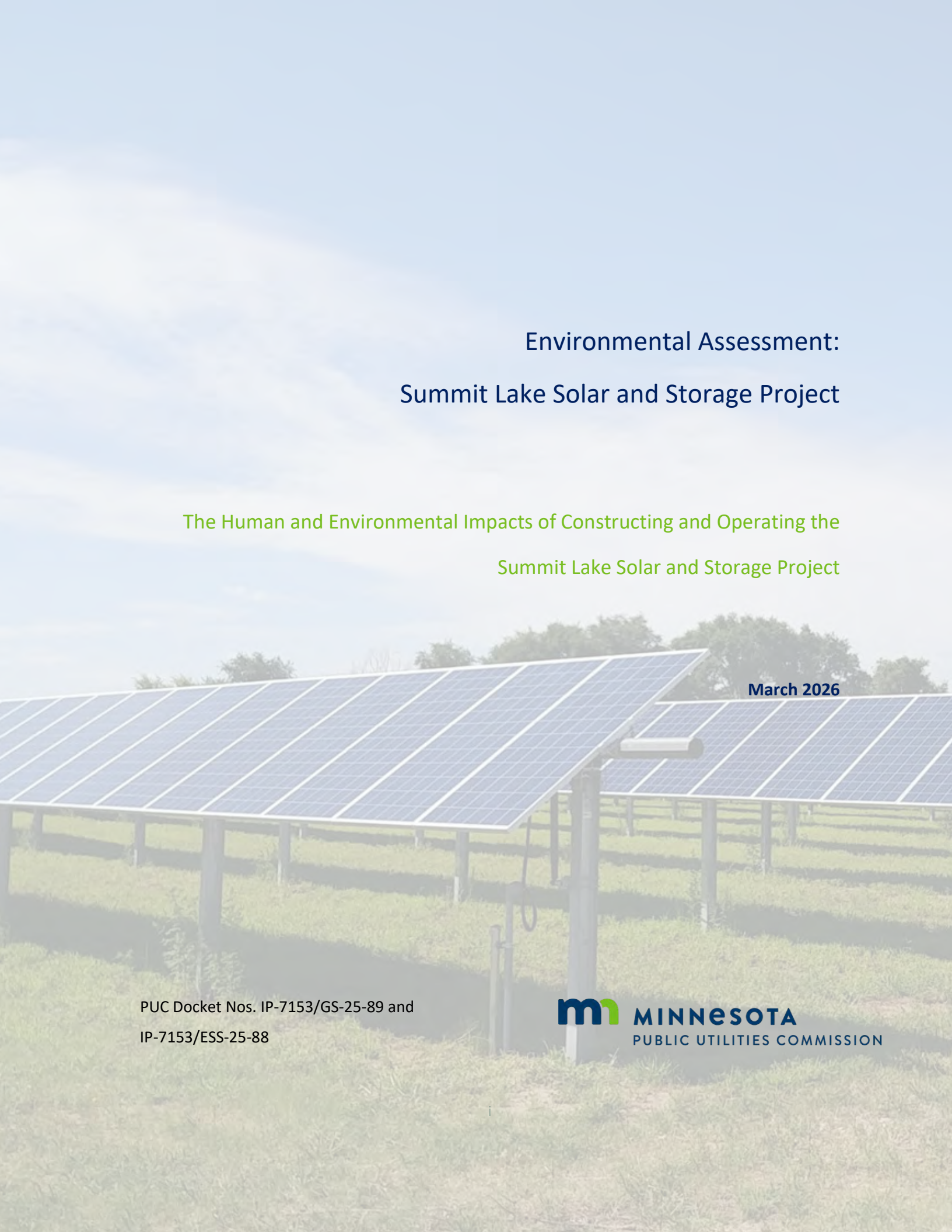




Environmental Assessment: Summit Lake Solar and Storage Project

The Human and Environmental Impacts of Constructing and Operating the
Summit Lake Solar and Storage Project

March 2026

PUC Docket Nos. IP-7153/GS-25-89 and
IP-7153/ESS-25-88

mi MINNESOTA
PUBLIC UTILITIES COMMISSION

Project Contacts

Responsible Government Unit

Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

Commission Representative

Craig Janezich
(651) 201-2203
craig.janezich@state.mn.us

Preparer

Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

Environmental Review Manager

Sam Weaver¹
(651) 539-1531
sam.weaver@state.mn.us

Project Proposers

Summit Lake Solar, LLC and Summit Lake Storage, LLC
8400 Normandale Lake Blvd, Suite 1200,
Bloomington, MN, 55437

Applicants Representative

Alia Mohammad
(612) 474-2681
amohammad@geronimopower.com

Summit Lake Solar, LLC and Summit Lake Storage, LLC (collectively Summit Lake or Applicants) propose to construct, own, and operate a 200 megawatt (MW) solar energy generating system, a 200 MW battery storage system, and associated facilities in Nobles County, Minnesota. Summit Lake must obtain two site permits from the Minnesota Public Utilities Commission before it can construct the proposed Summit Lake Project.

Sources

Much of the information used to prepare this environmental assessment comes from the joint site permit application. Additional sources include information from relevant federal and state environmental review documents for similar projects, spatial data and site visits.

Project Mailing List

To place your name on the project mailing list contact docketing.puc@state.mn.us or 651-201-2254 and provide the docket number (25-88 or 25-89), your name, email address, and mailing address. Please indicate how you would like to receive notices—by email or US mail.

Alternative Formats

This document can be made available in alternative formats, that is, large print or audio, by calling 651-296-0406 (local) or 1-800-657-3782 (toll-free).

¹ Prior to July 1, 2025, Sam Weaver was a staff member within the Department of Commerce, Energy Environmental Review and Analysis unit, which was tasked with developing this environmental assessment. As the result of legislation, and as of July 1, 2025, Sam Weaver is a staff member with the Public Utilities Commission.

Contents

1	Introduction	1
1.1	How is this document organized?.....	1
1.2	What do the Applicants propose to construct?	2
1.3	What is the state of Minnesota’s role?	3
1.4	What is the public’s role?	4
1.5	What is an Environmental Assessment?	4
1.6	Where do I get more information?	5
1.7	What permits are needed?	5
1.8	What are the potential impacts of the project?	5
1.8.1	Human Settlement.....	6
1.8.2	Human Health and Safety	7
1.8.3	Land-based Economies	7
1.8.4	Archeological and Historic Resources	7
1.8.5	Natural Resources.....	7
1.9	What factors guide the Commission’s decision?	9
1.10	Siting Factors – Analysis and Discussion	10
1.10.1	Discussion	12
1.11	Next Steps	13
2	Proposed Project	15
2.1	Solar Facility and BESS	15
2.1.1	Where is the project located?.....	15
2.1.2	How is the project designed?.....	15
2.1.3	How would the project be constructed?	21
2.1.4	How would the solar facility be operated and maintained?	26
2.1.5	What happens at the end of the solar facility’s useful life?	28
2.2	Project Costs	29
2.3	Project Schedule	30
3	Regulatory Framework.....	31
3.1	What Commission approvals are required?.....	31
3.2	What is environmental review?	31
3.3	What permitting steps have occurred to date?	31
3.4	Are other permits or approvals required?	33
3.4.1	Federal	35

Contents

3.4.2	State.....	36
3.4.3	Local.....	37
3.5	Do electrical codes apply?	38
3.6	Are any issues outside the scope of this EA?	38
4	Project Impacts and Mitigation.....	39
4.1	How are potential impacts measured?.....	39
4.1.1	Potential Impacts and Mitigation.....	39
4.1.2	BESS Operating Scenarios	40
4.1.3	Regions of Influence.....	41
4.2	Environmental Setting	42
4.3	Human Settlement.....	43
4.3.1	Aesthetics	43
4.3.2	Noise	46
4.3.3	Cultural Values	50
4.3.4	Land Use and Zoning.....	52
4.3.5	Property Values.....	55
4.3.6	Tourism and Recreation.....	57
4.3.7	Transportation and Public Services.....	58
4.3.8	Socioeconomics	60
4.3.9	Environmental Justice	62
4.4	Human Health and Safety	64
4.4.1	Electric and Magnetic Fields	64
4.4.2	Public Safety and Emergency Services	67
4.5	Land-based Economies	71
4.5.1	Agriculture	71
4.5.2	Tourism	75
4.6	Archeological, Cultural, and Historic Resources.....	75
4.7	Natural Resources.....	76
4.7.1	Air Quality	77
4.7.2	Geology and Groundwater.....	79
4.7.3	Soils.....	82
4.7.4	Surface Water Resources.....	85
4.7.5	Vegetation	89
4.7.6	Wildlife and Habitat	90

Contents

4.7.7	Rare and Unique Resources	93
4.7.8	Climate Change	97
4.8	Unavoidable Impacts	99
4.9	Irretrievable or Irreversible Impacts	100
4.10	Resource Topics Receiving Abbreviated Analysis.....	100
4.10.1	Displacement	100
4.10.2	Communications.....	101
4.10.3	Implantable Medical Devices	101
4.10.4	Forestry.....	101
4.10.5	Mining.....	101
4.11	Cumulative Potential Effects.....	101
4.11.1	Analysis Background	102
4.11.2	Human Settlement.....	103
4.11.3	Public Health and Safety	105
4.11.4	Land-based Economies	105
4.11.5	Archaeological and Historical Resources	105
4.11.6	Natural Resources.....	105
4.11.7	Rare and Unique Resources	105

Appendices

Appendix A: Maps

Appendix B: Amended Scoping Decision

Appendix C: Draft Energy Storage System Site Permit

Appendix D: Draft Solar Energy Generating System Site Permit

Appendix E: Draft Vegetation Management Plan

Appendix F: Applicants' Noise Modeling Results

Tables

Table 1.10-1: Application of Siting Factors - Solar Facility	10
Table 2.1.1-1: Project Location	15
Table 2.1.4-1: Regular Operations and Maintenance Tasks.....	28
Table 2.2-1: Estimated Project Cost Ranges	29
Table 2.3-1: Anticipated Project Schedule	30

