Final Supplemental Environmental Assessment for the Nemadji Trail Energy Center Project

Dairyland Power Cooperative

USDA Rural Utilities Service

December 2023

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
2023 Interim CEQ GHG Guidance	National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change
111B rules	New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units
111D rules	Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule
ATC	American Transmission Company
BACT	Best Available Control Technology
Basin	Basin Electric Power Cooperative
BMP	best management practice
Btu	British thermal unit
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CAA	Clean Air Act
CCGT	combined cycle gas turbine
CCS	carbon capture and sequestration/storage
CCUS	carbon capture utilization and storage
CEM	Continuous Emissions Monitoring System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COP21	United Nations Framework Convention on Climate Change
CPCN	Certificate of Public Convenience and Necessity
Dairyland	Dairyland Power Cooperative
DATCP	Department of Agriculture, Trade and Consumer Protection
EA	Environmental Assessment
EO	Executive Order
EPA	United States Environmental Protection Agency
FONSI	Finding of No Significant Impact
FR	Federal Register
GHGs	greenhouse gases
GWPs	global warming potentials

Abbreviation	Term/Phrase/Name
HFCs	hydrofluorocarbons
HRSG	heat recovery steam generator
HSP	Health and Safety Plan
IEC	International Electrotechnical Commission
IIJA	Infrastructure Investment and Jobs Act
IRA	Inflation Reduction Act
IWG	Interagency Working Group
kV	kilovolt
LDAR	leak detection and repair programs
LTRA	Long Term Reliability Assessment
MCEA	Minnesota Center for Environmental Advocacy
MISO	Midcontinent Independent System Operator
MMIWR	Missing and Murdered Indigenous Women and Relatives
MP	Minnesota Power
MTEP	MISO's Transmission Expansion Plan
MW	megawatt
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Grave Protection and Repatriation Act
NDC	nationally determined contribution
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants and Maximum Achievable Control Technology
NHPA	National Historic Preservation Act
NLEB	northern long-eared bat
NPS	National Park Service
NR	Natural Resources
NRCO	National Renewable Cooperative Organization
NRHP	National Register of Historic Places
NTEC	Nemadji Trail Energy Center
NTECEA	NTEC EA published in October 2020
OSHA	Occupational Safety and Health Administration
Owners	Dairyland Power Cooperative, Nemadji River Generations, LLC, and South Shore Energy, LLC
PFCs	perfluorocarbons

Abbreviation	Term/Phrase/Name
Project	one-on-one combined cycle natural gas turbine and associated facilities
PROMOD	ABB's PROMOD IV
PSCW	Public Service Commission of Wisconsin
PSD	Prevention of Significant Deterioration
PTE	potential to emit
RD	Rural Development
RFP	Request for Proposal
ROW	right of way
RSEA	Revised Supplemental Environmental Assessment
RUS	Rural Utilities Service
SEA	Supplemental EA
SC-CH_4	social cost of methane
SC-CO_2	social cost of carbon
SC-GHG	social cost of greenhouse gases
SC-N_2O	social cost of nitrous oxide
SCR	selective catalytic reduction
SF_6	sulfur hexafluoride
Siting Study	Site selection study to identify and evaluate potential Project sites
SHPO	State Historic Preservation Office
SPCC	Spill Prevention, Control, and Countermeasures
SSE	South Shore Energy, LLC.
STG	steam turbine generator
SWL&P	Superior Water Light & Power
SWPPP	Storm Water Pollution Prevention Plan
TCP	traditional cultural property
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
USDA	U.S. Department of Agriculture
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
WAC	Wisconsin Administrative Code
WisDOT	Wisconsin Department of Transportation
WDNR	Wisconsin Department of Natural Resources
WHS	Wisconsin Historical Society

1.0 PURPOSE AND NEED

1.1 Overview

In 2020, an Environmental Assessment (EA) was published for the Project (the "NTECEA"). A Finding of No Significant Impact (FONSI) was published in June 2021 which concluded the U.S. Department of Agriculture (USDA) Rural Utilities Service (RUS) environmental review process in accordance with National Environmental Policy Act of 1969 (NEPA) and Rural Development's (RD) Environmental Policies and Procedures (7 Code of Federal Regulations [CFR] Part 1970). On June 23, 2021, RUS received a petition from the Minnesota Center for Environmental Advocacy (MCEA), Sierra Club Environmental Law Program, Clean Wisconsin, and Honor the Earth to rescind the FONSI and to prepare a Supplemental EA (SEA) to include an analysis of greenhouse gas (GHG) emissions, climate change, and tribal environmental justice. The draft SEA was published in June 2022. Following publication of the SEA, comments were received from U.S. Environmental Protection Agency (EPA) as well as the Midcontinent Independent System Operator (MISO), MCEA, Sierra Club, Clean Wisconsin, Honor the Earth, and the public. A Revised Supplemental Environmental Assessment (the "RSEA") provides additional information to address comments received. The following is the Final SEA to incorporate edits received after the RSEA was published. See Section 1.3 for a complete NEPA history on the Project. The NTECEA, SEA, and RSEA are incorporated herein unless otherwise noted. Information from these previous documents is included or summarized in this Final SEA as appropriate. Additionally, the format of this Final SEA is generally consistent with the format of the previous SEA and RSEA; however, minor adjustments have been made in order to incorporate additional analysis and respond to comments.

Dairyland Power Cooperative (Dairyland) is proposing to participate with South Shore Energy, LLC (SSE), a subsidiary of ALLETE, Inc., and Nemadji River Generation, LLC, a subsidiary of Basin Electric Power Cooperative (Basin Electric) (together the "Owners"), in a one-on-one combined cycle natural gas turbine (CCGT) with an in-service date in 2028.

1.2 Purpose and Need for Federal Action

Dairyland intends to request financing from RUS under its Electric Loan Program for its share of the Project. The Secretary of Agriculture is authorized under the Rural Electrification Act of 1936, as amended) to provide Federal loans for rural electrification and telecommunication development (7 U.S.C. 901 et seq.). Specifically, RUS is authorized to provide funding or loan guarantees for the construction of electric distribution and transmission, as well as generation facilities, to provide and to improve electric service in rural areas of the U.S.

The proposed Federal Action is for RUS to decide whether to provide financing to Dairyland for Dairyland's portion of the Project.

1.3 Proposed Action

The Project includes a fired output of approximately 625 megawatt (MW) 1x1 CCGT electric generating unit consisting of one H-Class gas turbine generator, one heat recovery steam generator (HRSG) with duct firing, and one steam turbine generator (STG). NTEC will burn natural gas with the capability to be retrofitted to use fuel oil as a backup fuel. NTEC will be between approximately 26 acres to 75 acres, depending on the site selected for the Project, and would be located near Superior, Wisconsin. A general simulation of the Project is shown in Figure 1-1. The Project will be cooled using dry cooling by finned heat exchangers. The Project will include a 345-kilovolt (kV) transmission line tap at the existing Arrowhead to Stone Lake Transmission Line as well as a switching station located southeast of the potential plant sites. This transmission line will be between approximately 3.7 miles to 7.1 miles, depending on the site selected and constructed.

Figure 1-1: Nemadji Trail Energy Center

For a dry cooling heat rejection system, cooling would be provided by the following:

- A large-finned heat exchanger with fans (fin fan heat exchanger) moving ambient air across the outside of the tubes and fins (like a radiator in a car) would be used to reject the energy in the steam leaving the steam turbine.
- A separate, finned heat exchanger with fans would be used to reject the energy in the heat transfer fluid used in the auxiliary cooling loop. This auxiliary cooling loop is used for miscellaneous plant cooling duties such as lube oil cooling, compressed air cooling, generator cooling, and other similar duties associated with heat generated in equipment during operation.
- A third, finned heat exchanger with fans may also be included to cool the blown down water from the HRSG to acceptable limits for the process wastewater discharge for the facility.

The Project has been designed to account for foreseeable events, including severe weather, that may occur as a result of climate change. To this extent, the Project will be built above grade, except for foundations, some below grade duct bank, and below grade piping. No permeable pavement is planned. The Project required transmission line will co-locate along an existing transmission line to use existing access as much as possible, thus avoiding new stream crossings. Further, the Project, in accordance with RUS requirements, would be located outside 500-yr floodplains, based upon current (2012) FEMA flood maps. The existing stormwater pond onsite is to be expanded in place to accommodate NTEC. Stormwater would be collected and directed to this stormwater detention pond located near the southwestern boundary of the site. The existing pond discharges via underground pipe to the Nemadji River and would be expanded to attenuate the increase in runoff volume from Project construction. Dairyland is required to prepare and submit Erosion Control and Stormwater Management Plans (ECSWMPs) to the Wisconsin Department of Natural Resources (WDNR) for approval prior to construction. The ECSWMPs will address best management practices (BMPs) for activities within floodplains. Dairyland and the contractors will be required to implement and comply with any WDNR BMPs required and approved for floodplains as part of these plans.

Dairyland is required by its loan contract with RUS to use qualified contractors and good utility practice to design, build, and operate its facilities. The Project has been designed to be operational in all reasonably expected extreme weather conditions. It will be designed and constructed with the capability to operate any day of the year and to meet all reliability requirements during extreme weather events. For example, the Project will be capable of maintaining compliance with all North American Electric Reliability (NERC) standards for operation during all expected weather conditions, including NERC standard EOP-011-01 and its likely successor EOP-011-02, which set forth Emergency Preparedness and Operations standards for generator owners and were promulgated to address extreme weather and climate change. Further, the Project will be designed using current American Society of Heating, Refrigerating

and Air-Conditioning Engineers (ASHRAE) industry standards to operate for 365 days a year under a variety of climatic and weather conditions, including heat waves, thunderstorms, high wind events, ice, and heavy snowfall. Design will account for extreme weather conditions, due to the location of the Project in northern Wisconsin. The use of dry cooling negates the need to use an external water source to operate the facility and would avoid the formation of rime ice and fogging often associated with wet cooling under certain climatic conditions. Additionally, the NTEC facility will be enclosed in a building, which will help protect the facility from climatic conditions. Disturbance to areas outside the Project footprint will be limited and current vegetation outside the footprint will be left undisturbed. As appropriate, disturbed areas within the Project footprint will be revegetated.

Likewise, the electric transmission line for the Project will be designed using National Electric Safety Code (NESC) standards or better to withstand extreme weather conditions and to provide reliability. Transmission facilities are proposed to be co-located with existing transmission lines to minimize impacts on surrounding areas and to utilize existing access as practicable and feasible.

1.4 Project NEPA History and Reason for a Supplemental EA

Dairyland intends to request financial assistance from the USDA RUS under its Electric Loan Program for its share of the Project, thereby making the proposed project a Federal action subject to the NEPA, as amended (42 United States Code [U.S.C.] § 4321 et seq.) and the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 CFR Parts 1500-1508), and RD NEPA implementing regulations, Environmental Policies and Procedures (7 CFR Part 1970). Consistent with 7 CFR §1970.3(b)(iv)(C), Dairyland prepared environmental documentation that described the Project in detail and discusses its anticipated environmental impacts. RUS concurred with its scope and content. In accordance with 7 CFR § 1970.102(6), RUS adopted the report and issued it as the agency's EA for the proposed Project (NTECEA).

Dairyland published two notices, on October 30 and November 6, 2020, in a local newspaper, announcing the availability of the EA for a 30-day public review period, in accordance with 7 CFR §1970.102(6)(ii). The public review period ended on November 30, 2020. In accordance with NEPA, as amended (42 U.S.C. 4321 et seq.), the CEQ Regulations (40 CFR 1500–1508), and RD's Environmental Policies and Procedures (7 CFR Part 1970), RUS determined that the environmental effects of the proposed Project had been adequately addressed and that no significant impacts to the quality of the human environment would result from construction and operation of the proposed Project. Because RUS' action will not result in significant impacts to the quality of the human environment, an Environmental Impact Statement was not prepared for the Project. The Preferred Alternative was the Nemadji River 1 Alternative, consisting of

the Nemadji River plant site and the eastern transmission line macro-corridor. RUS also recognized the Public Service Commission of Wisconsin (PSCW) previously approved this alternative, confirming the site could be permitted and would minimize environmental impacts through Project design and mitigation measures imposed as part of permit conditions. A FONSI was published in June 2021 which concluded RUS' environmental review process in accordance with NEPA and RD's Environmental Policies and Procedures (7 CFR Part 1970).

On June 23, 2021, RUS received a petition from the Minnesota Center for Environmental Advocacy, Sierra Club Environmental Law Program, Clean Wisconsin, and Honor the Earth to rescind the FONSI and to prepare an SEA to include an analysis of GHG emissions, climate change, and tribal environmental justice. The petition stated that new studies related to climate change should be taken into account in the evaluation of the Project. The petition also noted that recently reinstated CEQ guidance requires agencies to evaluate GHG emissions and climate impacts (Executive Order [EO] 13990). This guidance was reinstated shortly after the NTECEA and FONSI were published. The petition also referenced EO 14008, which discourages fossil fuel infrastructure. RUS agreed that further analysis of the potential environmental impacts of the Proposed Action was warranted and a SEA would be prepared to take into account recent pathway studies outlined in the petition, as well as applicable EOs and reinstated CEQ guidance. The SEA was published in June 2022.

Following publication of the SEA, comments were received from EPA as well as MISO, the MCEA, Sierra Club, Clean Wisconsin, Honor the Earth, and the public (Appendix A). The following document RSEA has been prepared to revise the SEA and RSEA to address the comments received on the SEA and RSEA.[1] The RSEA and this Final SEA includes additional discussion and analysis responsive to the comments received. Most notably:

- A Social Cost of Carbon analysis has been conducted and is detailed in Section 3.2.2.1.3.1
- Upstream impacts are discussed in Section 3.2.2.1.3.2.
- The environmental justice analysis from the NTECEA was updated using EJSCREEN 2.0 (Section 3.3.1.4.)
- Appendix A provides comments received on the SEA as well as responses to comments received.

Further, at the time of the SEA publication, the document was prepared following the CEQ Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of

[1] The SEA was supplemental to the NTECEA, as is the RSEA. The NTECEA is incorporated herein unless otherwise noted.

Climate Change in National Environmental Policy Act Reviews (August 2016). In January 2023 CEQ issued revised interim guidance with the messaging that the guidance was effective immediately. As such, and consistent with discussions with EPA during this NEPA process, this Final RSEA specifically to consider the National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (CEQ 2023; referred to herein as the 2023 Interim CEQ GHG Guidance).

1.5 Profile of Owners

The Project includes the participation of SSE, Dairyland, and Basin Electric. As outlined in detail in the NTECEA, Dairyland is a generation and transmission cooperative, headquartered in La Crosse, Wisconsin, serving approximately 600,000 customers in four states – Wisconsin, Minnesota, Iowa, and Illinois (Dairyland, 2023; Figure 1-2) through its 24 member cooperative systems and serves 27 municipal customers in the Upper Midwest (Wisconsin, Iowa, Illinois and Minnesota). Dairyland and its members are part of a larger group of Touchstone Energy Cooperatives that work together to find innovative energy solutions and educate consumers about energy efficiency, safety, renewable energy, the cooperative business model, and the value of electricity.

SSE is a subsidiary of ALLETE, Inc., and Minnesota Power[2] (MP) is a division of ALLETE, Inc. SSE has taken over as an Owner since completion of initial studies by MP. SSE is not a rural electric cooperative and therefore not regulated by the USDA-RUS.

Since completion of the NTECEA and issuance of the FONSI, Basin Electric has joined with Dairyland and SSE in the Project. Basin Electric, established in 1961 and headquartered in Bismarck, North Dakota, is one of the largest electric generation and transmission cooperatives in the United States. Basin Electric's core business is generating and transmitting wholesale bulk electric power to customers, which primarily consist of 131 member cooperatives located in nine states. Basin Electric's service territory spans 550,000 square miles in the central United States from the Canadian border to Mexico, including parts of Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming (Figure 1-3). Basin Electric's member cooperatives distribute electricity to about 3 million consumers. Basin Electric owns 2,526 miles and maintains 2,565 miles of high-voltage transmission lines, owns and maintains substation equipment in 89 locations, and has equipment ownership in 16 additional locations. Basin Electric also owns and maintains telecommunications equipment at 224 telecommunication sites (Basin Electric, 2023). Although a rural electric cooperative, Basin Electric is no

[2] MP is a division of ALLETE, Inc. As discussed in Section 1.3 of the NTECEA, MP was a partner in initial studies for the Project. Since the conclusion of initial studies, SSE has taken over as Owner with Dairyland.

longer regulated by USDA-RUS, having bought out of the USDA electric program in 2015. Nemadji River Generation, LLC, is a subsidiary of Basin Electric.

Figure 1-2: Dairyland Cooperative and Minnesota Power Service Areas

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA_SuppplementalEA\1_2_ServiceAreas.mxd kasamuelson 1/28/2022
Service Layer Credits: Sources: Esri, Garmin, USGS, NPS

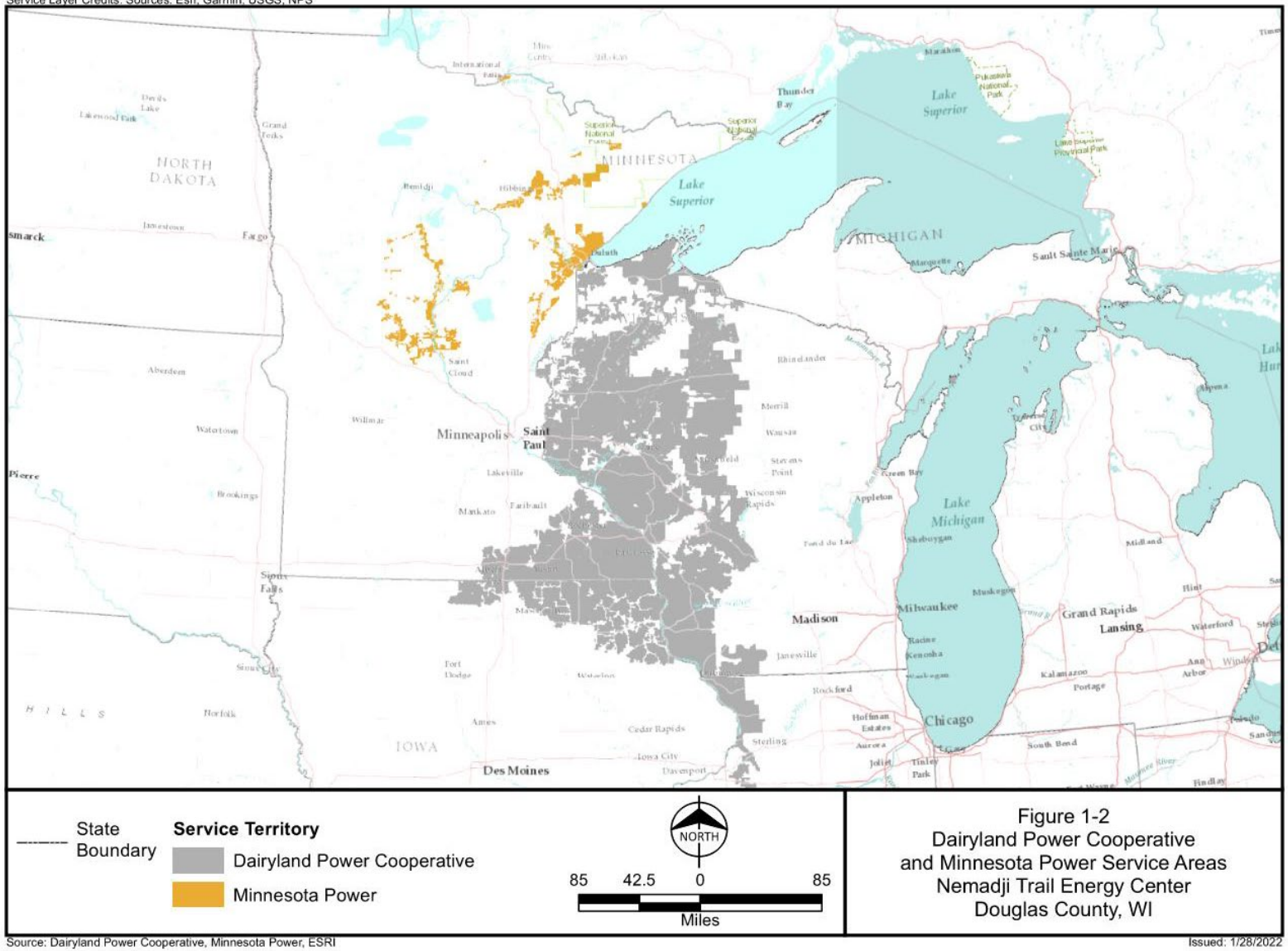
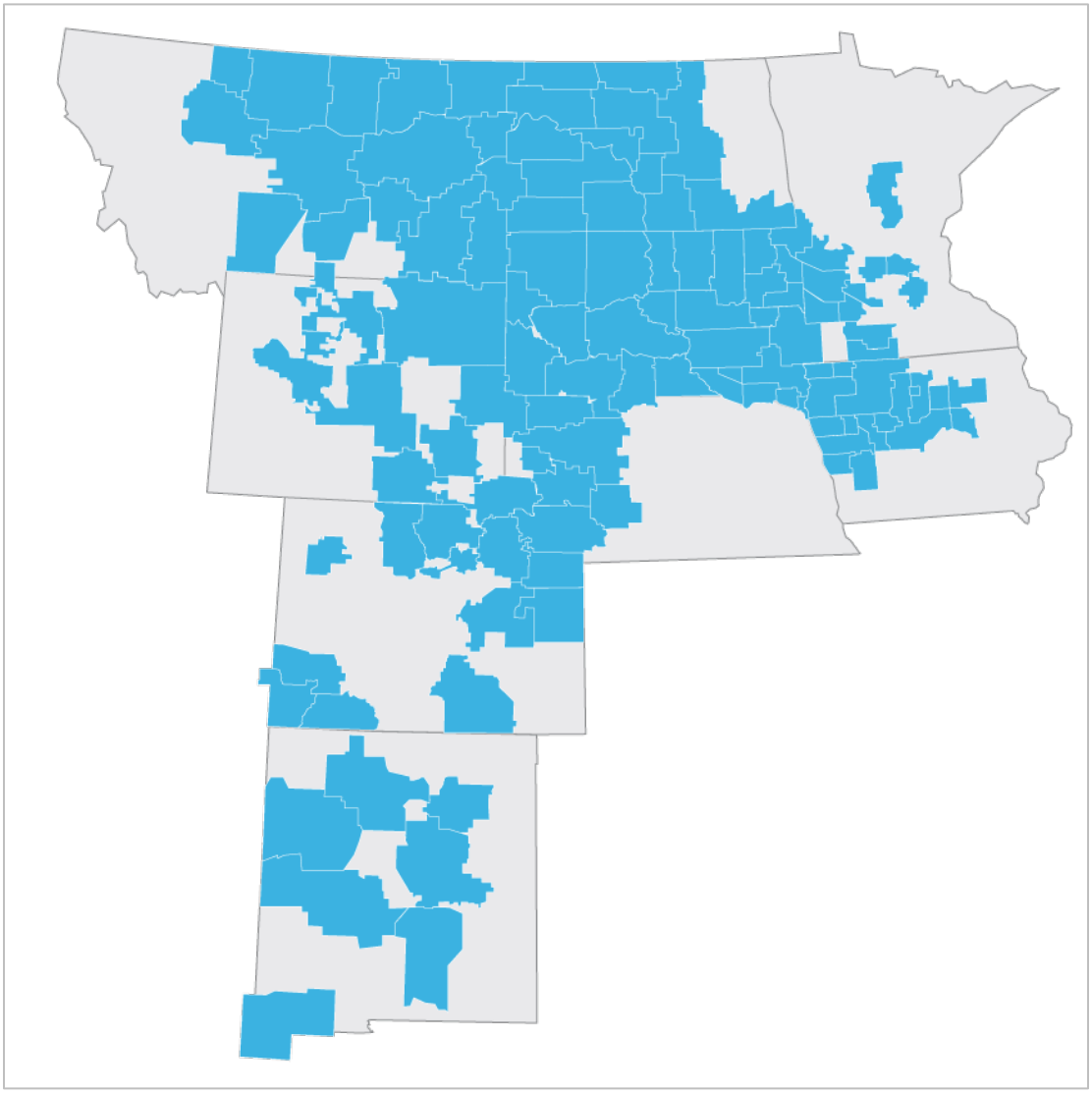


Figure 1-2
Dairyland Power Cooperative
and Minnesota Power Service Areas
Nemadji Trail Energy Center
Douglas County, WI

Source: Dairyland Power Cooperative, Minnesota Power, ESRI

Issued: 1/28/2022

Figure 1-3: Basin Electric Service Area



1.6 Purpose and Need for the Proposed Project

The Secretary of Agriculture is authorized under the Rural Electrification Act of 1936, as amended) to provide Federal loans for rural electrification and telecommunication development (7 U.S.C. 901 et seq.). Dairyland intends to seek Project funding under this program. Dairyland has conducted an extensive round of resource planning activities culminating in a Sustainable Generation Plan. A key component of the Plan is a share[3] of a highly efficient, state of the art, one-on-one combined cycle plant named the

[3] Dairyland's share in the facility will ultimately be determined by the size of the turbine selected and the additional generation needs Dairyland identifies. However, it is currently anticipated Dairyland's share in the facility will be approximately 50 percent, Basin Electric's share will be 30 percent, and SSE's share will be 20 percent.

Nemadji Trail Energy Center (NTEC or the Project). The NTEC facility is a cornerstone enabling Dairyland's Sustainable Generation Plan which features renewable energy sources. This Project will be designed to be highly flexible and capable of operating at intermediate load modes to fulfill both energy and capacity requirements for Dairyland to support the addition of renewable resources. The Project will also help address the 1,230 MW shortfall identified by the Midcontinent Independent System Operator[4] (MISO) to meet the planning reserve margin, a reserve necessary in the event of unplanned outages (MISO, 2022a).

From a resource planning perspective, Dairyland needs to secure capacity and energy resources that meet the system peak and demand for electricity for the years to come. This includes accounting for required system reserve margins in the MISO and covering Dairyland's forecasted losses to ensure reliability and resource adequacy during unforeseen events such as uncertainties in extreme weather and forced outages for generators. Dairyland needs to add new generating capacity to the current resource mix to serve growing load within the service territories that the member cooperatives serve (including the newly acquired member cooperative load of approximately 175 MW, in Minnesota and Illinois, from Interstate Power and Light) and to replace generation that was recently retired. The addition of the NTEC will also enable Dairyland to facilitate the addition of new renewable electricity sources to the power portfolio by complementing their intermittent nature.

The Owners are tasked with providing reliable and affordable electricity. NERC's most recent Long-Term Reliability Assessment warns that the MISO region faces a "high risk" of resource adequacy shortfalls from 2023-27, in part because generation retirements are outpacing replacement capacity. NERC's director of reliability assessment and performance analysis was quoted as saying that "[m]anaging the pace of our generation retirements and our resource changes to ensure we have enough energy and essential services is an absolute must" (Walton, 2022). NERC concluded that MISO faces a 1,300 MW shortfall beginning in Summer 2023, which continues to grow throughout the 10-year assessment period, and MISO has affirmed that the NERC assessment is consistent with its own analysis (Walton, 2022). NERC's Long Term Reliability Assessment (LTRA) states (NERC, 2022):

[4] MISO is an independent, not-for-profit RTO that does not own generation or transmission facilities. MISO became the nation's first RTO approved by FERC in 2001. The purpose of MISO is strictly to manage the generation and flow of electricity throughout its footprint. MISO manages approximately 72,000 miles of transmission lines across 15 U.S. states and the Canadian province of Manitoba. There are 58 registered transmission-owning members and 134 registered non-transmission-owning members in MISO. Per MISO, "45 million people depend on MISO to generate and transmit the right amount of electricity every minute of every day – reliability, dependably, and cost-effectively." (https://www.misoenergy.org/about/)

- "In the Midcontinent Independent System Operator (MISO) area, the previously-reported reserve margin shortfall has advanced by one year, resulting in a 1,300 MW capacity deficit for the summer of 2023. The projected shortfall continues an accelerating trend since both the 2020 LTRA and the 2021 LTRA as older coal, nuclear, and natural gas generation exit the system faster than replacement resources are connecting."
- "Natural gas is an essential fuel for electricity generation that bridges the reliability needs of the BPS during this period of energy transition."
- "MISO is facing resource shortfalls across this entire assessment period."

Separately, MISO explains: "Our studies indicate that our region needs a certain level of dispatchable and flexible resources to reliably manage the transition to the decarbonized energy sector that many of our members and states are pursuing" (Hansen, 2022). Specifically with respect to this Project, MISO explained: "MISO fully supports not only the development of new energy projects, but the orderly transition of existing resources to ensure short- and long-term grid reliability and prevent future resource inadequacies in the MISO region. For these reasons, MISO requests RUS, as it considers the NTEC Project, consider grid reliability and the role that the NTEC Project could play in resource adequacy." [5]

The shortfalls predicted by NERC and MISO should not be expected to resolve in the next couple years, particularly given that coal retirements are scheduled to continue to accelerate. The Project plays a critical role in that transition.

The NTECEA provides further discussion of Dairyland's purpose and need for this Project.

1.6.1 Dairyland's Need for Transition to Renewable Energy Generation

Renewable electrical energy sources are a cornerstone of Dairyland's Sustainable Generation Plan. Federal and state energy initiatives are focused on reductions in energy generation, and associated emissions, from coal-fueled systems and an increase in electricity generation from renewable sources. These initiatives are intended to decrease emissions of various gases linked to potential climate change. Known as GHGs, these substances have the potential to influence the warming and cooling mechanisms of the earth.

[5] Comments from MISO Regarding the Nemadji Trail Energy Center Project in Douglas County, Wisconsin and the Need for Grid Reliability (July 25, 2022), available at https://www.wpr.org/sites/default/files/july_25_2022_miso_comments_to_usda_re_ntec_project_4875-4970-0139.v1-c.pdf (last accessed Apr. 21, 2023).

Multiple initiatives, EOs, and other directives have provided options for reducing GHG emissions. Though these directives do not regulate GHG emissions, they provide a framework for limiting global temperature rise. These initiatives are discussed in the following sections.

1.6.1.1 Global Initiatives

Parties to the United Nations Framework Convention on Climate Change (COP21), which included the United States, reached a landmark agreement on December 12, 2015, referred to as the Paris Agreement. The central aim of the Paris Agreement is to keep global temperature rise well below 2 degrees Celsius above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5 degrees Celsius. A framework has been developed in order to reach these goals. Upon taking office on January 20, 2021, President Biden signed an EO to have the United States rejoin the Paris Agreement and the United States formally rejoined on February 19, 2021.

On November 13, 2021, the 2021 United Nations Climate Change Conference, more commonly referred to as COP26, concluded in Glasgow, Scotland. This was the first conference since the Paris Agreement of COP21 that expected parties to make enhanced commitments to mitigating climate change. The result of COP26 was the Glasgow Climate Pact. This Pact explicitly commits parties to reducing the use of coal and encourages more urgent cuts of GHG emissions as well as promises more climate finance for developing countries to adapt to impacts from climate change (COP26, 2021).

According to the terms of the Glasgow Climate Pact and numerous studies (Orvis, 2021, Hultman et al, 2021, and IEA, 2021), eliminating coal emissions in the U.S. is required to limit warming to no more than 1.5 degrees Celsius by 2100 to avoid catastrophic climate change impacts. Eliminating coal plant power emissions is a critical component in achieving near-term emissions reduction targets (approximately 51 percent reduction in GHG emissions by 2030) (Orvis, 2021, Hultman et al, 2021, and IEA, 2021). Studies have discussed a number of ways to achieve these targets, but a transition to zero-carbon energy is the main recommendation (Orvis, 2021, Hultman et al, 2021, and IEA, 2021).

1.6.1.2 Federal Initiatives

On April 2, 2007, the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act (CAA) and that the EPA has the authority to regulate GHGs in the Massachusetts v. U.S. EPA, 549 U.S. 497 decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the CAA:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O),

hydrofluorocarbons (HCFs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to GHG pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles. After a lengthy legal challenge, the United States Supreme Court declined to review an Appeals Court ruling upholding the EPA Administrator findings. While the United States does not have an overarching policy for GHG reduction, there are some GHG reduction regulations and tracking such as 40 CFR 98 Mandatory Greenhouse Gas Reporting, to which the Project will be subject.

EO 14008, *Tackling the Climate Crisis at Home and Abroad,* was signed by President Biden on January 27, 2021. The EO focuses on prioritizing climate in foreign policy and national security, and taking a government-wide approach to the climate crisis. The EO also establishes the National Climate Task Force, which "shall facilitate the organization and deployment of a Government-wide approach to combat the climate crisis. This Task Force shall facilitate planning and implementation of key Federal actions to reduce climate pollution; increase resilience to the impacts of climate change; protect public health; conserve our lands, waters, oceans, and biodiversity; deliver environmental justice; and spur well-paying union jobs and economic growth."

Section 209 of the EO states:

> The heads of agencies shall identify for the Director of the Office of Management and Budget and the National Climate Advisor any fossil fuel subsidies provided by their respective agencies, and then take steps to ensure that, to the extent consistent with applicable law, Federal funding is not directly subsidizing fossil fuels. The Director of the Office of Management and Budget shall seek, in coordination with the heads of agencies and the National Climate Advisor, to eliminate fossil fuel subsidies from the budget request for Fiscal Year 2022 and thereafter.

EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, was signed by President Biden on January 20, 2021. This EO directed the CEQ to rescind its draft guidance entitled *Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions* (84 Federal Register [FR] 30097). This previous draft guidance limited the consideration of long-term GHG emissions to expedite the NEPA process. The CEQ was also directed to review and

update its final guidance entitled *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (81 FR 51866). The CEQ is reviewing GHG guidance from 2016 to determine if any updates should be made. In the interim, Federal agencies are directed to consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions, including the previous GHG guidance from 2016. On January 9, 2023, CEQ published a non-binding, Interim National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (88 FR 1196) to assist Federal agencies in analyzing GHG emissions and climate change impacts from their proposed actions. With respect to on-going reviews, the guidance counsels that agencies should "exercise judgment when considering whether to apply this guidance to the extent practicable" and clarifies that agencies need not apply the guidance to "concluded NEPA reviews and actions for which a final EIS or EA has been issued." Among the guidance's key recommendations are to:

- quantify a proposed action's projected GHG emissions or reductions for the expected lifetime of the action;
- provide additional context for GHG emissions, including through the use of the best available social cost of GHG (SC-GHG) estimates;
- provide, where feasible, annual GHG emission increases or reductions; and
- use projected GHG emissions associated with proposed actions and their reasonable alternatives to help assess potential climate change effects and determine whether they will meet climate action goals and commitments.

In April 2021, President Biden announced a goal to cut GHG emissions by 50 to 52 percent below 2005 levels by 2030, a target which is the United States' "nationally determined contribution" or NDC, and has been formally submitted to the United National Framework Convention on Climate Change (White House, 2021). This goal also sets the US on a path to meet a net-zero 2050 goal as described in *The Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050* (U.S. Department of State and the United States Executive Office of the President, 2021). President Biden also announced a goal of 100 percent carbon pollution-free electricity by 2035. Clean energy deployment could be accelerated by "providing incentives and standards to reduce pollution from power plants; investing in technologies to increase the flexibility of the electricity system, such as transmission, energy efficiency, energy storage, smart and connected buildings, and non-emitting fuels; and leveraging carbon capture and sequestration/storage (CCS) and nuclear" (United States Department of State and the United States Executive Office of the President, 2021).

1.6.1.3 Wisconsin Initiatives

Governor Tony Evers of Wisconsin signed EO 38, *Relating to Clean Energy in Wisconsin*, on August 16, 2019. The EO established the Office of Sustainability and Clean Energy and charged the newly created office with the following:

a) In partnership with other state agencies and state utilities, achieve a goal of ensuring all electricity consumed within the State of Wisconsin is 100 percent carbon-free by 2050.
b) Ensure the State of Wisconsin is fulfilling the carbon reduction goals of the 2015 Paris Climate Accord.
c) Develop a clean energy plan to assist the State of Wisconsin in adapting to and mitigating the harm from climate change by using clean energy resources and technology. The Office of Sustainability and Clean Energy shall coordinate with the Department of Natural Resources, the Department of Transportation, the Public Service Commission, the Department of Agriculture, Trade and Consumer Protection (DATCP), other state agencies, Native Nations, local governments, utilities, businesses, and other stakeholders to develop and implement the clean energy plan.
d) Promote clean energy workforce training, in partnership with the University of Wisconsin System, Wisconsin Technical College System, private and non-profit workforce development programs and labor organizations, and the Wisconsin Manufacturing Extension Partnership.
e) Foster innovation, research, and business development within the renewable energy, energy efficiency and sustainability sectors.
f) Develop energy efficiency, sustainability and renewable energy standards for all new and existing state facilities, office buildings, and complexes.

In 2019, Governor Tony Evers signed EO 52, which created the Governor's Task Force on Climate Change. This task force published the *Governor's Task Force on Climate Change Report* (State of Wisconsin, 2020), which describes climate solutions for the State of Wisconsin to better adapt to and mitigate the effects of climate change. The report also discusses environmental justice and opportunities for renewable energy generation and resource conservation. The report includes Tier 2 proposals, which are options discussed during the task force's process, the public hearing, and public comment period. These Tier 2 proposals "merit further discussion and consideration outside the work of the task force" (State of Wisconsin, 2020). One proposal under the Tier 2 options was avoiding all new fossil fuel infrastructure, which would include:

- Avoiding all new fossil fuel infrastructure for electricity generation.
- Avoiding any new natural gas plants.
- Avoiding new pipelines. Oppose new or expanding infrastructure whose primary purpose is transporting fossil fuels through Wisconsin.

The report states (State of Wisconsin, 2020):

> Wisconsin cannot take meaningful climate action without bold action to reduce the use of fossil fuels and pivot to renewable energy. To stay within the Paris Agreement climate

> goals, we cannot build any new fossil fuel infrastructure, including infrastructure for the production and transportation of fossil fuels, such as wells, refineries, pipelines, and shipping terminals.

The report includes strategies for utility carbon-reduction goals. These strategies are (State of Wisconsin, 2020, p. 40):

- Establish carbon-reduction goals for utilities as follows:
  - By 2030, reduce net carbon emissions from the power sector to at least 60 percent below 2005 levels.
  - By 2050, reduce power sector net carbon emissions to 100 percent below 2005 levels.
- Utilities should be given flexibility in order to maintain reliable, resilient, and cost-effective infrastructure.

The report states that Wisconsin utilities "are on pace to reduce their aggregate emissions to 44 percent below 2005 levels by 2026, surpassing the 40 percent reduction target multiple providers had previously set for 2030" and that these projections did not include a coal plant retirement nor several renewable energy projects. The report also notes that "utilities may need some flexibility with their goals in order to maintain infrastructure that provides safe, reliable, and affordable energy and to allow for maintenance of grid stability" (State of Wisconsin, 2020, p. 40).

1.6.2 Natural Gas' Role in Transition to Renewable Resources

As a Wisconsin cooperative and due to the location of the Project in the state, efforts by Dairyland to reduce GHGs and incorporate more renewable generation into its portfolio will assist the State of Wisconsin in achieving its GHG reduction goals. Low natural gas prices are expected to accelerate the timeline of coal retirements (Orvis, 2021) and as a natural gas-fired power plant, the Project would contribute to this shift. At this point in time, gaps exist in the ability to rely upon 100 percent renewable power. Renewable energy such as solar and wind do not function as dispatchable energy sources due to the nature of the electricity generation being highly variable, both in duration and intensity (i.e., the sun shining or wind blowing during mostly daytime hours). Battery technology to store energy generated from renewables is improving and decreasing in cost, but it is not currently capable of meeting the electricity storage needs to meet system demand and load requirements. Therefore, flexible and reliable dispatchable power sources are necessary to close this gap, and high efficiency combined cycle natural gas-fired power plants meet this need better than any other dispatchable resource, while supporting the retirement of coal and reducing reliance on lower efficiency natural gas facilities to further drive GHG reductions in the near-term (EPRI, 2021). The Project will be designed to be highly flexible and capable

of operating in intermediate load modes to fulfill energy and capacity requirements alongside renewable additions until sufficient facilities and resources are developed to continue to provide reliable electric power throughout the Dairyland system. Additional discussion of the important role of natural gas generation in the energy transition is discussed in Section 1.5 above.

2.0 ALTERNATIVES

2.1 Introduction

Dairyland conducted detailed analysis and discussions with Dairyland Managers and Dairyland's Board of Directors through strategic planning sessions in the production of its preferred power supply plan over a 3-year period. Dairyland also conducted a study of self-build options along with potential NTEC participation. Dairyland conducted a request for proposals (RFP) from potential energy providers for capacity and energy on a long-term basis in MISO capacity zone 1 and 2. These proposals provided through the RFP included a variety of alternatives to meet Dairyland's supply needs, including:

- Coal
- Combustion turbines
- Combined cycle
- Reciprocating Engines
- Power Purchase Agreements

These alternatives varied widely in cost per annual MW hour, years of delivery, and MW provided. Cost ranged from $45,000 – $236,000/MW/year, and terms ranged from 3 – over 30 years. The various alternatives would provide from 10 to over 350 annual MW. These alternatives also included additional risks related to congestion and delivery, making it uncertain if these sources would be available when required. Dairyland determined none of these alternatives would be superior to participation in the NTEC Project, which would provide a very low energy cost, have a term life of at least 30 years, provide approximately 300 MW of dispatchable firm capacity, and minimize congestion, delivery and other risks.

In addition, Dairyland conducted discussions with developers and other cooperatives through the National Renewable Cooperative Organization (NRCO) to evaluate a wide range of options, including a multitude of renewable projects. The Dairyland study and planning effort culminated in the development of the Dairyland preferred power supply plan that strikes a balance between the need for accredited capacity in MISO zone 1, intermediate energy flexibility and numerous renewable resources. The plan was found by Dairyland's board to be the best course of action for Dairyland in this round of resource planning. The plan provides rate stability and reliability under a number of different future scenarios. Therefore, Dairyland decided to proceed with participation in the NTEC Project. Similarly, the PSCW also later concluded that renewable energy generation and battery storage are not alternatives to the Project. The PSCW reached this conclusion after considering expert testimony from its staff, the Owners, and opponents of the project. The PSCW found that the Owners credibly established that the project would

provide up to 625 MW of dispatchable generation to support the integration of renewable energy sources. The project will enhance system reliability because it will be able to ramp up and down very quickly, and that no higher priority options that could provide reliable and dispatchable generation were cost-effective and technically feasible. The expert testimony from the PSCW hearing also established that the proposed plant has significant advantages over batteries, which require recharge, limited duration, and shorter life cycles. Ultimately, the PSCW found that "there was ample testimony in the record to support a conclusion that the proposed project will facilitate deployment of such resources [non-combustible renewable energy resources], and that such resources alone could not provide the reliability benefits that are the target of this plant." [6]

The Project is included as a substantial resource in Dairyland's existing power supply plan, balancing the intermittent nature of renewable generation. Dairyland's Board of Directors, having evaluated the resource options available to Dairyland, authorized the pursuit of a share of the Project at its January 2016 board meeting.

Having determined to advance the NTEC project because it compared more favorably to other generation alternatives (including renewables and battery storage) for meeting the need for dispatchable generation to continue to reliably serve customers during the energy transition, MP[7] and Dairyland sought to evaluate potential alternative sites for a new generation project. Previously, a group of utilities serving the upper Midwest, particularly the states of Wisconsin, Minnesota, and North Dakota, conducted a site selection study (Siting Study) to identify and evaluate potential sites for the Project. The Siting Study included consideration of potential sites across the upper Midwest that could potentially be used for joint development of such a facility by multiple regional utilities. Specific sites would, therefore, be evaluated based on the site location, ability to serve the needs of the participating utilities, and capability of the facility to integrate into the systems of the participating utilities. The Siting Study identified several suitable sites throughout the upper Midwest that appeared to provide reasonable sites for the Project. MP and Dairyland were among the utilities with service territory over which the Siting Study was conducted and within which some sites were identified for potential future development. The objective of the Siting Study was to identify and evaluate potential sites for the future joint development and construction of the Project. MP and Dairyland reviewed this Siting Study in relation to this Project. While state siting requirements required supplemental analysis, in general, the Siting Study methodology remains valid. MP and Dairyland used the Siting Study as a substantial basis for the identification of alternative locations for

[6] PSCW. 2020. Final Decision Order on Docket 9698-CE-100.
[7] MP is a division of ALLETE, Inc. As discussed in Section 1.3, MP was a partner in initial studies for the Project. Since the conclusion of initial studies, SSE has taken over as Owner with Dairyland.

the Project. The following summarizes the overall Siting Study methodology and then focuses on those portions of the Siting Study applicable to the joint development of the Project by MP and Dairyland.

