion activities. Approval of the proposed action is not expected to result in new construction or expansion beyond the existing ISFSI footprint. The ISFSI is a passive facility that produces no liquid or gaseous effluents. Therefore, no significant radiological or nonradiological impacts are expected from the expansion or continued normal operations. Occupational dose estimates associated with expansion, continued normal operation, and maintenance of the ISFSI are expected to be at ALARA levels and within the regulatory limits of 10 CFR 20.1201.

The NRC staff determined that under 10 CFR 51.31, the preparation of an environmental impact statement is not required for the proposed action and that a FONSI is appropriate under 10 CFR 51.32.

7.0 LIST OF PREPARERS

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