Contents

Table 3.4-1: Potential Downstream Permits	33
Table 4.1.2-1: Regions of Influence for Human and Environmental Resources	41
Table 4.3.2-1: Noise Area Classifications (dBA).....	48
Table 4.3.2-2: Typical Sound Levels from Construction Equipment.....	48
Table 4.3.4-1: Land Cover	53
Table 4.3.8-1: Socioeconomic Characteristics of the Project Study Area.....	61
Table 5.2.4-1: Environmental Justice Review.....	64
Table 4.4.1-1: Electric and Magnetic Field Strength of Common Household Objects	65
Table 4.4.1-2: International Electric and Magnetic Field Guidelines.....	67
Table 4.7.1-1: Days in Each Air Quality Index Category (Marshall, Minnesota)	78
Table 5.5.1-2: Construction Related Criteria Pollutant Emissions.....	78
Table 4.7.3-1: Summary of Soils Within the Land Control Area	83

Graphics

Graphic 1.2-1: Proposed Summit Lake Solar and Storage Project	3
Graphic 2.1.2.2-1: Typical Solar Array.....	16
Graphic 2.1.2.2-2. Typical Solar Tracking Profile.....	17
Graphic 2.1.2.3-1: Typical Inverter and Transformer Station.....	18
Graphic 2.1.2.4-1: Representative BESS Module	19
Graphic 3.3-1: Permitting Process Summary	32
Graphic 4.3.1-1: Residences within one mile of the Land Control Area.....	44
Graphic 4.3.2-1: Decibel levels of common household activities.....	47
Graphic 4.7.1-1: Air Pollution Sources by Type.....	77

Acronyms and Abbreviations

Acronym/Abbreviation	Description
AC	alternating current
AIMP	Agricultural Impact Mitigation Plan
ALJ	administrative law judge
Applicants	Summit Lake Solar, LLC and Summit Lake Storage, LLC
BMP	best management practice
BWSR	Board of Water and Soil Resources
Commerce	Department of Commerce
Commission	Public Utilities Commission
CSW Permit	Construction Stormwater Permit
dBA	A-weighted sound level recorded in units of decibels
DC	direct current
DNR	Minnesota Department of Natural Resources
DSP	draft site permit
EA	environmental assessment
EJ	Environmental justice
EMF	electromagnetic fields
USEPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GHG	Greenhouse gas
IEEE	International Electrical and Electronic Engineers
kV	kilovolt
MBS	Minnesota Biological Survey
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
mG	milligauss
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MW	megawatt
MWh	megawatt hour
MWI	Minnesota Well Index
NAC	noise area classification
NCPDP	Nobles County Powered Data Park
NHD	National Hydrography Dataset
NHIS	Natural Heritage Information System
NWI	National Wetland Inventory
project	Summit Lake Solar and Storage Project
PV	photovoltaic
PWI	Public Waters Inventory
ROI	region of influence
ROW	right-of-way

Acronyms and Definitions

SCADA	supervisory control and data acquisition
SHPO	State Historic Preservation Office
SNA	Scientific and Natural Area
SWPPP	Stormwater Pollution Prevention Plan
TCLP	Toxicity Characteristic Leaching Procedure
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VMP	Vegetation Management Plan
VSP	Visual Screening Plan
WCA	Wetland Conservation Act
WHPA	Wellhead Protection Area
WMA	Wildlife Management Area

DEFINITIONS

Several terms used in this document have specific meaning in Minnesota law or regulation. Other terms are defined for clarity.

associated facilities means buildings, equipment, and other physical structures that are necessary to the operation of a large electric power generating plant or high voltage transmission line (Minnesota Rule 7850.1000, subpart 3).

construction means any clearing of land, excavation, or other action that would adversely affect the natural environment of the site or route but does not include changes needed for temporary use of sites or routes for nonutility purposes, or uses in securing survey or geological data, including necessary borings to ascertain foundation conditions (Minnesota Statute 216E.01, subdivision 3).

distribution line means power lines that operate below 69 kilovolts.

easement mean a grant of one or more of the property rights by the property owner to and /or for the use by the public, a corporation, or another person or entity.

energy storage system means equipment and associated facilities designed with a nameplate capacity of 10,000 kilowatts or more that is capable of storing generated electricity for a period of time and delivering the electricity for use after storage (Minnesota Statute 216E.01, subdivision 3a).

high voltage transmission line means a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more and is greater than 1,500 feet in length (Minnesota Statute 216E.01, subdivision 4).

land control area means the 1,179-acre area for which Summit Lake is assumed to have site control through ownership, a lease agreement, or an easement. The joint site permit application refers to this as the “Project Area.” For this document, it applies to the area for the solar facility as well as area for collection corridors and substation. The term is used to bound a review area and should not be understood to imply the Applicants have secured, or will definitely secure, the necessary land rights.

Acronyms and Definitions

large electric power generating plant means electric power generating equipment and associated facilities designed for or capable of operation at a capacity of 50,000 kilowatts or more (Minnesota Statute 216E.01, subdivision 5).

local vicinity means 1,600 feet from the land control area and collection line corridor.

mitigation means to avoid, minimize, correct, or compensate for a potential impact.

power line means a distribution, transmission, or high voltage transmission line.

preliminary development area means the 929-acre area within the land control area where the Applicants propose to build the solar and BESS facilities. This area does not include the collection corridors or required setbacks.

project area means one mile from the land control area and collection line corridor.

solar facility means ground-mounted photovoltaic equipment capable of operation at 50,000 kilowatts or more connected directly to the electrical grid and the associated facilities such as access roads and collector lines.

solar energy generation system means a set of devices whose primary purpose is to produce electricity by means of any combination of collecting, transferring, or converting solar-generated energy (Minnesota Statute 216E.01, subdivision 9a).

transmission line means power lines that operate at 69 kilovolts and above.

1 Introduction

Summit Lake Solar, LLC and Summit Lake Storage, LLC (Applicants) are proposing to construct and operate the Summit Lake Solar and Storage Project (project), a 200 megawatt (MW) solar farm and a 200 MW battery energy storage system (BESS) in Nobles County, Minnesota (Figure 1, **Appendix A**). The Applicants must obtain two site permits from the Minnesota Public Utilities Commission (Commission) before they can construct and operate the project. The BESS and the solar facility will independently connect to a proposed project substation. The project substation will connect to the electric transmission grid via an approximately 902 foot 345 kilovolt (kV) generation tie transmission line (Gen-Tie Line) that will connect the project substation to the Nobles Substation, which is owned and operated by Xcel Energy.

The Applicants filed a joint solar and storage site permit application (joint site permit application) on February 21, 2025², and the Commission found the joint site permit application to be substantially complete on April 8, 2025³. An amended site permit application was filed on December 18, 2025, to document changes to the preliminary project design⁴.

Commission Energy Infrastructure Permitting (EIP) staff – formerly Department of Commerce (Commerce) Energy Environmental Review and Analysis (EERA) staff – is responsible for conducting environmental review for site permit applications submitted to the Commission. EIP staff held public scoping meetings on May 21 and May 22, 2025, and has prepared this Environmental Assessment (EA) for the project. This EA addresses the issues identified in the EA Scoping Decision issued on July 17, 2025⁵ and the amended EA Scoping Decision issued on January 22, 2026⁶, as well as ways to mitigate potential impacts. These mitigation strategies can become enforceable conditions of the Commission’s site permit.

An EA is not a decision-making document, but rather an information document. The EA is intended to facilitate informed decisions by state agencies, particularly with respect to the goals of the Minnesota Power Plant Siting Act to “minimize adverse human and environmental impacts while insuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion”.⁷

1.1 How is this document organized?

The EA addresses the matters identified in the scoping decision.

This EA is based on the Applicants’ joint site permit application and public scoping comments. It addresses the matters identified in the EA scoping decision (**Appendix B**).

² eDockets Numbers [20252-215674-01 to -14](#)

³ eDockets Number [20254-217358-01](#)

⁴ eDockets Number [202512-226022-01 to -09](#)

⁵ eDockets Number [20257-221108-01](#)

⁶ eDockets Number [20261-227251-01](#)

⁷ Minnesota Statutes 216E.02, subd. 1.

Chapter 1

Introduction

- **Chapter 1** briefly describes the state of Minnesota’s role, discusses how this EA is organized, and provides a summary of potential impacts and mitigation.
- **Chapter 2** describes the project—design, construction, operation, and decommissioning.
- **Chapter 3** summarizes the regulatory framework, including the site permit process, the environmental review process, other approvals that might be required for the project, and the criteria the Commission uses to make its decisions.
- **Chapter 4** describes the environmental setting; details potential human and environmental impacts from the project; and identifies measures to mitigate adverse impacts. It summarizes the cumulative potential effects of the project and other projects and lists unavoidable impacts and irreversible and irretrievable commitments of resources.