2.1.1 Siting Study Objectives

The objectives of the Siting Study were consistent with the requirements of Dairyland and MP for the Project. The proposed sites were to be capable of accommodating up to 900 MW of natural gas-fueled combined cycle generation, with 780 MW combined cycle gas turbine technology considered for the base case analysis. The objective of the overall Siting Study was to perform a desktop screening to identify a minimum of three potential plant sites and provide the information necessary for the utilities to focus and support subsequent site acquisition and permitting efforts.

2.1.2 Siting Study Area

A Siting Study Area was defined to include the MISO region at the time of the Siting Study as it extended through the states of North Dakota, Minnesota, and Wisconsin. The Siting Study Area boundary is identified in Figure 2-1.

2.1.3 Siting Study Methodology

The Siting Study was completed in several phases. A brief description of each phase of the site selection process is included below.

- Phase 1 – Identify Preliminary Site Areas: the first phase of the site selection process was to identify Preliminary Site Areas that were near high voltage transmission lines and major natural gas pipelines.
- Phase 2 – Identify Candidate Site Areas: Preliminary Site Areas were screened using readily available maps and aerial photographs to eliminate sites with obvious development constraints and to consolidate sites that were geographically or electrically similar to each other. The remaining sites were designated Candidate Site Areas.
- Phase 3 – Candidate Site Quantitative Analysis: Candidate Site Areas were quantitatively evaluated against several criteria organized into six major categories: transmission access, fuel delivery, water supply, environmental, air quality impacts, and site development. The results of the quantitative analysis were used to rank the sites in order from the most preferred site to the least preferred site.
- Phase 4 – Identify Preferred Site Areas: Results of the quantitative analysis were reviewed by the collective Project team and the six highest performing sites (identified at Preferred Site Areas) were selected for further consideration.

- Phase 5 – Transmission Analysis of Preferred Site Areas: Preferred Sites were subjected to a transmission load flow analysis to identify potential overloads on the transmission system caused by injecting power at each of the Preferred Sites. These results were incorporated in the scoring matrix and the Preferred Sites ranked relative to one another with scoring assessed in all categories, including transmission load flow.

The initial step in the site selection process was to identify Preliminary Site Areas within the Siting Study Area, analyze each Preliminary Site through a high-level desktop analysis, and identify Candidate Site Areas to carry forward for detailed analysis. Candidate Site Areas are general locations, which may be larger than the amount of land required for plant development, that possess the necessary infrastructure and other characteristics that may allow them to be suitable power plant sites. The investigations completed to identify Candidate Site Areas included the following major tasks:

- Identify and map locations within the Siting Study Area for infrastructure that are critical to power plant development and where plant locations may be restricted for environmental and regulatory reasons.
- Identify Preliminary Site Areas with consideration of the necessary infrastructure, environmental constraints, and other development factors.
- Screen Preliminary Site Areas using readily available maps and other resources.

The methodology and results of these investigations are described in the following subsections.

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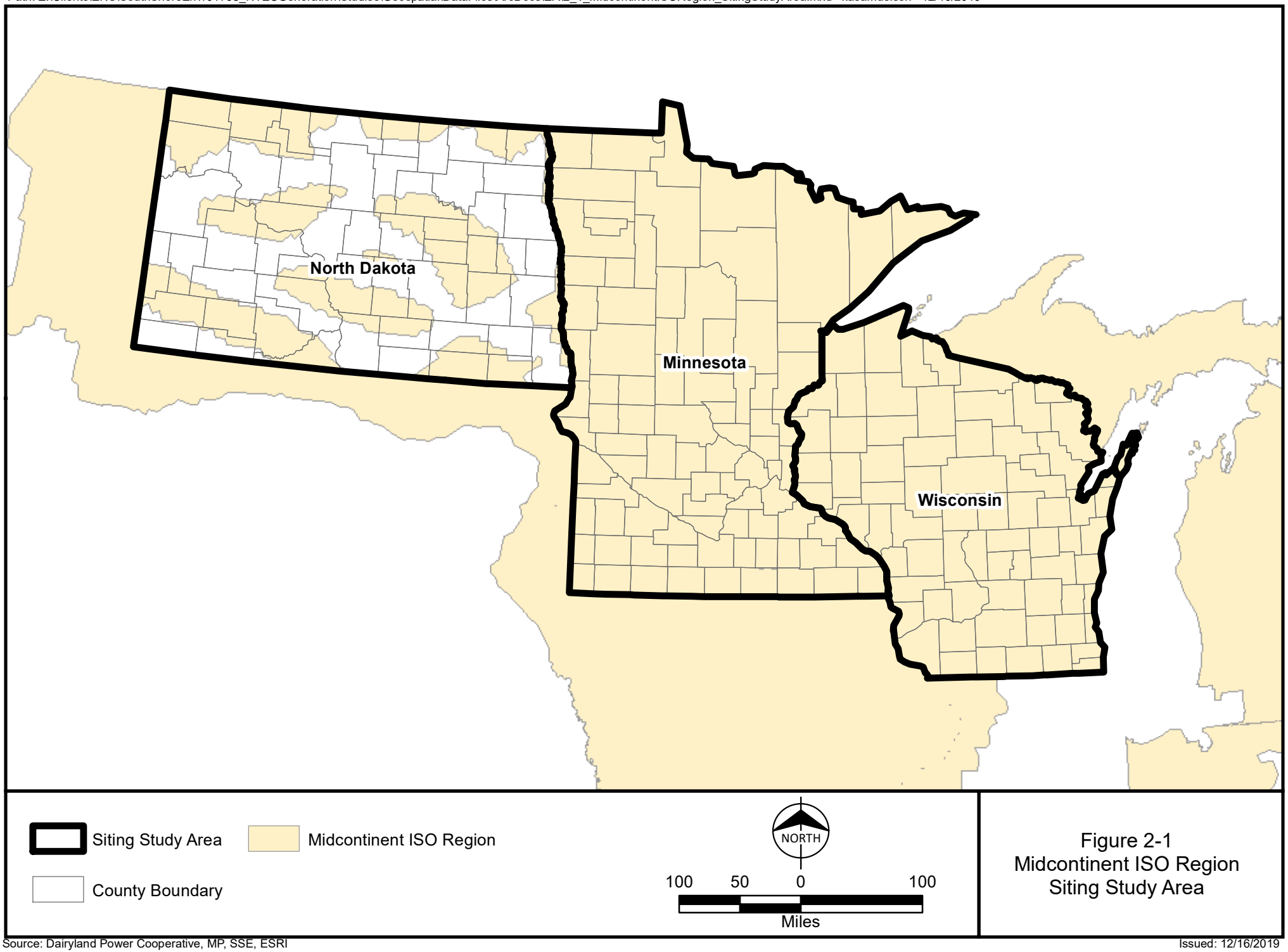


Figure 2-1
Midcontinent ISO Region
Siting Study Area

Source: Dairyland Power Cooperative, MP, SSE, ESRI

Issued: 12/16/2019

2.1.4 Preliminary Infrastructure Screening for Preliminary Site Areas

To minimize the potential impacts and costs of plant development, prospective Preliminary Site Areas should be located as near as practical to the necessary infrastructure, or physical resources, required for a new generation project. Preliminary Site Areas were identified based on the proximity of a site area to regional natural gas pipeline and transmission infrastructure. The first step in this process was to develop a composite map that overlaid natural gas pipeline infrastructure and high voltage transmission infrastructure. The basic infrastructure requirements used for this step were as follows:

- Preliminary Site Areas needed to be located directly adjacent to a transmission line or substation operating at 230-kV or higher.
- Preliminary Site Areas needed to be within 5 miles of a 16-inch diameter or larger natural gas pipeline.
- Preliminary Site Areas needed to be located within 5 miles of either a major river or a municipal wastewater treatment facility of sufficient capacity.

Using the criteria listed above, the locations of infrastructure critical to economic power plant development were determined and corresponding Preliminary Site Areas were identified. This resulted in the identification of 115 Preliminary Site Areas throughout the three-state Siting Study Area for additional screening investigations.

2.1.5 Desktop Screening for Preliminary Site Areas

The 115 identified Preliminary Site Areas that met the initial infrastructure requirements were subjected to a desktop screening analysis to eliminate or consolidate sites with obvious development constraints or redundant characteristics. For example, a preliminary site that was clearly surrounded by a residential neighborhood would be eliminated, and two preliminary sites that were geographically and electrically similar in nature would be consolidated into one site. Hence, a preliminary site could represent multiple suitable sites in close proximity to each other. In addition, preliminary sites that were within a national, state, or local park were eliminated. Through this process, 81 of the 115 Preliminary Site Areas were eliminated or consolidated. The remaining 34 Preliminary Site Areas, across the tri-state Siting Study Area, were designated as Preliminary Site Areas.

2.1.6 Candidate Site Areas

To achieve a manageable number of Preliminary Site Areas for more detailed analysis, it was necessary to further identify Candidate Site Areas from among these Preliminary Site Areas. The infrastructure screening increased the requisite natural gas pipeline diameter from a minimum of 16 inches to a

minimum of 20 inches. Preliminary Site Areas were then subjected once again to individual review and were evaluated relative to one another for strength of attributes. Following the desktop screening, 16 Candidate Site Areas were identified from the 34 Preliminary Site Areas. These Candidate Site Areas included:

- North Dakota: three sites
- Minnesota: seven sites
- Wisconsin: six sites

2.1.7 Candidate Site Areas Evaluation

A quantitative analysis process was used to rank the 16 Candidate Site Areas. The first step in using such a process is to identify the objectives or criteria to evaluate the candidates. The focus of the Candidate Site Areas evaluation, as well as the criteria discussed in this section, was to assess the advantages and disadvantages of each Candidate Site Area on a relative basis.

2.1.7.1 Candidate Site Areas Ranking Approach

The evaluation criteria used to judge the relative suitability of the Candidate Site Areas to support a gas-fired combined cycle generation facility cover a number of specific attributes. Each of these attributes represents a characteristic that is important in the evaluation of prospective sites and also serves to differentiate the Candidate Site Areas from one another. These evaluation criteria are not equivalent in their importance to the decision-making process. Therefore, each criterion was also assigned a weight indicative of its relative importance to the decision process. Criteria with the highest weights are considered the most critical for site development. The assignment of weights to the evaluation criteria was based on the collective professional judgment.

In total, 25 different criteria were used to evaluate the Candidate Site Areas. These criteria were first organized into six major categories, and these six major categories were allocated weights that totaled 100 percent. For example, the Site Environmental category was assigned a weight of 10 percent. Therefore, 10 percent of an overall evaluation score was based on environmental criteria. Within each major category, the criteria were assigned subweights indicative of each criterion's relative importance. The composite weight for each individual criterion was then calculated as an aggregate of all subweighted criteria within a major category. The evaluation categories, category weights, criteria, criteria subweights, and composite weights are summarized in Table 2-1.

Table 2-1: Candidate Site Area Evaluation Criteria

Major Category/Category Weight	Sub Criterion (weight) [Evaluation Points – 100 point scale)	Subcategory Rankings[a]	Scoring
Electric transmission/20 percent	Transmission ranking from Load Flow Analysis (45 percent) [9.0 points]	*0 – 20 percent relative ranking*	50
Electric transmission/20 percent	Transmission ranking from Load Flow Analysis (45 percent) [9.0 points]	*21 – 40 percent relative ranking*	40
Electric transmission/20 percent	Transmission ranking from Load Flow Analysis (45 percent) [9.0 points]	*41 – 60 percent relative ranking*	30
Electric transmission/20 percent	Transmission ranking from Load Flow Analysis (45 percent) [9.0 points]	*61 – 80 percent relative ranking*	20
Electric transmission/20 percent	Transmission ranking from Load Flow Analysis (45 percent) [9.0 points]	*81 – 100 percent relative ranking*	10
Electric transmission/20 percent	Locational Marginal Price (LMP) Analysis (45 percent) [9.0 points]	*Top 20th percentile*	50
Electric transmission/20 percent	Locational Marginal Price (LMP) Analysis (45 percent) [9.0 points]	*21st to 40th percentile*	40
Electric transmission/20 percent	Locational Marginal Price (LMP) Analysis (45 percent) [9.0 points]	*41st to 60th percentile*	30
Electric transmission/20 percent	Locational Marginal Price (LMP) Analysis (45 percent) [9.0 points]	*61st to 80th percentile*	20
Electric transmission/20 percent	Locational Marginal Price (LMP) Analysis (45 percent) [9.0 points]	*Bottom 20th percentile*	10
Electric transmission/20 percent	Interconnection cost (10 percent) [2.0 points]	*Existing switchyard expansion – bay space available*	50
Electric transmission/20 percent	Interconnection cost (10 percent) [2.0 points]	*New switchyard – line tap location*	10
Fuel supply and delivery/30 percent	Distance to interconnection (20 percent) [6.0 points]	*0 to 2 miles from site*	50
Fuel supply and delivery/30 percent	Distance to interconnection (20 percent) [6.0 points]	*2 to 4 miles from site*	30
Fuel supply and delivery/30 percent	Distance to interconnection (20 percent) [6.0 points]	*Greater than 4 miles from site*	10
Fuel supply and delivery/30 percent	Competitive supply (30 percent) [9.0 points]	*2 or more fuel suppliers within 15 miles of site*	50
Fuel supply and delivery/30 percent	Competitive supply (30 percent) [9.0 points]	*Only on fuel supplier within 15 miles of site*	10
Fuel supply and delivery/30 percent	Pipeline delivery pressure (20 percent) [6.0 points]	*Equal to or greater than 650 psig*	50
Fuel supply and delivery/30 percent	Pipeline delivery pressure (20 percent) [6.0 points]	*Less than 650 psig*	10
Fuel supply and delivery/30 percent	System upgrade costs (30 percent) [9.0 points]	*Minimal upgrades required (less than $25.0 million)*	50

Major Category/Category Weight	Sub Criterion (weight) [Evaluation Points – 100 point scale)	Subcategory Rankings[a]	Scoring
Fuel supply and delivery/30 percent	System upgrade costs (30 percent) [9.0 points]	*Moderate upgrades required ($25 to $50 million)*	30
Fuel supply and delivery/30 percent	System upgrade costs (30 percent) [9.0 points]	*Significant upgrades required (greater than $50 million)*	10
Water supply and delivery/20 percent	Surface water availability (30 percent) [6.0 points)	*High probability of water availability within 5 miles*	50
Water supply and delivery/20 percent	Surface water availability (30 percent) [6.0 points)	*Moderate probability of water availability within 5 miles*	30
Water supply and delivery/20 percent	Surface water availability (30 percent) [6.0 points)	*Low probability of water availability within 5 miles*	10
Water supply and delivery/20 percent	Groundwater availability (30 percent) [6.0 points]	*High probability of water availability within 10 miles*	50
Water supply and delivery/20 percent	Groundwater availability (30 percent) [6.0 points]	*Moderate probability of water availability within 10 miles*	30
Water supply and delivery/20 percent	Groundwater availability (30 percent) [6.0 points]	*Low probability of water availability within 10 miles*	10
Water supply and delivery/20 percent	Municipal reclaim water availability (30 percent) [6.0 points]	*Sufficiently permitted reclaimed water source within 5 miles*	50
Water supply and delivery/20 percent	Municipal reclaim water availability (30 percent) [6.0 points]	*Sufficiently permitted reclaimed water source within 10 miles*	30
Water supply and delivery/20 percent	Municipal reclaim water availability (30 percent) [6.0 points]	*Sufficiently permitted reclaimed water source within 15 miles*	10
Water supply and delivery/20 percent	Water discharge location (10 percent) [2.0 points]	*Acceptable water discharge location within 1 mile*	50
Water supply and delivery/20 percent	Water discharge location (10 percent) [2.0 points]	*No acceptable water discharge location within 1 mile*	10
Site Environmental/10 percent	Wetlands (25 percent) [2.5 points]	*High probability of avoiding wetlands*	50
Site Environmental/10 percent	Wetlands (25 percent) [2.5 points]	*Moderate probability of avoiding wetlands*	30
Site Environmental/10 percent	Wetlands (25 percent) [2.5 points]	*Low probability of avoiding wetlands*	10
Site Environmental/10 percent	Floodplains (25 percent) [2.5 points]	*Site outside of floodplain*	50
Site Environmental/10 percent	Floodplains (25 percent) [2.5 points]	*Part of site within floodplain, potential developable area*	30
Site Environmental/10 percent	Floodplains (25 percent) [2.5 points]	*Extensive floodplain, limited developable area*	10

Major Category/Category Weight	Sub Criterion (weight) [Evaluation Points – 100 point scale)	Subcategory Rankings[a]	Scoring
Site Environmental/10 percent	Cultural resources (25 percent) [2.5 points]	*Limited potential for cultural resources to be present*	50
Site Environmental/10 percent	Cultural resources (25 percent) [2.5 points]	*Moderate potential for cultural resources to be present*	30
Site Environmental/10 percent	Cultural resources (25 percent) [2.5 points]	*Significant potential for cultural resources to be present*	10
Site Environmental/10 percent	Sensitive species (25 percent) [2.5 points]	*10 sensitive species or less within county*	50
Site Environmental/10 percent	Sensitive species (25 percent) [2.5 points]	*11 to 20 sensitive species within county*	30
Site Environmental/10 percent	Sensitive species (25 percent) [2.5 points]	*Greater than 20 sensitive species within county*	10
Air quality impacts/10 percent	Class I Areas (30 percent) [3.0 points]	*Greater than 100 kilometers from Class I Area*	50
Air quality impacts/10 percent	Class I Areas (30 percent) [3.0 points]	*50 to 100 kilometers from Class I Area*	30
Air quality impacts/10 percent	Class I Areas (30 percent) [3.0 points]	*Class I Area within 50 kilometers*	10
Air quality impacts/10 percent	Air permit feasibility (35 percent) [3.5 points]	*Low relative probability of having NAAQS exceedances*	50
Air quality impacts/10 percent	Air permit feasibility (35 percent) [3.5 points]	*Moderate relative probability of having NAAQS exceedances*	30
Air quality impacts/10 percent	Air permit feasibility (35 percent) [3.5 points]	*High relative probability of having NAAQS exceedances*	10
Air quality impacts/10 percent	Nonattainment status (35 percent) [3.5 points]	*Site is not in a nonattainment county*	50
Air quality impacts/10 percent	Nonattainment status (35 percent) [3.5 points]	*Site is in an area with high potential to go nonattainment*	30
Air quality impacts/10 percent	Nonattainment status (35 percent) [3.5 points]	*Site is in a nonattainment county*	10
Site development/10 percent	Existing use (20 percent) [2.0 points]	*Industrialized / brownfield site area*	50
Site development/10 percent	Existing use (20 percent) [2.0 points]	*Agricultural site area*	30
Site development/10 percent	Existing use (20 percent) [2.0 points]	*Forested / natural / undisturbed site area*	10
Site development/10 percent	Site access (10 percent) [1.0 point]	*Less than 0.5 mile to paved road*	50
Site development/10 percent	Site access (10 percent) [1.0 point]	*0.5 to 1.5 miles to paved road*	30
Site development/10 percent	Site access (10 percent) [1.0 point]	*Limited site access or greater than 1.5 miles to paved road*	10
Site development/10 percent	Rail access (10 percent) [1.0 point]	*Class I rail line within 1 mile of site*	50
Site development/10 percent	Rail access (10 percent) [1.0 point]	*Class I line within 1 to 5 miles of site*	30

Major Category/Category Weight	Sub Criterion (weight) [Evaluation Points – 100 point scale)	Subcategory Rankings[a]	Scoring
Site development/10 percent	Rail access (10 percent) [1.0 point]	*Class I rail line greater than 5 miles from site*	10
Site development/10 percent	Proximity to FAA facilities (10 percent) [1.0 point]	*No FAA facilities within 5 miles of site*	50
Site development/10 percent	Proximity to FAA facilities (10 percent) [1.0 point]	*FAA facility within 1 to 5 miles of site*	30
Site development/10 percent	Proximity to FAA facilities (10 percent) [1.0 point]	*FAA facility within 1 mile of site*	10
Site development/10 percent	Noise / Visual receptors (20 percent) [2.0 points]	*No receptors within 0.5 mile of site*	50
Site development/10 percent	Noise / Visual receptors (20 percent) [2.0 points]	*1 to 5 receptors within 0.5 miles of site*	30
Site development/10 percent	Noise / Visual receptors (20 percent) [2.0 points]	*Greater than 5 receptors within 0.5 mile of site*	10
Site development/10 percent	Site expansion (15 percent) [1.5 points]	*200+ acres available with sufficient buffer zone*	50
Site development/10 percent	Site expansion (15 percent) [1.5 points]	*100 to 200 acres available*	30
Site development/10 percent	Site expansion (15 percent) [1.5 points]	*Fewer than 100 acres available*	10
Site development/10 percent	Site ownership (15 percent) [1.5 points]	*Owned by Project participant*	50
Site development/10 percent	Site ownership (15 percent) [1.5 points]	*Partially owned by Project participant*	30
Site development/10 percent	Site ownership (15 percent) [1.5 points]	*Site owned by one or more third parties*	10

a – The term “significant” is used throughout this table and was taken from the Siting Study. It is used to express a level of interest or concern and not in the context of NEPA.

2.1.7.2 Candidate Site Scoring Summary

As shown in Table 2-2 and Figure 2-2, the following sites were identified to be the top six performing sites: Wilton, SupGen, Prairie Island to Blue Lake, Antelope Valley to Huron, Arrowhead to Red Rock, and Wempletown to Rockdale. The Frazee and Blue Lake sites were further considered and not deemed well-suited for joint Project development.[8] Of the remaining candidate sites, the top six performing sites, referred to as Preferred Sites, were carried on to the next stage of the site selection process. The Preferred Sites were:

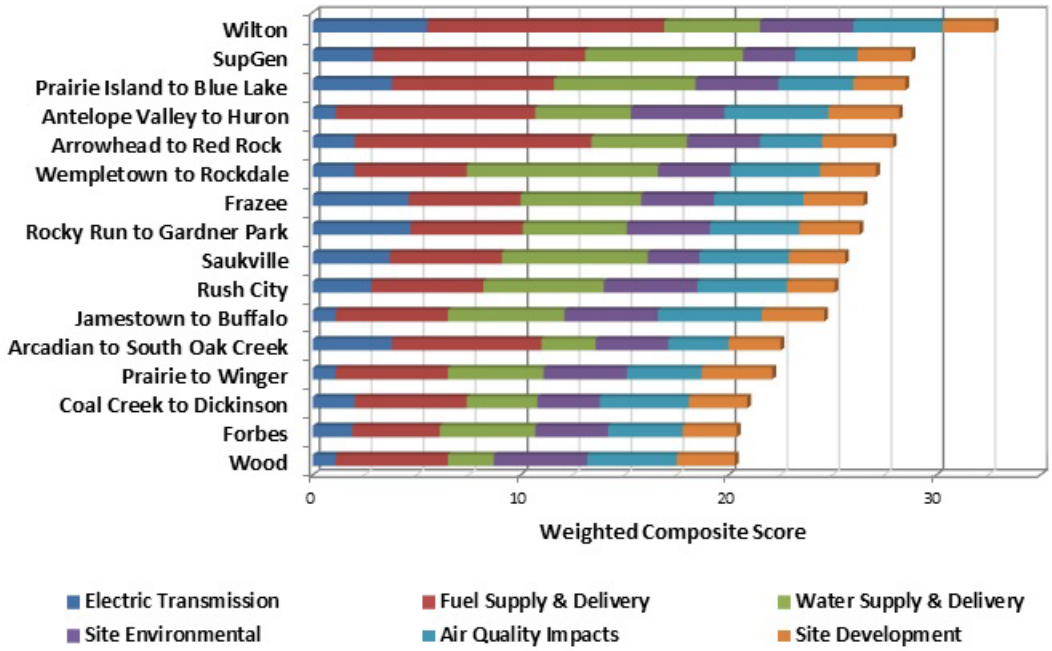
- Antelope Valley to Huron
- Arrowhead to Red Rock
- Rocky Run to Gardner Park
- SupGen
- Wempletown to Rockdale
- Wilton

[8] The Frazee and Blue Lake sites were not considered well-suited for a joint project between any utilities, not just for a project with MP and Dairyland as the participants.

Table 2-2: Candidate Site Scores

Major Category/ Criterion	Category/Criterion Weight	Antelope Valley to Huron	Arcadian to South Oak Creek	Arrowhead to Red Rock	Coal Creek to Dickinson	Forbes	Frazee	Jamestown to Buffalo	Prairie Island to Blue Lake	Prairie to Winger	Rocky Run to Gardner Park	Rush City	Saukville	SupGen	Wempletown to Rockdale	Wilton	Wood
Electric Transmission	**20%**																
Transmission Ranking from Load Flow Analysis	45%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LMP Analysis	45%	10	40	20	20	10	40	10	40	10	50	20	30	30	20	50	10
Interconnection Cost	10%	10	10	10	10	50	50	10	10	10	10	50	50	10	10	50	10
Fuel Supply & Delivery	**30%**																
Distance to Interconnection	20%	50	50	50	50	30	50	50	50	50	50	50	50	30	50	50	50
Competitive Supply	30%	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Pipeline Delivery Pressure	20%	50	10	50	10	10	10	10	50	10	10	10	10	50	10	50	10
System Upgrade Costs	30%	30	30	50	10	10	10	10	10	10	10	10	10	50	10	50	10
Water Supply & Delivery	**20%**																
Surface Water Availability	30%	50	10	50	30	50	50	10	50	50	50	50	50	50	50	30	10
Groundwater Availability	30%	10	30	10	10	10	30	50	10	10	30	30	50	30	50	30	10
Municipal Reclaim Water Availability	30%	0	0	0	0	0	0	30	50	0	0	0	0	30	50	0	0
Water Discharge Location	10%	50	10	50	50	50	50	10	10	50	10	50	50	50	10	50	50
Site Environmental	**10%**																
Wetlands	25%	50	50	30	30	30	50	30	50	50	50	30	30	50	50	50	50
Floodplain	25%	50	50	50	30	30	30	50	50	50	50	50	30	30	50	50	50
Cultural Resources	25%	30	30	10	10	30	10	50	30	30	30	50	30	10	30	30	50
Sensitive Species	25%	50	10	50	50	50	50	50	30	30	30	50	10	10	10	50	30
Air Quality Impacts	**10%**																
Class I Areas	30%	50	50	30	50	50	50	50	50	50	50	50	50	30	50	50	50
Air Permit Feasibility	35%	50	30	10	30	10	30	50	10	10	30	30	30	10	30	30	30
Nonattainment Status	35%	50	10	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Site Development	**10%**																
Existing Use	20%	30	30	30	30	10	30	30	30	30	30	30	30	10	30	30	30
Site Access	10%	30	50	50	10	50	50	10	50	30	50	50	50	50	50	50	50
Rail Access	10%	10	10	30	10	30	50	30	30	50	50	30	50	50	30	50	10
Proximity to FAA Facilities	10%	50	50	30	50	50	50	50	30	50	50	10	30	30	50	10	50
Noise / Visual Receptors	20%	50	10	10	30	10	10	30	10	30	10	10	10	10	10	10	10
Site Expansion	15%	50	30	50	50	50	30	50	30	50	30	30	30	10	30	30	50
Site Ownership	15%	10	10	50	10	10	10	10	10	10	10	10	10	50	10	10	10
Total Composite Score	**100%**	**28.20**	**22.50**	**27.90**	**20.90**	**20.40**	**26.50**	**24.60**	**28.50**	**22.10**	**26.30**	**25.10**	**25.60**	**28.80**	**27.10**	**32.80**	**20.30**

Figure 2-2: Candidate Site Rankings



The six top Preferred Sites were further evaluated for impacts on the transmission systems. At each site, the number of overloads resulting from the new generation was tallied and weighted according to the particular assets that were overloaded. Impacts on affected systems, either transmission lines or substations, were weighted according to the relative significance of the implied infrastructure upgrades required.[9] The relative percentage for each Preferred Site was then calculated based on the difference in score between the Preferred Site with the lowest total score and the Preferred Site with highest total score. Sites scores to be incorporated into the site scoring matrix were determined based on these relative percentages with a low score of 10 for those sites with the greatest impact and a high score of 50 for those sites having the least amount of impact. The nature and number of overloads encountered for each individual site can be seen in Table 2-3.

It can be seen from Table 2-3 that the Antelope Valley to Huron site received the highest total load flow analysis score out of the six sites evaluated and the Rocky Run to Gardner Park site received the lowest total score. Antelope Valley to Huron received a score of 54 due to a relatively high volume of overloaded assets resulting from the addition of 780 MW of additional capacity to the existing electric transmission infrastructure. In this case, it was determined that eight individual assets would be

[9] For instance, a 500-kV transmission line overload was weighted five times more than a 138/115-kV transmission line overload and weighted twice as much as a 500-kV transformer overload.

overloaded including several 230-kV and 345-kV transmission lines and a 345-kV substation, which figure among the more relatively expensive assets to upgrade. Conversely, it was determined that an addition of 780 MW at the Rocky Run to Gardner site did not result in any electric transmission asset overloads. Thus, it received the lowest possible score of zero. The relative percentages for each site were calculated based on these score extremes of 54 points and zero points. Matrix scores of 10, 20, 30, 40, and 50 were possible with a score of 10 corresponding to a relative percentage of 80% or above and a score of 50 corresponding to a relative percentage of 20% or below. As shown in Table 2-3, the Antelope Valley to Huron, Arrowhead to Red Rock, and Wilton sites all received the lowest score of 10. The Rocky Run to Gardner, SupGen, and Wempletown to Rockdale sites all received the highest possible score of 50. Transmission Load Flow Analysis scores were incorporated into the site scoring matrix for these six sites and the resulting site score totals were used to determine the rankings of the preferred sites relative to one another. The results can be seen in Table 2-4 and Figure 2-3.

Once the transmission load flow evaluation was completed, a number of sensitivity analyses were performed to test the sensitivity of the composite evaluation scores to various changes in criteria weighting. For these sensitivity analyses, only the weights assigned to the six major evaluation categories were adjusted. Six different sensitivity cases were executed: one case each for transmission, fuel, water, environmental, air quality, and site development. The weight for the category that was emphasized was increased 10 percent, and the other five categories were reduced by two percent each. The composite weights for each category and weighted composite scores for each site were then recalculated. Table 2-5 contains a schedule of the category weights used in the sensitivity analyses.

Table 2-3: Transmission Load Flow Analysis Scores for Preferred Sites

		Sub Equip Overloads					Line Overloads					Total Score	Relative Percentage	Matrix Score
		500-kV	345-kV	230-kV	161-kV	138/115-kV	500-kV	345-kV	230-kV	161-kV	138/115-kV			
Site Name	Initial Overload Point (MW)	5	4	3	2	1	10	8	6	4	2			
Antelope Valley to Huron	428.1		1					4	3			54	100.00%	10
Arrowhead to Red Rock	359.8			1					7			45	83.33%	10
Rocky Run to Gardner Park	897.3											0	0.00%	50
SupGen	768		1						1			10	18.52%	50
Wempletown to Rockdale	431.2		1								1	6	11.11%	50
Wilton	212.7			2		1			2		13	45	83.33%	10

*Constraints were considered up to 780 MW.

Table 2-4: Preferred Site Scores

Major Category/ Criterion	**Category/**Criterion Weight	**Antelope Valley to Huron**	**Arrowhead to Red Rock**	**Rocky Run to Gardner Park**	**SupGen**	**Wempletown to Rockdale**	**Wilton**
Electric Transmission	**20%**						
Transmission Ranking from Load Flow Analysis	45%	10	10	50	50	50	10
LMP Analysis	45%	10	20	50	30	20	50
Interconnection Cost	10%	10	10	10	10	10	50
Fuel Supply & Delivery	**30%**						
Distance to Interconnection	20%	50	50	50	30	50	50
Competitive Supply	30%	10	10	10	10	10	10
Pipeline Delivery Pressure	20%	50	50	10	50	10	50
System Upgrade Costs	30%	30	50	10	50	10	50
Water Supply & Delivery	**20%**						
Surface Water Availability	30%	50	50	50	50	50	30
Groundwater Availability	30%	10	10	30	30	50	30
Municipal Reclaim Water Availability	30%	0	0	0	30	50	0
Water Discharge Location	10%	50	50	10	50	10	50
Site Environmental	**10%**						
Wetlands	25%	50	30	50	50	50	50
Floodplain	25%	50	50	50	30	50	50
Cultural Resources	25%	30	10	30	10	30	30
Sensitive Species	25%	50	50	30	10	10	50
Air Quality Impacts	**10%**						
Class I Areas	30%	50	30	50	30	50	50
Air Permit Feasibility	35%	50	10	30	10	30	30
Nonattainment Status	35%	50	50	50	50	50	50
Site Development	**10%**						
Existing Use	20%	30	30	30	10	30	30
Site Access	10%	30	50	50	50	50	50
Rail Access	10%	10	30	50	50	30	50
Proximity to FAA Facilities	10%	50	30	50	30	50	10
Noise / Visual Receptors	20%	50	10	10	10	10	10
Site Expansion	15%	50	50	30	10	30	30
Site Ownership	15%	10	50	10	50	10	10
Total Composite Score	**100%**	**29.10**	**28.80**	**30.80**	**33.30**	**31.60**	**33.70**

Figure 2-3: Preferred Site Rankings

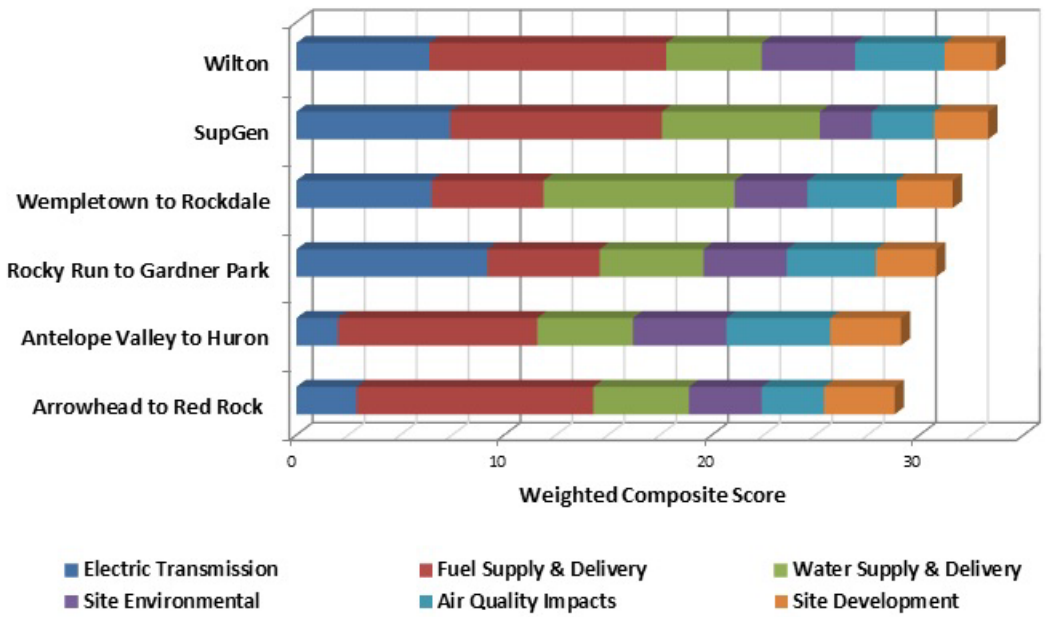


Table 2-5: Category Weights for Sensitivity Analyses for Preferred Sites

Category	Base Weighted (%)	Transmission Weighted (%)	Fuel Weighted (%)	Water Weighted (%)	Environmental Weighted (%)	Air Quality Weighted (%)	Site Dev Weighted (%)
Electric Transmission	20%	30%	18%	18%	18%	18%	18%
Fuel Supply & Delivery	30%	28%	40%	28%	28%	28%	28%
Water Supply & Delivery	20%	18%	18%	30%	18%	18%	18%
Site Environmental	10%	8%	8%	8%	20%	8%	8%
Air Quality Impacts	10%	8%	8%	8%	8%	20%	8%
Site Development	10%	8%	8%	8%	8%	8%	20%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

The results of the sensitivity analyses were summarized by comparing each site's ranking under the various cases. A site's rank was determined by sorting the sites based on their composite evaluation scores and then numbering them sequentially, with a rank of one assigned to the site with the highest base score. These ranks are summarized in Table 2-6. The shaded cells in this table indicate the sensitivity cases where individual sites either increased or decreased in rank.

Review of Table 2-6 indicates that site base rankings remained unchanged when evaluated for sensitivity to both the Environmental and Air Quality scoring categories. In each of the remaining sensitivity analyses, however, the site rankings were affected as indicated by shaded cells. Red cells indicate sites increasing in rank, and green cells indicate sites decreasing in rank from the base case scenario. The

Table 2-6: Preferred Site Area Rankings for Sensitivity Analyses

Site Name	Base Weighted Rank	Transmission Weighted Rank	Fuel Weighted Rank	Water Weighted Rank	Environmental Weighted Rank	Air Quality Weighted Rank	Site Dev Weighted Rank
Wilton	1	2	1	3	1	1	2
SupGen	2	1	2	1	2	2	1
Wempletown to Rockdale	3	4	4	2	3	3	3
Rocky Run to Gardner Park	4	3	6	4	4	4	4
Antelope Valley to Huron	5	6	5	6	5	5	6
Arrowhead to Red Rock	6	5	3	5	6	6	5

= Denotes a rank increase
= Denotes a rank decrease

changes in ranking for a site under each sensitivity case provide an indication of the relative strengths and weaknesses of each site and the drivers for each site's overall ranking.

2.2 Siting Study Conclusions

The objective of the Siting Study was to identify sites suitable for future development of a CCGT plant with a nominal capacity of 900 MW and to provide the information necessary to focus and support subsequent site acquisition and permitting efforts. Each of the six Preferred Sites identified in the Siting Study were recommended to be considered as suitable alternatives for future development activities. As site visits were not included in the scope of the Siting Study, the ability to investigate the preferred sites and rank them relative to one another was limited to the resources available for desktop review. Site visits and confirmation of water availability for specific sites were encouraged prior to subsequent actions. Further investigation of the transmission constraints at each of the Preferred Sites and evaluation transmission deliverability with respect to load and capacity zones was also recommended.

2.3 NTEC Site Selection

The overall Project objectives for Dairyland and MP, as joint developers of the NTEC Project, were comparable to those identified for the overall Siting Study discussed previously. Therefore, the objective in identifying potential sites for a joint project included all the requirements for infrastructure identified as part of the overall Siting Study. Dairyland and MP also identified several other factors specific to a joint project between these two utilities:

- All of MP's load and the vast majority of Dairyland's load is located in MISO Zone 1. As part of MISO's guidance for intrazone balancing of load and capacity, it was determined desirable for a new generation to serve MP and Dairyland load in Zone 1, to be located in MISO Zone 1.

- As MP and Dairyland service territories do not overlap, the utilities determined to provide for logistical convenience for both utilities, the new facility should be located as close to the boundary of their service territories as practical. This would minimize difficulties for one or both companies' accessing the facility due to extra travel distance or remote access.
- A location in proximity to both company's service territories provides a suitable hedge for each company's load purchase within MISO.
- Compliance with any applicable local and state regulatory requirements.

These factors, along with the overall goals of minimizing distance from transmission infrastructure, suitable gas supply facilities, and a water source needed to be considered as part of the identification of an area suitable for a joint Dairyland/MP project.

2.3.1 Identification of NTEC Study Area

Dairyland's service territory primarily includes large portions of western Wisconsin, southeastern Minnesota, and northern Iowa and Illinois (Figure 2-4). MP's service territory includes areas of north and central Minnesota. In considering these service areas, Dairyland and MP's territories border each other along the Minnesota/Wisconsin state line, extending south from Lake Superior – Duluth, Minnesota/Superior Wisconsin. The service territories roughly border each other for approximately 75 miles to the south. This seam between the two service territories was identified and the most reasonable location for a joint project between these utilities. An area extending 75 miles from the Duluth/Superior area was identified for consideration and identification of potential alternative sites for the NTEC Project (NTEC Study Area) (Figure 2-4).

2.3.2 Identification of Preferred Site Areas within NTEC Study Area

Having identified the NTEC Study Area for the Project, Dairyland and MP overlaid the Preferred Site Areas identified in the Siting Study with the NTEC Study Area to determine if any Preferred Site Areas were located within the NTEC Study Area. Two Preferred Site Areas, Arrowhead to Red Rock and SupGen, are located with the 75-mile circle where the Dairyland and MP service territories roughly border one another. The Arrowhead to Red Rock site is located southwest of Duluth within MP service territory, but only a short distance from Dairyland service territory. The SupGen site is located in Superior, Wisconsin, which is a short distance from both Dairyland and MP's service territories. In other portions of the NTEC Study Area, the two service territories are more widely separated and would be less desirable for a joint project.

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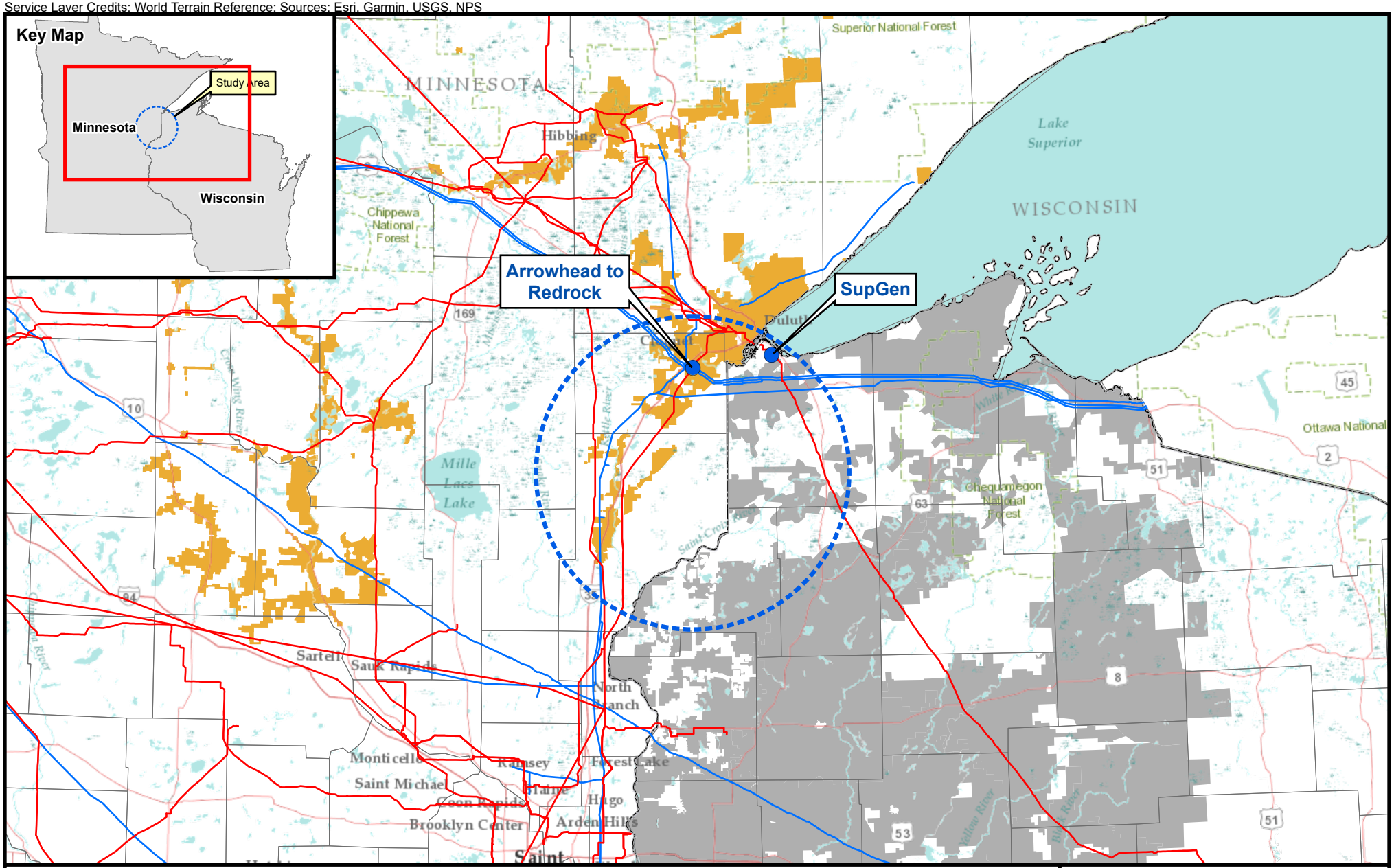
Service Layer Credits: World Terrain Reference: Sources: Esri, Garmin, USGS, NPS



Service Territory

- Dairyland Power Cooperative
- Minnesota Power
- NTEC Study Area
- Line Tap (<=5 miles to water)
- Transmission (>= 230 kV)
- Natural Gas Pipeline (>=16")
- State Boundary
- County Boundary

NORTH

25 12.5 0 25
Miles

Figure 2-4
NTEC Study Area
Nemadji Trail Energy Center
Douglas County, WI

Source: Dairyland Power Cooperative, Minnesota Power, ESRI, and Burns & McDonnell Engineering Company, Inc.