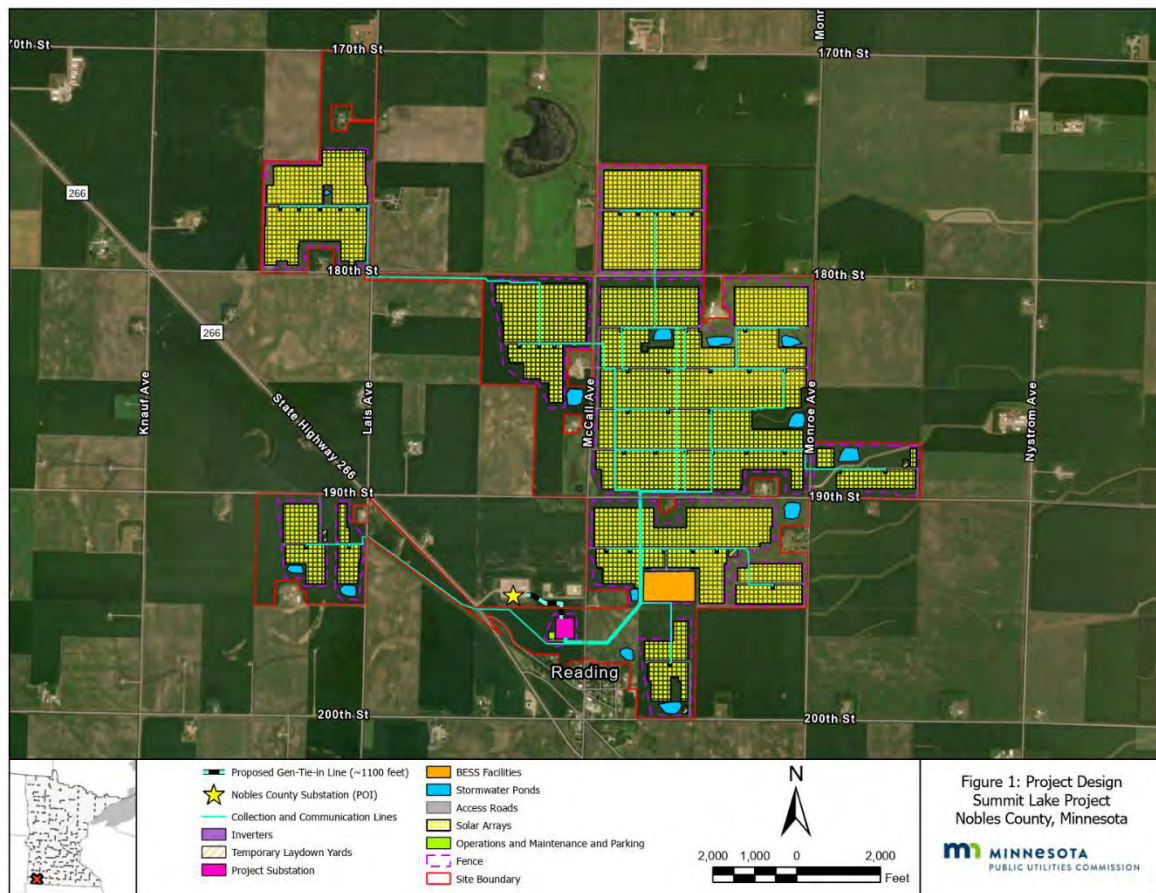
1.2 What do the Applicants propose to construct?

The Applicants propose to construct a 200 MW solar energy generating system, a 200 MW battery storage system, and associated facilities on a site of approximately 1,990 acres in Nobles County, Minnesota.

The project will consist of photovoltaic (PV) panels, trackers, inverters, transformers, access roads, security fencing, above-ground and below-ground electric collection lines, a project substation, battery storage facilities, and associated facilities (**Graphic 1.2-1**). The Applicants propose to locate the project facilities in an area that would occupy approximately 1,416 acres within the 1,990 acres of land under contract or owned by the Applicants. The solar and BESS facilities will be connected to the project substation via 34.5 kilovolt (kV) electric collection lines, which will likely be built as a hybrid system that uses above-ground collection lines between solar panels within an array, and below-ground lines between arrays and the project substation. The collection corridor is estimated to comprise approximately 22 acres of the project area. A short aboveground 345 kV transmission line will run from the project substation to the existing Nobles Substation.

Construction is anticipated to begin in 2026 with completion and operation anticipated in late 2028.

Graphic 1.2-1: Proposed Summit Lake Solar and Storage Project



1.3 What is the state of Minnesota's role?

The Applicants need two site permits from the Commission to construct the project. EIP prepared this EA. An administrative law judge will oversee a public hearing.

To build the project, the Applicants need two site permits from the Commission. The project may also require additional approvals from other federal and state agencies and local governments, for example, a Drain Tile Reroute and Abandonment Petition Approval from Nobles County or a Construction Stormwater Permit from the Minnesota Pollution Control Agency (MPCA). A site permit supersedes local zoning, building, and land use rules.⁸ The Commission's site permit decision must be guided, in part, however, by consideration of impacts to local zoning and land use in accordance with the legislative goal to "minimize human settlement and other land use conflicts."⁹

⁸ Minnesota Statutes 216E.10, subd. 1.

⁹ Minnesota Statutes 216E.03, subd. 7.

Chapter 1

Introduction

Summit Lake submitted a joint site permit application to the Commission for two site permits for the project on February 21, 2025 (Application)¹⁰. Summit Lake Solar and Summit Lake Storage submitted an amended site permit application on December 18, 2025 (Application Amendment)¹¹. The Commission must consider whether the record supports issuing site permits, and what conditions should be placed on the site permits.¹²

To ensure a fair and robust airing of the issues, the Minnesota Legislature set out a process for the Commission to follow when considering site permit applications.¹³ In this instance, an EA has been prepared, and a public hearing will be held. The goal of the EA is to describe potential human and environmental impacts of the project, whereas the intent of the public hearing is to allow interested persons the opportunity to advocate, question, and debate what the Commission should decide about the project. The record developed during this process—including all public input—will be considered by the Commission when it makes its decisions on the Applicants' joint site permit application.

1.4 What is the public's role?

Minnesota needs your help to make informed decisions.

During scoping, you told us your concerns about the project so that we could collect the relevant facts. At the public hearing, which comes next, you can tell us if you think we have represented that information correctly in this EA. Your help with the gathering and interpretation of information relevant to the project will help the Commission make informed decisions regarding the project.

1.5 What is an Environmental Assessment?

This document is an Environmental Assessment. The Commission will use the information in this document to inform their decisions about issuing site permits for the project.

This EA contains an overview of affected resources and discusses potential human and environmental impacts and mitigation measures. EIP staff prepared this document as part of the environmental review process. Scoping is the first step in the process. It provides opportunities to provide comments on the content of this environmental assessment, suggest alternatives, and to mitigate potential impacts.

¹⁰ Summit Lake Solar and Summit Lake Storage, Joint Application to the Minnesota Public Utilities Commission for the Summit Lake Solar Energy Conversion Facility and Battery Energy Storage System, February 21, 2025, eDockets Numbers [20252-215674-01 to -14](#).

¹¹ Summit Lake Solar and Summit Lake Storage, Site Permit Application Amendment, December 18, eDockets nos. [202512-226022-01 to -09](#)

¹² If the Commission grants a site permit, it chooses which of the studied locations is most appropriate. In this matter only one site location is studied.

¹³ Minnesota Statutes 216E.

Chapter 1 Introduction

1.6 Where do I get more information?

For additional information don't hesitate to contact Commission staff.

If you would like more information or if you have questions, please contact EIP staff: Sam Weaver (sam.weaver@state.mn.us / 651-539-1531) or Craig Janezich (sam.lobby@state.mn.us / 651-201-2203).

Information about the project, including the joint site permit application, notices, and public comments, can be found on eDockets: <https://www.edockets.state.mn.us/documents> by searching "22-88" or "25-89" under "Docket #'s". Information is also available on EIP's webpage for the project: <https://puc.eip.mn.gov/web/project/16069>.

1.7 What permits are needed?

Two site permits from the Commission are required. Federal, state, and local permits may also be necessary to construct the project.

The project requires two site permits from the Commission because it meets the definition of large electric power generating plant, which is any electric power generating equipment designed for or capable of operation at a capacity of 50 MW or more, and meets the definition of an energy storage system, which is any equipment and associated facilities designed with a nameplate capacity of 10 MW or more.

Various federal, state, and local approvals will be required for activities related to the construction and operation of the project. These permits are referred to as "downstream permits" and must be obtained by the Applicants prior to constructing the project.

1.8 What are the potential impacts of the project?

The project will impact human and environmental resources. Impacts will occur during construction and operation.

A potential impact is the anticipated change to an existing condition caused directly or indirectly by the project. Potential impacts can be positive or negative, short- or long-term, and can accumulate incrementally. Impacts vary in duration and size, by resource, and across locations. The impacts of constructing and operating a project can be mitigated by avoiding, minimizing, or compensating for the adverse effects and environmental impacts of a project.

The context of an impact—in combination with its anticipated on-the-ground effect and mitigation measures—is used to determine an impact intensity level, which can range from highly beneficial to highly harmful. Impacts are grouped: human settlement, human health and safety, land-based economies, archaeological and historic resources, and natural resources.

Select resource topics received abbreviated study because they were deemed to be of minor importance to the Commission's site permit decision. Potential impacts are anticipated to be negligible for displacement, communication, implantable medical devices, forestry, and mining.

Chapter 1

Introduction

1.8.1 Human Settlement

Large energy projects can impact human settlement. Impacts range from short-term, such as increased local expenditures during construction, to long-term, such as changes to viewsheds.

Aesthetics The impact intensity level is expected to be moderate and long-term. Locations where visual impacts may potentially be the greatest are adjacent to residences and along public roadways. The solar arrays will be visible from nearby residences and adjacent roadways.

Cultural Values The impact intensity level is anticipated to be minimal to moderate. The project is not anticipated to impact or alter the work and leisure pursuits of residents in such a way as to impact the underlying culture of the area, although the perceived rural landscape valued by much of the community may be altered by this industrial land use. Differences between cultural values related to large industrial facilities and rural character has the potential to create tradeoffs that cannot be addressed in the site permits.

Land Use and Zoning The impact intensity level is anticipated to be moderate due to the conversion of agricultural land to land used for energy generation. Land use impacts are anticipated to be long-term and localized. Constructing the project will change land use from agricultural to solar energy production and battery storage for a minimum of 30 years. After the project's useful life, the land control area could be restored to agricultural or other planned land uses by implementing appropriate restoration measures. Impacts can be minimized by using best practices to protect land and water quality.

Noise Distinct noises are associated with the different phases of project construction. The impact intensity level during construction will range from negligible to significant depending on the activity. Potential impacts during construction are anticipated to be intermittent and short-term. Impacts during operation are expected to be moderate and long-term. These impacts may affect nearby residences and are not projected to exceed state noise standards. Impacts are unavoidable but can be minimized.

Property Values Impacts in the local vicinity are anticipated to be minimal to moderate and decrease with distance and over time. Impacts to the value of specific properties within the local vicinity are difficult to determine but could occur.

Tourism and Recreation The impact intensity level to tourism and recreation resources is anticipated to be minimal. Most impacts will be short-term and related to construction.

Public Services Potential impacts to the electrical grid, roads and railroads, and other utilities are anticipated to be short-term, intermittent, and localized during construction. Impacts to groundwater (wells and septic systems) are not expected to occur, but drainage systems, including county and private drain tile, may be impacted. Overall, construction-related impacts are expected to be minimal, and are associated with possible traffic delays. During operation, negligible traffic increases would occur for maintenance. Impacts are unavoidable but can be minimized.

Socioeconomics The impact intensity level is anticipated to be minimal to significant. Effects associated with construction will, overall, be short-term and minimal. Positive effects may occur for some individuals and businesses, while negative economic effects may occur for others, specifically those involved in local agriculture. Impacts from operation will be long-term and significant.

Chapter 1

Introduction

Environmental Justice The project will not have disproportionately high and adverse human health or environmental effects on low-income, minority, or tribal populations.

1.8.2 Human Health and Safety

Large energy projects have potential to impact human health and safety.

Electronic and Magnetic Fields (EMF) Impacts to human health from possible exposure to EMFs are not anticipated. Potential impacts will be long-term and localized. These unavoidable impacts will be negligible. Impacts can be mitigated.

Public Safety and Emergency Services Like any construction project, there are risks. These include potential injury from falls, equipment and vehicle use, electrical accidents, etc. Public risks involve electrocution. Electrocution risks could also result from unauthorized entry into the fenced area. With BESS facilities, fire safety and emergency response procedures are a subject of notable concern. There is the potential to encounter land that has previously been impacted by hazardous substances, and if this occurs, hazardous materials must be documented, monitored, and disposed in coordination with MPCA. Potential impacts are anticipated to be minimal under typical operating conditions. Impacts would be short- and long-term and can be minimized.

1.8.3 Land-based Economies

Large energy projects can impact land-based economies by limiting land use for other purposes.

Agriculture Potential impacts to agricultural producers are anticipated to be minimal—lost farming revenues will be offset by lease agreements. Impacts to other agricultural businesses such as seed sellers, grain elevator operators, and equipment dealers. A loss of farmland in Nobles County would occur for the life of the project. With respect to prime farmland, the Applicants indicate that no prudent alternatives to the project exist. Impacts to drain tile systems are of great concern for the proposed project. Substantial impacts to drain tile are proposed, and the Nobles County Board of Commissioners must approve Summit Lake's plan for reroute and abandonment of county tile. All of these potential impacts are unavoidable but can be minimized.

Tourism Impact intensity is expected to be minimal, and short-term in duration. There may be potential for impacts to local recreational activities during construction, however impacts will be temporary.

1.8.4 Archeological and Historic Resources

The impact intensity level is anticipated to be negligible to minimal. Impacts would be localized. Impacts can be mitigated through siting and construction monitoring.

1.8.5 Natural Resources

Large energy projects can impact the natural environment. Impacts are dependent upon many factors, such as how the project is designed, constructed, maintained, and decommissioned. Other factors, such as the environmental setting, influence potential impacts. Impacts vary significantly within and across projects.

Air Quality Potential impacts to air quality during construction would be intermittent, localized, short-term, and minimal. Impacts are associated with fugitive dust and exhaust. Impacts can be mitigated. Once operational, the solar array will not generate criteria pollutants or carbon dioxide. Negligible

Chapter 1

Introduction

fugitive dust and exhaust emissions would occur as part of routine maintenance activities. Impacts are unavoidable and do not affect a unique resource. Impacts can be minimized.

Geology and Groundwater Impacts to geology and domestic water supplies are not expected. Localized impacts to groundwater resources, should they occur, would be intermittent, but have the potential to occur over the long-term. Indirect impacts from surface waters might occur during construction. Impacts can be mitigated through use of Best Management Practices (BMPs) for stormwater management.

Soils Impacts to soils will occur during construction and decommissioning of the project. The impact intensity level is expected to be minimal. Potential impacts will be both positive and negative, and short- and long-term. Isolated moderate to significant negative impacts associated with high rainfall events could occur. Because the soil at the solar facility will be covered with native perennial vegetation for the life of the project, soil health is likely to improve over the life of the project.

Surface Water The impact intensity level is anticipated to be minimal. Direct impacts to surface waters are not expected. Indirect impacts to surface waters may occur. These impacts will be short-term, of a small size, and localized. Impacts can be mitigated.

Wetlands The impact intensity level is anticipated to be minimal. Although there is a potential for wetlands to be indirectly affected, direct impacts are not expected. These impacts will be short-term, of a small size, and localized. Impacts can be mitigated.

Vegetation The solar facility will convert row crop farmland to perennial vegetation for the life of the project. Potential impacts of the solar facility can be mitigated through development of a vegetative management plan (VMP).

Wildlife and Habitat Potential impacts may be positive or negative and are species-dependent. Long-term, minimal positive impacts to small mammals, insects, snakes, etc. would occur. Impacts to large wildlife species, for example, deer, will be negligible. Significant negative impacts could occur to wildlife during construction and operation of the project. Once restored, the land control area will provide native habitat for the life of the project. The project does not contribute to significant habitat loss or degradation or create new habitat edge effects. Potential impacts can be mitigated in part through design and BMPs. The impact intensity level is expected to be minimal.

Rare and Unique Resources The impact intensity level is anticipated to be minimal. Impacts could be both short and long term and could be positive (e.g., through introduction of habitat), or negative (e.g., by removing trees during breeding or migratory season). Impacts can be mitigated.

Climate Change Construction emissions will have a short-term negligible increase in greenhouse gases that contribute to climate change. Overall, the project will generate energy that can be used to displace energy otherwise generated by carbon-fueled sources. The total GHG emissions produced by material collection, construction, and operation of the project will be minimal when compared to the reduction in GHG emissions long-term. The project's design incorporates design elements that minimize impacts from the increase in extreme weather events such as increase flooding, storms, and heat wave events that are expected to accompany a warming climate.

1.9 What factors guide the Commission's decision?

Minnesota statute and rule identify the factors the Commission must consider when determining whether to issue a site permit.

After reviewing the project record—including public comments—the Commission will determine whether to issue site permits and, if site permits are issued, where the solar facility and battery storage will be located and what permit conditions are appropriate.

Minnesota Statutes 216E.03 lists considerations that guide the study, evaluation, and designation of site permits. Minnesota Rule 7850.4100 lists the factors the Commission must consider when making a site permit decision.

- A. Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.
- B. Effects on public health and safety.
- C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.
- D. Effects on archaeological and historic resources.
- E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.
- F. Effects on rare and unique natural resources.
- G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity.
- H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries.
- I. Use of existing large electric power generating plant sites.
- J. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way.
- K. Electrical system reliability.
- L. Costs of constructing, operating, and maintaining the facility which are dependent on design and route.
- M. Adverse human and natural environmental effects which cannot be avoided.
- N. Irreversible and irretrievable commitments of resources.

The Commission is also guided by the “state's goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state's electric

Chapter 1

Introduction

energy security through efficient, cost-effective power supply and electric transmission infrastructure.”¹⁴

1.10 Siting Factors – Analysis and Discussion

This analysis applies the siting factors to the project. Some factors are described in just a few words. Other factors are more descriptive and include a list of elements that, when grouped, make up the factor.

Factor G (application of design options) and **Factor L** (costs dependent on design) do not apply as the design of the proposed project is the only design under consideration. **Factor H** (use of parallel or existing right-of-way) and **Factor J** (use of existing transportation, pipeline and electrical transmission systems) do not apply as those factors are specifically for routing permit projects. **Factor K** (reliability) is not discussed further here as the project is anticipated to maintain or improve the reliability of the electrical system. **Factor M** (unavoidable impacts) and **Factor N** (irreversible and irretrievable resource commitments) are discussed in [Section 4.8](#) and [Section 4.9](#), respectively, of this EA.

Other factors are ranked as follows:

	Impacts are anticipated to be negligible to minimal and able to be mitigated or consistent with factor
	Impacts are anticipated to be minimal to moderate and able to be mitigated in part or less consistent with factor, but nonetheless consistent
	Impacts are anticipated to be moderate to significant and unable to be mitigated fully or consistent in part or not consistent with factor

Table 1.10-1: Application of Siting Factors - Solar Facility

Factor A: Human Settlement		
Element	Construction	Operation
Aesthetics		
Displacement		
Cultural Values		
Electric Interference		
Environmental Justice		
Floodplains		
Land Use and Zoning		
Noise		
Property Values		
Recreation		
Socioeconomics		

¹⁴ Minnesota Statutes 216E.03, subd. 7(a).

Airports	●	●
Roads	○	●
Utilities	●	●
Factor B: Public Health and Safety		
Element	Construction	Operation
EMF	●	●
Emergency Services	●	○
Medical Devices	●	●
Public Safety	●	○
Stray Voltage	●	●
Worker Safety	●	●
Factor C: Land-based Economies		
Element	Construction	Operation
Agriculture	○	○
Forestry	●	●
Mining	●	●
Tourism	●	●
Factor D: Archaeological and Historic Resources		
Element	Construction	Operation
Archeological	●	●
Historic	●	●
Factor E: Natural Resources		
Element	Construction	Operation
Air Quality	●	●
Climate Change	●	●
Geology and Groundwater	○	●
Soils	○	●
Surface Water	●	●
Topography	●	●
Vegetation	●	●
Wetlands	●	●
Wildlife	○	●
Wildlife Habitat	●	●
Factor F: Rare and Unique Resources		
Element	Construction	Operation
Fauna	●	●
Flora	●	●

Factor I: Use of Existing Generating Plants		
Element	Construction	Operation
Existing Plants		

1.10.1 Discussion

The following discussion highlights potential impacts to factor elements that are anticipated to be moderate to significant, and factors determined less consistent, consistent in part, or not consistent.