Issued: 1/28/2022

2.3.2.1 Arrowhead to Red Rock

Arrowhead to Red Rock is a MP-owned site area and is the location of a line tap formed by the Northern States Power Company Arrowhead to Red Rock 345 kV electric transmission line and two 36-inch Great Lakes Gas Transmission natural gas pipelines. The site is also within 2 miles of a Northern Natural Gas Company natural gas pipeline. The site is located in Carlton County, Minnesota, approximately 5.5 miles south of the City of Cloquet and directly to the west of Chub Lake. The closest river is the St. Louis River, at approximately 3.5 miles to the northeast. Approximately half of the site area is currently used for agricultural purposes and the other half is forested. The site is accessed by Sheils Road to the south and is 2 miles away from a Burlington Northern Santa Fe (BNSF) rail line.

Following the quantitative scoring process in the overall siting study, this site ranked 5th out of the 16 Candidate Site Areas due to the following factors:

- Fuel Supply & Delivery: Scores in this category were strong. This site received the highest possible scores for distance to interconnection, pipeline delivery pressure, and system upgrade costs. It is located within close proximity to the Great Lakes Gas Transmission Ltd. pipeline corridor, allowing it to receive one of the highest scores of any of the candidate sites in this category. It is also located less than two miles from a 20-inch diameter Northern Natural Gas Company pipeline. This site was not, however, awarded a high score for competitive supply as the Northern Natural Gas line rated poorly as a primary source of fuel for other sites considered in the Study.
- Water Supply & Delivery: This site received a competitive score in this category as it is located approximately 3.5 miles from the St. Louis River, which has a 7Q10 of 185 millions of gallons per day (MGD). It did, however, receive a low score for potential groundwater availability, which served to bring its overall score down slightly.
- Other points to note about this site are that it received a lower relative score for the locational marginal prices (LMP) Analysis, which kept it from ranking higher in the top five. As a MP-owned site, it scored favorably in the site development category.

2.3.2.2 SupGen

SupGen is a MP-owned site located in Douglas County, Wisconsin, on the outskirts of the City of Superior. The Stone Lake to Arrowhead 345-kV electric transmission line, owned by American Transmission Company (ATC), traverses the site area. The closest natural gas pipeline is located approximately 5.5 miles south of the site area and includes two 36-inch diameter lines, owned by Great

Lakes Gas Transmission Limited. The site is situated directly on the bank of the Nemadji River and less than 2 miles from Lake Superior. The site area itself is partially forested and relatively free of development, except for a small concrete foundation and pond in the western-most corner. Much of the surrounding area has been appropriated for industrial use. The site is accessed directly by 31st Avenue E., and there is a branch of the BNSF rail line less than half a mile to the northwest.

Following the scoring process, this site ranked 2nd out of the 16 Candidate Site Areas due to the following factors:

- Fuel Supply & Delivery: Scores in this category were strong. This site received the highest possible scores for distance to interconnection, pipeline delivery pressure, and system upgrade costs. It is located within close proximity to the Great Lakes Gas Transmission Ltd. pipeline corridor allowing it to receive one of the highest scores of any of the Candidate Sites in this category. This site is also located approximately 8.5 miles from a 20-inch diameter Northern Natural Gas Company pipeline. This site was not, however, awarded a high score for competitive supply as this line rated poorly as a primary source of fuel for other sites considered in the Siting Study.
- Water Supply & Delivery: This site received one of the strongest overall scores of any candidate site in this category. It received the highest score for probability of surface water availability as it is located within 2 miles of Lake Superior. It also received moderate scores for both probability for groundwater availability and proximity to a sufficiently permitted wastewater treatment facility.

As a MP-owned site, it scored favorably in the site development category. This site scored competitively in all other categories and received a moderate score in the locational marginal price (LMP) analysis.

2.3.2.3 Brownfield Sites

Dairyland and MP had determined that the overall objectives of the Siting Study were applicable to those for this Project, however, the initial Siting Study had only considered greenfield sites. This was due to the wide geographic area of the Siting Study, the multiple and geographic variation of the participating utilities and the challenges associated with use of a site that may or may not be accessible to future utilities participating in a new generation Project. Therefore, in addition to reviewing the sites identified in the Siting Study within the NTEC Study Area, Dairyland and MP conducted a high level review to determine if any potential suitable brownfield sites were available and suitable as alternative sites for this Project. Brownfield sites include currently or previously developed commercial or industrial sites that are

either abandoned, idle, or underused for which the expansion or redevelopment of the site would limit or minimize impacts to other undeveloped areas. Similar to confining new linear facilities to existing linear ROW or corridors reduces the spread of linear infrastructure across the landscape, redevelopment of previous industrial or commercial sites can limit commercial and industrial development to previously disturbed areas.

Critical for this Project was the need to have suitable water supply, natural gas supply and access to electricity transmission in close proximity to minimize the impacts and costs associated with these resources. As outlined in the Siting Study, locations of intersection of natural gas pipelines and electricity transmission lines present the first siting consideration for a new generation facility. Dairyland and MP reviewed the transmission and natural gas infrastructure within the 75-mile study area and identified only small areas where these resources intersected or occurred in close proximity to each other. None of these locations were determined to contain existing or previous commercial or industrial sites but were typically all rural agricultural or undeveloped lands.

Several existing brownfield sites were identified near the SupGen area. Although not at intersections or in proximity to the critical infrastructure for a new generation facility, these sites were evaluated for potential use. These sites were either located in close proximity to residential areas, did not have sufficient land available for the Project, and/or were located in high density developed areas of Duluth. As a result of these locational challenges and potential for conflicts with adjacent land use, as well as a lack of necessary infrastructure that would create additional challenges and impacts to these areas to develop, these brownfield sites were not considered for the Project. No brownfield sites were determined available or suitable for project development within the NTEC Study Area.

2.3.3 Selection of Preferred NTEC Site

The following is a summary of conclusions reached for the Arrowhead to Red Rock site:

- Electric Transmission: This site received low scores for all three electric transmission categories. There is no existing substation on the site so a line tap would be required. The LMP was low relative to the other sites, receiving a score of 20 out of a possible 50 points. It received the second least desirable score from the transmission load flow analysis. With the addition of 780 MW, there would be eight individual assets overloaded including seven 230-kV transmission lines and one 230-kV substation.
- Fuel Supply & Delivery: Scores in this category were strong. This site received the highest possible scores for distance to interconnection, pipeline delivery pressure, and system upgrade

costs. It is located within close proximity to the Great Lakes Gas Transmission Ltd. pipeline corridor, allowing it to receive one of the highest scores of any of the candidate sites in this category. It is also located less than 2 miles from a 20-inch diameter Northern Natural Gas Company pipeline. This site was not, however, awarded a high score for competitive supply as the Northern Natural Gas line rated poorly as a primary source of fuel for other sites considered in the Study. It should be noted, however, that although there is currently no capacity available on the Northern Natural Gas pipeline, the close proximity of the line may still be considered an advantage in the long term. While it is anticipated that interconnecting to this pipeline for the purposes of this Project would incur substantial upgrade costs, it is nonetheless a fuel supply alternative, the existence of which may provide negotiating leverage and the potential for tapping an alternative fuel supply basin, should the need arise.

- Water Supply & Delivery: This site received a competitive score in this category as it is located approximately 3.5 miles from the St. Louis River, which has a 7Q10 flow rate of 185 MGD. It did, however, receive a low score for potential groundwater availability, which served to bring its overall score down slightly.
- It should be noted that this site has the advantage of being MP-owned.

The following is a summary of conclusions for the SupGen site:

- Electric Transmission: This site received the second highest electric transmission score of any of the preferred sites. While it did receive a low score for interconnection cost due to the need for construction of a line tap, it received the third highest score for the LMP analysis and the highest possible score for the transmission load flow analysis. With the addition of 780 MW, two individual assets would be overloaded requiring infrastructure updates for one 230-kV transmission line and one 345-kV substation.
- Fuel Supply & Delivery: Scores in this category were strong. This site received the highest possible scores for distance to interconnection, pipeline delivery pressure, and system upgrade costs. It is located within close proximity to the Great Lakes Gas Transmission Ltd. pipeline corridor allowing it to receive one of the highest scores of any of the candidate sites in this category. This site is also located approximately 8.5 miles from a 20-inch diameter Northern Natural Gas Company pipeline. This site was not, however, awarded a high score for competitive supply as this line rated poorly as a primary source of fuel for other sites considered in the Study. It should be noted, however, that although there is currently no capacity available on the Northern Natural Gas pipeline, the close proximity of the line may still be considered an advantage in the

long term. While it is anticipated that interconnecting to this pipeline for the purposes of this Project would incur potentially substantial upgrade costs, it is nonetheless a fuel supply alternative, the existence of which may provide negotiating leverage and the potential for tapping an alternative fuel supply basin, should the need arise.

- Water Supply & Delivery: This site received one of the strongest overall scores of any candidate site in this category. It received the highest score for probability of surface water availability as it is located within two miles of Lake Superior. It also received moderate scores for both probability for groundwater availability and proximity to a sufficiently permitted wastewater treatment facility.
- This site scored competitively in all other categories and has the advantage of being MP-owned.

The scoring for the Arrowhead – Red Rock and SupGen sites was very similar except in two categories – transmission system performance and water availability. In both these areas, the SupGen site was determined to rank better than the Arrowhead – Red Rock site. Development of the SupGen site was determined to result in considerably less overloads on the transmission system, likely resulting in much less need for other system projects to upgrade and support the system to avoid overloads. Impacts and costs associated with system upgrades would likely be less for the SupGen site, thereby minimizing overall project impacts and cost.

Further, the availability of water is an important consideration in development of a new power generation facility. The availability of water at the SupGen site provides support for plant water needs without more extensive, impacting, and costly development of a water supply (such as a pipeline) to support the site.

While both sites are in general proximity to the seam between the MP and Dairyland systems, the SupGen site is located more closely to the boundary between the systems. The Arrowhead – Red Rock site is located several miles into MP territory and would potentially require additional transmission infrastructure to connect into the Dairyland system.

On the basis of the SupGen site minimizing transmission system concerns, providing an adequate and available water source, and location central to the boundary of the MP and Dairyland service areas, MP and Dairyland selected the SupGen site for development of the proposed NTEC Project.

2.3.4 Alternative Generation Site Identification

Having identified the SupGen site (Figure 2-4) as a location vicinity for further investigation and development for the Project, the region around the site was evaluated for potential alternative generation

sites. The SupGen site, as considered in the site selection study, was confirmed to provide a reasonable site for Project development (Nemadji River Site; Figure 2-5).[10] The site is owned by MP and provides reasonable access to electricity, natural gas, and water/wastewater infrastructure, without the need for extensive additional development of these resources.

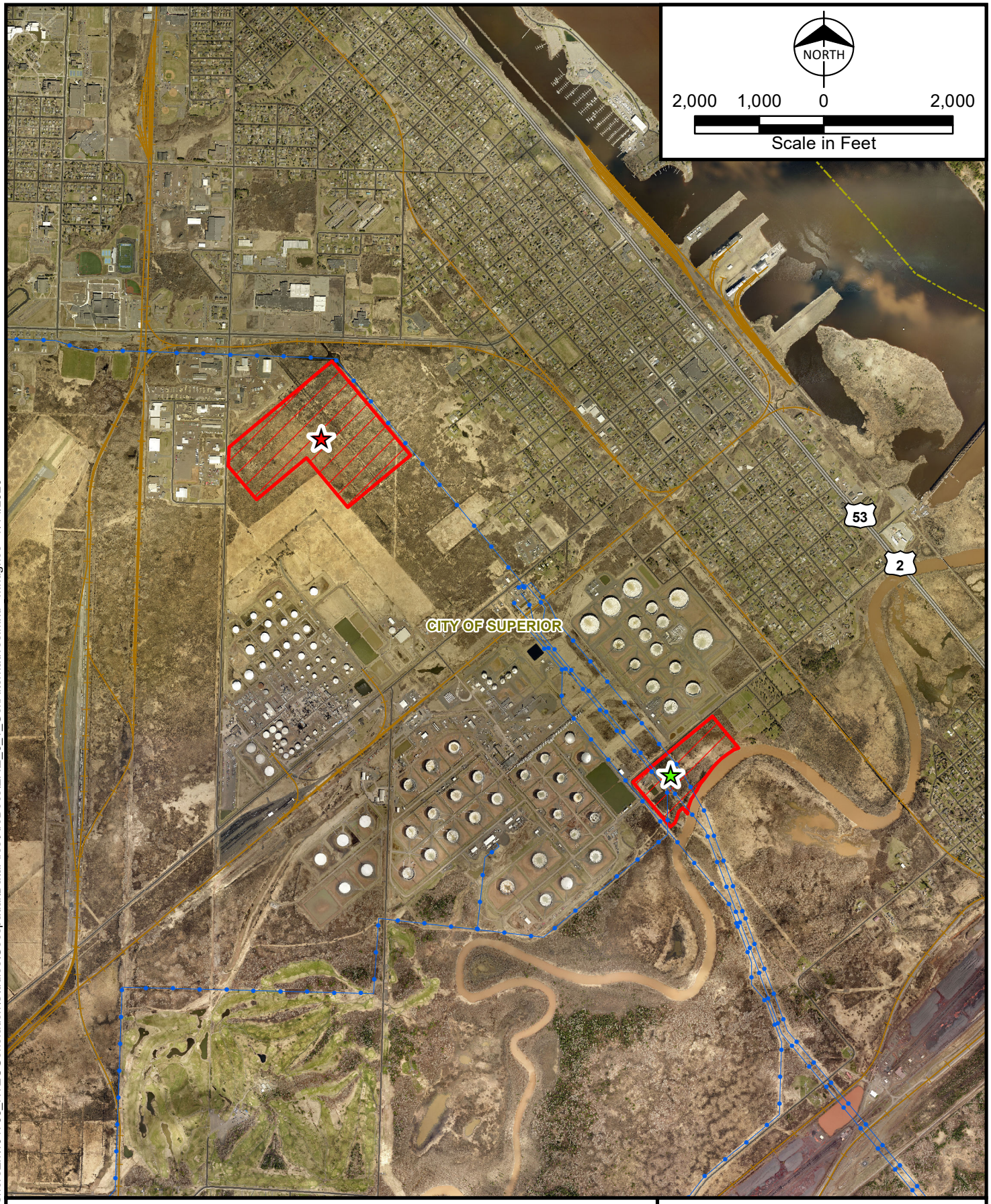
Other areas in the nearby vicinity of the site were subsequently investigated and considered for alternative sites for Project development. For other areas to be considered as potential alternatives, the following factors were considered:

- Sufficient land space is available for the generating unit and supporting infrastructure
- Corridors to connect electricity transmission and natural gas pipelines are available to access the site
- Proximity to appropriate electricity grid and natural gas pipeline tap locations to minimize impacts and costs associated with the development of this infrastructure
- Avoided major approval or permitting concerns such that the site would have a reasonable probability of being approved and permitted if selected for the Project.

The area around the Nemadji River Site contains a variety of developments. Tank farm facilities lie to the north of the site, within the City of Superior, including commercial and residential development, further north. The Nemadji Golf Course is to the west, and slightly beyond the golf course to the west is the Richard I. Bong Memorial Airport, creating potential concerns for stack height restrictions and above ground electrical transmission infrastructure across much of the area. Residential development extends to the east, with Lake Superior less than one mile to the east. The area to the south of the Nemadji River Site is relatively undeveloped, although it contains numerous utility corridors and some mining facilities. The area is heavily wooded and contains extensive wetlands.

Investigations of the area identified an alternative site for the facility approximately 1.5 miles north of the Nemadji River Site (Figure 2-5) to the east of Hill Avenue. The Hill Avenue Site is located just north of the tank farm and west and south of dense residential areas of the City of Superior. An open corridor is available to extend electricity and gas infrastructure into the site. Areas surrounding the Hill Avenue Site contain commercial and light industrial facilities, lowland scrub/shrub wetland community, or are undeveloped, wooded areas. Dairyland and SSE are including the Hill Avenue Site as part of Project development and evaluation activities.

[10] Figure 2-5, pages 2 and 3, provide a preliminary site layout for both the Nemadji River Site and the Hill Avenue Site. Site layouts are subject to change as final design progresses. The disturbance area would not change.



Hill Avenue Site
Nemadji River Site
Approximate Property Boundary
Railroad

Existing Transmission
161kV and Below
345kV
Municipal Boundary

Figure 2-5
Page 1 of 3
Alternative Generation Sites
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_5_1_GenAlternatives.mxd mhughes 7/14/2020

Source: Esri, Minnesota Power, City of Superior 2019 aerial photography, Energy Velocity, and Burns & McDonnell Engineering Company, Inc.

Issued: 7/14/2020

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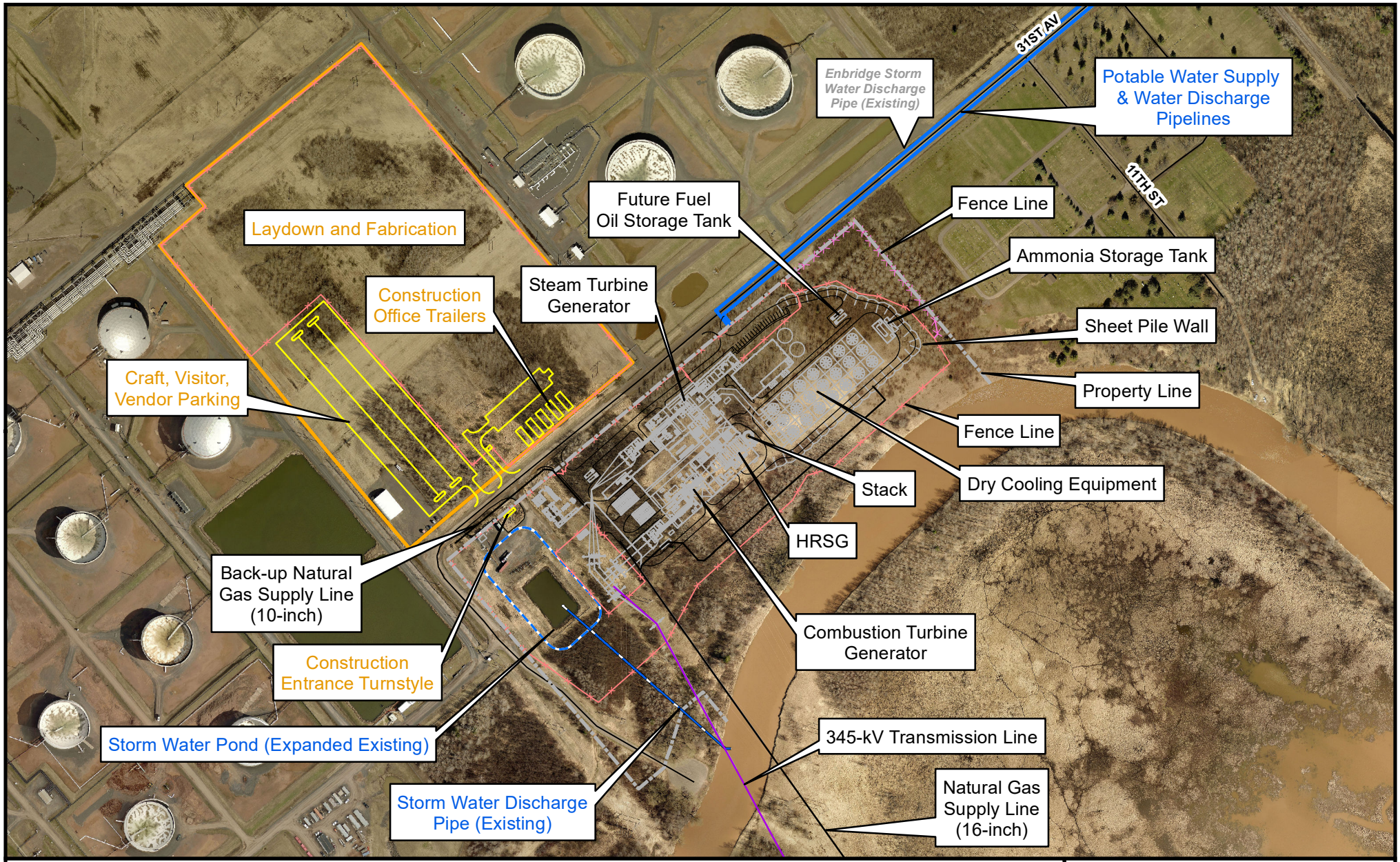


Plant Facilities
Temporary Construction
Property Boundary
Fence (Barded Wire)
Fence (Chain Link)
Stormwater Drainage Pipe
Proposed Natural Gas Lateral
Stormwater Pond
Water Pipeline
Laydown & Staging
Proposed Transmission Line

NORTH

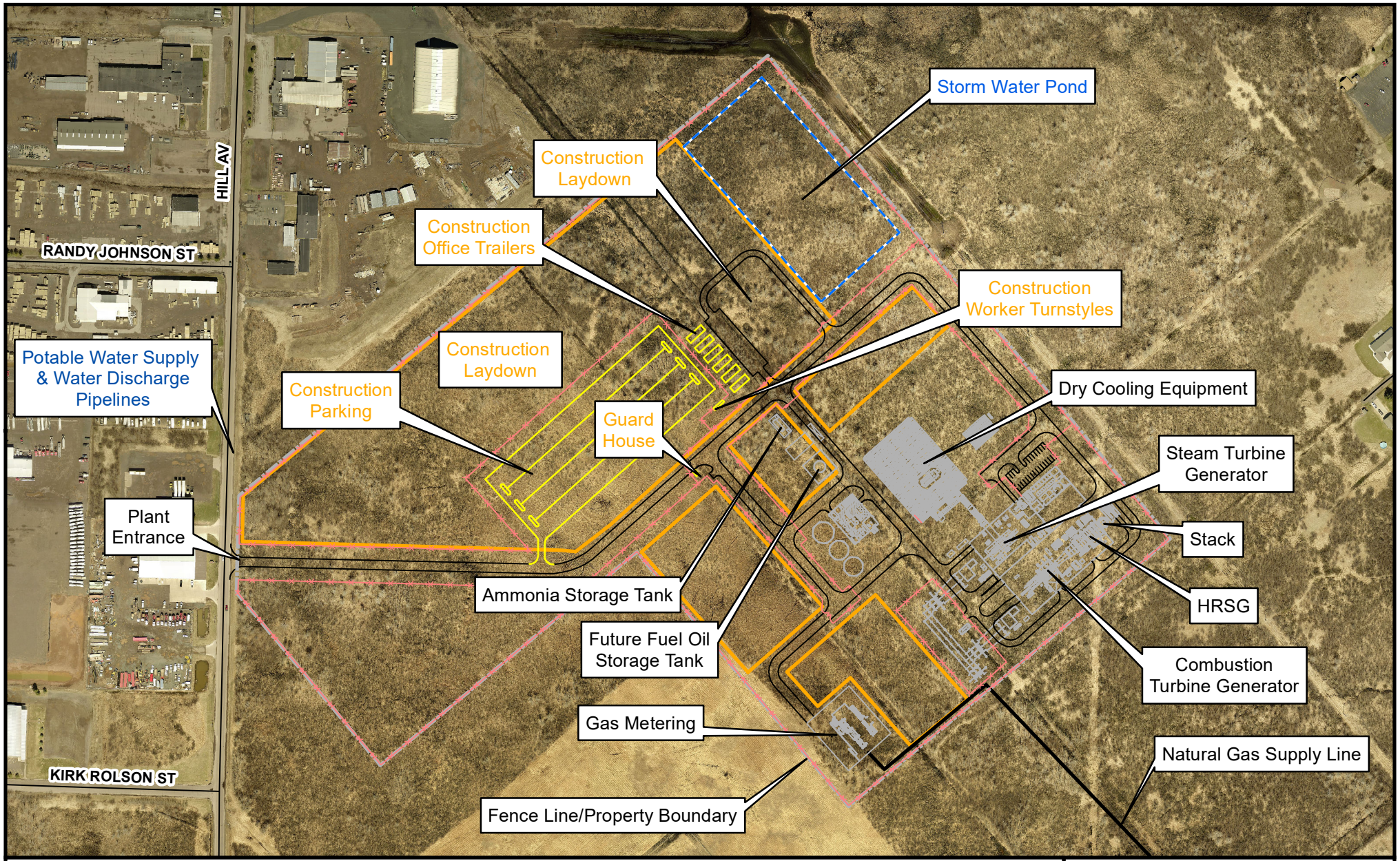
400 200 0 400
Scale in Feet

Figure 2-5
Page 2 of 3
Nemadji River Site Layout
Nemadji Trail Energy Center
Douglas County, WI

Source: City of Superior (Aerial 2019), EV, Minnesota Power, Dairyland Power Cooperative, and Burns & McDonnell Engineering Company, Inc.

Issued: 7/15/2020

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_5_3_HillAveSiteLayout_ACC.mxd mhughes 7/15/2020



Fence Line
Plant Facilities
Property Boundary
Stormwater Pond
Temporary Construction
Natural Gas Supply Line
Water Pipeline
Laydown & Staging

NORTH

400 200 0 400
Scale in Feet

Figure 2-5
Page 3 of 3
Hill Avenue Site Layout
Nemadji Trail Energy Center
Douglas County, WI

Source: City of Superior, WI (Aerial 2019), EV, Minnesota Power, Dairyland Power Cooperative, and Burns & McDonnell Engineering Company, Inc.

Issued: 7/15/2020

2.4 Linear Infrastructure Alternatives

Development of this new natural gas generation facility requires the development of associated electricity and natural gas infrastructure. The new facility would require a new electric transmission line to connect to a new switching station located southeast of the site. The switching station would then be connected to the electricity grid in order to deliver the power generated to the bulk power system. Ideally, the connection would be at a location minimizing conflicts with existing system reliability, to avoid or minimize the need for additional upgrades to accommodate the additional power being inserted into the system. ATC would be responsible for the connection between the switching station and the existing Arrowhead to Stone Lake 345-kV transmission line. In addition to an electrical transmission interconnect, a suitable supply of natural gas to fuel the facility is also required via a natural gas pipeline. A 16-inch diameter natural gas line for the Project will be constructed and owned by Superior Water Light & Power (SWL&P). As such, it is not evaluated as part of the Project. It is discussed in Chapter 4, Cumulative Impacts.

The proposed switching and tap points on existing natural gas pipelines capable of providing the required fuel supply are identified as end points for linear infrastructure extending from alternative generation sites. The location of potential generation sites and the connection/tap points form the basis for the development of a Study Area within which to identify and consider corridors for infrastructure development. The Study Area typically is identified within which several 0.5-mile wide macro-corridors can be developed. These macro-corridors are investigated in further detail to determine potential impacts for a new transmission line in the Study Area. These steps and the results for this study are discussed in detail in the following sections.

2.4.1 Macro-corridor Study Area Identification

After identification of the alternative generation sites, and prior to the development of a defined Study Area for the development of necessary linear infrastructure (macro-corridors), the primary constraints of the area were reviewed. Major considerations for developing a new transmission line between a new generation facility in Superior, Wisconsin, and a termination point southeast of the proposed facility included residential areas of the City of Superior, the Richard I. Bong Memorial Airport, several local parks, tank farm, and the Nemadji Golf Course.

Based on these identified potential constraint areas, a Study Area was established that was capable of providing sufficient geographic area to include multiple macro-corridor options that could connect Project endpoints (alternative generation plant sites and utility infrastructure connections) while providing

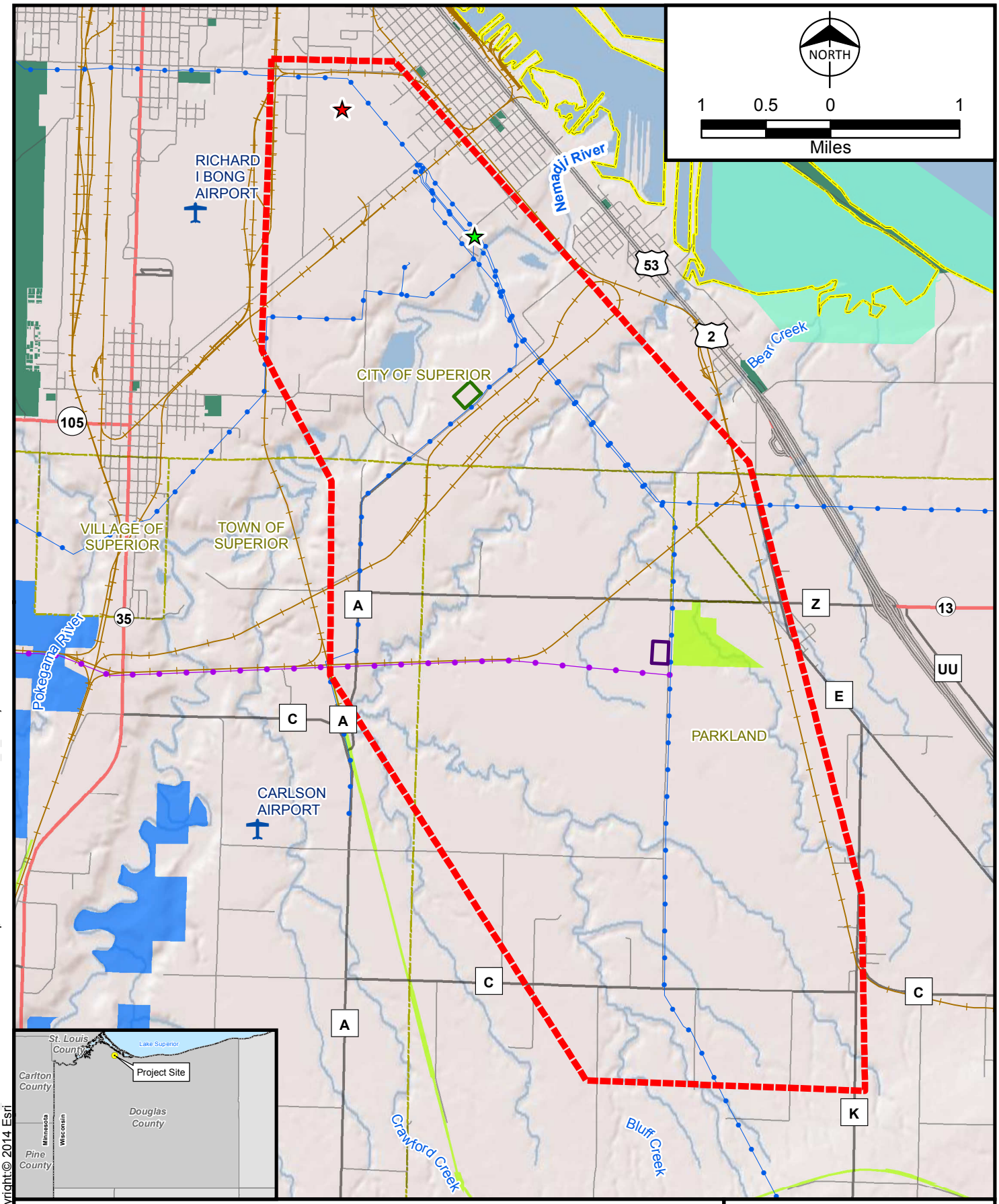
opportunities to avoid constraints and take advantage of opportunities (Figure 2-6). The Study Area is completely within Douglas County and was designed to provide a reasonable number of corridor opportunities, while at the same time not being too large as to encumber the process. The following sections provide a description of the Study Area and identify the macro-corridors developed within the Study Area for further investigation.

2.4.2 Resource Data Collection

Readily-available resource data within the Study Area was collected from Federal governmental agencies, state and local governments, utility companies, and other publicly available sources. This data was used to prepare Geographic Information System (GIS) maps and included the following resource categories:

- Land Use and Jurisdiction;
- Existing Transportation and Utility Corridors;
- Geology and Soils;
- Water Resources; and
- Cultural Resources.

The resource data was mapped in GIS format and combined with aerial photography to validate resources within the identified macro-corridors.



Study Area
Hill Avenue Site
Nemadji River Site
Airport
Railroad
161 kV and Below
345 kV
Parkland Switching Station
Superior Switching Station
County Boundary
Municipal Boundary
Public Park
State Managed Land
Lake Superior National Estuarine Research Reserve
Douglas County Forest

Figure 2-6
Study Area
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_6_StudyArea.mxd kasamuelson 3/8/2019
Service Layer Credits: Copyright:© 2014 Esri

Source: Esri, Minnesota Power, City of Superior, USGS PADUS, FAA, USGS NHD, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/8/2019

2.4.3 Identification of Alternative Macro-Corridors

Following the establishment and investigation of the Study Area, the area was evaluated for the identification of macro-corridors for the linear infrastructure requirements. Several general areas potentially suitable to contain macro-corridor alternatives were identified and evaluated to determine if they were suitable for the development of transmission line route (Figure 2-7). The macro-corridors were evaluated with consideration of the following constraints and opportunities, which were present in the Study Area:

- Communities and other developed areas within the Study Area
- Nemadji Golf Course
- Existing oil and gas infrastructure
- Existing transmission line corridors
- Roads and railroads
- Conservation areas

Constraints were considered in the development of the macro-corridors (see Figure 2-8 through Figure 2-13 for macro-corridor resource maps). Macro-corridors considered the locations of natural and social resources within the Study Area and potential opportunities available for the compatible location of a new transmission line such as roadways and existing transmission line corridors.

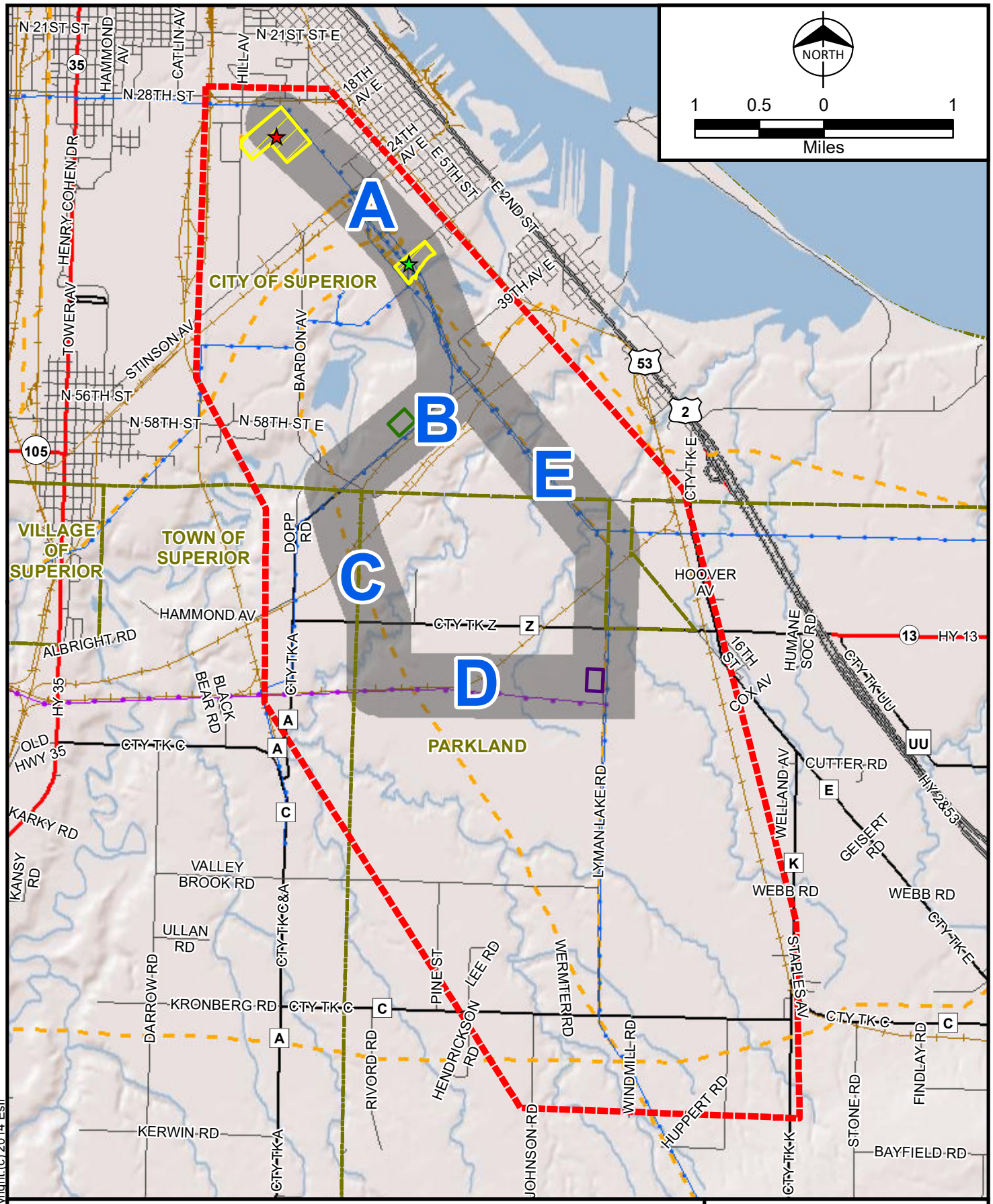


Figure 2-7
Macro-Corridors
Nemadji Trail Energy Center
Douglas County, WI

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Service Layer Credits: Copyright:(c) 2014 Esri

Source: Esri, Minnesota Power, City of Superior, Wisconsin DNR, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/16/2019

A number of existing utility corridors extend through the Study Area. Locating a transmission line along linear features may result in fewer environmental impacts because of the previous disturbance from construction and is considered good routing practice by confining linear facilities to common corridors. Existing transmission lines provide opportunities for routing the proposed transmission line adjacent to an existing right of way (ROW). However, locating along these facilities may be difficult due to development around these lines and can also limit flexibility to avoid resources along existing infrastructure. In considering these factors, along with other constraints in the Study Area, the identification of macro-corridors focused on following existing utility infrastructure, with macro-corridors wide enough (0.5 mile) to provide opportunities to avoid constraints if necessary.

A more detailed discussion and comparison of these macro-corridors is found in the following section.

2.4.4 Alternative Macro-Corridors

Figure 2-7 illustrates the alternative macro-corridors and identifies individual corridor segments by letter designation A through E. The following is a description of each macro-corridor.

The macro-corridors had several similarities. All macro-corridors crossed large areas of wetlands and woodlands within the City of Superior, the Town of Superior, or Parkland. Areas of hunting lease land and wetland mitigation areas are also included within the macro-corridors.

Corridor segment A generally extends from the Hill Avenue generation site alternative to the southeast, paralleling existing transmission for its entire length and existing pipeline infrastructure for over half its length. Due to the constraints in the area and existing linear infrastructure, only one macro-corridor was developed extending south from the Hill Avenue Site. This corridor is wide enough to provide flexibility to develop multiple alignments and avoid site specific constraints that may be identified later.

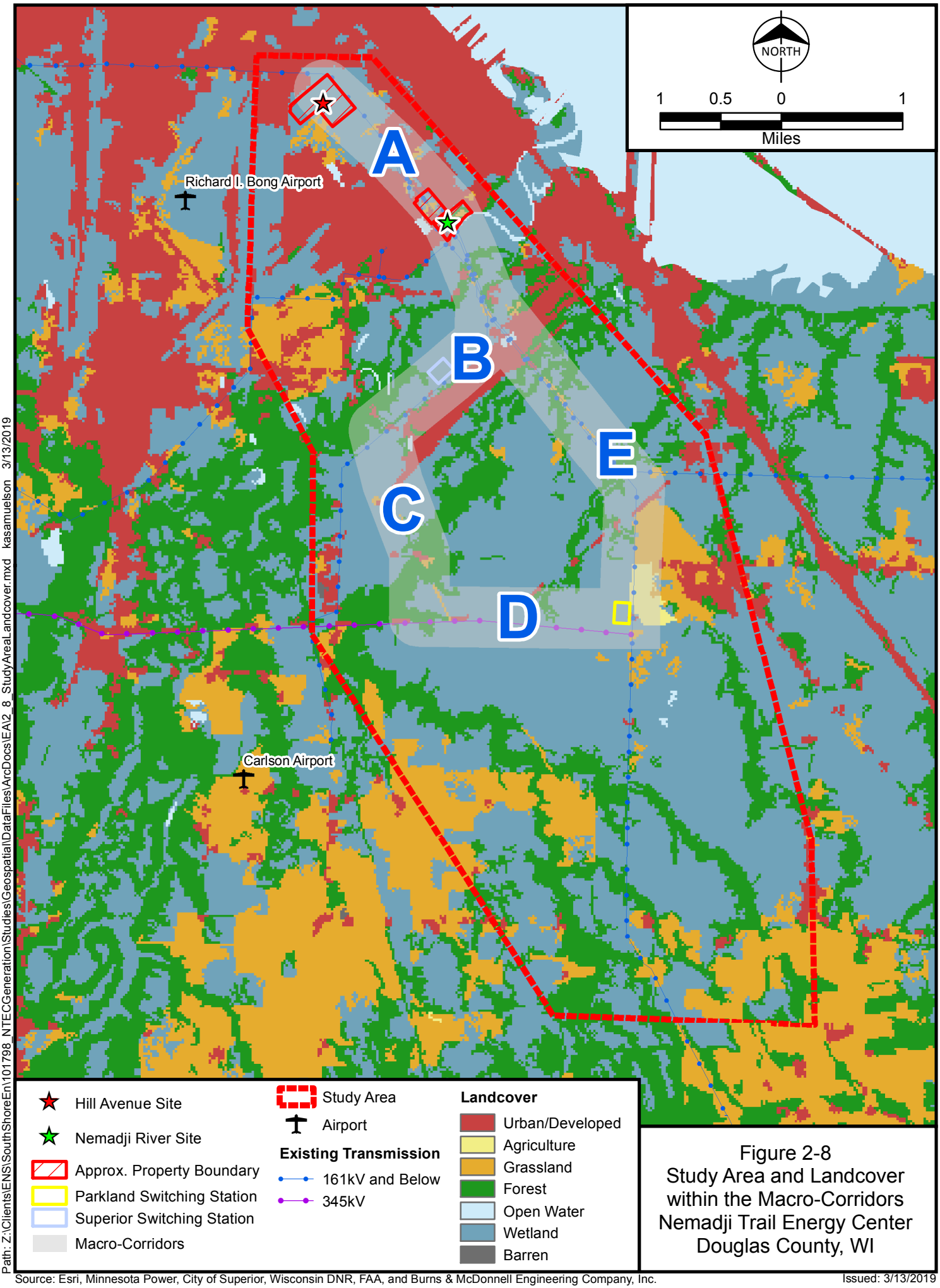

Figure 2-8
Study Area and Landcover within the Macro-Corridors
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_8_StudyAreaLandcover.mxd kasamuelson 3/13/2019

Source: Esri, Minnesota Power, City of Superior, Wisconsin DNR, FAA, and Burns & McDonnell Engineering Company, Inc.