FACTOR A: HUMAN SETTLEMENT

Aesthetics Visual impacts are subjective. Thus, potential impacts are unique to the individual and can vary widely. Because there are existing energy and infrastructure facilities nearby (**Figure 9**), the project will not be an entirely new type of feature on the landscape. For those with high viewer sensitivity, for example, neighboring landowners, visual impacts are anticipated to be moderate to significant, while for those that travel through the project area, visual impacts are likely to be minimal, although noticeable.

Cultural Values The project is not anticipated to impact or alter the work and leisure pursuits of residents in such a way as to impact the underlying culture of the area. Differences between cultural values related to renewable energy and rural character has the potential to create tradeoffs that cannot be addressed in the site permit.

Environmental Justice The project is not anticipated to have disproportionately high or adverse human health or environmental effects on low-income, minority, or tribal populations.

Land Use and Zoning Land use impacts are anticipated to be long-term and localized. The proposed solar facility is not entirely consistent with local land use ordinances and comprehensive land use plans for Nobles County. Constructing the project will change land use from agricultural to solar energy production for a minimum of 30 years, and the Applicants' proposed setbacks are less than the county's solar ordinance to meet generation needs. After the project's useful life, the land control area could be restored to agricultural or other planned land uses by implementing appropriate restoration measures. Impacts can be minimized.

Noise Distinct noises are associated with the different phases of project construction. These impacts will be temporary and intermittent and range from negligible to significant depending on the construction equipment used and the location of the listener. There is potential for noise during operation to be moderate and chronic. The potential impacts will be mitigated by implementing equipment and procedures, as well as conducting noise studies, to ensure the impacts will be minimal.

Property Values On whole, impacts to property values are anticipated to be minimal and to decrease with distance and over time. However, impacts to a specific property's value are difficult to determine. Because of this uncertainty, impacts to specific properties could be minimal to moderate.

Recreation Potential impacts to recreational resources associated with construction are anticipated to be short-term, intermittent, and localized. The impact intensity level is expected to be minimal to moderate, most likely occurring due to increased traffic and noise from construction. During

Chapter 1

Introduction

operation, no impacts to recreation are anticipated; negligible traffic increases would occur for maintenance.

Roads Potential impacts to roads and highways associated with construction are anticipated to be short-term, intermittent, and localized. The impact intensity level is expected to be minimal to moderate. During operation, no impacts to roads are anticipated; negligible traffic increases would occur for maintenance.

FACTOR C: LAND-BASED ECONOMICS

Agriculture Potential impacts to agricultural producers are anticipated to be minimal—lost farming revenues within the Land Control Area will be offset by lease agreements. A negligible loss of farmland in Nobles County would occur for the life of the project. The project will impact prime farmland. These potential impacts are localized and unavoidable.

FACTOR E: NATURAL RESOURCES

Geology and Groundwater Impacts to geology and domestic water supplies are not expected. Localized impacts to groundwater resources, should they occur, would be intermittent, but have the potential to occur over the long-term. Indirect impacts from surface waters might occur during construction. Impacts can be mitigated through use of BMPs for stormwater management.

Soils Impacts to soils will occur during construction and decommissioning of the project. The impact intensity level is expected to be minimal to moderate. Potential impacts will both positive and negative, and short- and long-term. Isolated moderate to significant negative impacts associated with high rainfall events could occur but can be mitigated with erosion prevention and sediment control BMPs. Because the soil at the solar facility will be covered with native perennial vegetation for the life of the project, soil health is likely to improve.

Wildlife and Habitat Impacts wildlife are anticipated to be minimal to moderate during construction and operation of the project. Additional BMPs can be implemented to avoid impacts to local and rare and unique wildlife (e.g., migratory birds.)

FACTOR I: POWER PLANTS

Because the solar facility is not constructed at an existing power plant, the solar facility is inconsistent with this siting factor.

1.11 Next Steps

A public hearing will be held in the project area; you can provide comments at the hearing. The Commission will then review the record and decide whether to grant a site permit.

An administrative law judge (ALJ) from the Court of Administrative Hearings (CAH) will hold a public hearing after the EA is complete and available. At the hearing you may ask questions and submit comments about the project. After the close of the comment period, the ALJ will provide a written report to the Commission with findings, conclusions, and recommendations for the Commission.

Chapter 1

Introduction

The Commission reviews all the information in the project record in determining whether to issue a site permit. Site permits define the location of the project and include conditions specifying mitigation measures. The Commission is expected to make a site permit decision in 2026.

2 Proposed Project

Summit Lake proposes to construct and operate an up to 200 MW solar farm and a 200 MW battery storage system in Nobles County, Minnesota. The project will occupy approximately 1,989 acres near the town of Reading. The project will interconnect to the electrical grid through a project substation that will be connected to Xcel Energy's Nobles substation via a 902 foot 345 kV Gen-Tie line. This chapter describes the project and how it would be constructed, operated, and decommissioned.

2.1 Solar Facility and BESS

2.1.1 Where is the project located?

The project is located in Nobles County, Minnesota (Figure 1).

As shown in **Graphic 1.2-1** the project is located in Nobles County, near the town of Reading. **Table 2.1.1-1** summarizes the project location. The project facilities would be located on approximately 1,417 acres within an area of approximately 1,989 acres of land owned or leased by the Applicants. The site is currently used mainly as cultivated farmland.

Summit Lake selected the site based on proximity to existing electric transmission infrastructure, sufficient solar resource, landowner participation, and available capacity on the grid to which the project will interconnect.¹⁵

Table 2.1.1-1: Project Location

Township	Range	Section(s)	Township	County
103N	40W	18	Elk	Nobles
103N	41W	10, 12-15	Summit Lake	Nobles

2.1.2 How is the project designed?

The project will consist of photovoltaic (PV) panels, trackers, inverters, transformers, access roads, security fencing, below- and above-ground electric collection and communication lines, a project substation and interconnection facilities, conduit, metering and switchgear, step-up transformers, supervisory control and data acquisition (SCADA) system, an operation and maintenance facility, a BESS, laydown yards, weather stations, and a short aboveground 345 kV transmission line.

2.1.2.1 SOLAR ARRAYS

The solar facility will utilize PV panels with tempered glass that may vary in size but are generally four to seven feet long by two to four feet wide and one to two inches thick. The panels will be installed north to south on a tracking rack system that has steel foundations and aluminum frames. Motors allow the racking to rotate from east to west throughout the day. Each tracking rack will contain multiple panels. On the tracking rack system, panels will be approximately 15 feet in height from the

¹⁵ Application, Section 3.1.

Chapter 2

Proposed Project

ground to the top of the panels when at a 45-degree angle (see **Graphic 2.1.2.2-2**). Height may vary due to manufacturer, topography, and vegetation constraints and could reach a height of approximately 20 feet from the ground. The photovoltaic panels will have a silicon and weatherized plastic backing or a side-mount or undermount aluminum frame, heat strengthened front glass, and laminate material encapsulation for weather protection. The main protection built into the module is from light wind, dust, sand and precipitation. Tracker technology helps prevent hail and wind damage to the modules by safely stowing the modules in a way that limits/reduces the risk of damage to the modules.

To limit reflection, solar photovoltaic panels are constructed of dark, light-absorbing materials. Modern panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming use of anti-reflective coatings, which will be used. The solar arrays will occupy most of the Solar Facility.

2.1.2.2 Linear Axis Tracking System

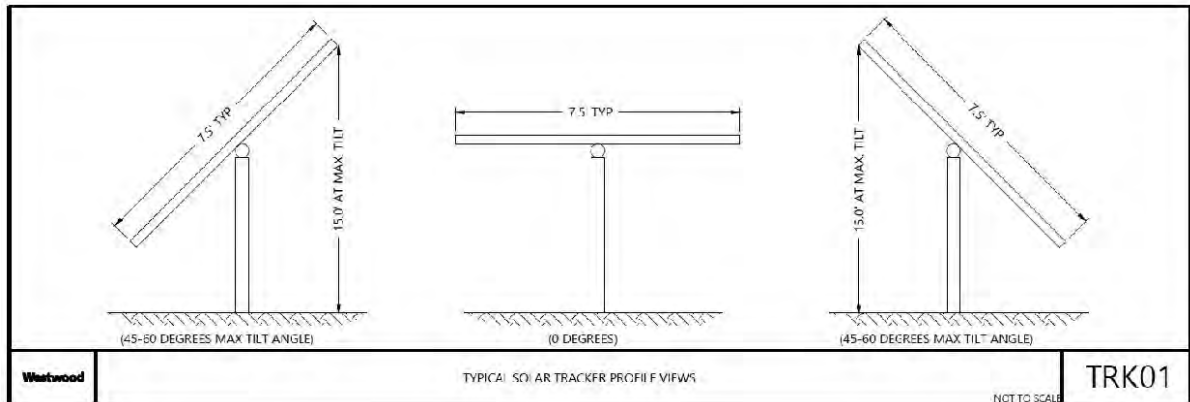
A linear axis tracking rack system allows the PV panels to track the sun throughout the day. The panels and tracking rack system are generally aligned in rows north and south with the photovoltaic panels facing east toward the rising sun in the morning, parallel to the ground during mid-day, and then west toward the setting sun in the afternoon. The panels are rotated by a small motor connected to the tracking rack system to slowly track with the sun throughout the day. The tracking rack system allows the solar facility to optimize the angle of the panels in relation to the sun throughout the day, thereby maximizing production of electricity and the capacity value.

The tracking rack system is mounted on top of steel piers that are typically driven into the ground, without the need for excavation or concrete to install the piers. The piers are driven into the ground with a hydraulically powered high-frequency hammer mounted on a tracked carrier. Piers are typically installed at 8 to 15 feet below the surface, pending site-specific conditions that will be determined through geotechnical borings prior to construction. **Graphics 2.1.2.2-1 and 2.1.2.2-2** show the general racking equipment and dimensions of a linear axis tracking rack system.