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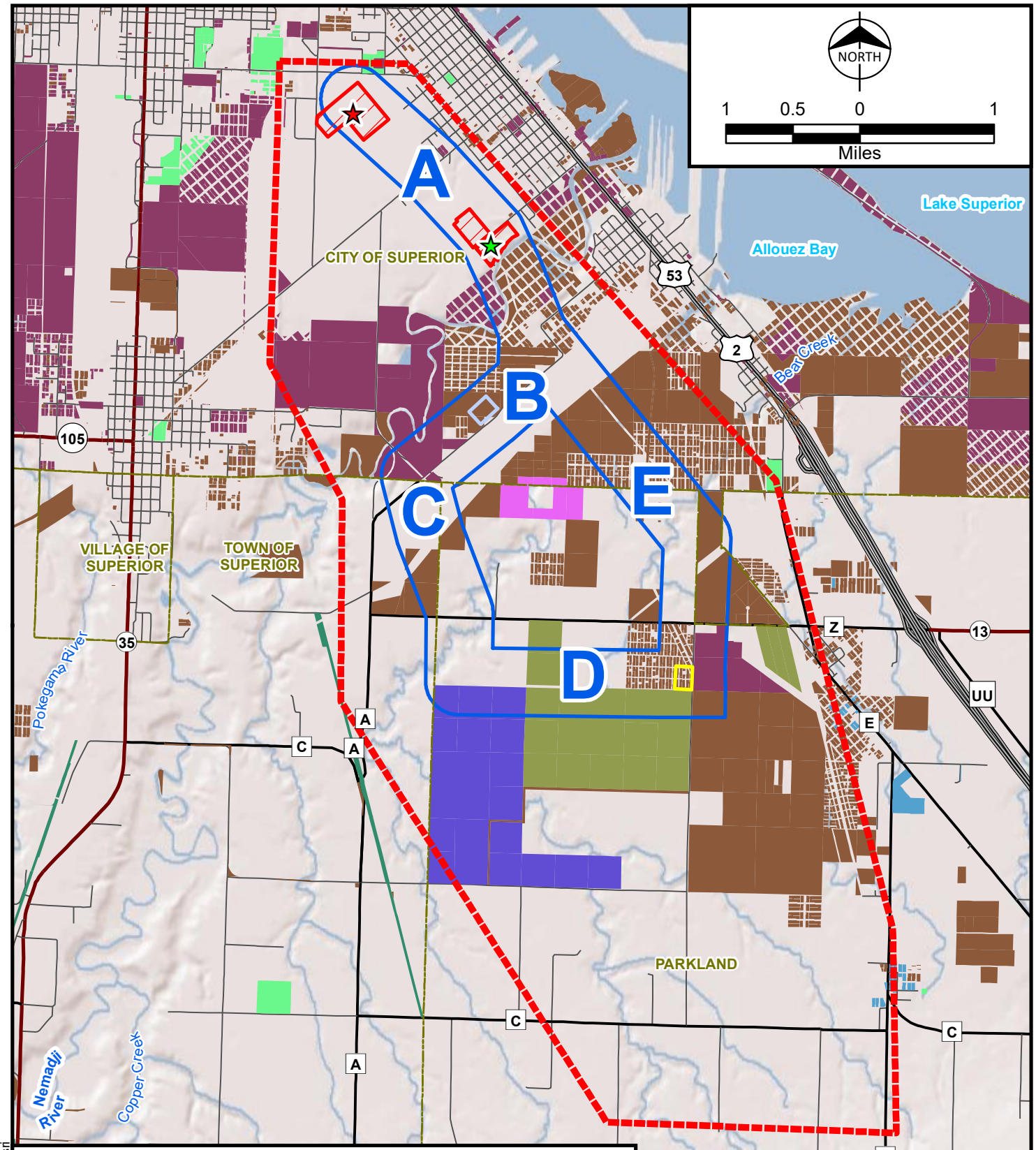

Hill Avenue Site

Nemadji River Site

Study Area

Approx. Property Boundary

Macro-Corridors

Municipal Boundary

Parkland Switching Station

Superior Switching Station

Land Ownership

City of Superior

Douglas County

Superior School District

West Wisconsin Land Trust

Town of Parkland

Timber Company

Wisconsin DNR

Wisconsin Wetlands LLC

Figure 2-9
Government and Primary Land Ownership within the Macro-Corridors
Nemadji Trail Energy Center
Douglas County, WI

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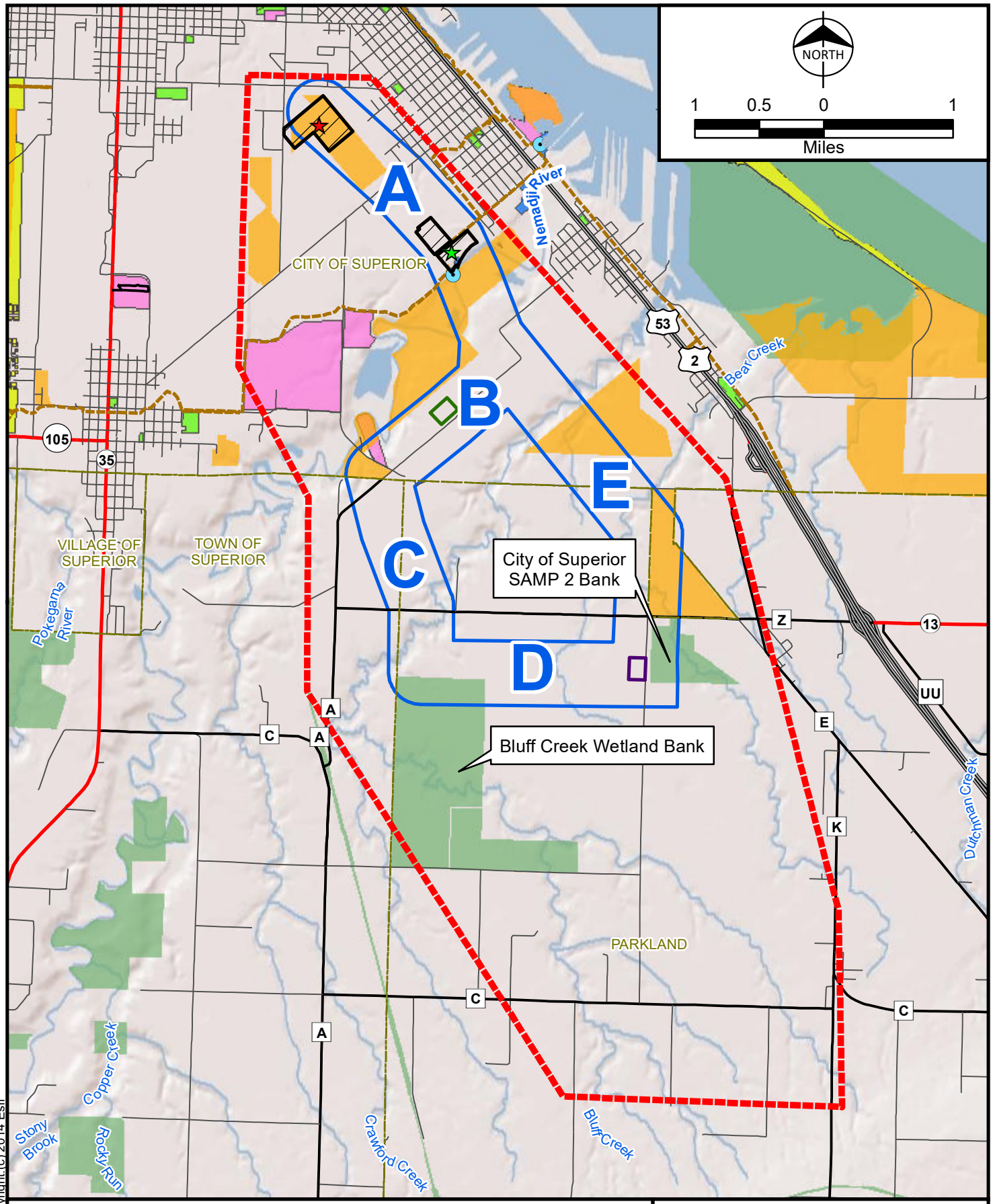

Hill Avenue Site
Nemadji River Site
Approx. Property Boundary
Parkland Switching Station
Superior Switching Station
Boat\Canoe Launch
Study Area
Recreation Trail
Municipal Boundary
Macro-Corridors
Hunting Area
Conservation Area

City Park and Recreation Areas
Special Use
Waterfront
Park
Open Space

Figure 2-10
Conservation and Recreation Areas within the Macro-Corridors
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_10_StudyAreaRecreation.mxd kasamuelson 12/16/2019
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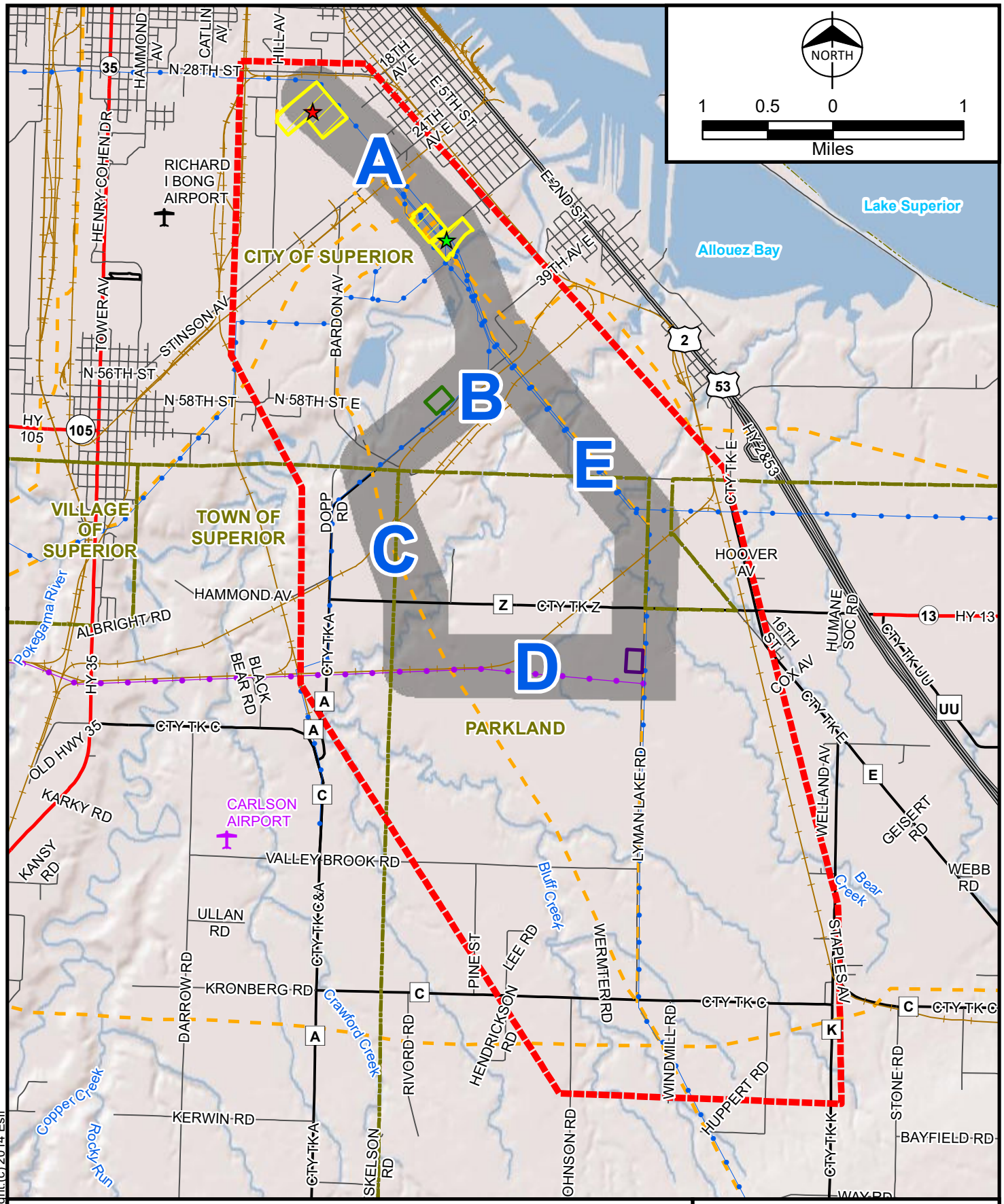

Hill Avenue Site
Nemadji River Site
Approx. Property Boundary
Parkland Switching Station
Superior Switching Station
Study Area
Municipal Boundary
Railroad
U.S. Highway
State Highway
County Road
Local Road
Macro-Corridors
Existing Transmission Line
161kV and Below
345kV
Public Airport
Private Airport
Existing Gas Pipeline

Figure 2-11
Transportation and Utilities within the Macro-Corridors
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_11_TransportationUtilities.mxd kasamuelson 12/16/2019
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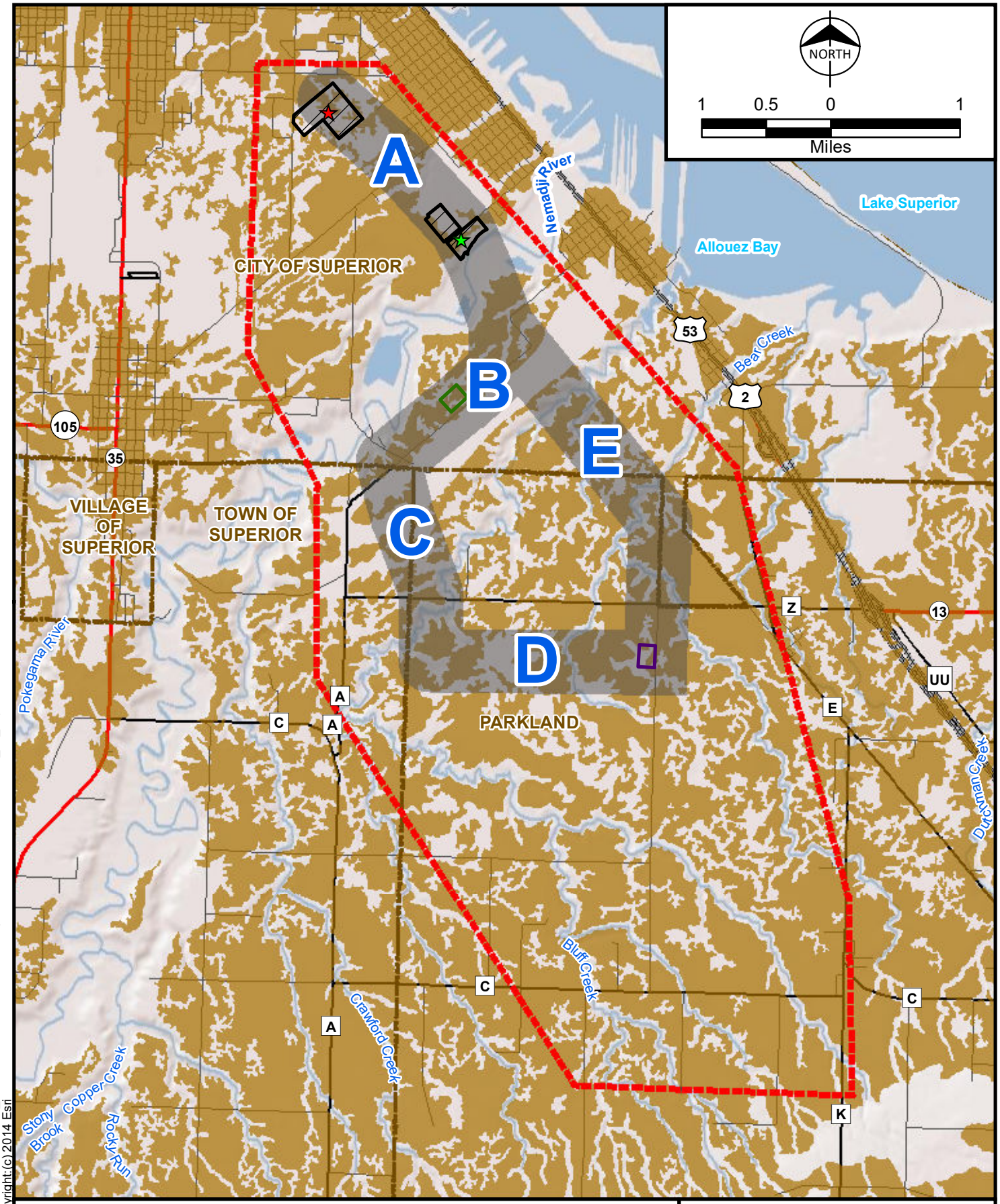

Hill Avenue Site
Nemadji River Site
Approx. Property Boundary
Study Area
Macro-Corridors
Parkland Switching Station
Superior Switching Station
Municipal Boundary
Farmland of Statewide Importance

Figure 2-12
Farmland of Statewide Importance
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_12_ImportantFarmland.mxd kasamuelson 12/16/2019
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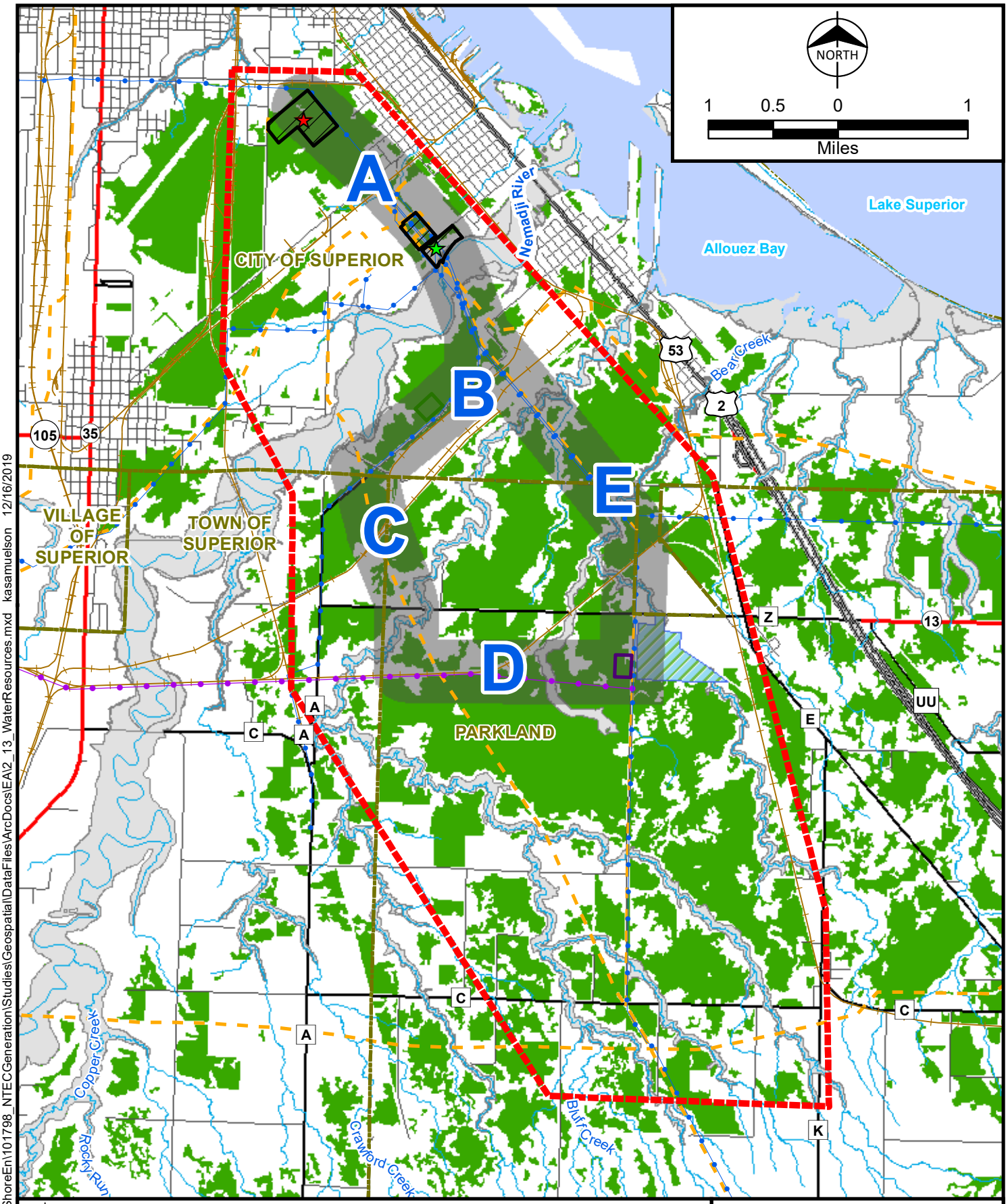


Hill Avenue Site
Nemadji River Site
Approx. Property Boundary
Parkland Switching Station
Superior Switching Station
Study Area
Macro-Corridors

Wetland Mitigation Bank
Stream\River
Floodplain
Wisconsin Wetland Inventory
Municipal Boundary

Existing Transmission Line
161kV and Below
345kV
Existing Gas Pipeline
Railroad

Figure 2-13
Water Resources
within the Macro-Corridors
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA\2_13_WaterResources.mxd kasamuelson 12/16/2019

Source: Esri, Minnesota Power, City of Superior, Wisconsin DNR, USGS PADUS, USGE NHD, FEMA, and Burns & McDonnell Engineering Company, Inc. Issued: 12/16/2019

2.4.5 Substation Siting Alternatives

Construction of the proposed Project requires interconnection of the plant to the existing 345-kV electrical system, as previously discussed. The nearest 345-kV line to be tapped for the project is the Arrowhead to Stone Lake 345-kV line located south of the proposed NTEC and Hill Ave sites. As limited space was available on both proposed plant sites for a 345-kV substation and construction of a switching station at either plant site would require construction of two new 345-kV lines for several miles to loop the Arrowhead to Stone Lake line in and out of the new switching station, a new switching station off-site was determined necessary and alternative sites were investigated and evaluated.

The Superior region of Wisconsin has a relatively high abundance of forested and shrub/scrub wetlands. In considering potential switching station locations, the evaluation focused on potential locations within the macro-corridors, as well as adjacent areas within a mile of the macro-corridor alternatives. Focusing the sites for station alternatives to this area minimized the potential, additional new 345-kV line that would be required to interconnect the switching station to the existing 345-kV system and the associated impacts of establishing new line ROW. Sites were evaluated for the presence of wetlands as well as numerous other factors, including clearing requirements, federal and state listed sensitive species or other resources, land use, proximity to residences and residential areas, grading and stormwater retention requirements, and willingness of landowners to sell the property. Additionally, location of the switching station near the Arrowhead to Stone Lake 345-kV line was recognized to minimize the length of new 345-kV line, and associated impacts to establish, construct and maintain the new line and ROW. The further the switching station from the existing line, the more new line and ROW required, and the more potential natural resource and social impacts expected.

Numerous sites within the macro-corridors and surrounding study area were identified and evaluated for the new switching station. Ultimately, two sites, the Parkland Switching Station and Superior Switching Station (Figure 2-7) were identified as alternative switching station sites for connection of the alternative macro-corridors into the 345-kV system. These sites were determined to minimize overall (temporary, permanent, conversion) wetland impacts as well as minimizing residential proximity and avoided occurrences of state listed sensitive resources. Land use at the sites was determined compatible for the development of a switching station and the proximity of the sites to the Arrowhead to Stone Lake line was approved by MISO, minimized impacts associated with any new line construction (although the Superior Switching Station site would require additional new 345-kV line to facilitate connection to the existing 345-kV system) and additional intrusion of transmission lines into the environment, collocated adjacent to the existing utility corridor as required by the PSCW, avoided residential proximity concerns, and could be obtained through a voluntary purchase from the existing landowner. The Parkland and

Superior Switching station alternative sites have therefore been retained for evaluation as part of the macro-corridor alternatives identified.

The existing transmission line, SWL&P's Winter to Stinson 115-kV transmission line, extends through a wooded area from the Hill Avenue alternative site to the Stinson Substation on 24th Avenue. An alternative alignment along the existing line would generally confine impacts to an already impacted corridor, although paralleling this line would require additional woodland clearing. This portion of Corridor segment A includes residential areas along the following roads: 12th Street, 13th Street, 14th Street, 19th Street, 21st Street, and 22nd Street. The corridor includes a portion of the Christ Lutheran Church property.

From the Stinson Substation to the Nemadji River, alignments within Corridor segment A could parallel either a transmission line (Gary to Stinson 115-kV, Superior to Minong 161-kV, or Ino to Superior 115-kV) or a pipeline (crude oil or natural gas). This area would require additional woodland clearing as well, though there is less woodland in this portion of Corridor Segment A compared to the area north of the Stinson Substation. The portion of Corridor segment A between 24th Avenue and the Nemadji River contains additional oil and gas infrastructure (tank farm), however, which would limit the number of alternative alignments that could be reasonably developed. Alignments within portion of Corridor segment A may require a transmission line crossing and/or a gas pipeline crossing depending on the alternative alignment. Any alternative alignment within Corridor segment A would also require a crossing of the Orange Trail. The corridor also includes a portion of the St. Francis Cemetery on the north bank of the Nemadji River. Corridor segment A provides the opportunity for crossing the Nemadji River and its associated floodplain at an existing crossing, limiting impacts to an existing river crossing, rather than creating new impacts elsewhere along the Nemadji River. South and east of the Nemadji River is primarily wooded. Alternatives within Corridor segment A would require additional woodland clearing in this area. Residential structures occur along East 18th Street. Alignments paralleling existing transmission lines or gas pipeline ROW through this area would confine impacts to existing ROWs and areas adjacent to existing utility corridors.

Corridor segment B is the more westerly of two macro-corridors that extend from the south end of Corridor segment A generally southwest then south. Corridor segment B includes opportunities to parallel 42nd Avenue as well as a rail line to Woodlawn Road. The corridor includes portions of the Nemadji sled hill and structures associated with the rail line. Alternatives through this area would require woodland clearing as the area is primarily wooded. Corridor segment B also includes the Superior Switching Station. If the Superior Switching Station Site is constructed for the Project, ATC would construct two

345-kV transmission lines from the Superior Switching Station Site to a tap location on the existing Arrowhead to Stone Lake 345-kV transmission line. This alternative would be the responsibility of ATC and is therefore not part of the Project or this application.[11] Corridor segment B connects to Corridor segment C.

After crossing Woodlawn Road, Corridor segment C turns and extends generally south, paralleling an existing Enbridge crude oil pipeline. Alternatives using Corridor segment C continue to Corridor segment D. Alternatives through this portion of Corridor segment C would require woodland clearing and would cross rail lines south of CR A. At CR Z, Corridor segment C extends due south and no longer parallels the crude oil pipeline. This portion of the corridor would also require woodland clearing, includes a crossing of Bluff Creek and its associated floodplain, and also has several structures, including the George Constance Senior Memorial Rifle Range, residences, and outbuildings.

Corridor segment D extends from the end of Corridor segment C due east along the existing Arrowhead to Stone Lake 345-kV transmission line. Alternatives through this corridor would require woodland clearing, a Duluth Missabe & Iron Range rail line crossing, and a crossing of an unnamed tributary of Bear Creek and its associated floodplain. Alternatives through this corridor would terminate at the Parkland switching station site.

Corridor segment E extends from the south end of Corridor segment A generally southeast then south, to the east of Corridor segment B. The corridor parallels two existing transmission lines (Superior to Minong 161-kV and Ino to Superior 115-kV) and an existing SWL&P natural gas pipeline. Alignments in Corridor segment E would require rail line crossings near 42nd Ave and East 18th Street. This area also contains several residences and structures related to rail line operations. Continuing south, Corridor segment E traverses primarily woodland and crosses City Limits Road. Several residences are located along City Limits Road within the macro-corridor. Alignments in this portion of Corridor segment E would require crossing Bluff Creek and Bear Creek and floodplain associated with each creek, as well as woodland clearing. Paralleling existing linear infrastructure within this corridor would limit impacts to areas adjacent to existing waterway crossings and would limit woodland clearing to areas adjacent to existing ROWs. Corridor segment E extends due south, crossing a Duluth Missabe & Iron Range rail line. Alternatives within Corridor segment E would cross this rail line, as well as Bear Creek for a second time. Corridor segment E contains the Parkland Wentworth Cemetery, Ambridge Gun Club, and a flying site

[11] The two 345-kV transmission lines that would be constructed by ATC from the Superior Switching Station Site to a tap location on the existing Arrowhead to Stone Lake 345-kV transmission line are included in the cumulative impacts discussion in Chapter 4 of this EA.

for the Duluth/Superior RC Club. South of CR Z, Corridor segment E continues to parallel existing transmission and pipeline ROW, as well as Lyman Lake Road, to the Parkland Switching Station area. This portion of the corridor contains a WDNR wetland mitigation program property, woodland, and several residences along Lyman Lake Road and several adjacent roads.

Each of the macro-corridors provided multiple opportunities to develop alignments for linear electricity transmission. As these facilities would be relatively short, the areas through which the macro-corridors extend are geographically proximate and were determined to have similar characteristics and resources. Each also contain existing infrastructure similar to that to be developed as part of the generation Project. All the macro-corridors were determined reasonable for potential route alignments and retained for further consideration during the environmental review process.

Within all the macro-corridor segments, existing linear facilities were present and could be followed for nearly the entire length of the proposed new transmission line between the generation sites and proposed switching stations. For the eastern macro-corridor, existing electricity transmission lines extended the entire distance from the Hill Avenue Site, through the Nemadji River Site continued to the Parkland switching station site. The western macro-corridor contained a combination of existing electricity transmission lines (Segments A, B, and D) along with an existing natural gas transmission corridor (Segment C). In keeping with the good routing practice of using or following existing linear infrastructure with new linear facilities, the most reasonable potential for electricity transmission line development would be following parallel to these existing facilities. Routes were identified adjacent to these existing linear facilities within the macro-corridors to quantify the potential impacts of development of the proposed line within each macro-corridor could reasonably be expected. Should deviations from these alignments be required, it is expected they would be for site specific issues or challenges, resulting in only minor changes to the potential impacts quantified.

The FAA applies imaginary surfaces to public use airports to identify and protect the airspace from potential obstructions. Because both routes cross FAA obstruction identification surfaces, the airspace near the Richard I. Bong Airport (SUW) was evaluated to determine any height restrictions for the two alternative transmission line routes within the macro-corridors. Based on the ground elevation and the distance from the transmission line routes to the SUW runways, some structures in short sections of both routes within approximately two miles of the airport could be restricted to approximately 150 feet above ground level (agl). Obstruction identification surfaces are less restrictive further from the airport where structure heights could be up to approximately 200 feet agl without exceeding an obstruction surface. However, the FAA would likely require marking and lighting for any structure that is greater than 200

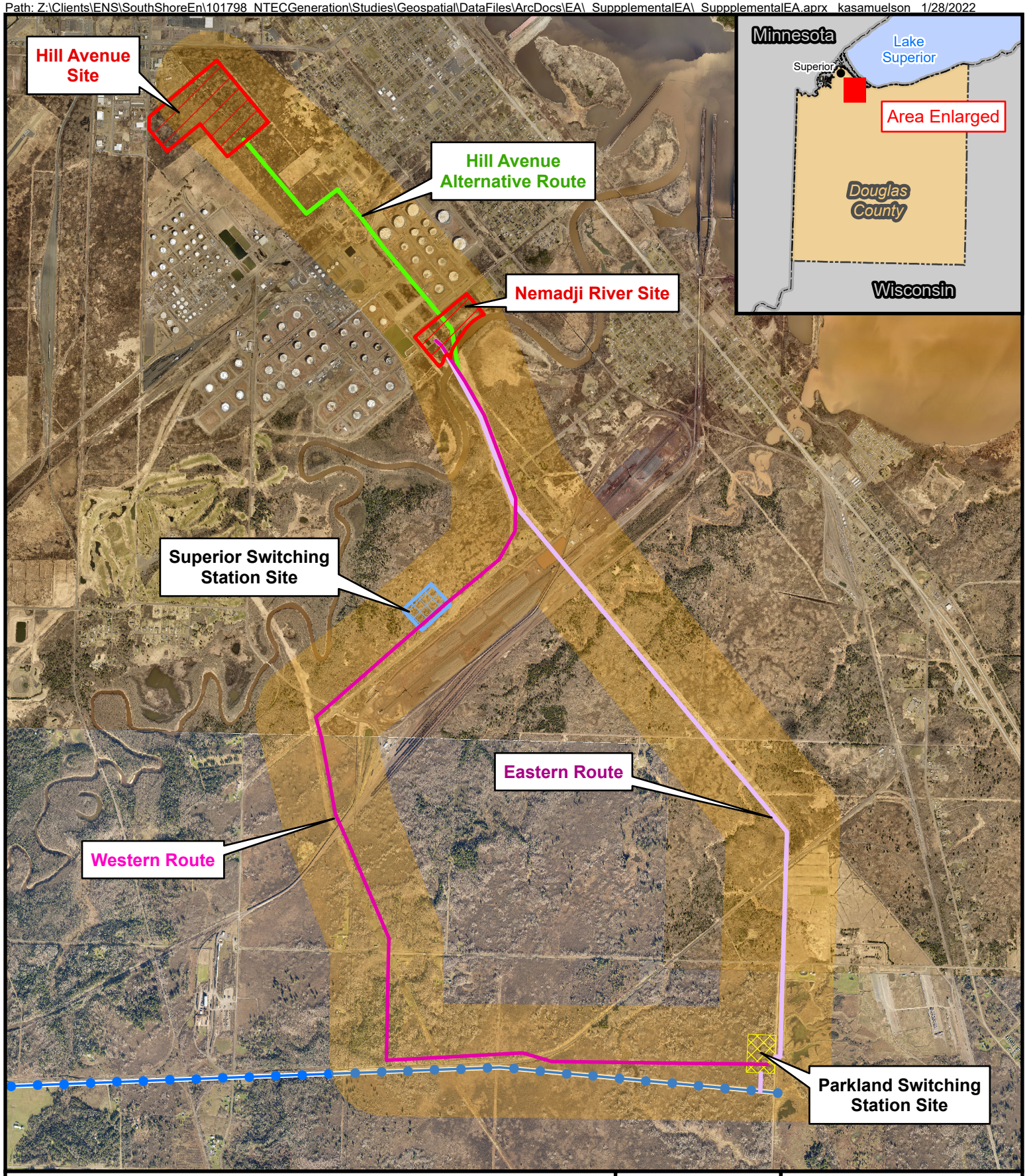
feet agl, regardless of where it is located in proximity to SUW or any other public use airport. The Project is not anticipated to have any structures greater than 200 feet agl. Likewise, structures that are found to exceed a Part 77 obstruction surface but found to not have a substantial adverse effect upon the navigable airspace after further FAA study may be issued a determination of no hazard by the FAA with the condition that they are marked and lighted to improve visibility.

2.5 Identification of the Project Alternatives for Evaluation

Construction of the NTEC Project requires identification, consideration, and evaluation of sites for location of the generation facilities, as well as alignments for development of the necessary linear electricity transmission facilities. The No Action Alternative and alternative technologies are addressed in Sections 2.6 and 2.7, respectively. While generation sites were well defined parcels of land, transmission line macro-corridors were areas of land approximately 0.5-mile wide, considerably greater than the 130 feet of ROW width actually required for the new 345-kV line. This difference in width was intended to provide flexibility for location of the actual transmission line following approval should unforeseen or previously unidentified obstacles be identified requiring minor deviations of the route. Location of the actual ROW, provided it remained within the macro-corridor approved, would be acceptable.

For the Project, two generation sites, Nemadji River and Hill Avenue, were identified, as were two macro-corridors (eastern and western) for transmission line development. Each site was combined with each macro-corridor as a unique Project alternative for comparison and evaluation. These alternatives were (Figure 2-14):

- Hill Avenue 1: Hill Avenue Site combined with eastern macro-corridor (Segments A and E)
- Hill Avenue 2: Hill Avenue Site combined with western macro-corridor (Segments A, B, C, and D)
- Nemadji River 1: Nemadji River Site combined with eastern macro-corridor (Segments A and E)
- Nemadji River 2: Nemadji River Site combined with western macro-corridor (Segments A, B, C, and D)



Macro-Corridors
Existing Electric Transmission
Existing Pipeline
Generation Plant Site
Parkland Switching Station
Superior Switching Station

Electric Transmission Options
Hill Avenue Alternative Route
Western Route
Eastern Route

NORTH
0 1,500 3,000
Feet

Figure 2-14
Project Alternative Sites, Switching Stations, and Transmission Line Routes Location and Overview

Source: South Shore Energy; MP; City of Superior 2019 aerial photography; Energy Velocity; Burns & McDonnell Engineering Company, Inc.

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The NTEC project originally selected wet cooling for the project using ground water as the water source because of its efficiency benefits, and economic advantages, and low environmental impacts. Due to concerns expressed by the WDNR associated with withdrawing the quantities of groundwater required, NTEC evaluated other water supply options, including utilization of Municipal water, and furthered their earlier investigations of dry cooling. Dry cooling was selected as a result of these studies. Options utilization Municipal water supply from SWL&P were dismissed as they would require substantial infrastructure upgrades, including a new larger pipeline from SWL&P's Lake Superior water treatment plant to either Project site, and would require additional water allocations from Lake Superior, both of which would present permitting challenges as well as environmental and social disruptions.

In dry cooling, a large finned heat exchanger with fans moving ambient air across the outside of the tubes and fins (like a radiator in a car) is used to reject the energy in the steam leaving the steam turbine. Removing energy in the steam causes the steam to condense inside the tubes. The steam needs to be condensed to allow pumping back up to the pressure needed by the HRSG. Dry cooling would have the benefits of eliminating any fogging or rime ice associated with wet cooling, as well as reduce water requirements and discharge to and from the Project considerably.

Chapter 3 of the NTECEA presented the potential impacts of each of the Project alternatives for comparison. In this Final SEA, Chapter 3 provides the potential impacts associated with GHG emissions and tribal environmental justice for each of the Project alternatives.

The PSCW has previously approved alternatives for various components of the Project. On January 31, 2020, the PSCW issued its final decision on the generation facility (Docket Number 9698-CE-100). The Certificate of Public Convenience and Necessity (CPCN) application was approved and the PSCW authorized the Nemadji River Site as the location for NTEC. On January 30, 2020, the PSCW issued its final decision on the electric transmission line for the Project (Docket Number 9698-CE-101). The transmission line CPCN was approved and the PSCW authorized the eastern route. On March 3, 2020, the PSCW issued its approval of a 16-in natural gas lateral to SWL&P (Docket Number 5820-CG-105) to supply natural gas to the NTEC generation facility as well as the 10-inch natural gas reroute required at the Nemadji River Site (Docket Number 5820-CG-106).

2.6 No Action Alternative

Under a No Action Alternative, RUS will not provide funding and the Project would not be built. The gas turbine generator, HRSG, STG, transmission line, substation, and other associated facilities would not be constructed. Dairyland would not add new generating capacity to the current resource mix to reliably

serve growing load within the service territories that the member cooperatives serve and to replace retiring generation. Dairyland would not help facilitate the addition of new renewable electricity sources to the power portfolio, nor would the Project be available to bridge reliability needs during the energy transition and support the need identified by MISO for grid reliability and resource adequacy. As such, the No Action Alternative does not meet the purpose and need of the Project.

2.7 Additional Technologies Considered and Eliminated from Detailed Study

In comments on the SEA in July 2022, the EPA asked that RUS consider modifications to the Project, essentially alternatives based on other generation technologies, to address all practicable mitigation measures. This included investigating the use of zero or carbon neutral fuel; carbon capture technology; switchgears that are SF_6-free; and the adoption of recommendations in the EPA Methane Challenge Program. RUS's findings are more fully explained in the following discussion and included in Appendix A of this Final SEA.

RUS found that the Clean Air Act regulations and specifically, Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) guidance, does not require a project to change technology or fuels when evaluating BACT. Alternative fuels and carbon capture were addressed in the PSD air permit application which is included as Appendix B to Final SEA.

As part of any decisions on project funding, RUS considers the financial risks to owners and ratepayers. For this Project, this would include consideration of the financial risks to owners and ratepayers by investing in technologies to control GHG emissions that are neither currently fully mature nor commercially available. This includes the various technologies and processes discussed below that could potentially be implemented to remove or reduce GHG emissions. RUS's core requirement is for loan security whereby there is a reasonable assurance that the loan will be repaid in full as scheduled. The project's technology must perform during the term of the loan at a level necessary to produce with a reasonable amount of certainty the revenues required to repay the RUS loan. This approach protects not only the taxpayer but also ensures that rural communities are receiving the benefits of the project with electric rates that are both reasonable and affordable.

The above does not relieve Dairyland or the NTEC Project from reviewing technologies to control GHG emissions such as carbon capture utilization and storage (CCUS) or processes to produce and deliver hydrogen to blend with or replace natural gas. RUS remains optimistic that in the coming years, further testing and development of these technologies will allow them to become viable options to reducing GHG emissions from fossil power generation facilities and that such projects could in fact be financed by RUS.

However, at this time, and based on the following additional details about alternative technologies, RUS does not believe it appropriate to require or finance the technologies described in Section 2.7.1 and Section 2.7.2.

2.7.1 Fuel

A number of fuel alternatives were analyzed as part of the Project. These fuels alternatives are summarized below.

2.7.1.1 EPA Fuel Considerations

In its comments on the SEA, the EPA discusses fuels other than natural gas that could be burned by electric generating unit (EGU) combustion turbines. With respect to fossil fuels, natural gas is the cleanest, most abundant, and most easily obtainable fuel, and it yields CO_2 emissions much less than other fossil fuels. Other types of fossil fuels would require pre-combustion, oxy-combustion or post-combustion capture systems to control CO_2 emissions from an EGU. The feasibility of these technologies, particularly with respect to burning natural gas as a primary fuel, are addressed below.

Hydrogen and ammonia are carbon-free fuels that are often discussed as alternatives to using fossil fuels, including natural gas. Currently, neither of these two fuels are available anywhere near the site, nor in the quantities required to operate the combustion turbines. EPA does not identify any sources of hydrogen capable of meeting the need, and RUS and the Applicants are not aware of any such sources. If hydrogen becomes commercially available in quantities suitable for use in the future, the Project turbines are capable of using an up to 30 percent hydrogen fuel mix. However, plans for development of hydrogen infrastructure are not known at this time.

Ammonia is a fuel capable of being added or blended directly into an existing natural gas infrastructure and combusted in a combustion turbine. A drawback to ammonia is the energy required to convert hydrogen to ammonia.[12] At present, RUS is not aware of any project in the U.S. that is using ammonia as a fuel by an EGU or any large scale commercially successful electric generating project using ammonia as a fuel. The only project that the EPA mentions that uses ammonia is a demonstration plant that has been set up in the United Kingdom that utilizes wind power to produce the energy for hydrogen electrolysis, creating what is called “green ammonia.”

Hydrogen is a carbon-free fuel that often discussed as an alternative to using fossil fuels, including natural gas. Although there are various methods for producing hydrogen, the two most practical approaches to

[12] https://www.epa.gov/stationary-sources-air-pollution/white-paper-available-and-emerging-technologies-reducing

supplying the NTEC Project with hydrogen to control GHG emissions would be i) the electrolysis of water using electrical energy derived from renewables and ii) steam methane reforming (SMR) of natural gas that includes CCUS. The best approach to relying on electrolysis would be to install electrolyzers at or close to the NTEC plant site which would use electrical energy received from either offsite and/or onsite renewable energy resources to produce what is referred to as "green hydrogen."

SMR that includes CCUS is essentially a pre-combustion capture approach used to eliminate CO_2 emissions from the natural gas. SMR could be performed offsite where natural gas is being produced, processed or stored. The hydrogen would then be transported via an intrastate or interstate piping system to the plant; however, a more practical approach would be to have the SMR process conducted at the plant site to avoid the potential technical issues and cost impacts associated with transporting high volumes of hydrogen in a piping system. There would still be technical challenges to overcome using either approach. One of the biggest issues to address is to determine where to transport the CO_2 for sequestration once it is captured and compressed.

There are several recent examples of combustion turbine installations proposing to blend up to 30 percent hydrogen with natural gas – with 100 percent capabilities. Two specific examples are described that include the Long Ridge Energy Generation Project in southeast Ohio and the Intermountain Power Agency project in Utah.

The 485-MW Long Ridge project purchased a GE 7HA.02 turbine, which the project owners indicate can initially burn up to 15 to 20 percent hydrogen and that it plans to transition to 100 percent green hydrogen. It is clear that further upgrades to the turbine will be necessary to accomplish burning 100 percent hydrogen; however, there are no specific details provided to indicate the scope or cost of the upgrades, which most likely would be substantial. In addition, the transition to 100 percent hydrogen will likely require upgrades to the onsite fuel supply piping. The plant owners indicate that they plan to produce hydrogen onsite and that they are considering the use of below-ground salt formations for large-scale hydrogen storage, but it is uncertain how much hydrogen will actually be produced and stored and what process and its capacity the owners intend to use to produce the hydrogen. The determination of the latter would be critical in determining the overall cost and feasibility of the project. The owners do indicate that burning higher percentages of hydrogen will be subject to fuel availability and economics. Therefore, the idea that the plant will utilize up to 100 percent hydrogen has only been established as a goal at this time; and, as a result, a much more rigorous engineering review and cost study would be required before such a project could ever be implemented.

Another example of a power plant project being developed to potentially use hydrogen is the Intermountain Power Agency's Intermountain Power Project (IPP) that will convert an existing 1,800 MW coal-fired power plant in Delta, Utah to an 840 MW natural gas combined-cycle plant. The plan is to cease coal-fired generation by 2025 and move forward with a new generation facility that will be designed to run on a mix of 30 percent hydrogen and 70 percent natural gas fuel at start-up initially, with a long-term goal to combust 100 percent hydrogen by 2045. The project will use excess energy generated from renewable resources located across the Western U.S. that is delivered to the plant site and used to produce "green hydrogen." The hydrogen will be produced via electrolysis and stored in an existing underground salt dome in the county. Hydrogen would then be continuously available to allow for baseload carbon-free utility-scale power generation.

Unlike the NTEC Project, IPP is uniquely situated due to its access to a wide variety of resources and substantial infrastructure to accommodate the building and operation of an 840 MW combined-cycle plant capable of burning 100 percent hydrogen. Existing infrastructure and resources include ample water, one of the largest deployments of electrolyzers in the world, two major electricity transmission systems, access to railroad and highway transportation, close proximity to existing natural gas interstate pipelines, and a site located directly over the only high-quality geologic salt dome in Western United States which would be used to store the hydrogen that is produced by the electrolysis onsite. Proximity to the high-quality salt dome is of course a big advantage. Another advantage to IPP is the access it will have to a vast transmission network system through which it will be able to receive an abundance of renewable energy derived from wind and solar projects located in various states across Western U.S. The plan is to use excess energy produced from these renewable resources that would otherwise be curtailed and to use the excess energy to produce hydrogen via electrolysis. Access to resources and infrastructure of this type and size is simply not available to either the NTEC Project or to any similar project that would be located in same general vicinity in Minnesota or Wisconsin.

IPP is one of the most ambitious and expensive energy projects in the U.S. that plans to burn hydrogen, and it is often called the world's "largest green energy storage project." The DOE refers to IPP as a "first-of-its-kind" hydrogen project, and it intends to provide the project with a loan guarantee in the amount of about $500 million. The cost of the project is expected to be at least $2 billion. The project would most likely incur some additional costs before the plant reaches commercial operation, and it would be expected to incur additional costs to allow the plant to reach the goal for burning 100 percent hydrogen by 2045 due to modifications and upgrades needed for both offsite and onsite facilities. IPP is expected to cost more than 3 times the estimated cost of the NTEC Project and it will be using technology at a scale not yet considered commercially successful. The IPP is still under development, and it has several critical

milestones to meet before it reaches the goal for burning 30 percent hydrogen and then 100 percent hydrogen.

2.7.1.2 NTEC Fuel Considerations

The NTEC BACT analysis investigated low carbon fuels and the combustion of biogenic sources. The proposed combustion turbine for the Project has not been designed to accommodate fibrous biomass, such as woody biomass, which is the most likely biomass available in sufficient quantities from the surrounding area. Additionally, changing the technology (i.e. – altering the design of the turbine or generation source and/or changing the fuel) is not required in a BACT analysis. A BACT analysis does not require redesign of the "project" or change in the method of operation when evaluating BACT. Therefore, for both regulatory and technical feasibility issues, biogenic sources are not a feasible option since they are not part of the original design.

Combustion of natural gas yields 40 to 50 percent less CO_2 than combustion of coal and petroleum coke and approximately 30 percent less CO_2 than combustion of residual oil. Accordingly, the preferential burning of a low-carbon gaseous fuel in the proposed combustion turbine is an extremely effective CO2 control technique. This control technique is technically feasible for the combustion turbine and duct burner and is an inherent part of the Project's design.

In addition to the BACT analysis, the Project team was required to consider project modifications by the PSCW as required under Wisconsin law. The Project team was required to evaluate other supply options, such as combustible renewable resources, to determine if these options were technically feasible and cost effective. After conducting an extensive contested case proceeding, and hearing expert testimony on potential alternatives to the Project, the Commission also determined that other options were not technically feasible and cost-effective in meeting the need for the Project. That decision has been affirmed upon judicial review by a trial court in Wisconsin. Similarly, in its order approving MP's petition for approval of an affiliated interest agreement related to its ownership interest in the Project, the Minnesota Public Utilities Commission (MPUC) explained that the record before that agency reflected a robust analysis of alternatives and that the Project was in the public interest and best met the need identified, in that docket, by MP.

RUS remains optimistic that in the coming years, further testing and development of these technologies will allow them to become viable options to reducing GHG emissions from fossil power generation facilities and that such projects could in fact be financed by RUS. However, at this time, and based on the

following additional details about alternative technologies, RUS does not believe it appropriate to require or finance these technologies.

2.7.2 Carbon Capture

Carbon capture was analyzed as part of the Project. There are a number of potential methods for carbon capture potentially applicable to a natural gas fired combustion turbine. The following summarizes RUS's consideration of these methods.

2.7.2.1 Post-combustion

Post-combustion CCUS technology has been installed or proposed for installation at a number of locations.[13] However, post-combustion carbon capture has not been commercially demonstrated in the power generation industry in baseload or full stream applications. Many of the projects where post-combustion CCUS technology has been installed are considered pilot or small-scale demonstration projects, or they are utilizing a system to process only a small slipstream of the flue gas thereby removing only a small portion of the CO_2 that would otherwise be emitted to the atmosphere. For example, the AES Warrior Run in Maryland and the AES Shady Point are coal-fired plants with carbon capture systems that remove only 2 percent or less of the CO_2 from the flue gas. Alabama Power's Plant Gaston is operating a 1-MW pilot project that is expected to capture 30 tons of CO_2 per day.

In some cases, post-combustion capture was demonstrated at a relatively small scale for a limited period only. The reference 320 MW natural gas combined-cycle plant in Bellingham, Massachusetts installed a post carbon capture system that processed a 40 MW slipstream from 1991 to 2005 to capture 85-95 percent of the CO_2 in the slipstream that would have otherwise been emitted. Less than 12 percent of the CO_2 in the total flue gas stream was ever removed, and the carbon capture system is no longer in operation. Although the project demonstrated the viability of the carbon capture system deployed, it did so at a small scale using a first-generation technology.

The proposed 900 MW combined cycle EGU in Scotland is anticipated to be completed by 2026 and, once operational, it will have the potential to capture up to 1.5 million tons of CO_2 annually. Although the plant would deploy a relatively large-scale carbon capture system, the system would still only remove about 50 percent of the CO_2 in the flue gas. Also, the carbon capture system is not yet operational since it is only in the planning stages of development. Therefore, the actual cost, risk and overall success of the project is not fully understood at this time. Furthermore, EPA identified two existing natural gas combined cycle plants that may be retrofitted with post carbon capture systems to potentially remove 95

[13] *Id*.

percent of the CO_2 in the flue gas. These include the Deer Park Energy plant in Texas and the Delta Energy Center in California. These are highly expensive carbon capture projects that are only in the early development stages in which the front-end engineering design (FEED) study for each project has not yet been prepared.

As such, RUS has not determined that any of the examples provided by EPA of post-combustion carbon capture systems that are being proposed can be considered commercially successful and viable technologies at this time to provide for large or full-scale capturing of CO_2 at other natural gas combined-cycle plants, such as NTEC.

2.7.2.2 Pre-Combustion

Pre-combustion capture is another approach that is used to eliminate CO_2 emissions from a fuel stock. When used in the electric power industry, this technology typically consists of an integrated gasification combined cycle (IGCC) power plant that converts a solid or liquid fuel into a gaseous fuel or syngas where the CO_2 is captured prior to the syngas being burned in a combustion turbine. Since natural gas is not a solid or liquid fuel stock, such a technology would not be technically feasible or practical. Typical fuel stocks include coal, coke, and residual fuel oil which are not as clean as natural gas and would yield higher CO_2 emissions without utilization of the pre-carbon capture system. The design and operation of an IGCC plant is complex and the capital cost for constructing an IGCC with or without CO_2 remains high. There have been IGCC projects with post-combustion capture that have been proposed or built, but many have been cancelled or are inactive due to cost or technical issues encountered during operation of the system. The technology needs further development for large scale use in the power industry and is not widely used in the power industry.

2.7.2.3 Oxy-Combustion

Additionally, "oxygen combustion" (or "oxy-combustion") has been identified as another potential approach to controlling or reducing GHG emissions from EGU combustion turbines. [14] RUS agrees that the "benefits offered by this technology are its potential for higher efficiencies, reduced overall costs, reduced criteria and hazardous air pollutants, and advantages for CO_2 emissions control." However, oxy-combustion is the least developed of the CO_2 capture technologies (compared to either pre-combustion capture and post-combustion capture). Although there are pilot scale projects that have demonstrated this technology, the technology is not commercially available nor are there are any full-scale demonstration plants in operation.

2.7.2.4 Summary of Carbon Capture Considerations

Even if one assumes that a carbon capture technology would be available whether using post-combustion, pre-combustion or oxy-combustion approaches discussed above, an obstacle to CCUS is sequestration. Although there are a few industrial-sized carbon sequestration projects operating worldwide, the technology for sequestering CO_2 is still being developed. A geological survey and evaluation would need to be performed to determine a storage formation to inject and provide long-term sequestration of the captured CO_2. Further surveys would be needed to address the logistics for shipping the compressed CO_2 to the storage site. Hence RUS does not consider any of these alternatives appropriate as requirements or for its financing of this Project.

To further support the discussion above, the EPA and state agencies require a review of previous BACT determinations as part of the BACT analysis process. The most comprehensive list is a database that EPA makes available to permitting agencies and applicants is the RACT/BACT/LAER Clearinghouse (RBLC). The RBLC was reviewed for prior BACT determinations for other combustion turbines and the RBLC only identified energy efficiency and specific items related to energy efficiency as methods to reduce GHG emissions (see Appendix B for output from the RBLC search). Further, EPA's RBLC does not list any add-on control technologies. The WDNR concurred with the BACT analysis and with the infeasibility of carbon capture as a control technology and issued the air permit.[15] See the Preliminary Determination and Air Permit issued by the WDNR for the Project.

[14] *Id*.
[15] Air permits can be viewed on WDNR's website: https://apps.dnr.wi.gov/warp_ext/AM_PermitTracking2.aspx?id=28121

2.7.3 Switchgears

SF_6 is a GHG which is commonly used as an insulating gas in electrical infrastructure, including switchgears. RUS investigated if SF_6-free switchgears were available for use on this Project to reduce potential GHG concerns. Switchgears that are SF_6 free at the voltage required for this Project (345-kV) are not currently commercially available or technically feasible. Therefore, they are not an option for the Project. SF_6 is discussed further in Section 3.2.2.1.2.2 herein.

2.7.4 Methane Challenge Program

EPA has developed the Methane Challenge Program in collaboration with oil and gas companies. The program is intended to support activities that reduce CH_4 emissions. The Methane Challenge Program is intended for oil and gas companies. The recommendations contained in the Methane Challenge Program are largely not applicable to a combustion turbine because the categories that have recommendations include compressors/engines, dehydrators, equipment leaks, pipelines, pneumatics/controls, tanks, valves, and wells. As this Project is a combustion turbine project, these listed sources largely do not apply to combustion turbine facilities. The Project facilities have already been designed to avoid/prevent/minimize leaks for safety reasons. One emission source at the Project site listed in the Methane Challenge Program categories is "equipment leaks/valves". A BACT analysis was performed for equipment leaks/valves in the air permit for natural gas and fuel oil piping components required for the Project (see Appendix B). The BACT requirements are the same or better than the recommendations in the Methane Challenge Program. For example, BACT for equipment leaks is a Leak Detection and Repair (LDAR) program and the Methane Challenge cite similar recommendations (Directed Inspection at Compressor Stations, for example). [16]

2.7.5 Alternative Generation and Storage

RUS considered renewable generation and battery storage as potential alternatives to the Project and eliminated those technologies from further detailed study because they do not meet the purpose and need for the Project to provide dispatchable generation to support the continued retirement of other generation sources. The Project will facilitate the deployment of renewable resources and overall system reliability by providing energy when intermittent renewable resources cannot. The analysis in the NTECEA reflected that renewable generation is not a feasible alternative to the Project because the Project is needed to balance the intermittent nature of renewable energy resources:

[16] https://www.epa.gov/sites/default/files/2016-06/documents/ll_dimcompstat.pdf

- "Dairyland needs to secure capacity and energy resources that meet the system peak and demand for electricity for the years to come. This includes accounting for required system reserve margins in MISO and covering Dairyland's forecasted losses to ensure reliability and resource adequacy during unforeseen events such as uncertainties in extreme weather and forced outages for generators." (EA at 1-4.)
- "The addition of NTEC will also enable Dairyland to facilitate the addition of new renewable electricity sources to the power portfolio by complementing their intermittent nature." (EA at 1-4; see also EA at 1-9.)
- "Dairyland conducted discussions with developers and other cooperatives through the NRCO to evaluate a wide range of options, including a multitude of renewable projects. The Dairyland study and planning effort culminated in the development of the Dairyland preferred power supply plan that strikes a balance between the need for accredited capacity in MISO zone 1, intermediate energy flexibility and numerous renewable resources. The plan was found by Dairyland's board to be the best course of action for Dairyland in this round of resource planning. The plan provides rate stability and reliability under a number of different future scenarios." (EA at 2-1.)

Likewise, natural gas facilities like the Project play an important role in the transition to renewable resources: At this point in time, gaps exist in the ability to rely upon 100 percent renewable power. Renewable energy such as solar and wind do not function as dispatchable energy sources due to the nature of the electricity generation being highly variable, both in duration and intensity (i.e., the sun shining or wind blowing during mostly daytime hours). Battery technology to store energy generated from renewables is improving and decreasing in cost, but it is not currently capable of meeting the electricity storage needs to meet system demand and load requirements. Therefore, flexible and reliable dispatchable power sources are necessary to close this gap, and high efficiency combined cycle natural gas-fired power plants meet this need better than any other dispatchable resource, while supporting the retirement of coal and reducing reliance on lower efficiency natural gas facilities to further drive GHG reductions in the near-term. Similarly, the PSCW specifically concluded that renewable energy generation and battery storage are not a alternatives to the Project. The PSCW reached this conclusion after considering expert testimony from its staff, the Owners, and opponents of the project. The PSCW found that the Owners credibly established that the project would provide up to 625 MW of dispatchable generation to support the integration of renewable energy sources. The expert testimony from the PSCW hearing also established that the proposed plant has substantial advantages over batteries, which require recharge, limited duration, and shorter life cycles. The PSCW also considered testimony that combined-cycle resources are more cost-effective when compared to batteries and batteries plus renewables.

Ultimately, the PSCW found that "there was ample testimony in the record to support a conclusion that the proposed project will facilitate deployment of such resources [non-combustible renewable energy resources], and that such resources alone could not provide the reliability benefits that are the target of this plant." [17]

RUS has reviewed the PSCW decision, expert testimony provided to the PSCW, and MISO's comment and concurs, as set forth in the EA, that renewable energy generation and/or battery storage will not meet the need for the Project.

2.7.6 Conclusion on Additional Technologies Considered

RUS conducted robust reviewing of alternatives for project as part of the NTECEA, SEA, and RSEA, both in Project siting and technologies. Subsequent to this review, RUS believes the alternatives presented in Section 2.5 and Section 2.6 are appropriate alternatives to carry forward in analysis in EA, SEA, RSEA, and this Final SEA.

[17] PSCW. 2020. Final Decision Order on Docket 9698-CE-100.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Chapter 3 provides an understanding of the affected environment and potential environmental consequences of each of the four Project alternatives for climate change and tribal environmental justice issues. Federal, state, and local regulations that apply to managing these resources are also discussed in context of the existing environment. For reference, a summary of potential Project impacts for all resources analyzed in the NTECEA is included in Section 3.1.

As part of the PSCW application, the Owners were required to identify alignments within the macro-corridors for Project development and permitting. These alignments were surveyed and used to develop potential Project alternatives that could result from transmission line construction. The potential impacts of these linear alignments were combined with the Site alternatives to compare the overall Project impacts of each alternative. These Proposed Action Alternatives were:

- Hill Avenue 1: Hill Avenue Site combined with eastern macro-corridor (Segments A and E)
- Hill Avenue 2: Hill Avenue Site combined with western macro-corridor (Segments A, B, C, and D)
- Nemadji River 1: Nemadji River Site combined with eastern macro-corridor (Segments A and E)
- Nemadji River 2: Nemadji River Site combined with western macro-corridor (Segments A, B, C, and D)

Additionally, switching station sites associated with each macro-corridor included parcels approximately 14 acres in size. Actual switching station footprint area will likely be approximately 4.4 acres. However, as final design and placement of each switching station on each parcel has not yet been determined, the potential environmental consequences associated with each switching station site have been estimated based on the entire 14 acre parcel to conservatively assess the potential human and natural resources effected at each site. Pending final design, the actual impacts associated with each switching station sites are anticipated to be somewhat less than those presented in the NTECEA.

Section 3.2 and Section 3.3 of this chapter assesses the potential impacts of the No Action Alternative and the Proposed Action Alternatives related to GHGs and tribal environmental justice. The No Action Alternative provides a basis for comparison in which none of the Project components would be constructed.

3.1 Summary of Project Impacts in the Previous EA

Table 3-1 provides a summary of potential environmental consequences of the Project Alternatives as discussed in the NTECEA. Please see Chapter 3.0 of the NTECEA for a more detailed discussion of potential environmental consequences of the Project.

Table 3-1: Summary of Potential Impacts

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
Air Quality	The existing air quality in the Douglas County area is designated as attainment or unclassifiable in regard to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. Construction of the Project has the potential for short-term adverse effects on air quality in the immediate area around the site. Minor and temporary generation of criteria pollutants and GHGs would occur during construction. It is anticipated that the Project would not affect the attainment status for Douglas County. The Owners would comply with the issued Wisconsin Department of Natural Resources (WDNR) construction air permit that would include emission limitations, monitoring requirements, and other terms and conditions. The Project would not cumulatively contribute to significant adverse air quality impacts.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.
Biological Resources	Temporary impacts from the Project could occur as a result of the increased presence of human and vehicle disturbance during construction. Temporary displacement of species might occur due to increased human activity in the area, vehicle traffic, and material transfer. Impacts to wildlife as a result of vehicle collisions would also be an increased risk during construction and operation. The majority of species affected would be mobile and able to move away from any impacts, but others could be vulnerable. Construction and operation of the Project would result in the permanent loss of vegetation communities, wildlife habitat, and plant and animal populations within the construction footprint. Additionally, some of the wildlife communities that occur at and in the vicinity of the Project would be temporarily displaced to surrounding areas where habitat is available. Construction of the either the Superior Switching Station or the Parkland Switching Station would impact approximately 14	No forest or grassland communities occurs at the Hill Avenue Site. The Hill Avenue Site Route would require clearing in forested areas for new ROW and along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 14.3 acres of the Hill Avenue Site Route in forested lands and shrubland habitats. The Eastern Transmission Route would require approximately 23.1 acres of woody vegetation to be cleared from forested lands and shrubland habitats to widen the corridor and accommodate the additional line. Woody vegetation would be removed where additional, new ROW is needed and along the edges of the existing utility corridor.	No forest or grassland communities occurs at the Hill Avenue Site. The Hill Avenue Site Route would require clearing in forested areas for new ROW and along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 14.3 acres of the Hill Avenue Site Route in forested lands and shrubland habitats. The Western Transmission Route would require clearing in forested areas for new ROW in addition to minor impacts to forested land along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 79.1 acres of the Western Transmission Route in forested lands and shrubland habitats. Woody vegetation would be removed where additional, new ROW is needed and along the edges of the existing utility corridor.	Construction of the proposed project at the Nemadji River Site would permanently impact approximately 7.1 acres of forest (approximately 4.6 acres of the quaking aspen forest in the northeastern portion of the site and approximately 2.5 acres of the mixed quaking aspen and black willow forest in the southeastern portion of the site) as well as impact approximately 7.2 acres of the forage grassland and wetland meadow communities The proposed project footprint at the Nemadji River Site avoids clearing trees and vegetation along the banks, immediately adjacent to the Nemadji River. A vegetation buffer with a minimum width of 100 feet would be maintained between the proposed project footprint and the Nemadji River. The loss of plant and animal habitat would occur adjacent to existing areas that have already been developed. The Nemadji River Site is adjacent to an existing tank farm and utility corridors. This area has	Construction of the proposed project at the Nemadji River Site would permanently impact approximately 7.1 acres of forest (approximately 4.6 acres of the quaking aspen forest in the northeastern portion of the site and approximately 2.5 acres of the mixed quaking aspen and black willow forest in the southeastern portion of the site) as well as impact approximately 6.47.2 acres of the forage grassland and wetland meadow communities The proposed project footprint at the Nemadji River Site avoids clearing trees and vegetation along the banks, immediately adjacent to the Nemadji River. A vegetation buffer with a minimum width of 100 feet would be maintained between the proposed project footprint and the Nemadji River. The loss of plant and animal habitat would occur adjacent to existing areas that have already been developed. The Nemadji River Site is adjacent to an existing tank farm and utility corridors. This area has

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
	acres of woody vegetation in forested lands and shrubland habitats. No grassland habitat is present within the footprint of the switching station site. Forested areas adjacent to the Project could provide potential habitat for the northern long eared bat. Snags that include potential summer roost trees for the northern long-eared bat were observed during the site visit along Bear Creek, adjacent to Study Area. No potential summer roost habitat was observed at either proposed facility site. No caves were identified within the Study Area. no bald or golden eagle nests were observed during field surveys that occurred within the Study Area. One invasive plant species, reed canary grass, was identified along all portions of the transmission line route and switching station site during the wetland delineation field. The three other invasive plant species were more sparsely distributed and were not observed at each Project component.			experienced some level of habitat fragmentation associated with development in and around the City of Superior. The Eastern Transmission Route would require approximately 23.1 acres of woody vegetation to be cleared from forested lands and shrubland habitats to widen the corridor and accommodate the additional line. Woody vegetation would be removed where additional, new ROW is needed and along the edges of the existing utility corridor.	experienced some level of habitat fragmentation associated with development in and around the City of Superior. The Western Transmission Route would require clearing in forested areas for new ROW in addition to minor impacts to forested land along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 79.1 acres of the Western Transmission Route in forested lands and shrubland habitats. Woody vegetation would be removed where additional, new ROW is needed and along the edges of the existing utility corridor.
Cultural Resources	Based on the distance from National Register of Historic Properties and the concurrence from the State Historic Preservation Office that no historic properties would be affected, it is anticipated that the Project would not have adverse impacts on cultural resources.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
Geology and Soils	Both Project sites would need to be graded and grading design would change the topography to facilitate storm water drainage patterns. Storm water runoff on the Nemadji River Site would be collected and directed to an onsite storm water detention pond. Storm water runoff on the Hill Avenue Site would be collected and routed to a new storm water detention pond. Both sites require excavation for underground utilities and deep structures such as pump pits. For the transmission line, foundation construction would occur after vegetation clearing is complete. Excavated soils from foundation drilling would be used for foundation backfill if appropriate. Surplus soils would be spread within upland areas of the right of way and stabilized. After all line construction is complete, the ROW is restored. Construction and operation of any Project alternative is not expected to affect geological formations. Soils at the Project site would be converted to plant site development with much of the area occupied by the facilities and covered by concrete and gravel areas. The transmission line corridor would be cleared but only soil areas at the structure locations would be permanently excavated. Other areas of hydric and statewide important soils would remain largely unaffected by construction and following any necessary stabilization would be available for agriculture and other activities.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.

Infrastructure, Transportation, Public Health and Safety, and Hazardous Materials	*Utilities:* Outages would be required on the Line No. 160 transmission line and the Line No. 761 transmission line to construct the new double circuit 345-kV The Project would require an outage to connect to the Arrowhead to Stone Lake 345 kV transmission line. The Project would require minor construction of water and wastewater pipelines to connect with the municipal system. *Transportation:* The daily automobile traffic to the site would increase from approximately 25 to 50 vehicles per day in the initial stages of construction to approximately 200 to 260 vehicles per day during peak months (April through December 2023). The traffic would begin to decrease until it reaches approximately 25 vehicles per day near construction completion. Material and equipment deliveries are anticipated to average between 15 and 25 trucks per day. Bulk deliveries for materials such as crushed stone, hot asphalt paving, and redi-mix concrete may occasionally exceed 25 vehicles on a given day. No permanent changes to existing roads are anticipated as part of this Project. No permanent damage to roads is anticipated with the implementation of mitigation measures. There is currently no connection or proposed connection to rail lines related to the Project. Rail lines would be spanned by the Project transmission lines. The FAA issued Determination of No Hazard/Does Not Exceed letters for the stacks at the Project sites. The FAA issued a Determination of No Hazard/DNE letter for all the transmission line structures that were studied on October 2, 2018. The Project would require off-ROW access roads. *Public health and safety:* Access roads would be blocked from public access. Existing healthcare facilities are anticipated to be sufficient for the Project during construction and operation, and no necessary improvements are anticipated. The Project would have fire suppression measures of its	At the beginning of the Eastern Transmission Route, an existing 115-kV line would be replaced with a double circuit 345/161-kV line, and the 115-kV line would be shifted onto the existing 161-kV structures.	The Western Transmission Route extends southeast from the Nemadji River Site to the existing Line No. 160. The Western Transmission Route would be built double circuit with the 161kV Line 160 for a couple spans before extending southwest as a single-circuit transmission line.	The existing electric transmission lines that traverse the Nemadji River Site would need to be relocated to facilitate construction of the generation plant. At the beginning of the Eastern Transmission Route, an existing 115-kV line would be replaced with a double circuit 345/161-kV line, and the 115-kV line would be shifted onto the existing 161-kV structures. The fiberoptic cable between the Nemadji River Site and the Hill Avenue Site would need to be relocated if the Nemadji River Site is constructed. An existing 10-inch natural gas line would need to be relocated at the Nemadji River Site.	The existing electric transmission lines that traverse the Nemadji River Site would need to be relocated to facilitate construction of the generation plant The Western Transmission Route extends southeast from the Nemadji River Site to the existing Line No. 160. The Western Transmission Route would be built double circuit with the 161kV Line 160 for a couple spans before extending southwest as a single-circuit transmission line. The fiberoptic cable between the Nemadji River Site and the Hill Avenue Site would need to be relocated if the Nemadji River Site is constructed. An existing 10-inch natural gas line would need to be relocated at the Nemadji River Site.

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
	own, as well as facilities for the storage of hazardous materials. No City fire department improvements are anticipated. Police protection would be provided by the City of Superior and the Wisconsin State Patrol during both construction and operations, and no improvements are anticipated. *Waste management:* Local waste disposal and sanitation facilities are not anticipated to be adversely affected by the additional waste streams generated during construction and operation of the Project. No additional solid wastes would be generated by the Project as byproducts from the production of electricity.				

Land Use, Recreation, Farmland, and Coastal Facilities	*Land use:* Construction of either switching station would convert approximately 14 acres of woody vegetation in forested lands and shrubland habitats to a switching station with electric transmission infrastructure. It is anticipated that most of the impacts to grasslands along the transmission route would only be temporary construction. Some permanent impacts to grassland habitats would occur where transmission line poles and foundations would be set. No grassland habitat is present within the footprint of either switching station site. *Recreation:* No direct impact to parks anticipated. While the Sites may be visible from these parks and loud Site noise such as from steam blows may be heard offsite, several streets with homes, combined with nearby commercial and industrial areas provide visual and sound buffers between the Sites and the existing parks. The transmission line routes primarily extend through undeveloped wooded areas. The switching station sites are also mostly surrounded by woodland, which helps provide visual buffers. The 18th Street and Nemadji canoe launch access may be impacted during construction of facilities through temporary road closures and temporary increased noise. The Project may impact visitors to the Orange Trail by increased traffic crossing the trail or temporary closures during Project construction, as well as slightly increased traffic crossing the trail during Project operation. Construction traffic and any road closures would be temporary in nature and cease after construction is complete. The Eastern and Western Transmission Routes south of the Nemadji River Site would require clearing woodland in a portion of the Allouez Area Parcel 1 hunting area. The routes generally follows existing transmission line and natural gas line through this area. Clearing would remove woodland habitat and result in a minor change to the habitat mix on these areas.	*Land use:* The Hill Avenue Site consists entirely of undeveloped lowland scrub/shrub wetland community. No forest or grassland community occurs at the Hill Avenue Site. The Hill Avenue Site Route would require clearing in forested areas for new ROW and along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 14.3 acres of the Hill Avenue Site Route in forested lands and shrubland habitats. The Eastern Transmission Route for the transmission line would likely be constructed within an existing utility corridor that contains a natural gas pipeline and overhead electrical transmission lines; however, approximately 23.1 acres of woody vegetation would be cleared from forested lands and shrubland habitats to widen the corridor and accommodate the additional line. Woody vegetation would be removed where additional, new ROW is needed and along the edges of the existing utility corridor. *Recreation:* The Hill Avenue Site would reduce the size of the Murphy Oil – 5 hunting area by approximately 72 acres. The Eastern Transmission Route would cross the Itasca Area hunting area and the Annex hunting area. The route generally follows existing transmission line and natural gas line through these parcels. The transmission line route from the Hill Avenue Site south to the Nemadji River would also remove a portion of the Murphy Oil – 5 hunting area from hunting activities. Clearing would remove woodland habitat and result in a minor change to the habitat mix on these areas. Access to all or portions of these areas may also be controlled during construction. Once completed, access to these areas would be restored. The connecting facilities extending from the Hill Avenue Site to the southeast	*Land use:* The Hill Avenue Site consists entirely of undeveloped lowland scrub/shrub wetland community. No forest or grassland community occurs at the Hill Avenue Site. The Hill Avenue Site Route would require clearing in forested areas for new ROW and along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 14.3 acres of the Hill Avenue Site Route in forested lands and shrubland habitats. The Western Transmission Route would require more clearing in forested areas for new ROW in addition to minor impacts to forested land along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 79.1 acres of the Western Transmission Route in forested lands and shrubland habitats. Woody vegetation would be removed where additional, new ROW is needed and along the edges of the existing utility corridor. *Recreation:* The Hill Avenue Site would reduce the size of the Murphy Oil – 5 hunting area by approximately 72 acres. The Western Transmission Route would cross a small portion of the Allouez Area Parcel 2 hunting area. The transmission line route from the Hill Avenue Site south to the Nemadji River would also remove a portion of the Murphy Oil – 5 hunting area from hunting activities. Clearing would remove woodland habitat and result in a minor change to the habitat mix on these areas. Access to all or portions of these areas may also be controlled during construction. Once completed, access to these areas would be restored. The connecting facilities extending from the Hill Avenue Site to the southeast	*Land use:* Construction of the proposed project at the Nemadji River Site would permanently convert approximately 7.1 acres of forest and approximately 7.2 acres of the forage grassland and wetland meadow communities to power generation use. This use is compatible with adjacent land uses, which include an oil tank farm and an oil refinery. *Recreation:* Increased traffic and operation noise near the fishing access at 18th Street during operation. Traffic during operation of the Project would increase vehicles on nearby roads but is not anticipated to significantly increase traffic due to the number of employees anticipated or reduce access to these facilities. The Eastern Transmission Route would cross the Itasca Area hunting area and the Annex hunting area. The route generally follows existing transmission line and natural gas line through these parcels. Clearing would remove woodland habitat and result in a minor change to the habitat mix on these areas. Access to all or portions of these areas may also be controlled during construction. Once completed, access to these areas would be restored. *Farmland*: The Eastern Transmission Route extends along the edge of a row crop field north of its intersection with County Road Z for approximately 930 feet. The row crop field crossed by the Eastern Transmission Route would be impacted during construction of the Project. This section of route is within existing ROW, limiting impacts to already impacted areas. Soil along this portion of the route would likely be disturbed during transmission line construction and temporary access. If planted, crops in the ROW could be damaged during construction. After construction is complete in the area, farming activities can resume.	*Land use:* Construction of the proposed project at the Nemadji River Site would permanently convert approximately 7.1 acres of forest and approximately 7.2 acres of the forage grassland and wetland meadow communities to power generation use. This use is compatible with adjacent land uses, which include an oil tank farm and an oil refinery. The Western Transmission Route would require more clearing in forested areas for new ROW in addition to minor impacts to forested land along the existing shared utility corridors. Woody vegetation clearing would occur along approximately 79.1 acres of the Western Transmission Route in forested lands and shrubland habitats. Woody vegetation would be removed where additional, new ROW is needed and along the edges of the existing utility corridor. *Recreation:* Increased traffic and operation noise near the fishing access at 18th Street during operation. Traffic during operation of the Project would increase vehicles on nearby roads but is not anticipated to significantly increase traffic due to the number of employees anticipated or reduce access to these facilities. The Western Transmission Route would cross a small portion of the Allouez Area Parcel 2 hunting area. Clearing would remove woodland habitat and result in a minor change to the habitat mix on these areas. Access to all or portions of these areas may also be controlled during construction. Once completed, access to these areas would be restored.

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
	Access to all or portions of these areas may also be controlled during construction. Once completed, access to these areas would be restored. *Farmland*: No farming activities currently occur at either Site. No farming has occurred in the recent past. The Western Transmission Route and Hill Avenue Site Route do not cross farmland. No known agricultural buildings and animal dairy confinement operations are located near the Project. In addition, the Project's electrical clearances and ROW width are designed to limit neutral-to-earth and induced voltages that can create concern with livestock operations. *Coastal:* No coastal facilities are located within the Project Study Area or macro-corridors. The nearest CBRS area is located approximately 30 miles northeast of the Project area along the Lake Superior shoreline in Bayfield County. No impacts to coastal facilities are anticipated due to the Project.	would introduce a new utility corridor through the hunting area. *Farmland*: The Eastern Transmission Route extends along the edge of a row crop field north of its intersection with County Road Z for approximately 930 feet. The row crop field crossed by the Eastern Transmission Route would be impacted during construction of the Project. This section of route is within existing ROW, limiting impacts to already impacted areas. Soil along this portion of the route would likely be disturbed during transmission line construction and temporary access. If planted, crops in the ROW could be damaged during construction. After construction is complete in the area, farming activities can resume.	would introduce a new utility corridor through the hunting area.		

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
Noise	Project construction would result in temporary and minor noise impacts in the surrounding area. Construction-related sounds would vary in intensity and duration depending on specific stages and activities of construction but would not be permanent. Nearby residences may temporarily experience increased noise during construction. Minor temporary disturbances to wildlife could occur. Steam blows have the potential to increase sound levels near the Project during their temporary and infrequent occurrence. Following the initial steam blow for commercial operation, subsequent steam blows would be rare occurrences, anticipated once every 10 to 15 years as part of major system maintenance. Because these are rare and not long-term sources of noise, their impact is expected to be minimal. A preliminary noise study was conducted incorporating dry cooling equipment. The results of this study showed noise levels that would be in excess of U.S. Environmental Protection Agency (EPA) noise guideline levels. These levels were discussed with the finned heat exchanger suppliers and they confirmed the EPA noise guideline levels are achievable for the required equipment with proper mitigation measures. The Project will incorporate appropriate noise mitigation required to achieve EPA noise guideline levels.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.

Socioeconomics and Environmental Justice	During construction, the Project would create up to 260 jobs during peak activity. The number of workers onsite would begin at nominal levels at the beginning of construction and steadily increase over time, declining as major construction activities are completed. Local businesses near the Facility, such as gas stations, convenience stores, and restaurants, may experience increases in business during construction due to construction workers onsite. Local materials such as concrete, lumber, and general hardware may be purchased from local businesses. This increased demand would cease after construction is complete and would not add considerably to the demand on existing business, services, or community facilities. The Project would create up to 25 full-time permanent jobs. These new permanent employees may be from the local workforce or may relocate to the area for the position. Considering the population of the City of Superior and Douglas County, the addition of 25 jobs is not anticipated to considerably increase demand for housing, schools, or other local services. The City of Superior and Douglas County would receive payments in lieu of taxes of around one million dollars annually (two-thirds to the city; one-third to the county) from the State of Wisconsin for hosting a generation facility. The City of Superior would also receive considerable fees from the facility for increased use of the City's wastewater treatment system. County sales tax revenues are likely to increase over time, especially during the intense construction phase. There could be a negative local budget impact due to the increased use of 31st Avenue East, which is currently a short-paved road with an extended gravel portion that would need to be paved and maintained over time. Regional economic benefits are estimated at around one billion dollars over 20 years.	Census Tract 210 is considered to be in an environmental justice low-income area. Census Tract 210 within the Study Area contains 52 residences. The nearest residence is located approximately 230 feet west of the Eastern Transmission Route on 42nd Avenue East. This portion of transmission line is within an existing transmission line corridor. The ROW is surrounded by trees in this area, which provide a partial visual buffer. The minimal impacts within Census Tract 210 do not constitute disproportionately high and adverse impacts to this environmental justice area.	No environmental justice areas crossed by Hill Avenue 2	Census Tract 210 is considered to be in an environmental justice low-income area. Census Tract 210 within the Study Area contains 52 residences. The nearest residence is located approximately 230 feet west of the Eastern Transmission Route on 42nd Avenue East. This portion of transmission line is within an existing transmission line corridor. The ROW is surrounded by trees in this area, which provide a partial visual buffer. The minimal impacts within Census Tract 210 do not constitute disproportionately high and adverse impacts to this environmental justice area.	No environmental justice areas crossed by Nemadji River 2

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
	The Project would not directly impact any residences, public facilities, farming structures, cemeteries, religious facilities, or other structures. Temporary disruptions to normal traffic may occur during construction as equipment and employees commute to and from the Project. The frequency of the daily workforce automobile traffic would follow the Project workforce numbers onsite at a given time. The daily automobile traffic to the site would increase from approximately 25 to 50 vehicles in the initial stages of construction to approximately 200 to 260 vehicles for peak months (April through December 2023). The traffic would begin to decrease until it reaches approximately 25 vehicles near construction completion and during operation.				
Visual Resources	The aesthetics of the surrounding area would be altered by the Project. Vegetation would need to be cleared permanently for the Project Site, transmission line ROW, and switching station site. The Project site would require lighting for safety and security. Light emissions at the Project Site would increase compared to current levels of light emissions as a result of facility lighting. The dominant visual features of the Project would be a stack, a finned heat exchanger, and other facility equipment at the Project Site. The transmission line routes parallel existing linear infrastructure for the majority of its length. The switching station sites are surrounded by undeveloped forested and shrubland habitats. None of the Project facilities are out of character with features already present across the visual landscape and the Project does not generally introduce new visual elements into the viewshed, keeping new facilities in proximity to already developed locations. Due to these factors and the distance from these scenic byways, it is anticipated that the Project would not significantly impact visual resources in the area.	The Hill Avenue Site has no light emitting sources currently onsite. Wooded areas located offsite of the Hill Avenue Site would provide a buffer to help mitigate light impacts to surrounding development. The stack and transmission line would be visible from multiple viewpoints throughout the area; most of the transmission line route is within undeveloped forested areas along existing utilities as well as within existing transmission line corridors. The tallest features of the site would be the stack, which would be approximately 171 feet above ground level at the Hill Avenue Site. The Hill Avenue Site is undeveloped lowland scrub/shrub surrounded by wooded areas and Hill Avenue on the west side.	The Hill Avenue Site has no light emitting sources currently onsite. Wooded areas located offsite of the Hill Avenue Site would provide a buffer to help mitigate light impacts to surrounding development. The stack and transmission line would be visible from multiple viewpoints throughout the area; most of the transmission line route is within undeveloped forested areas along existing utilities, however, as well as within existing transmission line corridors. The tallest features of the site would be the stack, which would be approximately 171 feet above ground level at the Hill Avenue Site The Hill Avenue Site is undeveloped lowland scrub/shrub surrounded by wooded areas and Hill Avenue on the west side.	The lighting regime near the Nemadji River Site is currently influenced by lighting at the existing oil and gas facilities located immediately adjacent to the site property, although no light emitting sources currently occur on the site itself. The trees on the eastern boundary of the Nemadji River Site would provide a buffer and help mitigate additional lighting impacts. The stack and transmission line would be visible from multiple viewpoints throughout the area; most of the transmission line route is within undeveloped forested areas along existing utilities, however, as well as within existing transmission line corridors. The tallest features of the site would be the stack, which would be approximately 194 feet above ground level at the Nemadji River Site. The Nemadji River Site is located adjacent to existing industrial areas.	The lighting regime near the Nemadji River Site is currently influenced by lighting at the existing oil and gas facilities located immediately adjacent to the site property, although no light emitting sources currently occur on the site itself. The trees on the eastern boundary of the Nemadji River Site would provide a buffer and help mitigate additional lighting impacts. The stack and transmission line would be visible from multiple viewpoints throughout the area; most of the transmission line route is within undeveloped forested areas along existing utilities, however, as well as within existing transmission line corridors. The tallest features of the site would be the stack, which would be approximately 194 feet above ground level at the Nemadji River Site. The Nemadji River Site is located adjacent to existing industrial areas.

Water Resources	*Surface Water*: Considering the distance of the Project from Outstanding or Exceptional Resource Waters; trout streams; and wild and scenic rivers, and with the implementation of mitigation measures described in Section 3.10.3, it is anticipated that construction and operation of the Project would not result in impacts to these features. *Groundwater*: No groundwater would be used for the Project. Therefore, there would be no impacts to groundwater. No impacts to domestic or high capacity pumping wells are anticipated. *Floodplain*: The Superior Switching Station, Parkland Switching Station, and all laydown yards are not within 100-year floodplain. All rivers would be spanned by the transmission line. Two transmission line structures would need to be placed within the Nemadji River floodplain due to the floodplain width. *Wetlands/Riparian:*[a] The switching station sites would be placed entirely within wetland areas. Forested and shrub/scrub wetland areas would be cleared of vegetation at the switching station sites. After further engineering and design conducted after the NTECEA was published, and further consultation with the Wisconsin DNR and the USACE, the footprint of the switching stations (and therefore wetland impact) was reduced to between 4.1 and 4.4 acres. On April 1, 2022, wetland mitigation credits were purchased for anticipated Project impacts. *Wastewater*: The Project would be responsible for installation of the sewer extension and tie-in to connect to the City's wastewater system. It is expected that the plant would be connected as an industrial customer, would utilize existing piping to the extent practical, and any new piping would be high-density polyethylene and would be routed in existing ROW to the extent practical. The City of Superior would require the Owners to take ownership of the sewer line extension and lift station because	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.	No unique impacts anticipated for this alternative.

Resource	Impacts common to all Project Alternatives	Hill Avenue 1 Impacts	Hill Avenue 2 Impacts	Nemadji River 1 Impacts	Nemadji River 2 Impacts
	they would be constructed to service a single, privately held facility. Approximately 0.06 million gallons per day would be discharged to the City sewer. Delivery meters would be used to collect wastewater volume readings and would be owned by the Project. *Stormwater*: The post-construction storm water management facilities would be designed to meet the performance standards addressed in NR 151. Drains for areas around equipment that could be contaminated with oil would be gravity drained and directed through an oil/water separator prior to discharge to the municipal sewer system. At either Site, the wet detention pond would be used as a sediment basin during Project construction to remove sediment loads from storm water runoff in accordance with Wisconsin Administrative Code (WAC) NR 151.11(6m)(b)2. Following site stabilization, the sediment basin would be cleaned out and converted to a wet detention basin. The detention basin is designed to reduce the total suspended solids load by at least 80 percent, based on an average annual rainfall.				

a - This analysis was conducted prior to the U.S. Supreme Court's decision in *Sackett v. Envtl. Protection Agency*, which was released on May 25, 2023. Analysis of Project impacts to wetlands and related regulatory requirements may be updated based on that decision and any related agency guidance.

3.2 Air Quality and Greenhouse Gases

This section expands on Section 3.1 Air Quality, of the NTECEA and Section 3.2 of the SEA. This section describes the affected environment and potential environmental consequences related to GHGs and the potential implications for these emissions to influence climate change. This section has been modified as part of this Final SEA to consider the 2023 Interim CEQ GHG Guidance and clarify information to address comments received on the SEA. Existing conditions and environmental consequences associated with other air emissions are addressed in Section 3.1 (Air Quality) of the NTECEA.

Shortly before the publication of the NTECEA, the WDNR provided notification of the air permit approval on September 1, 2020. Following the October 2020 NTECEA, the original Owners submitted an air construction permit application for the proposed construction of fugitive emissions of air contaminants from piping components and haul road traffic fugitives at NTEC (preferred site only) on January 22, 2021. The Department issued the final construction permit (21-MMC-011) on July 8, 2021.

On December 10, 2021, the Owners submitted an air construction permit application to WDNR. To confirm that construction of the Project is complete prior to the expiration of the issued permits, the Owners submitted a new PSD air permit application for the Project (preferred site only) in December 2021 to acquire a new, consolidated permit with an expiration date that better aligns to the Project's construction schedule and other necessary environmental permits. The study area evaluated for the PSD analysis was the emissions from units within the NTEC fence line for the generation facility. Important factors include, but are not limited to, the difficulty of winter construction work in Superior, Wisconsin, and the amount of work necessary for construction of the power plant, natural gas delivery infrastructure and additions to the local electrical transmission network. This PSD application is provided in Appendix B and is discussed in Section 3.2.2. A draft version of the construction permit was made available for public comment on April 22, 2022, and concluded with a virtual public meeting on May 23. WDNR issued its response to any comments received during the public comment period on January 26, 2023, which commenced a 45-day comment period for EPA to make comments. The EPA did not submit comments during this comment period. The public had until May 11, 2023, to petition the EPA to make comments on WDNR's comment response. EPA received no petitions during the period.

On February 21, 2023, the Applicants requested that WDNR delay issuance of the final permit until July 31, 2023, to better align the permit's timeline with other regulatory permitting efforts.

3.2.1 Affected Environment

The Project would be located in an area containing a mix of undeveloped lands, residential developments, commercial and industrial activities and facilities. Many of these uses contribute air emissions. Sources would include wood burning stoves and fireplaces, petroleum-fueled systems for heating and hot water, automobile and other vehicle emissions, and other activities that rely on combustion of fossil fuels. These activities generate a variety of air pollutants, many of which are identified, tracked, and regulated by the EPA under the Clean Air Act. In addition, several components of these emissions are identified as GHGs.