Graphic 2.1.2.2- 1: Typical Solar Array



Graphic 2.1.2.2-2. Typical Solar Tracking Profile



2.1.2.3 ELECTRICAL COLLECTION SYSTEM

Solar panels collect and release energy as DC power at approximately 1,500 volts. Inverters, placed at the end of solar arrays, are required to convert the DC power generated by the solar panels to the AC power that is needed to transmit the energy through cabling into transformers, then the project substation, and ultimately into the electrical grid. Transformers are used to step up or step down AC voltages. For the solar facility, a transformer will be used to step up the voltage from the solar panels to 34.5 kV before it is transmitted to the project substation. Another transformer will be located within the project substation that will further step up the AC voltage from 34.5 kV to 345 kV before it is transmitted to the Nobles substation via the 345 kV gen-tie line. The voltage is required to be at 345 kV to interconnect with the Nobles substation and the existing electrical grid.

The electrical collection system of the solar facility is made up of electrical cables that connect the solar arrays, inverters, transformers, and project substation. The electrical collection system for the solar facility will be installed either below-ground or in a hybrid arrangement with aboveground cabling connecting the solar arrays to one another and below-ground cables connecting the solar arrays to the project substation. For both options, below-ground collection lines will be installed at least four feet below ground surface.

The electrical collection system will be site-specific depending on geotechnical analysis, constructability, costs, and availability of materials. Final engineering and procurement will help determine the construction method for the electrical collection system. The electrical cables that would be used for each type of electrical collection system are described below.

Hybrid Below-ground and Above-ground Electrical Collection System

A hybrid below-ground and above-ground electrical system is being considered for the solar facility for several reasons including ease of access for operations and maintenance, reduced ground disturbance, and cost considerations. If above-ground cabling is utilized, it would only be utilized to connect solar panels together within each solar array.

In the hybrid electrical collection system, DC collection cables will be strung under each row of panels on steel arms and a steel cable attached to the piles. At the end of each row, hanging brackets will connect several racks/rows of cables to a common collection point near their assigned

Chapter 2

Proposed Project

inverter/transformer skid where the cables will then be routed below-ground to the inverter/transformer skid where the current is converted to AC and voltage is stepped up to 34.5 kV. From the inverter/transformer skid, the AC collection would be installed below ground to the Project Substation. The 34.5 kV collection and communication lines between solar arrays and the Project Substation will be routed below-ground at a minimum depth of four feet. Cables connecting each unit of solar arrays will be directionally bored under county roads.

Central Inverter / Transformer Skids

Regardless of the collection system configuration (below-ground or hybrid), the Solar Facility will utilize central inverter/transformer skids and include a transformer into which the inverters will feed electricity. The final number of inverters will depend on the inverter size, as well as inverter and panel availability. The preliminary design proposes 44 central inverter skids; the preliminary layout would be the same regardless of which electrical collection system configuration is selected. These skids provide the foundation for the inverter, transformer, and Supervisory Control and Data Acquisition (SCADA) system. The skids will be placed atop a concrete slab or pier foundations and typically measure 10 feet wide by 25 feet long, with a structure height of approximately 12 feet above grade. Concrete slabs are typically 1 to 1.5 feet deep and pier foundations are up to 15 feet deep. Concrete slabs would be used if subgrade soil conditions are such that skin friction and end bearing values are too low to support driven pile foundations. Pier foundations would be used as a typical foundation solution as long as the subgrade soil conditions allow for driven piles. This would represent good skin friction and end bearing capacities. Concrete foundations will be poured onsite or precast and assembled off-site.

The inverter/transformer skids will be located in the interior of the Solar Facility along access roads. **Graphic 2.1.2.3-1** shows a typical central inverter and step-up transformer station.

Graphic 2.1.2.3-1: Typical Inverter and Transformer Station



2.1.2.4 BESS FACILITY

The rated power capacity of the proposed BESS is up to 200 MW and the energy capacity is 800 MWh. The storage duration is 4 hours. When the BESS is operating at full capacity and discharging 200 MW, then it is able to discharge for 4 hours. Rated power capacity is the maximum rate of discharge (MW) that the BESS can achieve. Energy capacity is the maximum amount of stored energy (MWh). Storage duration is the amount of time storage can discharge at its power capacity before depleting its energy capacity¹⁶.

Summit Lake proposes to locate the BESS within 20 acres of the south-central portion of the project area and utilize an AC-coupled system (i.e., all batteries are in one location as opposed to being distributed throughout the Solar Facility). This type of system allows for efficient access, monitoring, and maintenance; has more flexible energy and power capacity sizing; and has more flexible dispatch capabilities. The preliminary design for the BESS incorporates a modular layout based on currently available technology.

Battery storage technology is advancing at a rapid pace and, as such, the options that may be available for the BESS when Summit Lake begins procuring infrastructure could be significantly more advanced or offered in a wider selection than those currently available. Summit Lake will analyze current market offerings during final engineering to select the specific BESS model for the Project. A variety of lithium iron phosphate battery (LFP) technologies are under review for the Project and the preliminary design presented herein contemplates a typical BESS. The actual footprint of the BESS may vary based on the model selected during final engineering.

The BESS will be a modular system comprised of LFP batteries encased in stand-alone enclosures (see **Graphic 2.1.2.4-1**). Standalone enclosures are necessary, as opposed to a large warehouse or storage building, to ensure people cannot enter into the battery enclosures for safety reasons. The enclosure dimensions are anticipated to be 40 feet long by 10 feet wide by 9.5 feet high. Multiple enclosures will be utilized in tandem, and each individual enclosure will have a Battery Management System for automated monitoring and managing of the batteries to ensure design performance, as well as providing control for the charging/discharging of the batteries along with temperature monitoring and control of the individual battery cell temperature with an integrated cooling system.

Graphic 2.1.2.4-1: Representative BESS Module



¹⁶ NREL. 2019. Grid-Scale Battery Storage - Frequently asked questions. Available online at <https://www.nrel.gov/docs/fy19osti/74426.pdf>

Chapter 2

Proposed Project

2.1.2.5 PROJECT SUBSTATION

The project substation will be a 34.5 to 345 kV step up substation with metering and switching gear required to connect to the transmission grid. The project substation will be shared by the solar facility and BESS and will have separate bays for each facility. It will be designed according to regional utility practices, MISO Standards, Midwest Reliability Organization Standards, NESC, and the Rural Utility Service Code. The area within the Project Substation footprint will be graveled to minimize vegetation growth in the area and reduce fire risk. The Project Substation will be fenced with a six foot chain-link fence, topped with one foot of barbed wire in accordance with NESC standards. Based on the preliminary design, approximately 5.1 acres will be required to construct and operate the Project Substation.

2.1.2.6 OPERATIONS AND MAINTENANCE FACILITY

An Operations and Maintenance (O&M) building will be shared by the Solar Facility and BESS and will be located adjacent to the Project Substation. The O&M building will be made of metal. It will contain an office for the onsite Plant Manager, a technician room, restroom, and storage area for equipment required for operations and maintenance. Equipment within the O&M building will include a SCADA cabinet, spare panels, spare parts for the Project Substation and BESS, and equipment to operate the Project Substation, as well as safety equipment for working with live electricity.

2.1.2.7 FENCING

Permanent security fencing will be installed along the perimeter of the solar arrays within the solar facility and around the project substation and BESS. Fencing will be secured to posts which will be directly embedded in the soil or set in concrete foundations as required for structural integrity. The fencing around the solar facility will consist of an agricultural woven wire fence and will extend approximately seven feet above grade. As typically requested by the MDNR on other projects, barbed wire will not be used around the perimeter of the solar facility. In place of barbed wire, one foot of three to four strands of smooth wire will be placed atop of the woven wire fence for a total height of approximately eight feet above grade. Gates will be strategically installed at corners for deer egress and contact information for the site manager will be posted at the gates. The fencing around the Project Substation and the BESS will be a 6-foot above grade chain-link fence and include one foot of barbed wire on top to comply with the National Electric Safety Code (NESC). This fencing will be designed to prevent the public from gaining access to electrical equipment which could cause injury or death.

2.1.2.8 ACCESS ROADS

Although the total length of access roads will depend upon final site design, the preliminary layout of the solar facility anticipates approximately 21.2 acres of graveled access roads. The BESS and project substation would share approximately 0.3-mile of gravelled access roads. These roads will be used for operations and maintenance activities and would provide emergency access should any incidents occur. Access roads will be up to 16 feet wide where straight and may temporarily widen to approximately 45 feet along curves and at internal road intersections during construction to accommodate large construction equipment. The preliminary Project design contemplates 13 access points to the Solar Facility from existing public roads and one access point to the BESS and Project Substation from McCall Avenue to each facility. All entrances to the Solar Facility and BESS will be secured with locked gates.

2.1.2.9 Stormwater Ponds

The preliminary design for the Project includes 13 stormwater ponds throughout the Land Control Area that will comprise 28.3 acres of the Site. These stormwater basins are generally located in existing low areas. As noted in the Draft Vegetation Management Plan (included as **Appendix E** of this EA), the area within the stormwater basins will be vegetated with a wet seed mix that will help stabilize soils after rain events.

2.1.2.10 Weather Stations

The Solar Facility and BESS will have up to six weather stations that will be up to 20 feet in height. Weather stations will be within the Preliminary Development Area, and the final locations will be determined during final engineering design.

2.1.3 How would the project be constructed?

Summit Lake anticipates that construction of the solar facility will begin in 2026 with an in-service date of late 2028. This section summarizes construction activities. Unless otherwise noted, this summary has been adapted from the Draft Agricultural Impact Mitigation Plan (AIMP) of the joint site permit application.

Summit Lake anticipates that construction will begin in 2026 to meet an in-service goal of late 2028. The actual construction schedule is dependent upon permitting, final design, delivery of equipment, and workforce availability.