GHGs have been identified as contributing to the earth's temperature. Called the "greenhouse" effect, this is a naturally occurring phenomenon in which various gases in the earth's atmosphere (classified as GHGs) play a role in determining the earth's temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are CO_2, CH_4, N_2O, and fluorinated gases. Primary GHGs are discussed, as follows:

3.2.1.1 CO_2

CO_2 is a colorless, odorless gas. It is emitted both naturally and through human activities. CO_2 is naturally present in the atmosphere as part of the earth's carbon cycle (the natural circulation of carbon among the atmosphere, oceans, soil, plants, and animals). While CO_2 emissions come from a variety of natural sources, an increase in CO_2 emissions has been recorded in the atmosphere since the industrial revolution. CO_2 is the primary GHG emitted through human activities, primarily from the combustion of fossil fuels such as coal, oil, and gas. The transportation and electricity sectors are the largest CO_2 emitters in the United States (EPA, 2021) and are the biggest CO_2 emitters in the Project area.

3.2.1.2 CH_4

CH_4 (methane) is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. In 2019, CH_4 accounted for about 10 percent of all United States GHGs from human activities (EPA, 2021). Human activities emitting CH_4 include leaks from natural gas systems and the raising of livestock. CH_4 is also emitted by natural sources such as decomposition of vegetation, particularly in anerobic environments such as wetlands. In addition, natural processes in soil and chemical reactions in the atmosphere help remove CH_4 from the atmosphere.

CH_4's lifetime in the atmosphere is much shorter than CO_2, but CH_4 is more efficient at trapping radiation than CO_2. Pound for pound, the comparative impact of CH_4 is more than 25 times greater than CO_2 over a 100-year period (EPA, 2021). Methane is the primary GHG emitted during the extraction and production of natural gas and is a driver of current warming (Lackner et al., 2021). The largest sources of CH_4 in the project area are the transportation, electricity, and natural gas sectors.

Natural gas use is prevalent throughout the study area. Newer technology standards and mandated leak detection and repair programs (LDAR) are being implemented throughout the country to reduce the emissions of methane from oil and gas production. Low or negative cost methane abatement is possible in the oil and gas subsector where captured methane adds to revenue instead of being released to the atmosphere (U.N., 2021). On November 15, 2021, the EPA proposed standards to reduce methane and other harmful pollution from the oil and gas industry. This proposed rule would expand and strengthen emissions reductions that are currently on the books for new, modified and reconstructed oil and natural gas resources, and would require states to reduce methane emissions existing sources nationwide for the first time. In November 2022, EPA proposed additional standards to "update, strengthen and expand its November 2021 proposal" (EPA, 2023). Public hearings were held in January 2023. The public comment period on the supplemental proposal ended in February 2023. If this proposed rule is put in to place, the oil and gas industry would be required to lessen methane emissions and therefore reduce its contribution to climate change. These expected reductions in GHGs from the oil and gas industry would in turn reduce the carbon intensity[18] of natural gas as an energy source.

3.2.1.3 N_2O

N_2O (nitrous oxide) is a clear, colorless gas with a slightly sweet odor. In 2017, N_2O accounted for about 7 percent of all United States GHGs emissions from human activities (EPA, 2021). Human activities such as agriculture, fuel combustion, wastewater management, and industrial processes are increasing the amount of N_2O in the atmosphere and are the largest sources of N_2O in the Project area. N_2O is also naturally present in the atmosphere as part of the earth's nitrogen cycle and has a variety of natural sources. N_2O molecules stay in the atmosphere for an average of 114 years before being removed by a sink or destroyed through chemical reactions. The impact of 1 pound of N_2O on warming the atmosphere is almost 300 times that of 1 pound of CO_2 (EPA, 2021).

[18] As defined by the U.S. Energy Information Administration, carbon intensity is the amount of carbon by weight emitted per unit of energy consumed (CO_2 emissions/energy).

3.2.1.4 Fluorinated Gases

Unlike many other GHGs, fluorinated gases have no natural sources and only come from human-related activities. They are emitted through their use as substitutes for ozone-depleting substances (e.g., as refrigerants) and through a variety of industrial processes such as aluminum and semiconductor manufacturing. Many fluorinated gases have very high global warming potentials (GWPs) relative to other GHGs, so small atmospheric concentrations can have disproportionately large effects on global temperatures (EPA, 2021). They can also have long atmospheric lifetimes—in some cases, lasting thousands of years. Like other long-lived GHGs, most fluorinated gases are well-mixed in the atmosphere, spreading around the world after they are emitted. Many fluorinated gases are removed from the atmosphere only when they are destroyed by sunlight in the far upper atmosphere. In general, fluorinated gases are the most potent and longest lasting type of GHGs emitted by human activities.

There are four main categories of fluorinated gases—HFCs, PFCs, SF_6, and nitrogen trifluoride. The major emissions source of HFC compounds is their use as refrigerants—for example, in air conditioning systems in both vehicles and buildings. These chemicals were developed as a replacement for chlorofluorocarbons because they do not deplete the stratospheric ozone layer. PFCs are produced as a byproduct of aluminum production and are used in the manufacturing of semiconductors. PFCs generally have long atmospheric lifetimes and GWPs near 10,000. SF_6 is used in magnesium processing and semiconductor manufacturing, as well as a tracer gas for leak detection. SF_6 is also used as an insulating gas in electrical transmission equipment, including circuit breakers. The GWP of SF_6 is 22,800, making it the most potent GHG that the Intergovernmental Panel on Climate Change has evaluated (EPA, 2017).

3.2.1.5 Global Warming Potentials

GHGs vary widely in the power of their climatic effects; therefore, climate scientists have established a unit called GWP. The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. The GWP of CO_2 is set to equal 1. CH_4 and N_2O are approximately 25 and 298 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere; thus, they have GWPs of 25 and 298, respectively. Carbon dioxide equivalent (CO_2e) is a quantity that enables all GHG emissions to be considered as a group despite their varying GWPs. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 3-2.

Table 3-2: Global Warming Potentials and Atmospheric Lifetimes

Greenhouse Gas	Atmospheric Lifetime (years)[1]	Global Warming Potential (100-year time horizon)[2]
Carbon dioxide (CO_2)	50–200	1
Methane (CH_4)	12	25
Nitrous oxide (N_2O)	114	298
Sulfur hexafluoride (SF_6)	3,200	22,800

Sources:
(1) IPCC, 2007
(2) 40 CFR 98 Subpart A

3.2.1.6 Potential Effects of Greenhouse Gases

An increase in GHGs released to the atmosphere has been linked to warming of the earth on a global scale. Earth's average temperature has risen by 1.5 °F over the past century and is projected to rise another 0.5 to 8.6 °F over the next hundred years. Rising global temperatures have been accompanied by changes in weather and climate. Many places have seen changes in rainfall, resulting in more droughts, floods/intense rain as well as heat waves. Oceans are warming and becoming more acidic (EPA, 2021). Ice caps and glaciers are melting, causing sea levels to rise. Other effects include, but are not limited to, the spread of diseases out of their normal range, habitat loss, negative impacts to agriculture production, increased air pollution episodes, and impacts to the economy are expected to result from climate change (EPA, 2021).

3.2.2 Environmental Consequences

The following sections provide potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to emissions of GHGs.

3.2.2.1 Proposed Action Alternatives

Construction and operation of the proposed 625-MW combined-cycle combustion turbine and associated support equipment at either Project Site would be subject to applicable state and Federal air quality regulations. These regulations would apply to the Project equipment, which would include a combustion turbine, a finned heat exchanger for cooling, an auxiliary boiler, two natural gas-fired gas heaters (natural gas heater), an emergency diesel fire pump, an emergency diesel generator, and fuel oil storage tanks. Regulations applicable to the proposed Project are Wisconsin Administrative Code (WAC) provisions, Title V Operating Permits, PSD review, New Source Performance Standards, and National Emission Standards for Hazardous Air Pollutants and Maximum Achievable Control Technology (NESHAP).

3.2.2.1.1 Direct Construction Impacts

During construction of the plant, transmission line, and switching station, small amounts of air pollutants, including GHGs, would be temporarily generated. The largest source of GHG emissions during construction is the combustion of fuels such as gasoline or diesel by construction equipment. An approximate estimate of construction emissions of GHG emissions has been developed based on an expected three-year construction period with expected equipment usage during those three years. The emissions were estimated based all expected construction equipment (such as vibratory compactors, skid steers, concrete trucks, dozers, graders, forklifts, manlifts, cranes and many other equipment) for the expected hours per year for each of the three-year construction period. Emission factors from EPA's 40 CFR Part 98 GHG Reporting Rule were utilized to estimate the emissions from each piece of equipment combusting fuel. Emissions from the expected construction equipment from diesel and gasoline combustion are estimated to be approximately 91,120 total tons CO_2e[19] over the three-year construction period (approximately 35,150 tons in Year 1; 47,350 tons in Year 2; and 8,620 tons in Year 3). These construction emissions would be temporary in nature, would fall off rapidly with distance from construction areas, and would be of insufficient quantity and duration to significantly contribute to potential climate change impacts. Once the construction activities are completed, construction-related emissions would cease.

Project Alternatives using the Western Transmission Route and/or the Hill Avenue Site (Hill Avenue 1, Hill Avenue 2, and Nemadji River 2) would have slightly longer transmission line which would result in a slight increase in construction related GHG emissions as construction would likely take additional time to complete.

3.2.2.1.2 Direct Operations Impacts

3.2.2.1.2.1 GHG Emissions and BACT Analysis

Emissions will be generated by the combustion turbine, auxiliary boiler, circuit breaker, natural gas heaters, emergency diesel fire pump, emergency diesel generator, and fuel piping components (see Table 3-6). GHG emissions from the Project equipment include CO_2, CH_4, SF_6, and N_2O emissions. These calculated GHG emissions were multiplied by their appropriate GWP shown in Table 3-2 and summed to obtain the overall project CO_2e emissions. Consistent with Wisconsin and EPA guidance, air dispersion

[19] The construction emissions analysis included estimates for CO_2, CH_4, and N_2O emissions. As such, CO_2e is used to report the total estimated construction emissions.

modeling of CO_2e was not conducted since there is no modeling threshold for this pollutant nor National Ambient Air Quality Standard set for GHG emissions.

A BACT analysis was performed for GHG. BACT is an emission limitation based on the maximum degree of reduction which the WDNR determines is achievable, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs. A GHG BACT analysis was performed for all new equipment proposed for the Project.

A summary of the BACT emission limits and the associated control technologies for the combined-cycle combustion turbine are shown in Table 3-3. BACT emission limits and associated control technologies for the auxiliary equipment are listed in Table 3-4.

Table 3-3: Summary of Greenhouse Gas BACT Results: Combined-Cycle Operation

Pollutant	Fuel	Control	BACT Emissions	Average
Greenhouse gases	Natural gas	Use of natural gas as a fuel, monitoring and control of excess air, efficient turbine design, and oxidation catalyst	850 lb CO_2/ megawatt-hour, gross	12-month rolling
	Fuel oil	Use of ultra-low sulfur diesel as a fuel, monitoring and control of excess air, efficient turbine design, and oxidation catalyst	1,180 lb CO_2/ megawatt-hour, gross	12-month rolling

Table 3-4: Summary of Greenhouse Gas BACT Results: Auxiliary Equipment

Equipment	Pollutant	Control[a]	BACT Emission Rate[a]
Auxiliary boiler - B02	Greenhouse gases (CO_2e)	GCP/clean fuels	160 lb/MMBtu
Circuit Breaker – F03	SF_6	Leak monitoring	<0.5% loss rate
Natural gas heaters -P04 and P05 (each)	Greenhouse gases (CO_2e)	GCP/clean fuels	NA
Emergency diesel fire pump – P06	Greenhouse gases (CO_2e)	GCP/clean fuels	NA
Emergency diesel generator – P07	Greenhouse gases (CO_2e)	GCP/clean fuels	NA
Diesel tanks – T01, T02, T03	NA		
Haul Roads – F01	NA		
Natural gas and fuel oil piping components – F02	GHG	Fuel Piping	LDAR program - instrument monitoring

(a) GCP = good combustion practices; lb/MMBtu = pound per million British thermal units

BACT for GHG from the combined-cycle turbine includes utilizing low-GHG fuels, such as natural gas and fuel oil, the lowest emitting fuels utilized and shown to be technically feasible in combustion turbines, along with energy efficiency. Currently, there are no technically feasible, demonstrated-in-practice, and economically feasible add-on controls for control of GHGs from combustion turbines. The 2021 PSD application assessed the feasibility of incorporating various GHG control strategies. The GHG mitigation strategies evaluated were fuel selection, energy efficiency measures, post-combustion control, carbon capture, and carbon sequestration. Table 3-5 provides an overview of the findings in the PSD. The full PSD application, in Appendix B, contains a full discussion of the technologies considered.

Table 3-5: Summary of Technically Feasible Greenhouse Gas Control Technologies for Combustion Turbine

Control System		Technical Feasibility	Comments
Fuel Selection	Low Carbon Fuels	Feasible	Natural gas has been selected as the primary fuel for this project
	Combustion of Biogenic Sources	Not Feasible	See Section 5.6.2.1.2 of the PSD Application in Appendix B
Energy Efficiency	Continuous Excess Air Monitoring and Control	Feasible	Standard for the turbines under consideration
	Efficient Turbine Design	Feasible	Standard for the turbines under consideration
Post Combustion Controls	Catalytic Oxidation	Feasible	Will reduce CH_4 emissions but create CO_2
	Thermal Oxidation	Not Feasible	See Section 5.6.2.3.2 of the PSD Application in Appendix B
Carbon Capture	Pre-combustion CO_2 capture	Not Feasible	See Section 5.6.2.4.1 of the PSD Application in Appendix B
	Post-combustion CO_2 capture	Not Feasible	See Section 5.6.2.4.2 of the PSD Application in Appendix B
Carbon Sequestration	Mineral Trapping	Not Feasible	See Section 5.6.2.5.1 of the PSD Application in Appendix B
	Physical Adsorption	Not Feasible	See Section 5.6.2.5.2 of the PSD Application in Appendix B
	Hydrodynamic Trapping	Not Feasible	See Section 5.6.2.5.3 of the PSD Application in Appendix B
	Solubility Trapping	Not Feasible	See Section 5.6.2.5.4 of the PSD Application in Appendix B

The control technologies determined technically feasible include low-carbon fuel (natural gas), monitoring and control of excess air, efficient turbine design, and catalytic oxidation. The use of low-carbon fuels and aggressive energy-efficient design to reduce CO_2 emissions is inherent in the design of the proposed combustion turbine under consideration and is considered the baseline condition. BACT for

GHG emissions from the combustion turbine was determined to be the use of natural gas as a fuel, monitoring and control of excess air, efficient turbine design, and an oxidation catalyst. These design options will allow the combustion turbine to not exceed 850 lb CO_2/ megawatt-hour (gross) on a 12-month rolling average basis while combusting natural gas and 1,180 lb CO_2/ megawatt-hour (gross) on 12-month rolling average basis while combusting fuel oil.

Potential GHG emissions from the Project are shown in Table 3-6.

Table 3-6: Project Emissions of Greenhouse Gases

Source	Air Emissions (tons per year)						
	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	CO_2e
Combustion turbine[a]	2,179,978.7	1,187.2	1,564.0	--[b]	--	--	2,675,731
Auxiliary boiler - B02	51,236	0.97	0.097	--	--	--	51,289
Circuit Breaker – F03	--	--	--	--	--	5.3e-03	120
Natural gas heater #1 – P04	5,124	0.10	0.010	--	--	--	5,129
Natural gas heater #2 – P05	5,124	0.10	0.010	--	--	--	5,129
Emergency diesel fire pump – P06	79.5	3.2e-03	6.4e-04	--	--	--	80
Emergency diesel generator – P07	838	3.4e-02	6.8e-03	--	--	--	841
Diesel tanks – T01, T02, T03	--	--	--	--	--	--	--
Haul Roads – F01	--	--	--	--	--	--	--
Natural gas and fuel oil piping components – F02	--	39.06	--	--	--	--	977
Total	2,242,381	1,227	1,564	--	--	5.3e-03	2,739,294

Source: Prevention of Significant Deterioration Air Construction Permit Application (December 2021)

(a) Represents worse-case emissions scenario, assuming that the combustion turbine operates every hour of a year at the highest load with duct burning. In reality, the turbine will operate less than every day and every hour and may operate at loads less than 100 percent and without duct firing.

(b) Dashes indicate no emissions expected for this source

Potential GHG emissions are greater than 75,000 tons per year, which requires further analyses/assessments regarding emissions of GHG associated with the construction and operation of the Project pursuant to the requirements under Wisconsin law specified in the WAC Chapter Natural Resources (NR) 405. The PSD permit application (Appendix B) contains the following analyses/assessments regarding emissions of regulated pollutants, including GHG emissions, associated with the construction and operation of the Project:

- Evaluation of ambient air quality in the area for each regulated pollutant for which the Project will result in a significant net emissions increase
- Demonstration that emissions increases resulting from the Project will not cause or contribute to an increase in ambient concentrations of pollutants exceeding the remaining available PSD increment and the National Ambient Air Quality Standards (NAAQS)
- Assessment of any adverse impacts on soils, vegetation, visibility, and growth in the area
- A BACT analysis for each regulated pollutant for which the Project will result in a significant net emissions increase

The following units will be equipped with emission monitoring systems:

- The combustion turbine will be equipped with oxygen monitors as part of a continuous monitoring (CEM) system.
- Each SF_6 circuit breaker will be equipped with a low-pressure alarm to detect leaks.
- The natural gas and fuel oil piping components will be monitored with leak detection instruments.

Additionally, an impacts analysis was performed for an assessment of potential adverse impacts on soils, vegetation, visibility, and growth from the emission of GHGs. This analysis was performed in accordance with EPA and WDNR guidelines for an additional impacts analysis as part of the PSD permit application. It was concluded that the Project will not have a significant[20] adverse impact on the air quality, soils, vegetation, visibility, and growth in the surrounding area.

Large sources of GHG emissions report annually to the WDNR on tons per year of actual emitted of CO_2 and N_2O GHGs. Based on the inventory shared on WDNR's website,[21] in 2021, large reporting sources reported over 69,040,000 tons per year in the state. Note that this is not comprehensive, as it does not include methane emissions from these sources, nor does it include other sources that did not trigger reporting per NR 438. When compared to the maximum potential to emit (PTE) of all GHG emissions (CO_2, N_2O, SF_6, and CH_4), even assuming that the combustion turbines operate every hour of every day for a full year,[22] the NTEC Project would emit only 3.9 percent of the GHG emissions in the State of Wisconsin.

[20] The term "significant" in this section is used in Additional Impact Analyses and not in the context of NEPA.
[21] https://dnr.wisconsin.gov/topic/AirEmissions/Historical.html
[22] It is not anticipated that the Project will operate every hour of every day for a year. As such, the emission estimate used is a conservative estimate of NTEC's share of total Wisconsin emissions.

3.2.2.1.2.2 SF_6

In addition to CO_2 and methane, the following SF_6 containing equipment is proposed at each site:

- Three 345-kV circuit breakers are proposed for the substations located at each site. The substation circuit breakers will be monitored via a pressure switch and alarms.
- Two 19-kV (estimate) low-side generator circuit breakers will be located in the plant at each site before the step-up transformers that feed the onsite switchyard. The generator circuit breakers will be monitored via a pressure switch and alarms.

Each of the circuit breakers will contain SF_6. SF_6 is a potent GHG with a GWP of 22,800 times that of CO_2. The circuit breakers are state-of-the-art and will be sealed and, therefore, SF_6 leakage will be minimized. The circuit breakers will each be equipped with a two-stage pressure switch with a low-pressure alarm to indicate a potential leak. Modern circuit breakers and switches are designed as totally enclosed-pressure containing systems with far lower potential for SF_6 emissions than older circuit breakers. The current International Electrotechnical Commission (IEC) standards are that new equipment be built to low leakage limits (less than 0.5 percent per year). The effectiveness of these leak-tight closed systems is further enhanced by equipping them with an alarm that provides a warning when SF_6 has leaked from the breaker. The Project will also include six disconnect switches at each substation site; however, the switches are open air type switches and do not contain SF_6.

3.2.2.1.3 Indirect Operation Impacts

As part of evaluating projects that have the PTE GHGs, CEQ has provided the 2023 Interim CEQ GHG Guidance to develop the cost of GHG emissions to society. In accordance with this guidance, RUS has calculated the social cost of carbon (SC-CO_2) associated with the proposed Project, both Proposed Action Alternative and the No Action Alternative. In contrast to NAAQS pollutants, no direct impacts have been established for GHGs. RUS therefore determined the SC-CO_2emissions associated with GHGs from the Project constitutes an indirect effect during Project operation. Section 3.2.2.1.3.1 discusses RUS's evaluation of the SC-CO_2 associated with the Project. In addition, Section 3.2.2.1.3.2 discusses estimated upstream emissions indirectly associated with the Project.

3.2.2.1.3.1 Social Cost of Carbon

In preparing this analysis of the potential SC-CO_2 associated with the Project, RUS referenced the *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under EO 13990* published by the United States Interagency Working Group (IWG) on Social Cost of

Greenhouse Gases in February 2021.[23] This report contains interim estimates of the SC-GHG split to reflect the cost of carbon, methane, and nitrous oxide (SC-CO_2, SC-CH_4, SC-N_2O). SC-GHG is defined as the monetary value of the net harm to a society from emitting one metric ton of that GHG to the atmosphere each year. These estimates are provided by the IWG to allow analysts to incorporate – when appropriate – net social benefits or costs of GHG emissions in benefit-cost analyses and in policy decision making processes.

In the 2021 IWG Interim Estimates, SC-GHG monetary values were calculated for average discount rates of 5 percent, 3 percent, and 2.5 percent, as well as the 95th percentile 3 percent. Higher discount rates mean that future effects of an action, such as the emission of GHGs, are considered to be less significant than present effects; lower discount rates reflect that future and present impacts are closer to equally significant.[24] The social cost values are found in Table A-1 of the IWG Interim Estimate's appendix and Table 3-7 below. It should be noted that the IWG report presents the SC-GHG in 2020 dollars per metric ton. For consistency with the methodology presented in the IWG report, the results of this SC-CO_2 analysis are discounted to the present value year 2025, the project construction year. Results throughout this section are presented in 2025 dollars.

[23] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf
[24] EPA Fact Sheet – Social Cost of Carbon. https://www.epa.gov/sites/default/files/2016-07/documents/social-cost-carbon.pdf, page 1-2.

Table 3-7: Annual [rounded] SC-CO_2, 2025-2050 Social Cost of Greenhouse Gases published in the IWG Technical Support Document: Social Cost of Greenhouse Gases Interim Estimates

Table A-1: Annual SC-CO_2, 2020 – 2050 (in 2020 dollars per metric ton of CO_2)

	Discount Rate and Statistic			
Emissions Year	5% Average	3% Average	2.5% Average	3% 95th Percentile
2020	14	51	76	152
2021	15	52	78	155
2022	15	53	79	159
2023	16	54	80	162
2024	16	55	82	166
2025	17	56	83	169
2026	17	57	84	173
2027	18	59	86	176
2028	18	60	87	180
2029	19	61	88	183
2030	19	62	89	187
2031	20	63	91	191
2032	21	64	92	194
2033	21	65	94	198
2034	22	66	95	202
2035	22	67	96	206
2036	23	69	98	210
2037	23	70	99	213
2038	24	71	100	217
2039	25	72	102	221
2040	25	73	103	225
2041	26	74	104	228
2042	26	75	106	232
2043	27	77	107	235
2044	28	78	108	239
2045	28	79	110	242
2046	29	80	111	246
2047	30	81	112	249
2048	30	82	114	253
2049	31	84	115	256
2050	32	85	116	260

The annual metric tons of CO_2 emissions for the MISO West region for the Proposed Action Alternative and the No Action Alternative were calculated as part the Production Cost Modeling for years 2025-2040 (see Section 4.2 for a description of the Production Cost Modeling analysis). [25] The Production Cost Modeling analysis utilized MISO's Transmission Expansion Plan (MTEP) models, which are developed by MISO annually and are used for economic analysis. MISO develops MTEP models for the fifth, tenth, fifteenth, and twentieth years into the future. Due to this, estimates for Years 2040 through 2050 are

[25] The Production Cost Modeling analysis estimated emissions of CO_2 using the MTEP model in PROMOD to compare emission reductions with the addition of the Project to MISO West. Other GHGs were not estimated as part of the Production Cost Modeling analysis.

unavailable in MTEP Future 1. Therefore, because this information is not reasonably available,[26] RUS used the average for the last five years of model data to estimate emissions for years 2041-2050. RUS determined this to be a reasonable approach due to anticipated fluctuations beyond 2040 that would result from additional generation coming online and generation retirements, fluctuations in energy demand due to climatic or other conditions, and NTEC outages for maintenance or other reasons. RUS notes that predictions this far into the future have inherent uncertainty, but believes that this methodology results in the best opportunity to assess the Project, particularly as compared to the No Action Alternative.

These emission values were used in conjunction with the social cost estimates provided in the IWG Technical Support Document to calculate the SC-CO_2 for each scenario for years 2025-2050[27] (analysis lifespan) as well as the difference between the two scenarios. Similarly, the CO_2 PTE for the Project was calculated and used to calculate the SC-CO_2 for emissions from the Project over the analysis lifespan. CH_4 and N_2O emissions were excluded from these calculations since they could not accurately be determined based on the data from the model.

SC-GHG Results

Annual SC-CO_2 values for emissions from the Project were estimated based upon CO_2 PTE calculations (Appendix C). These PTE values represent a maximum permitted emissions scenario (assuming the combustion turbine operated at maximum load with duct firing every hour of every day) and for the purpose of these calculations it was assumed that the Project would operate at these maximum levels every year for the lifespan of this analysis.[28] The PTE is 2,252,626 tons per year of CO_2. The SC-CO_2 was calculated for average discount rates 5 percent, 3 percent, and 2.5 percent, as well as the 95th percentile of an applied 3 percent rate, for the analysis lifespan and then summed to represent a total social cost in 2020 dollars. These values are shown in Table 3-8. For the average discount rates high to low over the analysis lifespan the SC-CO_2 was calculated to be \$0.7, \$2.5, and \$3.8 billion in 2020 dollars. The SC-CO_2 for the 95th percentile 3 percent discount rate was calculated to \$7.7 billion. Due to the PTE calculations representing a worst-case scenario, these cost values represent a conservative (*i.e.*, over-) estimation.

[26] 40 CFR 1502.21

[27] The IWG Technical Support Document only includes cost estimates through year 2050. Due to this, the analysis lifespan was limited to IWG's timeframe.

[28] Although permitted to operate at these levels, it is anticipated that the Project would rarely, if ever, see these levels due to, for example, fluctuations in energy demand, plant dispatch, scheduled outages, and other operational events.

Table 3-8: Total SC-CO_2 Carbon from Project for 2025-2050 in 2020 Dollars (in Billions)

Discount Rate	5% Average	3% Average	2.5% Average	3% 95th Percentile
2025-2050 SC-CO_2 (Cost in 2020 dollars)	$0.7	$2.5	$3.8	$7.7

Additionally, annual SC-CO_2 values for the entire MISO West Region, with and without the NTEC facility and associated displacement of coal-fired emissions, were calculated for average discount rates of 5 percent, 3 percent, 2.5 percent, as well as the 95th percentile of an applied 3 percent rate for years 2025-2050. These values were then summed to represent an analysis lifespan total cost of CO_2 emitted by the region without the NTEC Project in 2020 dollars. These values are presented in Table 3-9 and are displayed as a range. The addition of the Project into the MISO West Region has been modeled to support the reduction of total CO_2 emissions compared to the No Action Alternative (see Chapter 4, Cumulative Impacts) and therefore will also decrease the total projected SC-CO_2 values. For average discount rates high to low over the analysis lifespan the reduction in the SC-CO_2 was calculated to be $845 million, $1.2 billion, and $1.7 billion in 2025 dollars. The reduction of CO_2 over the analysis lifespan was $3.5 billion in 2020 dollars for the 95th percentile of an applied 3 percent discount rate.

Table 3-9: MISO West Region Total SC- CO_2 for 2025-2050 presented in 2020 Dollars

Discount Rates	5% Average	3% Average	2.5% Average	3% 95th Percentile
Proposed Action Alternative SC-CO_2	$20.7 billion	$76.9 billion	$115.8 billion	$234.3 billion
No Action Alternative SC-CO_2	$21.5 billion	$78.1 billion	$117.5 billion	$237.9 billion
Difference	-$0.8 billion	-$1.2 billion	-$1.7 billion	-$3.5 billion

Based on indirect and cumulative effects analysis of the Project, it was determined that construction and operation of the NTEC Project would result in an overall decrease in CO_2 emissions within MISO West. Cumulative impacts are discussed in more detail in Chapter 4. These reductions in the SC-CO_2, associated with the displacement of higher GHG producing coal facilities, would range from between $845 million and $3.5 billion, depending on the discount rate considered. Tables showing annual totals for both the Project emissions and the MISO West Regional Analysis are included in Appendix C.

3.2.2.1.3.2 Upstream Impacts

As part of the indirect impact analysis of the Project, RUS calculated upstream GHG emissions from the transportation of natural gas for operation of the Project were estimated. The Project is anticipated to displace a comparable level of electricity generation from coal fired facilities. To provide additional

context, upstream emissions from the transportation of coal that would be required to produce the same electrical output as combustion of gas at the Proposed Facility. Additionally, for context, because the Project is anticipated to displace a comparable level of electricity generation from coal fired facilities, the upstream emissions from the transportation of coal that would be required to produce the same electrical output as combustion of gas at the Facility were also estimated for comparison, specifically to represent the No Action Alternative.

Methodology for Calculating Upstream Emissions

Natural Gas:

In order to analyze indirect effects of the Proposed Action, RUS consulted the EPA Inventory of U.S. GHG Emissions and Sinks as well as the EPA's "Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Combustion Turbine Electric Generating Unit", published April 21, 2022, [29] for use to determine an emission factor for upstream natural gas transportation losses. Additionally, Northwest Power and Conservation Council's "Upstream Methane Emissions and Power Planning", published January 7, 2020[30] and Center for Climate and Energy Solutions "Natural Gas", retrieved July 27, 2021[31] were consulted to confirm the loss rates. These losses are considered an indirect effect of the Project as NTEC will require natural gas to operate.[32] The facilities transporting this gas are currently in-place, aside from the tap line to the plant, and owned and operated by others. In consideration of these studies, RUS determined a 1.5 percent methane loss during upstream natural gas from extraction, processing, transportation, and distribution was appropriate. RUS consulted the National Energy Technology Laboratory's (NETL) Upstream Dashboard Tool (v.3)13 for an emission factor that represents natural gas leakage emissions from transportation only. To calculate annual CO_2e[33] emissions from upstream transportation of natural gas, an annual MMBtu/year (1 Million British Thermal Units/year) of natural gas usage was determined. This was based on the annual average estimated facility output (with duct firing and HRSG) of 5,086,555,320 kilowatt hour (kWh)/year. Using the average facility net heat rate at these conditions of 6,925 Btu/kWh, the annual natural gas use at the facility was estimated to be 35,224,396 MMBtu/year. The NETL emission factor leakage rate is equivalent to 9.26 lb CO_2e/MMBtu of natural gas. Multiplying this natural gas leakage rate (9.26 lb CO2e/MMBtu) by the total

[29] https://www.epa.gov/stationary-sources-air-pollution/white-paper-available-and-emerging-technologies-reducing
[30] https://www.nwcouncil.org/sites/default/files/2020_01_p3.pdf
[31] https://www.c2es.org/content/natural-gas/
[32] The natural gas pipeline is not considered part of the Proposed Action. Losses are considered an indirect effect.
[33] CO_2e emissions are estimated in this section due to the various GHGs analyzed in the natural gas upstream leakage and in the comparison to upstream coal emissions.

estimated annual natural gas use (35,224,396 MMBtu/year) provided a natural gas leakage emissions estimate of 163,132tons CO_2e per year).

Coal:

In order to estimate indirect effects of the No Action Alternative, emissions from coal combustion for commensurate energy generation were calculated. This was done to assess emissions if the Project were not built, a scenario in which the region would continue to rely on existing coal energy generation infrastructure and coal facility retirements would be delayed to meet energy needs. The same Facility output of 5,086,555,320 kWh/year was used to calculate upstream emissions using coal to generate the same electrical output of the Project. Coal has a higher required heat input for generating the same electrical output as natural gas due to coal-fired generation being less efficient than natural gas. An average coal heat rate of 10,002 Btu/kWh was used for these calculations, based on values from IEA's "Average Tested Heat Rates by Prime Mover and Energy Source, 2011 – 2021."[34] Based on this heat rate, 50,875,726 MMBtu/yr of heat input from coal would be required to provide the same electrical output.

Using this heat input from coal and an emission factor of 215.88 lb CO2e/MMBtu, as provided in 40 CFR 98, Tables C-1 and C-2, annual CO_2e emissions from combustion of coal to provide the same level of electricity output as for the NTEC facility would be 5,491,485 TPY CO_2e. Information on GHG emissions associated with transportation of coal are not widely available. RUS consulted a 2020 paper titled "Rolling coal: The GHG emissions of coal rail transport for electricity generation."[35] This paper provided estimates of the median and upper quartile comprehensive distribution emissions of coal via rail transport to be between 2.2 and 5.2 percent of operational emissions, respectively. In extreme cases, the comprehensive transportation emissions are as high as 35 percent of operational emissions. For this analysis, the upper quartile value of 5.2 percent of operational emissions was used because it was presented that sub-bituminous coal (the primary coal used in the MISO West area) has some of the longest shipping distances, contributing to greater use of fuel and associated emissions. At 5.2 percent of operational emissions (5,491,485 TPY CO_2e), estimated upstream coal transport emissions are estimated to be 285,558 tons CO_2e per year.

<u>Upstream Emissions Conclusions:</u>

[34] https://www.eia.gov/electricity/annual/html/epa_08_02.html
[35] Journal of Cleaner Production. *Rolling coal: The greenhouse gas emissions of coal rail transport for electricity generation*. Volume 259, 20 June 2020. Accessed March 2023 from https://www.sciencedirect.com/science/article/abs/pii/S0959652620308179.

Based on these calculations, the Project is anticipated to result in upstream emissions due to the methane leakage of approximately 163,132 tons of CO_2e per year, assuming a 1.5 percent loss of methane during transportation of natural gas. The No Action Alternative (continued reliance on existing coal plants) is anticipated to emit approximately 285,558 tons CO_2e per year, approximately 122,425 tons more CO2e compared to the Proposed Action Alternative, assuming an emissions rate of 5.2 percent of operational emissions resulting from transportation for coal operation. The SEA predicted a net annual average reduction of 964,000 tons per year of CO_2 under the Proposed Action Alternative, which is equal to 964,000 ton per year CO_2e.[36] Therefore, even with the additional upstream emissions of CO_2e from methane leakage, the Project is still anticipated to support the reduction of overall emissions in MISO West by over 800,000 tons per year of CO_2e.

Additionally, using data from the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018, the American Gas Association documents that total methane annual emissions declined 16 percent between 1990 and 2019. This trend is attributable to the development of new control technologies and better industry practices (American Gas Association, 2022). It is expected that this reduction in methane emissions will continue with ongoing industry and government programs aimed at further reducing leakage from the natural gas system nationwide, including the system providing natural gas to the proposed NTEC facility. NTEC will be in compliance with these programs including New Source Performance Standards, issued by the EPA, and codified in 40 CFR 60, for existing and new oil and gas facilities. Overtime, RUS believes the upstream emissions associated with the NTEC facility would be further reduced from those estimated at this time.

3.2.2.1.4 Proposed Action Alternative Conclusions

As discussed in Section 4 (Cumulative Impacts), the Production Cost Modeling demonstrates that the Project will reduce congestion in the region and facilitate the increased use of renewable energy and will displace the use of coal and less efficient gas plants, thereby supporting a net effect of reducing emissions. The MISO 2021 Future 1, which is incorporated into the production cost modeling, indicates a 63 percent reduction in carbon emissions compared to 2005 levels, so long as sufficient dispatchable resources are available to support increased renewable development. MISO Futures 2 and 3 (developed after the Production Cost Modeling was conducted) indicate that additional reductions are possible, but importantly, those models continue to show a significant need for dispatchable generation such as the Project.

[36] The production cost modeling only analyzed CO_2 reductions in MISO West and did not include other GHGs. If CH_4 and N_2O were also included in estimates, the reductions are anticipated to be even greater than this value.

With respect to the 2050 Administration goals of net-zero emissions economy-wide, it is likely that additional technical developments would be required to meet these goals. As applicable, these technologies could be implemented for the Project to contribute to the net-zero emissions goal.

3.2.2.2 No Action Alternative

Under the No Action Alternative, no direct Project emissions will occur. Dairyland would not help facilitate the addition of new renewable electricity sources to the power portfolio. Dairyland would still need to develop or contract additional dispatchable resources to complement the intermittent nature of any additional renewables. Dairyland would need to identify new generating capacity to add to the current resource mix to serve growing load within the service territories that the member cooperatives serve and to replace generation that was recently retired.

3.2.3 Mitigation

The following mitigation has been proposed related to GHG emissions. Other previously proposed air quality mitigation is provided in Section 5.1 of this Final SEA.

Construction Mitigation

- During construction, steps will be taken to prevent excessive emissions of GHG resulting from construction activities and vehicular traffic. These steps may include reducing the idling of construction vehicles. See RUS's responses to EPA's comments on the NTECEA in the 2021 FONSI for the Project for further details on specific measures related to the EPA construction emissions control checklist for the Project.

Operation Mitigation

- The Owners submitted the PSD permit application for the Project to WDNR and will adhere to conditions and requirements of the application during operation of the Project. The Owners will also be working with the equipment vendors to realize equipment efficiency gains between approval and commercial operation that can be incorporated into construction and operation of the facility.
- Any GHG and VOC emissions from the piping components will have fugitive emissions. Fugitive emissions are, by their nature, very difficult to monitor directly, as they are not emitted from a discrete emission point. Therefore, the Owners propose the following compliance demonstrations, recordkeeping, and monitoring requirements:

  - Conduct instrument monitoring inspections on piping components each calendar quarter to detect leaks of natural gas and fuel oil.
  - Keep a log of all the quarterly instrument monitoring inspections from piping components that are part of this Project.
  - Develop a Facility Leak Detection Plan
- These proposed work practices are consistent with the BACT determinations identified above and in the PSD Application (Appendix B).

3.3 Tribal Environmental Justice

The following sections describe potential environmental consequences of the Project related to climate change and tribal communities. This section supplements the environmental justice analysis in the NTECEA (Section 3.8) and the tribal environmental justice analysis in the SEA (Section 3.3). Tribal coordination is discussed in Section 6.5.

3.3.1 Affected Environment

The Red Cliff Band of Lake Superior Chippewa Indians and the Fond du Lac Reservation Resource Management Division sent letters to USDA-RUS requesting that RUS conduct a SEA to consider climate change from associated GHG emissions from the Project, as well as how the Project may impact treaty rights and other cultural resources, including upstream extraction of natural gas. The following sections discuss tribal considerations and social characteristics in the Project area and provides a regulatory overview.

3.3.1.1 Tribal History and Traditional Cultural Properties

The State of Wisconsin has a long history of human occupation. There are numerous cultural traditions recognized in Wisconsin (Table 3-10). Traditions refer to a time of technological, social, and economic continuity across geographic areas. Generally, during each tradition, populations organized tools, living areas, and subsistence strategies in ways that produced similar archaeological signatures and assemblages (e.g., projectile points types, pottery manufacturing and motifs, house patterns, mortuary practices). Traditions can help contextualize the archaeological record and highlight behavioral shifts over time. Stages and phases within the traditions are more temporally refined periods. This section provides an overview of the cultural traditions of Wisconsin.

Table 3-10: Cultural Traditions and Stages in Wisconsin

Cultural Period	Estimated Calendar Date
Paleoindian Tradition	11000-8500 B.C.

Cultural Period		Estimated Calendar Date
Archaic Tradition		8500-1000 B.C.
Early Archaic Stage		8500-6000 B.C.
Middle Archaic Stage		6000-3000 B.C.
Late Archaic Stage		3000-1000 B.C.
Woodland Tradition		1000 B.C. – A.D. 1100
Early Woodland Stage	Emergent	1000-300 B.C.
Middle Woodland Stage	Terminal	300 B.C – A.D. 400
Late Woodland Stage		A.D. 400 – A.D. 1100
Mississippian Tradition		A.D. 1000 – Present
Middle Stage – Aztalan / Points South Phases		A.D. 1000 – A.D. 1500
Upper Stage – Oneota Phase		A.D. 1000 – A.D. 1800
Post-Contact Tradition		A.D. 1630 – Present
Euro-American		A.D. 1630 – Present
American Indian		A.D. 1630 – Present

Source: Brown 1986; Birmingham et al. 1997; Ritzenthaler 1985

The early 19th century was characterized by continued Euro-American encroachment and by several treaties that forced the Ojibwe bands off their lands. In 1830, the United States government passed the Indian Removal Act. The law allowed the government to grant unsettled lands west of the Mississippi River to tribes in exchange for their lands within the boundaries of established states. This law was used as the impetus for treaties in 1837, 1842, and 1854 that forced the Ojibwe and other tribes to relinquish large amounts of land. However, the groups were supposed to retain the right to hunt and fish on their ancestral lands (Wisconsin Historical Society [WHS], 2017).

In 1850, a removal order was issued for all Ojibwe bands, but they sent a delegation to President Fillmore protesting their treatment and asking for permanent reservations. Four years later, the government established reservations at Bad River, Lac Courte Oreilles, Lac Du Flambeau, and Red Cliff; however, the tribe was still supposed to have the right to hunt and fish on their ceded lands (WHS, 2017). In 1854, a group of Native American tribes ceded a portion of northeastern Minnesota to the United States (approximately 6.4 million acres). This treaty allowed for the tribes to retain their rights to hunt, fish, and gather on the ceded lands. The following tribes exercise those rights today: the Bois Forte Band of Chippewa, Fond du Lac Band of Lake Superior Chippewa, and Grand Portage Band of Lake Superior

Chippewa (Stults et al., 2016.) The 1854 Treaty Authority was established as an inter-tribal natural resource management organization tasked with managing off-reservation rights within the ceded lands.

Stults et. al. (2016) studied species and ecosystems of significant[37] cultural importance to the bands in the 1854 ceded territory that are likely to be impacted by climate change. The study assessed the sensitivity and adaptability of the resources to the effects of climate change, and suggested adaptation strategies for each of the species/habitats studied. Detailed adaptation plans were developed for the following: air quality, walleye, sturgeon, culturally significant plants, sugar maple, wild rice, Labrador tea, water quality/quantity, moose, paper birch, and boreal wetlands. General adaptation strategies were developed for all species/ecosystems considered in the study and 269 detailed strategies were developed for the 11 focus species/ecosystems listed above. Adaptation actions were grouped into one of five categories: collaboration; conservation; preservation and maintenance; education; monitoring and assessment; and restoration.

Treaties and government actions demonstrate the extensive ties of Native Americans to the lands of Wisconsin. Along with archaeological sites and remains for Native Americans, cultural resources may also include traditional cultural properties (TCPs), defined as sites or places of traditional cultural or religious importance to specified social or historical groups. TCPs are often cultural resources that meet the eligibility criteria for listing on the National Register of Historic Places (NRHP) and are considered "historic properties" under the National Historic Preservation Act (NHPA).

The National Park Service (NPS) *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1998) define "traditional" as referring to those beliefs, customs, and practices of a living community of people that have been passed down through the generation, usually orally or through practice. The significance of a TCP is in the role that the property plays in a community's historically rooted customs, beliefs, and practices. Examples of properties possessing significance include:

- A location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice;
- A location associated with the traditional beliefs of a Native American group relating to its origins, its cultural history, or the nature of the world;
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historical identity;

[37] The term "significant" in this section is used to express a level of cultural importance and not in the context of NEPA.

- A rural community whose organization, buildings, and structures, or patterns of land use reflect the cultural traditions valued by its long term residence;
- Or an urban neighborhood that is the traditional home of a particular cultural group, and that reflects its beliefs and practices.

Often TCPs are overlooked or not identified during archaeological, historical, or architectural surveys. The existence and significance of TCPs, and their locations, can only be determined through ethnographic research. In many cases TCPs may not be discernible to anyone other than a knowledgeable member of the group that attribute significance to the TCP.

Of the six recognized bands of Ojibwe with connections to the region, the Fond Du Lac Band of Lake Superior Chippewa maintained a special association with the Project vicinity. In 1918 or 1919, approximately 180 deceased members of the Fond du Lac Band of Lake Superior Chippewa were removed from their Wisconsin Point Cemetery and buried in a mass grave at the St. Francis Xavier Cemetery. Minnesota Steel, a U.S. Steel subsidiary, facilitated the removal of the burials to build an ore dock and rail terminal. Agate Land Company acted as their land purchasing agent (Carlson, 2009). However, the ore dock and rail terminal project were never constructed in the Wisconsin Point Cemetery removal area.