Construction will begin after all necessary permits and approvals have been received, including a Large Generator Interconnection Agreement from MISO for the BESS (the solar facility already has an executed Generaor Interconnection Agreement). Project construction will begin with workforce mobilization and the initial site preparation including vegetation removal and grading. Construction will likely take place over two construction seasons. Summit Lake anticipates approximately eleven laydown yards on 5.4 acres of the project area. The Applicants anticipate grading approximately 1,482 acres of Site for development of the PV facility and the BESS¹⁷.

Typical construction equipment will be used for the project – scrapers, bulldozers, dump trucks, motor graders, vibratory compactors, watering trucks, and backhoes. Additional specialty equipment could include a skid steer loader, pile driver, concrete truck and boom truck, a high reach bucket truck, a medium duty crane, all-terrain forklift, and a truck-mounted auger or drill rig. Upon completion of construction, heavy equipment will be removed from the project site.

The Applicants estimate that for several weeks – during delivery of the trackers and solar panels – there will be between 10 and 20 semi-truck deliveries daily. Traffic will decrease once these components are delivered. Traffic volume during construction will predominantly come from worker travel to the construction site.

The Applicants estimate that the project will create approximately 200 temporary jobs for construction and installation phases, and three permanent full-time jobs for the project operation phase.

¹⁷ Applicants, Draft Agricultural Impact Mitigation Plan, eDockets No. [20252-215674-08](#)

ACCESS ROADS

As a component of earthwork, permanent access roads and permanent turnouts will be developed. This work will start with the stripping and segregating of topsoil materials from the anticipated 16-foot-wide road width. Topsoil removed from permanent access roads will be removed to suitable locations near the site of removal and spread across existing topsoil for storage. Storage locations will be identified and recorded on site maps to facilitate final reclamation after decommissioning. The subgrade materials will be compacted 16-foot-wide to the specified compaction requirements as laid out by the civil and geotechnical engineer. After compaction is reached and verified, the road will be installed, typically done with or without geo-fabric depending on the soil type, and then, with a surface of 4 to 12 inches of gravel. The gravel will be placed level with the existing grade to facilitate drainage and minimize ponding.

After gravel is installed and compacted, drainage ditches will be shaped as identified on the final grading plan. Finally, the previously stripped and windrowed topsoil material will be re-spread throughout Solar Facility.

SOLAR ARRAYS

Once grading activities are complete, the racking system supports will be constructed using steel piles driven into the ground. The solar facilities will be constructed in blocks, and multiple blocks could be constructed simultaneously. Construction of the blocks will include pre-positioning and driving piles; mounting the tracking rack system to the piles; pre-positioning of panels; mounting panels to the tracking rack system; the completion of electrical connections, terminations and grounding; and installation of cable management systems. In some situations where soils are low strength or consist of loose, non-cohesive sand, helical screw or auger-type foundation posts may be used. Helical screw or auger-type foundation posts are not anticipated; however, final determinations will be made after the geotechnical work is completed. Foundations are typically steel and are used where high load bearing capacities are required. The pile is driven using a hydraulic ram that moves along tracks and is operated by two workers. Soil disturbance will be restricted to the hydraulic ram/screw machinery, about the size of a small tractor, temporarily disturbing soil at each pile insertion location and while driving between drilling locations.

The remainder of the tracking rack system will be installed by construction crews using hand tools and all-terrain tracked equipment to distribute materials. Array racking will be bolted on top of the foundation piling to create a “rack” to which the solar panels can be fastened.

During array and racking assembly, multiple crews and various types of vehicles will be working within the project area. To the extent practicable, vehicular traffic will be limited to permanent and temporary access roads to minimize soil disturbance, mixing, and compaction; however, vehicular traffic will occur off of roads throughout the Project during construction. Off-road construction vehicles include flatbed trucks for transporting array components, small all-terrain vehicles, rough-terrain forklifts and skid-steers, and pick-up trucks for transporting equipment and workers throughout the project area. Panels will be staged in advance throughout the project area and brought to specific work areas for installation by trailers pulled by small tractors or by all-terrain tracked equipment. The solar panels will be installed by multiple crews using hand tools. Installation crews

Chapter 2

Proposed Project

will proceed in serpentine fashion along staked temporary access roads in a pre-established route to minimize off-road traffic.

ELECTRICAL COLLECTION SYSTEM

Collection cables may be installed in a below-ground system or hybrid above-ground / below-ground system (see Section 4.1.1.2). Directional boring will be used during construction if the electrical collection and communication lines are located within wetlands and the lines will be located below-ground. In addition, electrical cables connecting blocks of solar arrays will be directionally bored under public roadways

A below-ground collection system will involve the installation of all cables in trenches or ploughed into place at a depth of at least four feet below grade. During trench excavation, the topsoil and subsoil will be removed and stockpiled separately. Once the cables are laid in the trench, the area will be backfilled with subsoil followed by topsoil.

If a hybrid option is selected and above-ground cabling is utilized, the DC collection cables will be strung under each row of panels on steel arms and a steel cable attached to the piles. At the end of each row, hanging brackets would connect several racks/rows of cables to a common collection point near their assigned inverter/transformer skid where the cables will be routed below-ground at a minimum depth of at least four feet below grade to the inverter/transformer skid where the current is converted to AC and voltage is stepped up to 34.5 kV. From the inverter/transformer skid, the AC collection would be installed below ground to the Project Substation, as described above for the below-ground collection system.

The electrical collection system will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement will help determine the construction method for the electrical collection system.

PROJECT SUBSTATION

Construction work within the project substation site will include site preparation and installation of substructures and electrical equipment. Installation of concrete foundations and embedment for equipment will require the use of trenching machines, concrete trucks and pumpers, vibrators, forklifts, boom trucks, and large cranes. Above-ground and below ground conduits from this equipment will run to a control enclosure that will house the protection, control, and automation relay panels. A station service transformer will be installed for primary AC power requirements. Batteries and battery chargers will be installed inside the enclosure for auxiliary power to the switchyard's control system. Crushed rock will cover the area of the project substation and adequate lighting will be installed around the project substation for worker safety during construction and operation.

One of two methods will be used to install project substation foundations. Option 1 would be to use a small rubber tire backhoe to dig out major foundations prior to pouring the concrete slabs. Option 2 would use an auger/drill type machine for minor foundations.

In both scenarios, the limit of disturbance will be within the footprint of the project substation for both the foundation equipment and the concrete delivery trucks. All topsoil from the project

Chapter 2

Proposed Project

substation footprint will be removed to a pre-established suitable location for storage. The storage area will be near the site where the soil was removed and graded to facilitate revegetation. Subsoil will be removed, if necessary, to an acceptable pre-established and approved area for storage where the subsoil will be stabilized and remain undisturbed. After decommissioning, subsoil will be returned to the area from which it was excavated.

BESS

Construction of the BESS will begin with grading and site leveling. Topsoil will be segregated and placed in a designated location. Summit Lake does not anticipate soil removal for construction of the BESS due to the existing, relatively flat topography.

Site preparation will include installation of substructures and electrical equipment. Installation of concrete and steel pile foundations and embedment for equipment will require the use of trenching machines, excavators, concrete trucks, pumpers, vibrators, forklifts, and cranes. Medium-voltage cables will be installed below ground between the power conversion systems and the Project Substation. The BESS will include individual BESS containers, inverters (or power conversion systems), switchboards, low voltage cabling, medium voltage switchgear, a junction box, and medium voltage transformers. A fire alarm system will be integrated into each BESS container to help identify and communicate any alarms and give proper notification to the operations team.

Each equipment enclosure (power conversion system and BESS containers) will be installed on a foundation designed to support its weight based on regional soil conditions. These foundations will either be steel-reinforced concrete slabs or steel pile foundations. For BESS foundations, a small excavator would be used to dig the major foundation areas before pouring the concrete slabs. For Steel Pile Installation, a pile driver embeds steel piles to create a foundation for the enclosures.

The power conversion system and BESS containers will be transported to the site on flatbed semi-trailers and placed on the foundations using an overhead crane. The containers will then be secured and fastened to the concrete pads and steel piles with anchor bolts. Crushed rock will be placed between and around installed BESS equipment. Adequate lighting will be installed around the BESS site for worker safety during construction and operation. Lighting will be downlit and controlled via timers, sensors, and switches to limit light usage to the extent necessary to meet safety and security requirements.

STORMWATER DRAINAGE

Summit Lake indicates that it will use a permanent stormwater management system throughout the life of the project to protect and enhance the quality of surrounding surface and sub-surface waters by removing water volume, excess nutrients, sediment, and pollutants from stormwater runoff before leaving the project site. The permanent stormwater management system will utilize natural infiltration resulting from 55 permanent stormwater basins and vegetation beneath the solar panels to prevent and minimize the negative effects of stormwater runoff. Stormwater basins will be vegetated with wet seed mix in accordance with the Draft Vegetation Management Plan (**Appendix E**) and maintained in an herbaceous state for the life of the Project. These basins will be designed to capture, route, and treat stormwater runoff for volume control and water quality per Minnesota's Construction Stormwater General Permit. A construction stormwater permit and associated

Chapter 2

Proposed Project

Stormwater Pollution Prevention Plan (SWPPP) will be developed prior to construction and implemented during construction.

FENCING

Permanent security fencing will be installed along the perimeter of the solar arrays and preliminary development area. Additional gates will be strategically installed at corners for deer egress and contact information for the site manager will be posted at the gates. The fencing around the solar facility will consist of an agricultural woven wire fence and will extend approximately seven feet above grade. In place of barbed wire, one foot of three to four strands of smooth wire will be placed atop of the woven wire fence for a total height of approximately eight feet above grade. Gates will be strategically installed at corners for deer egress and contact information for the site manager will be posted at the gates.

The project will also include interior fencing around the project substation and the BESS, which will be a 6-foot above grade chain-link fence that will include one foot of barbed wire on top to comply with the NESC.

RESTORATION

As portions of the project near completion, temporary staging and laydown areas and other temporary disturbance areas within the Preliminary Development Area will be restored in accordance with the VMP. Topsoil will be spread and the project will be graded to natural contours, where possible, and soil will be de-compacted in accordance with the project AIMP. Summit Lake anticipates that the post-construction clean-up and site restoration activities will take approximately two to four months.