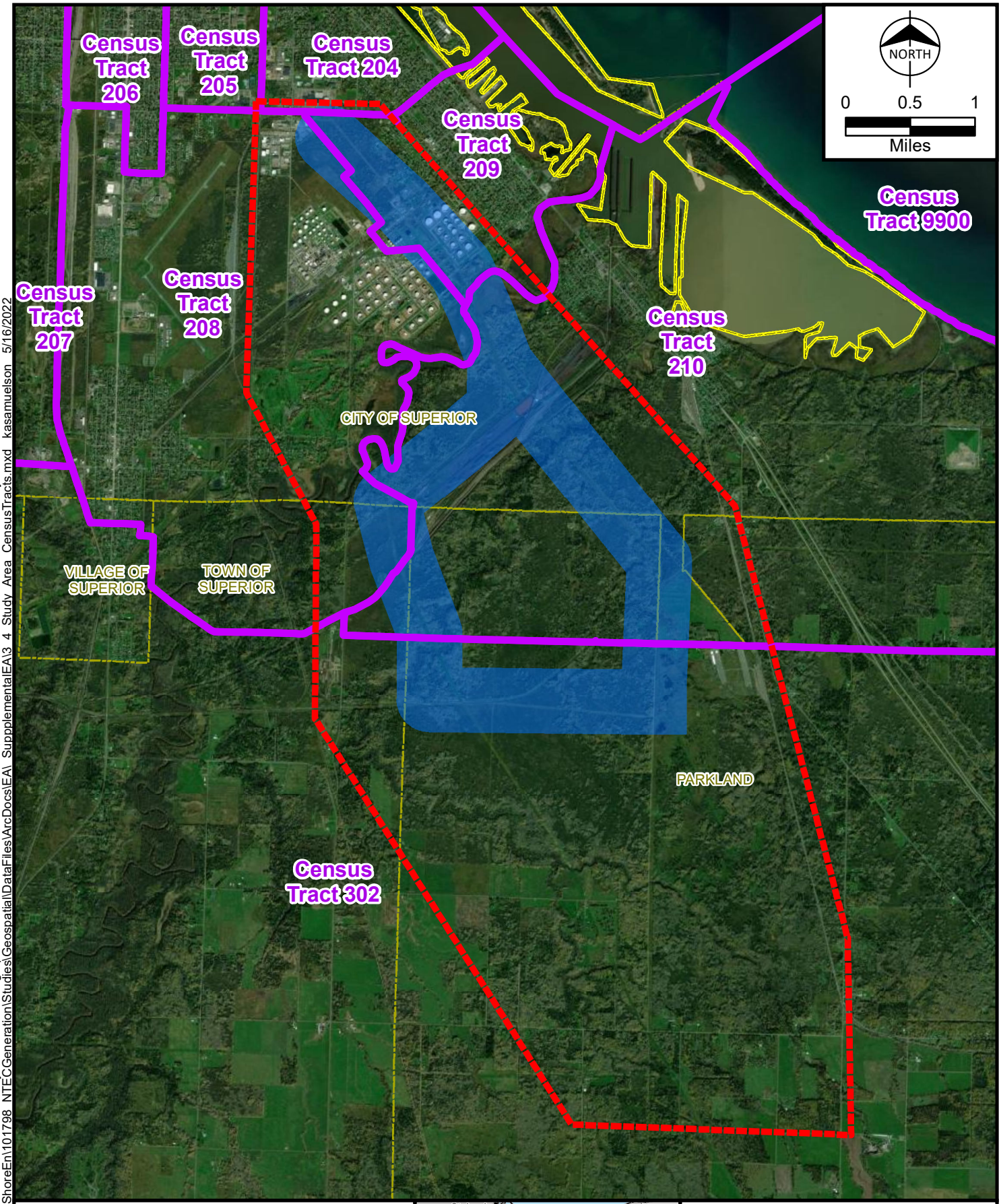
The Ojibwe (aka Chippewa) used this portion of Wisconsin Point as a cemetery from at least the seventeenth century until the early 20th century. The remains of many prominent Chippewa individuals, including Chief Joseph Osaugie (also spelled Osawagee or Osagi), were reportedly buried there and moved to the St. Francis Cemetery (Carlson, 2013). At present, the Fond du Lac Band of Lake Superior Chippewa maintain the remaining portions of the cemetery at Wisconsin Point. Both the Wisconsin Point and St. Francis Xavier cemeteries are culturally significant places to the Fond du Lac Band of Lake Superior Chippewa.

3.3.1.2 Social Characteristics

The U.S. Census Bureau (2019) American Community Survey 5-Year Estimates has published demographic data for 2015-2019 and limited data from the 2020 Decennial Census. Table 3-11 shows the population for Douglas County, the City of Superior, the Town of Superior, the Town of Parkland, and for the census tracts within which Project components would be located (Figure 3-1).

The Study Area population composition is primarily white, with small percentages of black or African American, American Indian, Asian, and other races. The median household income levels within the Study Area range from $44,792 to $77,235. The City of Superior had the greatest percentage of people whose income in the past 12 months was below poverty level (14.1 percent) while the Town of Superior

had the lowest percentage (5.2 percent). American Indian populations in these geographies range from 0.3 percent to 3.0 percent. Approximately 1.0 percent of the population of Douglas County overall is American Indian or Alaska Native.



Study Area

Macro-Corridors

Municipal Boundary

County Boundary

Census Tract Boundary

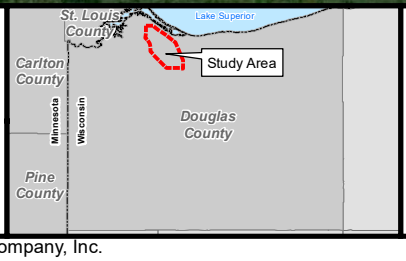


Figure 3-1
Census Tracts
SSE and DPC
Nemadji Trail Energy Center
Douglas County, WI

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Source: Esri, Minnesota Power, and Burns & McDonnell Engineering Company, Inc.

Issued: 5/16/2022

Table 3-11: Population Characteristics – City of Superior and Census Tracts near Project

Demographic Group	Douglas County, Wisconsin	City of Superior	Town of Superior	Town of Parkland	Census Tract 204	Census Tract 205	Census Tract 208	Census Tract 209	Census Tract 210	Census Tract 302
Total population	43,295	26,223	2,078	1,354	3,255	2,768	3,492	2,260	1,855	5,236
White (percent)	92.9	91.4	97.5	95.3	96.9	89.3	91.3	99.0	85.1	94.6
Black or African American (percent)	1.4	2.0	0.0	0.0	0.4	3.1	1.2	0.1	6.8	0.6
American Indian and Alaska Native (percent)	1.9	2.0	1.1	2.8	0.3	1.4	1.3	0.8	3.0	2.1
Asian (percent)	1.2	1.8	0.3	0.2	0.6	4.8	0.4	0.0	3.7	0.3
Native Hawaiian and Other Pacific Islander (percent)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Some other race (percent)	0.2	0.3	0.0	0.0	0.0	0.4	0.7	0.0	0.0	0.1
Two or more races (percent)	2.4	2.4	1.1	1.7	1.8	0.8	5.1	0.2	1.5	2.4
Hispanic or Latino (percent)	1.6	2.1	0.0	1.5	1.9	2.9	2.0	0.2	0.0	0.7
Median household income	$ 53,986	$ 46,957	$77,235	$59,522	$57,069	$51,289	$61,705	$44,792	$49,962	$71,042
All people whose income in the past 12 months is below the poverty level (percent)	12.0	14.1	5.2	5.3	9.2	11.4	10.7	10.3	9.1	7.4

Source: U.S. Census Bureau American Community Survey 5-Year Estimates, 2015-2019; U.S. Census Bureau 2020 Decennial Census.

It has been reported that Native American women are more likely to experience violence than white women, and women in some tribal communities are ten times more likely to be murdered than the national average (Bachman et al., 2008). Over 5,700 Native American and Alaska Native women and girls were reported missing in 2017. This epidemic has been referred to as the Missing and Murdered Indigenous Women and Relatives (MMIWR) epidemic. Extractive industries, such as for oil and natural gas, have been investigated in recent years to assess their impacts on crime in local communities (North Dakota State and Local Intelligence Center, 2012; Ruddell, 2014). Man camps, also known as modular housing, provide temporary dwellings for transient workers on pipeline projects. These camps are often in rural areas where law enforcement is not equipped to handle large influxes of temporary residents. These camps have been implicated in higher rates of violence against Indigenous women in North America (National Inquiry into Missing and Murdered Indigenous Women and Girls, 2019). Duluth's harbor, just opposite the border of Superior, has been identified as a site for trafficking of Native people (PAVSA, 2022; CBS Minnesota, 2011; Star Tribune, 2013).

3.3.1.3 Regulatory Overview

The American Indian Religious Freedom Act of 1978 (42 U.S.C § 1996) established policy to protect and preserve rights for Native American groups to believe, express, and exercise their traditions. These rights include access to sites with historical or religious value, use and possession of sacred objects, and the freedom to worship through traditional rites and ceremonies.

The Native American Grave Protection and Repatriation Act (NAGPRA; 25 U.S.C. §§ 3001–3013) was enacted in 1990 and requires federal agencies and institutions receiving federal funding to return cultural items to lineal descendants, Native American tribes, and Native Hawaiian organizations. Cultural items include human remains, funerary objects, sacred objects, and objects of cultural patrimony. The act describes procedures for inadvertent discovery of cultural items on federal or tribal lands.

In 1994, President Clinton published the Government-to-Government Relations with Native American Tribal Government Presidential Memorandum (59 FR 22951). This memorandum reiterated the federal government's commitment to a government-to-government relationship with federally recognized Native American and Alaska Native tribes, and to advance self-governance of tribes. The memorandum provided principles for interaction between the federal government and federally recognized Native American tribes and required consultation with such tribes prior to taking actions that would have substantial direct effects on tribal governments.

EO 13175 provided guidelines for federal agencies to have "an accountable process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications," and reiterated the right of self-governance by tribes and the U.S. commitment to have a government-to-government relationship. The EO also set forth guidelines to reduce the imposition of unfunded mandates upon Native American tribes.

In addition, the letter from the Red Cliff Band of Lake Superior Chippewa Indians mentioned the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) which was adopted in 2007. Although approved by a number of countries, UNDRIP has not yet been approved by the United States. The United States has declared support for UNDRIP, however. UNDRIP establishes "universal framework of minimum standards for the survival, dignity and well-being of the indigenous peoples of the world" (United Nations, 2022). The UNDRIP expands on human rights as related to indigenous peoples.

3.3.1.4 Environmental Justice

Environmental justice concerns may arise from the human health or environmental effects of a project on minority or low-income populations. EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations" (CEQ, 1997). In the memorandum that accompanied EO 12898, the President specifically recognized the importance of procedures under NEPA for identifying and addressing environmental justice concerns. The memorandum states that "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA."

Environmental justice issues are identified by first determining whether minority or low-income populations are present. If so, then any disproportionate effects on these populations would be identified and considered. The CEQ guidance states that minority populations should be identified when the percentage of minority residents in the affected area exceeds 50 percent or is meaningfully greater than the percentage of minority residents in the general population (CEQ, 1997). If the percentage of minority residents of the population in the area census tract exceeds the county level by more than 10 percent, it is considered to be "meaningfully greater" for the purposes of the analysis. The CEQ guidance also states that low-income populations should be identified based on poverty thresholds as reported by the U.S.

Census Bureau (USCB). If the poverty rate for the population of the area census tract exceeds the county poverty rate by more than 10 percent, it is considered to be an area of environmental justice concern for the purposes of the analysis. The NTECEA included an environmental justice analysis that utilized the EPA EJSCREEN tool (see Section 3.8.1.4 of the NTECEA). The analysis found that Census Tract 210 was in an environmental justice low-income area. The poverty rates for the remaining Study Area census tracts were not substantially higher (and for Census Tracts 204, 209, and 302, the poverty rates were lower) than the county poverty rate.

As recommended by EPA in their comments from July 2022, this analysis was updated for the Project using EJSCREEN 2.0 in October 2022 using the same methodology as described in Section 3.8.1.4 of the NTECEA and above (Table 3-12). Environmental justice issues are identified by first determining whether minority or low-income populations are present. If so, then any disproportionate effects on these populations would be identified and considered. Table 3-12 provides total minority and poverty information for the Study Area.

Table 3-12: Total Minority and Poverty near Project

Environmental Justice Factor	Douglas County, WI	Census Tract 204	Census Tract 205	Census Tract 208	Census Tract 209	Census Tract 210	Census Tract 302
Total minority (percent)	8	5	13	7	1	15	6
Low-income population (percent)	30	26	33	28	29	33	20

Source: EPA EJScreen 2.0, 2022

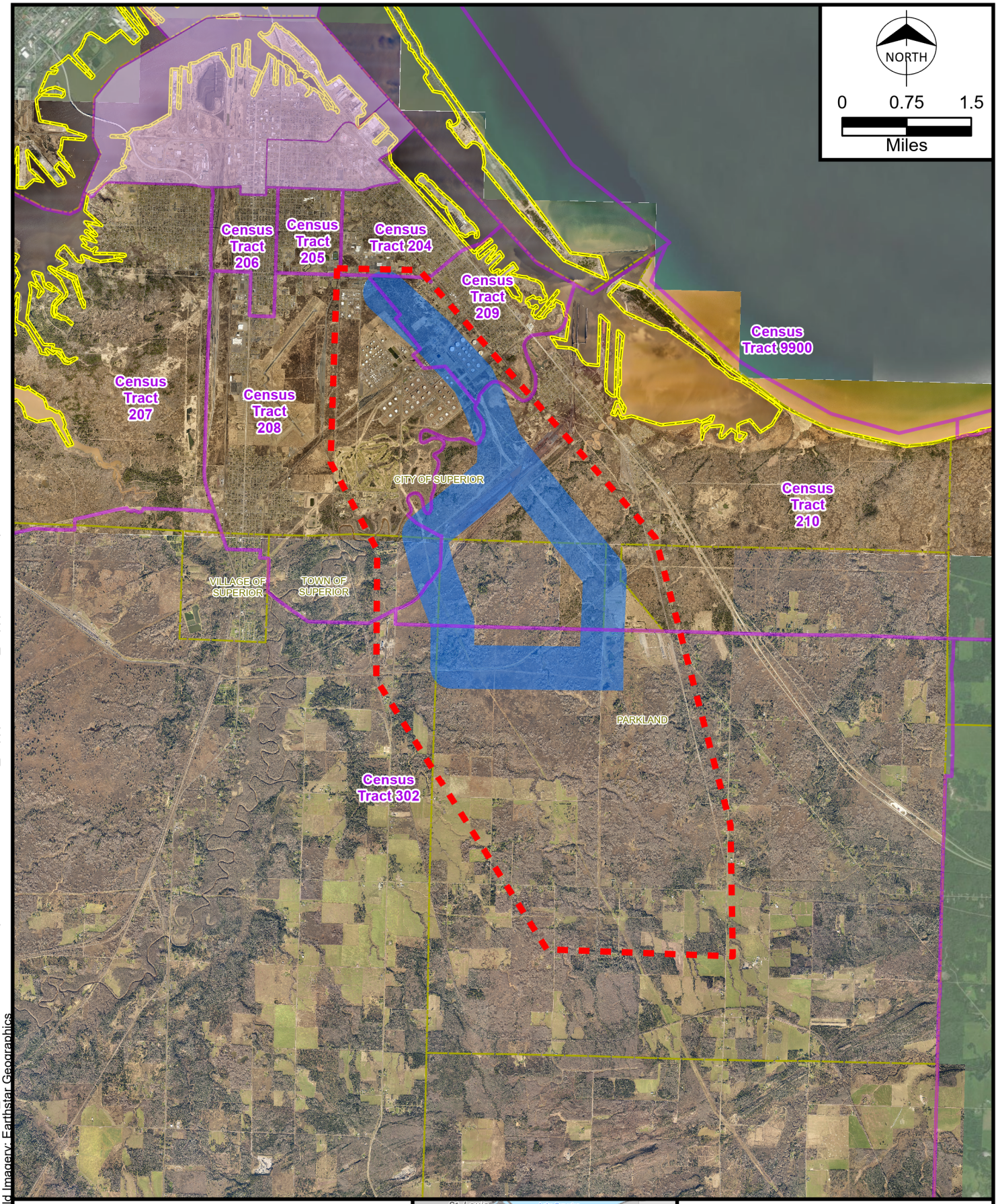
Based on this methodology and EJSCREEN 2.0, no EJ communities were identified in the Project Study Area (Table 3-12). Census Tract 210 is no longer considered to be in an environmental justice low-income area as it was in the NTECEA based on EJSCREEN 2.0. The poverty rates for all Study Area census tracts are not substantially higher (and for Census Tracts 204, 208, 209, and 302, the poverty rates are lower) than the county poverty rate. Therefore, no environmental justice low-income areas were identified in the Study Area. The percentage of minority residents in Census Tracts 205 and 210 is only slightly higher (and for Census Tracts 204, 208, 209, and 302, slightly lower) than the percentage for Douglas County as a whole. Therefore, no environmental justice minority areas were identified in the Study Area.

Additionally, as part of RUS investigations using the Climate and Economic Justice Screening Tool, which was developed by CEQ as part of EO 14008,[38] no climatic burdens above the screening tool thresholds were identified for the Study Area (Figure 3-2). The tool identifies disadvantaged communities using eight burden categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. None of the census tracts in the Study Area meet any burden thresholds or socioeconomic thresholds that would identify the tract as disadvantaged. Additionally, the census tracts were not above the burden threshold (90th percentile) for any of the climate change indicators (expected agriculture loss rate, expected building loss rate, expected population loss rate, projected future flood risk, and projected future wildfire risk).

3.3.2 Environmental Consequences

The following sections provide potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to tribal environmental justice and climate change.

[38] https://screeningtool.geoplatform.gov/en/about#11.32/46.6091/-92.0382



Study Area

Census Tracts Not Identified as Disadvantaged

Census Tracts Identified as Disadvantaged

Macro-Corridors

Municipal Boundary

County Boundary

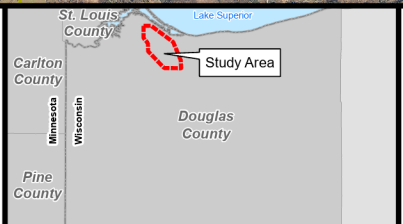


Figure 3-2
CEJST Results
SSE and DPC
Nemadji Trail Energy Center
Douglas County, WI

Source: Esri, Minnesota Power, City of Superior 2019 Aerials, USGS PADUS, FAA, USGS NHD, and Burns & McDonnell Engineering Company, Inc.

Issued: 5/22/2023

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Service Layer Credits: World Imagery: Earthstar Geographics

3.3.2.1 Proposed Action Alternatives

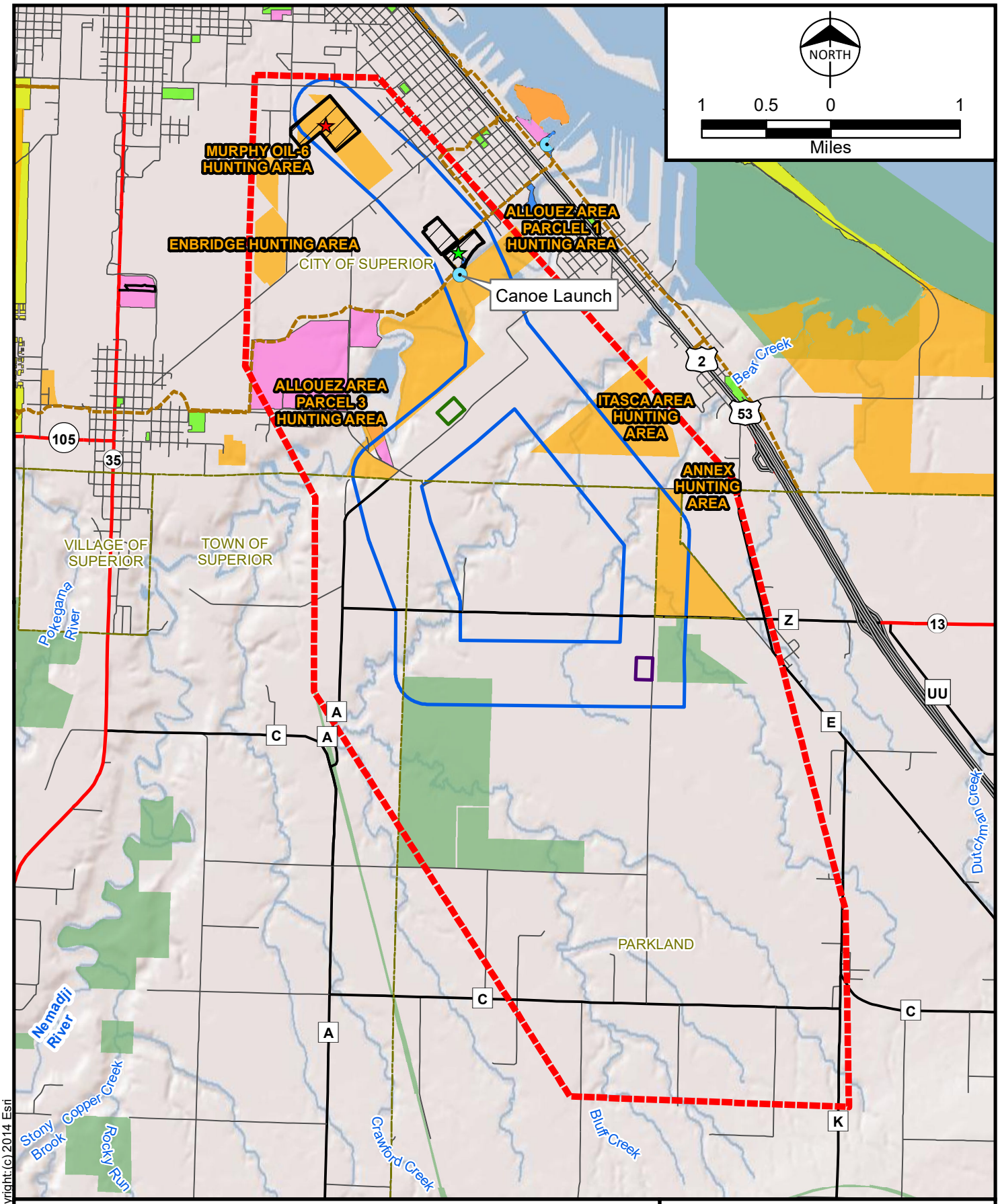
No direct impacts to tribes are anticipated. No construction or facilities will be located on tribal lands, and no impacts to TCPs or Native American cultural sites are anticipated to be disturbed.

The Proposed Action will increase GHG emissions in the immediate Project vicinity. While the Proposed Action will cause GHG emissions in the direct vicinity, climate change occurs on a global scale. No guidelines or thresholds for local climate impacts due to localized GHG emissions have been developed or identified by the US EPA. There are no NAAQS or health exposure thresholds for GHGs. While criteria pollutants such as NOx, SO_2, CO and particulates cause localized health impacts, GHGs have effects on the global carbon cycle and cause system-wide changes.

The Proposed Action is not anticipated to require additional oil or gas development. The Proposed Action would use existing, developed sources for natural gas. As such, the Proposed Action would not contribute to a need for more man camps or other development boom circumstances linked to increases in criminal activity, including human trafficking.

As discussed in Section 3.3.1.1, approximately 180 Ojibwe burials were moved from the Wisconsin Point Cemetery to the St. Francis Cemetery around 1918-1919. The Fond du Lac Band of Lake Superior Chippewa consider the St. Francis Xavier Cemetery a TCP because it contains these burials. The St. Francis Catholic Cemetery is located to the northeast of the NTEC Site along 31st Ave E and is buffered by approximately 130 feet of trees. As noted in October 2020 EA, the St. Francis Xavier Cemetery would not be impacted by the Project.

Native American access to ceded lands for hunting, fishing, and gathering may be temporarily curtailed or restricted during Project construction. Fishing access to the Nemadji River is provided at 18th Street and 11th Street. There are also several hunting areas owned by the City of Superior and Douglas County within the Study Area that may be used by Native Americans (along with the general public) to access local resources (Figure 3-3). As identified in Stults et. al. (2016), several fish species are of great cultural significance to tribes in the 1854 territory, including black crappie, walleye, northern pike, sturgeon, brook trout, lake trout, and whitefish. The study also identified multiple species that occur within the Project study area that could be hunted (white-tailed deer, turkey, etc.) or gathered (berries, wild rice, etc.) The fishing access at 18th Street and Nemadji canoe launch are accessed from roads also used to access the Nemadji River Site and are near the transmission routes south of the Nemadji River Site.



Hill Avenue Site
Nemadji River Site
Approx. Property Boundary
Parkland Switching Station
Superior Switching Station
Boat\Canoe Launch
Study Area
Recreation Trail
Municipal Boundary
Macro-Corridors
Hunting Area
Conservation Area

City Park and Recreation Areas
Special Use
Waterfront
Park
Open Space

Figure 3-3
Conservation and Recreation Areas within the Study Area
Nemadji Trail Energy Center
Douglas County, WI

Path: Z:\Clients\ENS\SouthShoreEn\101798_NTECGeneration\Studies\Geospatial\DataFiles\ArcDocs\EA_SupplementalEA\3_5_StudyArea_Hunting_Launch.mxd kasamuelson 6/8/2022

Source: Esri, Minnesota Power, City of Superior, USGS PADUS, Wisconsin DNR, FAA, USGS NHD, and Burns & McDonnell Engineering Company, Inc.

Issued: 6/8/2022

Though not directly crossed, the access may be limited or temporarily closed during construction of facilities through temporary road closures and temporary increased noise associated with construction. If the Nemadji River Site is constructed, there would be increased traffic and operation noise near the fishing access at 18th Street during operation. Traffic during operation would primarily include employees entering or exiting the plant facility, as well as occasional maintenance vehicles. Traffic during operation of the Project would increase vehicles on nearby roads but is not anticipated to significantly increase traffic due to the number of employees anticipated or reduce access to these facilities.

The Preferred Site is not located within a hunting area. The transmission line route south of the Nemadji River Site would require clearing woodland in a portion of the Allouez Area Parcel 1 hunting area, the Itasca Area hunting area, and the Annex hunting area. The route generally follows existing transmission line and natural gas line through these parcels, however. Clearing would remove woodland habitat and result in a minor change to the habitat mix on these areas. Access to all or portions of these areas may also be controlled during construction. Once completed, access to these areas would be restored.

No EJ communities were identified in the Project Study Area (Table 3-12). Census Tract 210 is no longer considered to be in an environmental justice low-income area as it was in the NTECEA based on EJSCREEN 2.0. Additionally, as part of RUS investigations using the Climate and Economic Justice Screening Tool, none of the census tracts in the Study Area meet any burden thresholds or socioeconomic thresholds that would identify the tract as disadvantaged. Because no EJ communities were identified in the Study Area, the Project will not have disproportionately high and adverse impacts on EJ communities.

3.3.2.2 No Action Alternative

Under the No Action Alternative, no emissions will occur related to the Project. Native American access to ceded lands for hunting, fishing, and gathering would not be temporarily curtailed or restricted during Project construction. Since no construction would occur, fishing access and recreational areas would not be temporarily impacted by construction activities.

3.3.3 Mitigation

If the Archaeological Study Area configuration is changed, additional archaeological investigations; documentation of historic-age, non-archaeological resources; and NRHP evaluations may be necessary.

If buried cultural resources are encountered during Project construction, land-disturbing activities in the immediate area must be halted, and the investigators and WHS/State Historic Preservation Office (SHPO) archaeologists must be notified. Any exposed cultural resources will be evaluated for their significance and appropriate actions to address these finds coordinated with WHS/SHPO.

The Owners will continue to coordinate with the Tribes throughout the construction and operation of the Project to identify, discuss, and address their concerns.

The Owners will coordinate the proper construction signage near recreation area access points on the roads used by construction vehicles for the Project to make drivers aware of the increased hazards associated with the construction vehicle(s) presence.

The Owners will post notice regarding any relevant construction activity in public hunting areas during hunting season. The public hunting areas will remain open for hunting during construction, albeit, the actual construction zone will be closed for safety reasons.

4.0 CUMULATIVE IMPACTS

This chapter lists the past, present, and reasonably foreseeable future actions (RFFAs) in the Study Area that may affect the resources analyzed in this EA. An assessment of cumulative effects of the Project is provided as well. See the NTECEA for a discussion of cumulative effects of the Project for other resources analyzed. The CEQ regulations implementing NEPA defines cumulative impacts as, "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such action." (40 CFR §1508.7).

To determine the contribution of the Project to cumulative effects, impacts on air quality related to GHGs and on tribal environmental justice were analyzed for a geographic scope that includes a wider area than the footprint of the Project. For air quality, the geographic scope is MISO West. For tribal environmental justice, the geographic scope is Douglas County. Temporally, past projects are considered part of the affected environment / environmental baseline, which has been described in Chapter 3 as well as in the NTECEA. Ongoing effects of past actions that are relevant to the analysis are also considered in this section. Present projects are those currently underway, either actively being constructed or in operation. Lastly, reasonably foreseeable projects are those in development or proposed that have been publicly announced.

4.1 Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and RFFAs that have affected the resources of the Douglas County include:

- Construction of a new 16-inch natural gas line from the Nemadji River Site to the existing Great Lakes Transmission natural gas line
- Relocation of 10-inch natural gas line at the Nemadji River Site
- Relocation of the fiberoptic cable between the Nemadji River Site and the Hill Avenue Site
- Relocation of existing electric transmission at the Nemadji River Site
- Construction of two parallel single circuit electric transmission lines from the Superior Switching Station to a tap point on the existing Arrowhead to Stone Lake transmission line (if the Superior Switching Station Alternative is constructed)
- Past residential and business development in the surrounding area
- Existing Husky Energy Superior Refinery operations and April 2018 fire
- Forest management and timber harvesting in Douglas County
- Retirement of coal facilities throughout the MISO West region

4.2 Cumulative Impacts

4.2.1 Air Quality and Greenhouse Gases

Previous activities in the Study Area that have impacted air quality and contributed to GHG emissions include construction activities associated with residential and business development, and forest management activities. The existing Husky Energy Superior Refinery had a fire in April 2018. Residents were evacuated in the surrounding area. The incident at the refinery included the combustion of oil and asphalt, which contributed to air emissions in the area. Husky Energy monitored air quality between April 2018 and June 2018 at the Superior Refinery site and in the surrounding area. None of that monitoring showed concentrations above health-based thresholds.

The following RFFAs would contribute to vehicle emissions in the area: construction of a new 16-inch natural gas line from the Nemadji River Site to the existing Great Lakes Transmission natural gas line; relocation of a 10-inch natural gas line at the Nemadji River Site; the relocation of the fiberoptic cable between the Nemadji River Site and the Hill Avenue Site; the relocation of existing electric transmission at the Nemadji River Site; and construction of two parallel single circuit electric transmission lines from the Superior Switching Station to a tap point on the existing Arrowhead to Stone Lake transmission line (if the Superior Switching Station is constructed). These construction activities are anticipated to be intermittent and temporary in nature, ceasing after construction is complete. During operation, the transmission line, pipelines, and fiberoptic cable may require periodic inspection and maintenance. Vehicles used during these activities would contribute to vehicle emissions in the area, though these activities would also be intermittent and temporary in nature.

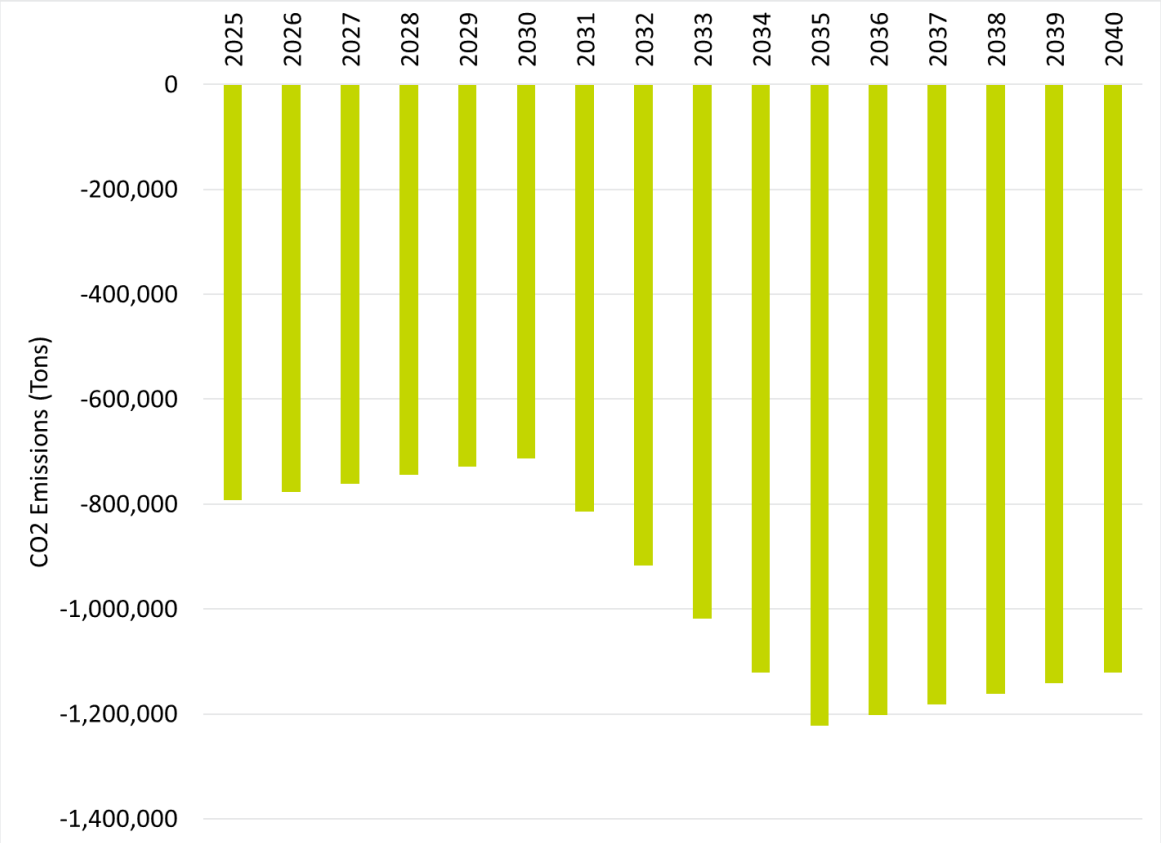
During construction of the Project, exhaust emissions, fugitive dust, and other construction-related emissions would occur. However, these increases would be temporary in nature and cease when construction is complete. As such, these emissions are not anticipated to substantially impact the overall air quality in the region, and no cumulative impacts to air quality would occur as a result of construction activities.

4.2.1.1 Nodal Production Cost Modeling

Currently, there is no standard methodology to determine how a project's incremental contribution to GHGs will translate into physical effects on the global environment. As a result, this section focuses on the level of CO_2 from Project emissions and the impact of Project emissions on CO_2 throughout the MISO

footprint (see Figure 2 in Appendix D, Production Cost Modeling).[39] While natural gas is a less carbon intensive fuel than coal, there are emissions associated with its production and use. The Project is anticipated to emit 2,739,294 tons per year of CO_2e including a permitted emission level of up to 2,242,381 tons per year of CO_2[40]. However, the Project is expected to be one of the most efficient dispatchable facilities in MISO and its operation is expected to result in less coal generation in both MISO West and specifically in Dairyland and MP service territories (Appendix D; Figure 4-1).

Figure 4-1: 2025 – 2040 MISO West Annual CO_2 Emission Reductions with NTEC



Nodal Production Cost Modeling was performed to estimate the quantity of electricity produced from different generation facilities in future years (Appendix D). The production cost modeling was performed using ABB's PROMOD IV (PROMOD) production cost modeling software. PROMOD is a production cost modeling software that simulates hourly chronological security-constrained unit commitment and economic dispatch. PROMOD incorporates future demand, generating unit operating characteristics,

[39] The Project is located in the MISO planning regions and therefore its operation has the capacity to influence generation assets primarily throughout the MISO footprint.
[40] The air construction application Project PTE (permitted values) represents worse-case continuous operation and does not represent "typical" operation.

transmission grid topology and constraints. The software has been used for more than 40 years in the energy industry for a variety of applications and is commonly and regularly used by MISO and other RTOs, including, for example, PJM.[41] The objective of the production cost simulations within PROMOD is to minimize cost while adhering to constraints, such as generating unit operational characteristics, transmission topology, and balancing energy supply with customer demand. Using PROMOD for production cost modeling, at a high level, forecasts the MISO day-ahead energy market dispatch of generators while adhering to multiple constraints to dispatch the most efficient, lowest variable cost generators. The Production Cost Modeling used MISO's Transmission Expansion Plan ("MTEP") ("the MISO MTEP model"). For purposes of this analysis, PROMOD simulations were performed to simulate and isolate the impact NTEC would have on generation dispatch and the associated emissions across the region. By simulating the mix of generation sources (coal, natural gas, renewables, and other sources), RUS was able to estimate the total CO_2 emissions generated within the MISO West region both with and without the NTEC project. [42] As NTEC will be one of the most energy efficient, and thereby lower emitting and cost effective, facilities in MISO, it will be dispatched ahead of other older, higher emitting, less efficient and more costly facilities. Additionally, part of NTEC's purpose is to reduce transmission congestion to enable additional inflow of renewable energy into the MISO system. Therefore, RUS determined the MISO MTEP model was an appropriate approach to evaluate cumulatively how NTEC would impact overall CO_2 emissions.

MISO is a not-for-profit that does not own generation or transmission facilities; the purpose of MISO is strictly to manage the generation and flow of electricity throughout its footprint. MISO manages approximately 72,000 miles of transmission lines across 15 U.S. states and the Canadian province of Manitoba. There are 58 registered transmission-owning members and 134 registered non-transmission-owning members in MISO (MISO, 2022b). MISO's MTEP models are developed through a robust, FERC approved, stakeholder process that includes rigorous review by experts. As MISO explains, "The MISO Transmission Expansion Plan (MTEP) is developed annually through an inclusive and transparent stakeholder process. MISO evaluates various types of projects through the MTEP process that, when taken together, build an electric infrastructure to meet local and regional reliability standards, enable competition among wholesale capacity and energy suppliers in the MISO markets, and allow for competition among transmission developers" (MISO, 2022b). One of the guiding principles of the MTEP

[41] https://www.pjm.com/-/media/committees-groups/subcommittees/cs/20170811/20170811-item-02-pjm-promod-overview.ashx (PJM presentation discussing use of PROMOD)

[42] The Production Cost Modeling analysis estimated emissions of CO_2 using the MTEP model in PROMOD to compare emission reductions with the addition of the Project to MISO West. Other GHGs were not estimated as part of the Production Cost Modeling analysis.

models is to "analyze system scenarios and make the results available to federal, state, and local energy policy makers and other stakeholders to provide context and to inform choices" (MISO, 2023a).

Each MISO planning cycle begins by collaboratively building regional models with various stakeholders. MISO staff reviews data provided by stakeholders and compiles data into a set of models. Stakeholders review draft models and provide MISO with feedback before the models are deemed final (MISO, 2023b). The MTEP model was chosen for this analysis because it provides a means to estimate NTEC-related changes to the generation emissions profile, providing a mechanism for with and without NTEC emissions comparisons. RUS considered this modeling appropriate because it uses MISO-specific data from stakeholders in the region and has a thorough review process in which stakeholders can provide feedback. MISO uses the models to evaluate and recommend transmission investments. Since 2003 over $42 billion of assets have been approved as part of the MTEP process (MISO, 2022c). MISO develops PROMOD MTEP models for the fifth, tenth, fifteenth, and twentieth years into the future. The following are descriptions of MTEP as explained by MISO:[43]

- "[MTEP21] evaluates studies and planning initiatives that help MISO address future grid needs."
- "MISO's MTEP process iterates annually to provide a comprehensive grid expansion plan that meets reliability, policy and economic needs. It is in constant evolution and prioritizes transmission needs depending on systemwide needs (top down) and local service territory needs identified by local utilities (bottom up). The process is designed to ensure necessary grid infrastructure is in place to support the reliable operation of the transmission system; support achievement of state and federal energy policy requirements; and enable a competitive electricity market to benefit all customers. MISO's transmission planning processes uses Futures, which are meant to capture a range of possible outcomes over the next 20 years. It does this by incorporating a value-based process that integrates both top-down and bottom-up efforts, and integrates numerous, iterative opportunities for stakeholder feedback."
- "Each cycle, MISO undergoes a rigorous stakeholder process that offers numerous opportunities over 18 months for advice and input from our diverse stakeholder community, which includes utilities, state regulators, and public interest organizations including environmental and consumer groups. Planning Advisory Committee (PAC) meetings are held monthly, and subregional planning meetings are interspersed on this timeline."

[43] Reference: MTEP21.

MISO models existing generation in its MTEP models along with projected future generation fleet changes during the model time periods. These project changes, referred to by MISO as MISO Futures, incorporate utility integrated resource plans, state and utility emissions goals, and industry trends to project the continued fleet transition currently underway throughout MISO.

The Production Cost modeling used the most recently approved MISO Future as its base case, the 2021 Future 1. Future 1 identified several major changes to the electric system over the model period compared to the existing system: (1) increased utilization of electric vehicles and other beneficial electrification (2) nearly a ninety percent reduction of coal for energy production (3) substantial increases in the production of renewable energy, including an exponential increase in the deployment of solar resources and (4) a continued crucial need for dispatchable natural gas facilities to support the increased deployment of renewables (MISO, 2021). MISO's comments to the SEA reiterate its conclusions in its future development process: as more renewable resources are placed into service, the need for resources like the Project increases substantially.

As part of the 2021 MTEP process, three different futures were developed. However, at the time this study was performed, only the base future, Future 1, PROMOD model had been developed.

For this NTEC production costing study, minor adjustments were made to the underlying MTEP models based on MP and Dairyland input[44]. These changes were made to reflect more recent information regarding existing unit retirements, such as retirement dates determined during MP or Dairyland's integrated resource planning process or other analysis performed after the MTEP models were developed. These unit retirement updates which were made are outlined below in Table 4-1.[45]

[44] Basin did not provide input on the MTEP assumptions due to the timing of this analysis in relation to Basin's joining of the partnership on NTEC.
[45] The retirements identified in Table 4-1 are not a comprehensive list of generator retirements; rather, they reflect only updates to the MTEP model, which included other previously-announced retirements. For example, Xcel Energy plans to retire Sherburne (Sherco) Units 1 and 2 in 2026 and 2023, respectively.

Table 4-1: MTEP Model Requirement Updates

Generator	Fuel Type	MTEP Retirement Year	Updated Retirement Year[48]
Boswell 1	Coal	2029	Retired before first model year
Boswell 3	Coal	2026	2030
Boswell 4	Coal	2026	2050
Cannon Falls Energy 1	Natural Gas	2024	2050
Cannon Falls Energy 2	Natural Gas	2024	2050
Coal Creek 1	Coal	2022	2050
Coal Creek 2	Coal	2022	2050
Duane Arnold	Nuclear	2026	Retired before first model year
John P Madgett 1	Coal	2026	2050
Sherburne 3	Coal	2031	2029
Silver Bay PC:2	Coal	2026	Retired before first model year
Taconite Harbor EC:1	Coal	2026	Retired before first model year
Taconite Harbor EC:2	Coal	2026	Retired before first model year

In addition to generator retirement date updates, the Great River Energy Coal Creek high-voltage direct current transmission line, which was recently sold, was updated in the modeling to stay online throughout the study period. Before Coal Creek's sale, when the MTEP models were being developed, there was uncertainty around the high-voltage direct-current line's future (Great River Energy, 2021). With the recent sale of the Coal Creek line it was not expected to retire in 2022 as was originally included in the MTEP models.

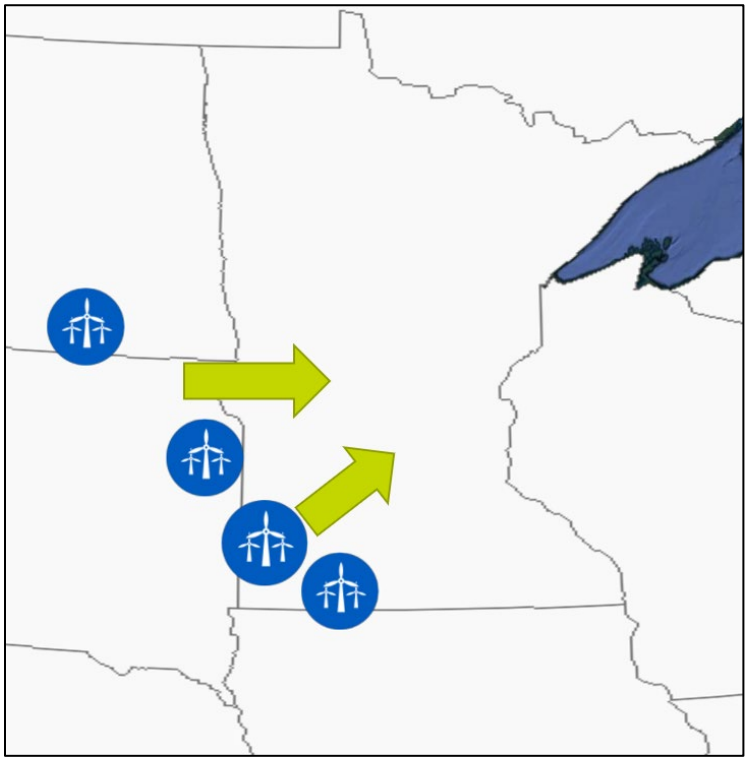
Based on the Production Cost Model forecasts for year 2040 modeling showed total CO_2 emissions for MISO West without NTEC at 65,880,966 tons per year. With NTEC, modeling for 2040 showed a total CO_2 emissions of 64,759,361 tons per year, a reduction of 1,121,600 tons per year. As modeled, the Project is expected to support the reduction of CO_2 emissions in MISO West by an average of 964,000 tons per year (2025-2040; Appendix D). With the Project displacing coal generation and requiring less frequent operation of less efficient fossil fuel units, there is a net decrease in GHG emissions. The production cost modeling only analyzed CO_2 reductions in MISO West and did not include other GHGs.

[48] Retirement year of 2050 is representative of a date later than 2040 which is the last year of the model simulations

If CH_4 and N_2O were also included in estimates, the reductions are anticipated to be even greater than this value.

Additionally, the proposed location of NTEC will reduce transmission congestion across the region as well, which will result in more generation from renewable resources, specifically wind, due to a reduction in renewable resource curtailment (Appendix D). Congestion exists between the renewables-heavy western portion of MISO and the load centers in the eastern portion of MISO (Figure 4-2).

Figure 4-2: Flow Direction and Location of Wind Rich Areas in MISO West



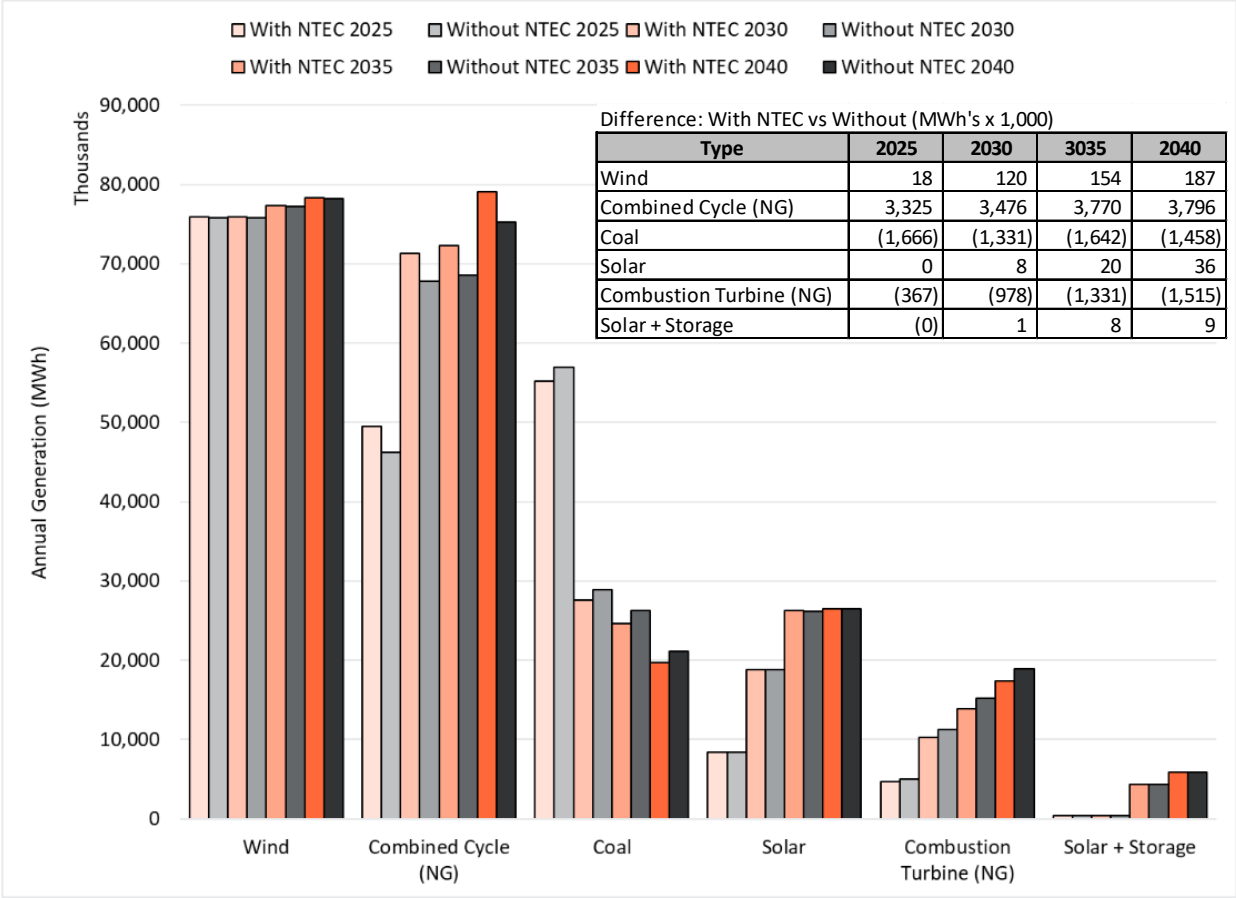
NTEC would be located in the eastern portion of MISO West, relieving congestion between renewable generation and the load centers.

Figure 4-3 provides annual generation in megawatt-hour by resource type in two scenarios (with and without NTEC) from 2025 through 2040.[47] Removing NTEC from the model results in less efficient (i.e., uses more fossil fuel to produce energy), higher production cost resources, generating more frequently.

[47] The Production Cost Modeling analysis utilized MISO's MTEP models, which are developed by MISO annually and are used for economic analysis. MISO develops MTEP models for the fifth, tenth, fifteenth, and twentieth years into the future. Due to this, estimates for years after 2040 are unavailable in MTEP Future 1.

This shift results in more reliance on coal, natural gas peaking, and fuel oil generators – these generation technologies typically emit more carbon per megawatt-hour than NTEC.

Figure 4-3: Annual Generation by Resource Type With and Without NTEC



Difference: With NTEC vs Without (MWh's x 1,000)

Type	2025	2030	3035	2040
Wind	18	120	154	187
Combined Cycle (NG)	3,325	3,476	3,770	3,796
Coal	(1,666)	(1,331)	(1,642)	(1,458)
Solar	0	8	20	36
Combustion Turbine (NG)	(367)	(978)	(1,331)	(1,515)
Solar + Storage	(0)	1	8	9

NG – natural gas

<u>Impact of IRA, IIJA, Proposed CAA Rules and Other Government Initiatives</u>

On May 23, 2023, EPA published draft New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units (111B rules); Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule (111D rules). The proposed regulations would set limits for new gas-fired combustion turbines, existing coal, oil and gas-fired steam generating units, and some existing gas-fired combustion turbines. EPA's proposed standards would be based on best system emissions reduction technologies such as CCS, low-GHG hydrogen co-firing, and natural gas co-firing.

The fundamental findings of the modeling are not expected to materially change as a result of proposed or recently enacted federal laws or regulations such as the Inflation Reduction Act (IRA), Infrastructure Investment and Jobs Act (IIJA), or proposed Clean Air Act 111B &111D rules. While those programs affect what resources utilities may develop and deploy as well as potentially affect how often certain resources are dispatched, the IRA, IIJA, and proposed 111 rules do not reform or modify the energy markets in which the Project will operate. The MISO market calls upon (or dispatches) the lowest cost resource that is deliverable when and where the market needs the resources, controlling for any limitations of the transmission system to reliably deliver energy from one place to another.

MISO market participants may only bid the marginal price of the next unit(s) of electricity, and the initial investment of a unit is not priced into the market sale. As a result, the market price largely reflects the price of fuel to create the energy. Thus, renewable resources are always priced less than both the Project and fossil fuel resources (unless a transmission constraint prevents the actual delivery of the energy). Deliverable renewable resources will always be dispatched first and before the Project. The Project simply will not be dispatched when there are sufficient renewable resources that can be delivered to where the energy is used. Federal or state policies that require or incent additional renewable resource development will result in the Project operating less frequently. However, they do not alleviate the need for resources like the Project, as demonstrated by MISO's comments to the Draft SEA.

While the modeling could not and did not anticipate unpublished rules, the modeling did generally consider a lower carbon future. Because the fundamental market design is not altered by any recent enacted or proposed federal initiative, the conclusions from that modeling remain sound. While the Project will not be dispatched when deliverable renewables are available, the Project will displace coal and less efficient natural gas so long as those resources exist in the MISO system. That will remain so if the proposed 111 rules go into effect as recently published or in some similar form. Incentives set forth in the IRA, IIJA, or related state initiatives would have a similar effect. To the extent that they increase the availability of renewable resources, those programs will reduce the amount that the Project operates. But those rules will not change the order in which MISO dispatches electric generation units.

In addition, and with respect to the 111 rules, RUS notes that the rules were not released until May 11, 2023, nearly one year after the SEA was available for comment. As EPA had not published the rules when the modeling was performed, the rules were not specifically modelled. However, as discussed above, the rules do not modify the market rules that lay the foundation for the conclusions drawn in the modeling.

Finally, RUS notes that if the 111B rules go into effect, the Project will be required to comply with those rules to operate. To the extent that the final rules require reductions to GHG emissions, the Project will also be required to meet the final emissions limitations, which are not expected to be known until 2024.

4.3 Tribal Environmental Justice

The Proposed Action will increase GHG emissions in the immediate Project vicinity, while supporting the reduction of GHG emissions from the regional power fleet. The Fourth National Climate Assessment (U.S. Global Change Research Program [USGCRP], 2018) highlighted how climate change poses a unique threat to indigenous livelihoods and economies, and that the interconnected social and ecological systems that the physical, mental, and indigenous values-base health are based on are being disrupted by climate change (Chapter 15). As noted in *The Status of the Tribes and Climate Change Report* (2021, pg. 22):

> "Tribes are often at the leading edge in adapting to climate change; implementing locally based, scientifically supported actions to mitigate climate change; and creating the necessary systemic shifts to reconnect people with both environment and community. Despite this resiliency, climate change impacts for many Tribal communities are already severe, the challenges they face responding to impacts are daunting, and the need to take action is urgent."

As discussed in this Final SEA, coal-fired power plant retirements are accelerating and high efficiency dispatchable energy sources like the Project will close the gap needed until renewable energy sources are capable of covering energy needs. GHG emission modeling was completed for the MISO West region with and without NTEC incorporated. Based on these modeling results, although the NTEC facility itself will contribute to GHG emissions, it is anticipated that NTEC will support the reduction of current overall net emissions of GHGs throughout the MISO system through the increased reduction in coal generation, and provide an opportunity for more renewable energy generation, while also maintaining reliable energy production to avoid blackouts.

As the Project would result in a net decrease in GHGs, it would contribute to efforts to prevent or reduce future climatic changes such as increased rainfall and flooding that could lead to changes in erosional patterns that may impact the Ojibwe burials at the St. Francis Catholic Cemetery or other tribal resources. As described in Section 1.4, the construction of this Project will aid in the transition to renewable electricity, and in turn cause a net decrease in GHG emissions. This transition to renewables will reduce the effects of climate change on a global and, subsequently, a local level, helping to minimize Project-related climatic risks to indigenous peoples.

5.0 SUMMARY OF MITIGATION

The following is a summary of mitigation proposed in this Final SEA as well as previous mitigation measures in the NTECEA and SEA for the Project. Some of these measures have been updated based on ongoing Project development and changes in mitigation requirements for specific resources. Air Quality (Section 5.1) has been updated to reflect additional GHG information from this Final SEA.

5.1 Air Quality

During construction, steps will be taken to prevent excessive emissions of GHGs and particulate matter resulting from construction activities and vehicular traffic. These steps may include increasing the efficiency of the vehicle technology, using lower-carbon fuels, be efficient where the vehicles travel throughout the construction site, and reducing the idling of construction vehicles, as well as compacting, seeding, covering, paving, wetting, sweeping, or otherwise controlling particulate matter emissions.

Post-construction, the areas disturbed during construction will receive final cover to eliminate dust. All exposed soil areas will be seeded to grow grass, lesser-traveled road surfaces will be graveled and compacted, and the new main roads on-site will be surfaced with asphalt. The roads will be monitored and either wetted or swept to clean any fugitive dust that may occur due to on-site wheeled traffic.

The selective catalytic reduction (SCR) and oxidation catalyst will be integrated into the HRSG design by the supplier of the HRSG. The HRSG supplier will also provide ports in the stack to monitor HRSG stack emissions. The Continuous Emissions Monitoring System (CEMS) will monitor the HRSG NO_x stack emissions through these ports.

The Owners submitted the PSD permit application for the Project to WDNR and will adhere to conditions and requirements of the application during operation of the Project. The Owners will also be working with the equipment vendors to realize equipment efficiency gains between approval and commercial operation that can be incorporated into construction and operation of the facility.

Nodal Production Cost Modeling for year 2040 showed total CO_2 emissions for MISO West without NTEC at 65,880,966 tons per year. With NTEC, modeling for 2040 showed a total CO_2 emissions of 64,759,361 tons per year, a reduction of 1,121,600 tons per year. As modeled, the Project is expected to support the reduction of CO_2 emissions in MISO West by an average of 964,000 tons per year (2025-2040; Appendix D). With the Project displacing coal generation and requiring less frequent operation of less efficient fossil fuel units, there is a net decrease in GHG emissions.

Any GHG and VOC emissions from the piping components will have fugitive emissions. Fugitive emissions are, by their nature, very difficult to monitor directly, as they are not emitted from a discrete emission point. Therefore, the Owners propose the following compliance demonstrations, recordkeeping, and monitoring requirements:

- Conduct instrument monitoring inspections on piping components each calendar quarter to detect leaks of natural gas and fuel oil.
- Keep a log of all the quarterly instrument monitoring inspections from piping components that are part of this Project.
- Develop a Facility Leak Detection Plan

These proposed work practices are consistent with the BACT determinations identified above.

5.2 Biological Resources

The following sections describe the avoidance, minimization measures, and WDNR-identified actions for the Project to help conserve federally protected species, Wisconsin's rare species, and high-quality natural communities.

5.2.1.1 Northern Long-eared Bat[48]

Reproductive females and their young are highly vulnerable to mass mortality during their maternity period (June 1 – July 31) because they aggregate in maternity colonies. Young northern long-eared bats (NLEB) start flying by 18 to 21 days after birth and therefore cannot leave the roost for several weeks after birth (U.S. Fish and Wildlife Service [USFWS], 2015; FR, 2016). One of the following options should be implemented to avoid take of the NLEB:

1. Assume the bats are present within suitable habitat and avoid removal of potential roost trees or any trees within 150 feet of a known occupied maternity roost tree from April 1 – October 31. If the Project can implement these avoidance measures, there will not be any further Project restrictions related to the NLEB. If take cannot be avoided, further consultation with the USFWS and WDNR will be necessary.

[48] After the publication of the SEA, the NLEB was reclassified from threatened to endangered under the Endangered Species Act. This text has been updated to reflect this reclassification, which was effective March 31, 2023. Due to changes in species listing status over the course of the Project, RUS updated the endangered species consultation under Section 7 of the Endangered Species Act. The Project reached the determination of "May Affect, Not Likely to Adversely Affect" for the Northern Long-eared Bat.

2. Not assume the NLEB is present within suitable habitat along the alternative routes and have a qualified biologist conduct surveys to determine if the NLEB is present (a copy of the survey biologist's credentials and a copy of the survey protocols must be sent to the WDNR Endangered Resources Review Program for approval prior to the initiation of surveys). According to the USFWS and WDNR, if the NLEB is not found within the Study Area as a result of the surveys, there will be no Project restrictions related to these species. If surveys are conducted and the NLEB or maternity colonies are detected, option 1 must be followed. Survey results should be submitted to the USFWS and WDNR Endangered Resources Utility Liaison.

5.2.1.2 Eagles

While the bald eagle was removed from the Federal Endangered Species list in August 2007, it is still federally protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Golden eagles are considered a nonbreeding, infrequent inhabitant in Wisconsin. Eagles can be sensitive to human disturbance, especially during the breeding and nesting seasons. Per the USFWS National Bald Eagle Management Guidelines (2007), human activity within 660 feet of an active nest should be avoided from January 15 – July 30. No bald eagle nests were observed during field surveys that occurred within the Study Area; however, if a bald eagle nest should be identified within the Survey Area, the USFWS National Bald Eagle Management Guidelines (2007) would be followed.

5.2.1.3 Invasive Species

In compliance with WAC Chapter NR 40 Invasive Species Identification, Classification and Control Rule, the Owners will mitigate the potential to spread invasive plant species during Project activities. Invasive plant species locations will be shown on the construction plans and flagged on-site to avoid during construction, where feasible. In areas where impacts to the invasive plant species are unavoidable, equipment will be cleaned prior to moving from an infested area to a non-infested area.

Equipment cleaning will primarily be conducted by brush, broom, or other hand tools along the Project. The Owners may periodically require equipment to be cleaned by compressed air. Equipment used during ground disturbing activities will be cleaned prior to leaving the Project ROW to reduce the risk of spreading invasive plant species beyond the Project ROW.

Construction equipment brought on-site will be required to be free of muck and invasive species. In accordance with Wisconsin DATCP Chapter 20, WAC, seed mixtures that contain potentially invasive species or species that may be harmful to native plant communities will be avoided.

5.2.1.4 Revegetation

Construction activities will include clearing, grubbing, grading, excavation, infrastructure construction, and re-vegetation. In areas where restoration is required, seeding and mulching will be completed in accordance with WDNR Technical Standard 1059 – Seeding for Construction Site Erosion Control. The seed mix used will be appropriate to the surrounding area and similar to pre-construction conditions. The seedbed will be adequately prepared to promote successful germination. Seed mixes will not contain invasive species. Permanent seed mixtures will be selected to produce dense vegetation based on soil and site conditions, along with intended final use. Temporary seeding will be applied to areas of exposed soil where the establishment of vegetation is desired, but the areas have not been brought to final grade or on which land-disturbing activities will not be performed for a period greater than 30 days, but vegetative cover is required for less than 1 year. Areas needing protection during periods when permanent seeding is not applied, will be seeded with annual species.

Upon completion of restoration, each work location will be monitored to document stabilization and re-vegetation. Monitoring will continue until vegetative cover reaches 70 percent of previous cover.

5.2.1.5 Migratory Birds

The Migratory Bird Treaty Act prohibits the take of migratory birds and their eggs, young, or active nests. The loss of plant and animal habitat within the footprint of the proposed Project, would primarily occur adjacent to existing areas that have already been developed or are associated with existing utility and public road ROWs. The Nemadji River Site is adjacent to an existing tank farm and utility corridors and this area has experienced some level of habitat fragmentation associated with development in and around the City of Superior. The Eastern Transmission Route for the transmission line would be constructed within an existing utility corridor that contains a natural gas pipeline and overhead electrical transmission lines or the Western Transmission Route would be constructed parallel to existing linear infrastructure; however, woody vegetation would be cleared from forested lands and shrubland habitats along the edges of the existing utility corridor to widen the corridor and accommodate the additional line. During the extent of the Project, trees that would be removed would be done so outside of the migratory bird nesting period for Wisconsin (May 15 to August 1) to avoid impacts to nesting migratory birds (USDA, 2018).

5.3 Cultural Resources

If the Archaeological Study Area configuration is changed, additional archaeological investigations; documentation of historic-age, non-archaeological resources; and NRHP evaluations may be necessary.

If buried cultural resources are encountered during Project construction, land-disturbing activities in the immediate area must be halted, and the investigators and WHS/SHPO archaeologists must be notified. Any exposed cultural resources will be evaluated for their significance and appropriate actions to address these finds coordinated with WHS/SHPO.

The Owners will continue to coordinate with the Tribes throughout the construction and operation of the Project to identify, discuss, and address their concerns.

The Owners will coordinate the proper construction signage near recreation area access points on the roads used by construction vehicles for the Project to make drivers aware of the increased hazards associated with the construction vehicle(s) presence.

The Owners will post notice regarding any relevant construction activity in public hunting areas during hunting season. The public hunting areas will remain open for hunting during construction, albeit the actual construction zone will be closed for safety reasons.

5.4 Geology and Soils

BMP erosion control techniques will be used to mitigate soil impacts. Topsoil will be kept separate from subsoils and will be stockpiled in a different location than subsoils. This topsoil will be used after construction to resurface areas disturbed by construction activities. Compacted soils will be disked prior to final stabilization. It is not anticipated that any subsoil removed for excavations will be spread in upland cropland or pasture. The Storm Water Management Technical Standards from WDNR will be used during construction and operation.

A Storm Water Pollution Prevention Plan (SWPPP) will be submitted to WDNR as part of Project permitting activities. The Owners will implement, monitor, and maintain BMPs, described in the SWPPP to minimize erosion and sedimentation. The Owners will comply with the construction site storm water discharge permit (Wis. Admin. Code NR 216) that was submitted to WDNR for the Project in December 2018.

5.5 Infrastructure, Transportation, Public Health, and Waste Management

The following presents mitigation measures for transportation, public health, and waste management resources for the Project. No mitigation measures related to utility infrastructure are proposed.

Transportation

The Owners do not anticipate permanent damage to roads. As a precautionary measure, the Owners will video-document the condition of all roads on the construction vehicle routes to document the road condition prior to the start of construction. Any documented adverse impacts to the roads incurred due to the construction of the Project will be addressed through consultation with applicable road authorities regarding the Owners' responsibility for repairing the adversely impacted roads.

The Owners will coordinate the proper construction signage on the roads used by construction vehicles for the Project to make drivers aware of the increased hazards associated with the construction vehicle(s) presence.

Public Health and Safety

The Owners will develop a Health and Safety Plan (HSP) to address public and worker safety during the construction and operation of the Project. The HSP would identify any requirements for temporary fencing around staging, excavation, and laydown areas during construction, as well as protocols for emergency responses. The Owners would work with local first responders to develop emergency response procedures in the HSP. The HSP would also include provisions for worker protection as is required under Occupational Safety and Health Administration (OSHA) CFR1926. During construction, all employees, contractors, and sub-contractors would be required to adhere to OSHA safety procedures, which will be taught in mandatory training sessions for all construction workers on site. All heavy equipment would meet OHSA safety standards and personal safety equipment would be required for all workers on site. Any accidents or incidents would be reported to the designated safety officer. During construction there is a risk of accidental fires being started by human activities such as refueling heavy equipment or the use of vehicles in dry vegetated areas. The HSP will have procedures in place to address and restrict the various activities that have a fire-related risk. A fire-suppression system will be incorporated into Project design. The Project will implement industry-approved design measures to reduce fire-related risks.

Waste Management

A Spill Prevention, Control, and Countermeasures (SPCC) plan[49] has been created for the Project (SSE, Dairyland, Burns & McDonnell Engineering Company, Inc. [Burns & McDonnell], 2019). This plan establishes procedures, methods and equipment, and other requirements for equipment to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines.

The oil/water separator will be designed to remove 20 micron and larger oil droplets to concentrations of less than 10 ppm. It will be designed to store 1,000 gallons of oil. The oil/water separator will be constructed as a double walled buried tank and will have a leak monitor to detect a breech in the inner tank wall. The tank will be cathodically protected. Any oil collected will be pumped out as required for disposal.

The Project will have a construction superintendent responsible for oil spill containment and cleanup. The construction superintendent will report spills and supervise cleanup and disposal of any contaminated soil and spill cleanup materials for any substantial volume (defined as 55 gallons or more) of chemicals such as lubricants, fuel, grease, or other oil. Diesel and gasoline fuel will be temporarily stored at the Project site during construction in aboveground tanks. Preventative measures will be implemented during re-fueling or transfer of these fuels to reduce the risk of spills. Lubricating oils and certain other industrial chemicals required for the project will be stored in specially designed and covered containment areas. Equipment will be kept in good working condition through routine inspections and service to reduce the risk of leaks of transmission, hydraulic, or brake fluid. Chemical storage areas will be well marked and include eye wash stations, first aid kits, safety showers, hose stations, and spill kits with absorbent pads and/or material.

Larger spills will be removed from the containment area using a vacuum tank truck or will be pumped into a suitable container for cleanup. Contaminated soil and/or absorbent pads or products used to cleanup a spill will be immediately removed, stored, and disposed of in accordance with Wisconsin state regulations. Absorbent pads or other manufactured absorbent products will be used to cleanup minor spills. These pads and absorbent products will be stored on maintenance trucks and/or in a dedicated cabinet that is readily accessible.

[49] The SPCC Plan is available on the PSCW website at: http://apps.psc.wi.gov/vs2015/ERF_search/content/searchResult.aspx?UTIL=9698&CASE=CE&SEQ=100&START=none&END=none&TYPE=none&SERVICE=none&KEY=none&NON=N. PSC Reference No. 357005.

The oil contaminated gravity drain system collects waste liquid which has the potential of containing quantities of oil and conveys the waste through an oil/water separator. Permanent combination safety shower/emergency eyewash stations with tepid water conditioning skid will be installed at all battery rooms and chemical storage areas including near the aqueous ammonia storage tank and SCR vaporization skids.

The Project site will be maintained to contain debris and waste in approved containers and locations. Regular trash and waste removal from the site will occur and a recycling program will be implemented for the site. Wastes are anticipated to be removed and disposed of at a local landfill by a local service provider. Recycling pickup services are anticipated to be provided by a local disposal company.

5.6 Land Use

During construction, portions of the Project site will be cleared, grubbed, graded, excavated, and revegetated. In areas not impacted by these activities, such as riparian vegetation along the Nemadji River outside the ROW and areas of the transmission line ROW that do not require clearing, existing vegetation will be preserved where practicable. The amount of soil exposed during construction will be minimized. Seed mixtures will be selected to produce dense vegetation based on soil and site conditions, along with intended final use. In areas where restoration is required, seeding and mulching will be completed in accordance with WDNR Technical Standard 1059 – Seeding for Construction Site Erosion Control, Chapter DATCP 20, WAC regarding noxious weed seed content and labeling, and Wisconsin Department of Transportation (WisDOT) Mix 75 – Erosion Control Native Mix.

Temporary seeding will be applied to areas of exposed soil where the establishment of vegetation is desired, but the areas have not been brought to final grade or on which land-disturbing activities will not be performed for a period greater than 30 days, but vegetative cover is required for less than 1 year. Areas needing protection during periods when permanent seeding is not applied, must be seeded with annual species.

Final stabilization is achieved when all soil-disturbing activities at the site have been completed and a uniform (i.e., evenly distributed, without large bare areas) perennial vegetation cover with a density of 70 percent of the native background vegetative cover has been established on all unpaved areas or areas not covered by permanent structures or with alternative surfacing, such as riprap or crushed rock.

During construction, areas that have been seeded will be inspected by a qualified person at least once every 7 days and within 24 hours after every precipitation event that produces 0.5 inch of rain or more during a 24-hour period. Where areas of concern are identified, the area will be re-seeded and watered,

and fertilizer will be applied, if applicable. The Project site will be inspected at least once per month to monitor vegetative growth until final stabilization is achieved after construction and stabilization activities are complete.

The Owners will comply with WAC, Chapter NR 40, WAC – Invasive Species Identification, Classification and Control during monitoring and management of invasive plant species. The Owners will control any prohibited plant species identified onsite during inspection and monitoring activities and will minimize the spread of restricted plant species beyond their known boundaries throughout the duration of the Project.

In accordance with the Wisconsin DATCP Chapter 20, WAC, seed mixtures that contain potentially invasive species or species that may be harmful to native plant communities will be avoided. Seed will be tested for purity, germination, and noxious weed seed content, and will meet the minimum requirements prescribed in the current edition of Rules for Testing Seed, published by the Association of Official Seed Analysts.

To minimize impacts to agricultural areas, construction of the transmission line will occur after harvest and/or before spring planting and be contained within the existing ROW to the greatest extent practicable, to reduce the potential for loss of crop production. Outside of winter months, matting will be used in wet areas to spread out heavy vehicle loads and minimize soil disturbance.

The Owners will coordinate the proper construction signage near recreation area access points on the roads used by construction vehicles for the Project to make drivers aware of the increased hazards associated with the construction vehicle(s) presence.

5.7 Noise

Within twelve months of the date when the project is fully operational, and within two weeks of the anniversary date of the pre-construction ambient noise measurements, sound level measurements will be repeated both with and without the Project in operation to verify noise levels do not exceed contractually guaranteed levels, as well as EPA guideline levels. Sound measurements will be taken at the same measurement points that were analyzed for the ambient measurements. The Owners will provide notice to nearby residents of expected timeframes for steam blow operation.

5.8 Socioeconomics and Environmental Justice

Construction activities will primarily be scheduled between the hours of 7:00 a.m. and 10:00 p.m. to minimize noise impacts to nearby residences. The Owners will provide notice to nearby residents of expected timeframes for steam blow operation.

The Owners do not anticipate permanent damage to roads. As a precautionary measure, the Owners will video-document the condition of all roads on the construction vehicle routes to document the road condition prior to the start of construction. Any documented adverse impacts to the roads incurred due to the construction of the Project will be addressed through consultation with applicable road authorities regarding the Owners' responsibility for repairing the adversely impacted roads.

The Owners will coordinate the proper construction signage on the roads used by construction vehicles for the Project to make drivers aware of the increased hazards associated with the construction vehicle(s) presence.

Contractors will be chosen from a competitive bid process and will be local whenever practical. Local materials such as concrete, lumber, and general hardware may be purchased from local businesses.

5.9 Visual Resources

Building entrances will be illuminated with fixtures mounted directly above doors. Outdoor light fixtures will be fully shielded and directed downward to minimize light visible from adjacent properties and to reduce glare in the area. Any floodlights required for the operation of the Project will be directed inward towards the facility and will have top and side shields.

Cleared ROW would be revegetated as soon as practicable as described in Section 3.2.3.5. Existing vegetation outside the plant footprint, ROW, switching station areas, and laydown yards will be left intact to reduce visibility of the Project and provide screening. During construction, work areas would be maintained in an orderly manner and trash and construction debris removed to help avoid unsightly areas. All disturbed areas would be restored as soon as practicable. Disturbance would be limited to those areas necessary for construction, limiting clearing and ground disturbance.

5.10 Water Resources

Minimization efforts will be utilized to the extent practical where wetland impacts are unavoidable. Construction activities will be prioritized during winter months to take advantage of ground freeze and use of ice roads to limit ground disturbance. Outside of winter months, matting will be used in wetland

areas to spread out heavy vehicle loads and minimize soil disturbance. Additionally, tracked vehicles will be used to the extent practical to further spread out vehicle loads throughout wetland area with matting.

Existing site entrances will be used to the extent practical to reduce the number of new roadside and wetland crossings required for construction vehicles to access the site. BMPs outlined in the SWPPP will be used to avoid and minimize stormwater sedimentation and disturbance within wetland areas.

The Sites will be designed to avoid and minimize temporary and permanent impacts to waterways. The post-construction storm water management facilities would be designed to meet the performance standards addressed in NR 151.

To the extent practicable, off-ROW access roads eliminate the need to cross wide waterways during construction. For smaller intermittent and ephemeral waterways within the ROW, temporary prefabricated span bridges will be used to span waterways. Following the removal of all temporary bridges, contours will be regraded to pre-construction conditions as needed.

A SPCC plan has been created for the Project. This plan establishes procedures, methods and equipment, and other requirements for equipment to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines. The equipment at the site is outside the 100-year and 500-year floodplain.

The wetlands and waterways WDNR permit application materials were submitted on December 18, 2018. The USACE Section 401 and 404 permit application was submitted in March 2020. The Owners will comply with permit application requirements for wetlands and waterways.

5.11 Tribal Environmental Justice

If the Archaeological Study Area configuration is changed, additional archaeological investigations; documentation of historic-age, non-archaeological resources; and NRHP evaluations may be necessary.

If buried cultural resources are encountered during Project construction, land-disturbing activities in the immediate area must be halted, and the investigators and WHS/SHPO archaeologists must be notified. Any exposed cultural resources will be evaluated for their significance and appropriate actions to address these finds coordinated with WHS/SHPO.

The Owners will continue to coordinate with the Tribes throughout the construction and operation of the Project to identify, discuss, and address their concerns.

The Owners will coordinate the proper construction signage near recreation area access points on the roads used by construction vehicles for the Project to make drivers aware of the increased hazards associated with the construction vehicle(s) presence.

The Owners will post notice regarding any relevant construction activity in public hunting areas during hunting season. The public hunting areas will remain open for hunting during construction, albeit, the actual construction zone will be closed for safety reasons.

6.0 COORDINATION, CONSULTATION, AND CORRESPONDENCE

This chapter describes the public outreach over the course of the Project as well as the coordination, consultation, and correspondence with Federal, tribal, state, and local agencies.

6.1 Public Involvement

The Owners developed a communication plan to inform the public about the Project and to request feedback from stakeholders. The ongoing communication efforts include:

- Establishing and updating a website (http://www.nemadjitrailenergycenter.com/)
- Issuing news information to media outlets
- Holding public meetings related to the Project
- Providing regular updates to public officials and area legislators

Five informational meetings were held for the Project between September 2017 and November 2018: an RUS formal scoping meeting, a stakeholder meeting, and three open houses. The meetings consisted of open house style presentations about the NTEC Project, a mapping exercise, and a question and answer portion. See Chapter 6.0 in the NTECEA for a summary of the meetings held and comments received.

6.2 Agency Consultation

Letters or postcards were sent to agencies to inform agency contacts of the stakeholder meeting, three open house meetings, and the RUS formal scoping meeting. The meetings provided agencies and the general public with information on the Project as well as an opportunity to ask questions and provide initial feedback. Agency correspondence and a list of agencies invited to each meeting is provided in Appendix C of the NTECEA. The Owners consulted with multiple federal agencies, including the Federal Aviation Administration, U.S. Fish & Wildlife Service, U.S. Army Corps of Engineers, and numerous tribal leaders. Additionally, the Owners consulted state and local agencies, DATCP; the Wisconsin Legislative Black Caucus; the PSCW; WDNR; WisDOT; the WHS; the City of Superior; Douglas County; local airport officials; the Superior School District; Superior Chamber of Commerce; University of Wisconsin – Superior; Northwood Technical College – Superior; the Douglas County Highway Department; the Housing Development Corp of Superior; Parkland Sanitary District No. 1; Superior Housing Authority; and the Town of Parkland. Chapter 6 of the October 2020 EA provides a summary of this correspondence as well as lists of permits required from each agency.

RUS has determined that a finding of no adverse effect in accordance with 36 CFR § 800.5(b) is appropriate for this undertaking. RUS provided its determination of no adverse effect to consulting

parties on August 11, 2023. RUS received responses from the Fond du Lac Band of the Minnesota Chippewa and the Wisconsin Historical Society on August 11, 2023, and August 14, 2023. The Fond du Lac Band indicated that it believed that the Saint Francis Xavier Cemetery would be adversely affected by the project. The SHPO requested a refreshed review of background information.

RUS provided updated background information to the Wisconsin State Historic Preservation Officer (SHPO) on September 1, 2023. These results indicated that RUS had considered all known resources within the project's APE. Accordingly, RUS indicated to SHPO that its determination of effect, made August 11, 2023, considered all relevant resources. Therefore, RUS considered the SHPO's request administrative rather than substantive and indicated that the review period began August 11, 2023. No additional comment was received from SHPO. RUS received no substantive comments relative to the determination that the Project would result in no adverse effect to historic properties.

Also, due to changes in species listing status over the course of the Project, RUS updated the endangered species consultation under Section 7 of the Endangered Species Act. The Project reached the determination of "May Affect, Not Likely to Adversely Affect" for the Northern Long-eared Bat.

6.3 Locations for Public Review of the Revised Supplemental EA

A Notice of Availability was published in the Superior Telegram which informed the public of the availability of this RSEA and the public comment period from July 28 to August 28, 2023. Table 6-1 provides a list of libraries that received the RSEA for public review. These libraries also received copies of the NTECEA, SEA, and the PSCW CPCN applications. The RSEA was also made available online.[50] RUS requested that questions and comments be sent to RUS at: NTEC.RSEA@usda.gov. The Red Cliff Band requested an extension of the comment period on the RSEA on August 28, 2023. RUS extended the public comment period to September 10, 2023.

Table 6-1: List of Library Locations

Library	Address and Phone Number
Superior Public Library	1530 Tower Avenue Superior, WI 54880 (715) 394-8860

[50] A copy of the Final SEA may be viewed online at the following websites: Rural Utilities Service at https://www.rd.usda.gov/resources/environmental-studies/assessment/nemadji-trail-energy-center-wisconsin, on the Dairyland Power Cooperative website at https://www.dairylandpower.com/NTEC/EA, and the project website at http://www.nemadjitrailenergycenter.com/resources.html.

Library	Address and Phone Number
La Crosse Public Library	800 Main Street La Crosse, WI 54601 (608) 789-7100
Murphy Library Resource Center University of Wisconsin – La Crosse	1631 Pine Street La Crosse, WI 54601 (608) 785-8505

6.4 Public Comments Received to Date

USDA-RUS set up a Project public comment email inbox where comments could be submitted for consideration in the NEPA process. Over 500 comments were received after the FONSI was published in June 2021. The comments received primarily discussed concerns over the impacts of GHGs and the government's lack of action on climate change and requests for RUS to not provide funding for the Project. RUS has considered these comments and the SEA as part of its findings on the Project and its decision whether or not to finance Dairyland's portion of the Project. Appendix A contains the list of commenters and responses to the general themes included in these comments.

As noted in Chapter 1, RUS received a petition from the Minnesota Center for Environmental Advocacy, Sierra Club Environmental Law Program, Clean Wisconsin, and Honor the Earth to rescind the FONSI and to prepare a SEA to include an analysis of GHG emissions and climate change in June 2021. RUS agreed that further analysis of the potential environmental impacts of the Proposed Action was warranted. This SEA was prepared to address the petition filed.

Following publication of the SEA, comments were received from EPA as well as the MCEA, Sierra Club, Clean Wisconsin, Honor the Earth, and the public (Appendix A). This Final SEA has been prepared to revise the SEA to address, as appropriate and necessary, the additional comments received on the SEA.

As described in Section 1.2 in this Final SEA, at the time of the SEA publication, the document was prepared following the CEQ Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (August 2016). In January 2023 CEQ issued revised interim guidance with the messaging that the guidance was effective immediately. As such, and consistent with discussions with EPA during this NEPA process, the SEA has been subsequently revised specifically herein to consider the 2023 Interim CEQ GHG Guidance.

6.5 Tribal Coordination

On August 11, 2017, letters that provided preliminary Project details were mailed by the Owners to the Red Cliff Band of Chippewa, Bad River Bands of Chippewa, and the Fond du Lac Band of Lake Superior Chippewa (Appendix E). In addition to providing preliminary Project details, the letters invited the tribes to participate with the Owners in the pre-filing process and requested feedback regarding cultural resources in the APE. The letters included an invitation to a public meeting held on September 7, 2017. Advertisements were run in the paper for the open house on September 1 and 5, 2017. On August 16, 2017, the Owners met with the Fond du Lac Band of Lake Superior Chippewa to discuss the Project. On August 21, 2017, the Owners met with Red Cliff and Bad River Bands of Chippewa (separately) to discuss the Project. The Owners met with the Lac Courte Oreilles Band on January 8, 2019. The Owners also reached out to the St. Croix and Forest County Potawatomi Bands, but have not yet received a reply. Jill Hoppe, Tribal Historic Preservation Officer for the Fond du Lac Band of Lake Superior Chippewa, sent the Owners an image of approximate locations of some cultural sites from their cultural database. Three of the locations fall within the Project Study Area and two are adjacent to the Area of Potential Effect but outside of it.

A letter was sent to tribal contacts on June 11, 2019, in regard to the SHPO concurrence that the Project would have no impact on historic properties. This letter was sent to the St. Croix Chippewa Community, Lac Courte Oreilles Band of Lake Superior Chippewa, Bad River Bands of Lake Superior Chippewa, Forest County Potawatomi Community, and Red Cliff Band of Chippewa. A letter was given to the Fond du Lac Band of Lake Superior Chippewa during a meeting on August 5, 2019. The letter requested responses be sent within 30 days. No responses were received. The Fond du Lac Band of Lake Superior Chippewa discussed potential monitoring options during construction at the August 5, 2019, meeting. The group planned to send SSE a proposal by September 9, 2019.

By letter dated March 16, 2020, the following additional Tribes[51] were contacted in regard to the SHPO concurrence that the Project would have no impact on historic properties:

- Fort Belknap Indian Community
- White Earth Nation
- Lac Vieux Desert Band of Lake Superior Chippewa Indians
- Lac du Flambeau Band of Lake Superior Chippewa Indians
- Lac Courte Oreilles Band of Lake Superior Chippewa Indians

[51] Tribal names have been updated in this RSEA to match naming convention on tribal websites. Original list in NTECEA and SEA were generated using the HUD tribal directory assessment tool at https://egis.hud.gov/TDAT/.

- Menominee Indian Tribe of Wisconsin
- Grand Portage Band of Lake Superior Chippewa
- Keweenaw Bay Indian Community
- St. Croix Chippewa Indians of Wisconsin
- Minnesota Chippewa Tribe
- Sokaogon Mole Lake Chippewa Community
- Mille Lacs Band of Ojibwe (Mille Lacs Band of the Minnesota Chippewa Tribe Mille Lacs Band of Ojibwe)
- Leech Lake Band of Ojibwe
- Miami Tribe of Oklahoma
- Ho-Chunk Nation
- Stockbridge-Munsee Community Band of Mohican Indians
- Oneida Nation

Tribes were asked to submit comments by April 17, 2020. No responses were received during the response period or to date.

As noted in Section 6.4, the Red Cliff Band of Lake Superior Chippewa Indians and the Fond du Lac Reservation Resource Management Division sent letters to USDA-RUS in October 2021 requesting that RUS conduct a SEA to consider climate change from associated GHG emissions from the Project, as well as how the Project may impact treaty rights and other cultural resources, including upstream extraction of natural gas. These topics are discussed in Section 3.3. Both tribes were notified directly of the publication of the SEA in 2022. The Red Cliff Band of Lake Superior Chippewa Indians and the Fond du Lac Reservation Resource Management Division requested an extension of their comment period for the SEA, which RUS granted, extending their ability to comment by 30 days (for a total of 60 days), until August 23, 2022. No comments were received from either tribe during this time or since it expired. RUS contacted the tribes directly at the close of the comment period to verify their intent to submit comments; both tribes indicated they would not be commenting.

As described in Section 6.2, RUS has determined that a finding of no adverse effect in accordance with 36 CFR § 800.5(b) is appropriate for this undertaking. RUS provided its determination of no adverse effect to consulting parties on August 11, 2023. RUS received responses from the Fond du Lac Band of the Minnesota Chippewa and the Wisconsin Historical Society on August 11, 2023, and August 14, 2023. The Fond du Lac Band indicated that it believed that the Saint Francis Xavier Cemetery would be adversely affected by the project. The SHPO requested a refreshed review of background information.

RUS met with the Fond du Lac Band Tribal Historic Preservation Officer (THPO) on August 22, 2023. During the conversation, RUS discussed the importance of the Saint Francis Xavier Cemetery to the Fond du Lac Band of the Minnesota Chippewa. RUS indicated that any objection to the determination of effect should be expressed in terms of National Register of Historic Places (NRHP) nominating criteria. At the end of this meeting, RUS and the Fond du Lac Band THPO were in agreement on this issue. On August 23, 2023, the Fond du Lac Band THPO provided refined boundary information about areas of concern and stated that they were preparing comments to address NRHP eligibility. No additional comments were received from the Fond du Lac Band.

6.6 Comments on the RSEA

Local newspaper notices announcing the availability of the RSEA were published on July 28 and August 4, 2023, in the Superior Telegram. A copy of the RSEA was available for public review at the following libraries:

- Superior Public Library, 1530 Tower Avenue, Superior, WI 54880
- La Crosse Public Library, 800 Main Street, La Crosse, WI 54601
- Murphy Library Resource Center University of Wisconsin – La Crosse, 1631 Pine Street, La Crosse, WI 54601

The Red Cliff Band requested an extension of the comment period on the RSEA on August 28, 2023. RUS extended the public comment period to September 10, 2023.

RUS received over 3,600 comments on the RSEA. RUS has included a summary of these comments received and RUS responses in Appendix F.

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8.0 LIST OF PREPARERS

The revised supplemental environmental review for the Project was prepared by Burns & McDonnell under the direction of RUS and Dairyland Power Cooperative. The Final SEA was prepared by Environmental Protection Specialists within the Environmental and Historic Preservation Division of the USDA-RUS. Table 8-1 contains a specific list of individuals who assisted RUS in the preparation of this document.

Table 8-1: List of Preparers

Name	Organization	Experience	Role in Final SEA Preparation
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