Disturbed areas will be reseeded and re-vegetated with specific seed mixes in accordance with the site-specific Vegetation Management Plan and the SWPPP. Seed mixes will be designed to be used with the vegetation management practices of periodic mowing, grazing, and selective spot herbicide applications. All areas that will not contain permanent facilities (i.e., area under the arrays, the laydown yards, and the stormwater basins) will be stabilized with erosion control measures, such as silt fence, sediment control logs, temporary seeding, and mulching as needed until permanent vegetation has been established. Additionally, a temporary cover crop will be planted with the perennial seed mixes to stabilize the soil and prevent erosion during the time it takes for the seeds to establish.

The Applicants anticipate that the short-term establishment practices will occur from years 0 through 5, with long-term maintenance practices occurring from year 6 onward. Vegetation is expected to be fully established during the sixth growing season after native seed mix is planted. The long-term goal is to vegetate 95 percent of the Project site with at least 90 percent of the species being native. Additional short- and long-term goals are discussed within the VMP. Mechanical removal and selective spot herbicide treatments may be used to treat certain biennial and perennial noxious weeds and woody species. The Applicants will coordinate with the Minnesota Interagency Vegetation Management Planning Working Group in finalizing the VMP.

Chapter 2

Proposed Project

2.1.4 How would the solar facility be operated and maintained?

Following commissioning and commercial operation, the care, custody, and control of the facility will transfer from the construction team to the operations staff. Operations staff will have full responsibility for the facility to ensure operations and maintenance are conducted in compliance with approved permits, prudent industry practice, and the equipment manufacturer's recommendations. Primary tasks include scheduled monthly and quarterly inspection(s) of electrical equipment, vegetation management, and snow removal on access drives.

The expected service life of the solar facility and BESS is 30 years. At the end of 30 years, should Summit Lake desire to extend operations it would apply for amendments to the site permits to allow continued operation of the solar facility and BESS. Should Summit Lake decide to continue operation, a decision would be made as to whether existing equipment could be used or upgrades with newer technologies are required.

The solar facility and BESS will be operated and maintained in tandem, using the same staff. It is estimated that three to four full-time permanent positions will be required to operate and maintain the solar facility and one to two full-time permanent positions to operate and maintain BESS. A maintenance plan will be created for both facilities to ensure safe and efficient performance, including a scheduled check of the main items and a predictive maintenance approach of the devices subjected to derating / degradation. Derating / degradation refers to the known process of components losing some efficiency or otherwise degrading over the course of the Project life cycle. Like all technology and physical components, a certain amount of this is unavoidable, and Summit Lake will plan for it and maintain the facility as needed.

Maintenance activities will be performed during the day to the extent that they do not disrupt energy production. Approved technicians will service the BESS units and associated equipment once per month. A performance audit and inspection to assess the quality of equipment will be conducted annually. If any equipment needs to be replaced before the Projects' end-of-life, the Applicants will reuse, recycle, or dispose of equipment in accordance with applicable regulations and best management practices.

An O&M building will include areas for the storage of the spare parts and the tools required for maintaining project facilities. The facilities will be operated through a real-time control system for most operations functions.

Performance monitoring will use a real-time and continuous collection of data acquired by the onsite meteorological station, energy meter, and SCADA. The SCADA system provides data on solar energy generation and production, availability, meteorology, and communications. The solar modules will communicate directly with the SCADA system for remote performance monitoring, energy reporting, and troubleshooting. Operators will be notified immediately of any abnormalities allowing for timely corrective action regardless of time of day.

The BESS will have a Battery Management System that will allow automated monitoring and managing of the batteries to ensure design performance, as well as provide control for the charging/discharging of the batteries along with temperature monitoring and control of the individual battery cell temperature with an integrated cooling system.

Chapter 2

Proposed Project

Performance monitoring of the Solar Facility and BESS will consist of a weekly or monthly download of the data acquired by the onsite meteorological stations, SCADA system, and the Battery Management System.

Table 2.1.4-1: Regular Operations and Maintenance Tasks

Equipment	Task	Frequency
Solar Modules	Photovoltaic Panels visual check	Once Yearly
	Wirings and junction boxes visual check	Once Yearly
	Photovoltaic strings measurement of the insulation	Once Yearly
	Advanced diagnostics	
	Overview aerial thermal scan	Once Yearly
	Photovoltaic strings and string boxes faults	Once Yearly
	Photovoltaic panels washing	No regular washing planned (only as site-specific conditions warrant)
	Vegetation Management (if necessary at site)	Up to three times a year depending on site conditions
BESS	System Visual Inspection	Quarterly
	Filter Inspection	Quarterly
	Fire Safety system Inspection and Maintenance	Once Yearly
Electric Boards	Case visual check	Once Yearly
	Fuses check	Once Yearly
	Surge arresters check	Once Yearly
	Torque check	Once Yearly
	DC voltage and current check	Once Yearly
	Grounding check	Once Yearly
Inverters	Case visual inspection	Once Yearly
	Air intake and filters inspections	Once Yearly
	Conversion stop for lack of voltage	Once Yearly
	AC voltage and current check	Once Yearly
	Conversion efficiency inspection	Once Yearly
	Datalogger memory download	Once Yearly
	Fuses check	Once Yearly
	Grounding check	Once Yearly

2.1.5 What happens at the end of the solar facility's useful life?

As the project progresses through its service life, the Applicants may seek to repower the project. The Applicants' decision on whether to pursue repowering will consider the equipment performance,

Chapter 2

Proposed Project

maintenance costs, extending the useful life of the project, or a desire to increase generation output. Any site permit issued by the Commission will specify the maximum generating capacity, so if the generation capacity increases, the existing site permit or permits must be amended. At the end of the project's useful life, Summit Lake will either take the necessary steps to continue operation of the project (re-permitting and retrofitting) or will decommission the project.

Commission-issued site permits require that the permittee be responsible for removing all project components and restore the site to pre-construction conditions at the end of a project's useful life and that the permittee is responsible for all costs associated with decommissioning the project. Summit Lake provided a draft decommissioning plan as Appendix G of its joint site permit application.

If the project is not repowered, Summit Lake will decommission the project and remove the project facilities. Decommissioning would include removal of the solar arrays (panels, racking, and steel posts), inverters, fencing, access roads, and lighting. Above-ground electrical and communications cabling would be removed; below-ground cabling would be removed to a depth of four feet.

Summit Lake anticipates that the total estimated cost to decommission the project is approximately \$23,593,198. Estimated salvage/scrap value is approximately \$39,457,909, offsetting the cost resulting in \$15,864,800 in surplus. The decommissioning bond will be posted no earlier than the tenth anniversary of operation. The cost of decommissioning will be updated every five years after the tenth year of operation.

2.2 Project Costs

Summit Lake estimates the total cost to construct the project to be approximately \$510 million (**Table 2.2-1**). Summit Lake indicates that this cost depends on various factors such as construction labor, project equipment and materials, electrical and communication systems, taxes/tariffs, and final design considerations. Actual costs will depend on final material and labor costs, and salvage value from decommissioning.

Table 2.2-1: Estimated Project Cost Ranges

Project Component	Estimated Cost (\$USD millions)
Solar Facility	
Engineering, Procurement and Construction Contractor	330 - \$396
Development Expense	\$9 - \$13
BESS Facility	
Engineering, Procurement and Construction Contractor	70
Development Expense	3-4
Solar Facility and BESS	
Interconnection	8 - 9.5
Financing	5-7
Project Gen-Tie Line	0.6 – 0.8
Total Installation Cost	510
Decommissioning	23.6
Salvage Value	(39.5)
Total Project Cost	525.9

2.3 Project Schedule

Summit Lake anticipates the project will begin commercial operation by the end of 2028. **Table 2.3-1** shows Summit Lake’s estimated development and construction milestones.

Table 2.3-1: Anticipated Project Schedule

Activity	Anticipated Timeframe
Land Acquisition	Completed prior to application
MISO Interconnection Agreement	Completed for solar facility, in progress for BESS
Commission Site Permit	Q3 2026
Downstream Permits	Prior to construction
Equipment Procurement and Contractor Selection	2026
Construction	Q4 2026 to Q4 2028
Testing and Commissioning	Q4 2028
Commercial Operation Date	Q4 2028

3 Regulatory Framework

Chapter 3 discusses the site permitting process used by the Commission. It describes the environmental review process and lists the factors the Commission considers when making a site permit decision. This chapter also discusses required approvals from federal and state agencies and local units of government with permitting authority for actions related to the project. Lastly, it lists topics outside the scope of this EA.

3.1 What Commission approvals are required?

The project requires two site permits from the Commission before it can be constructed.

The project requires an energy generating site permit from the Commission because it meets the definition of a *large electric power generating plant*, which means any electric power generating equipment designed for or capable of operation at a capacity of 50 MW or more.¹⁸ The project also requires an energy storage site permit because it meets the definition of an *energy storage system*, which means equipment and associated facilities designed with a nameplate capacity of 10 MW or more that is capable of storing generated electricity for a period of time and delivering the electricity for use after storage.¹⁹ The Solar Facility is exempt from Certificate of Need requirements because it is a solar energy generating system and is being developed and permitted by an independent power producer.²⁰ In addition, a Certificate of Need is not required for energy storage systems.²¹ Therefore, a Certificate of Need is not required for the proposed Solar Facility or BESS.

3.2 What is environmental review?

Environmental review informs interested persons about potential impacts and possible mitigation measures associated with the project; environmental review informs Commission decisions.

Minnesota law requires that potential human and environmental impacts be analyzed before the Commission decides whether to grant site permits. This analysis is called environmental review. Environmental review for this project requires preparation of an EA and a public hearing.²²

3.3 What permitting steps have occurred to date?

The Commission accepted the joint site permit application as complete on April 8, 2025, 2024. Public information and scoping meetings were held in Worthington, Minnesota on May 22, 2025, and online on May 21, 2025. An amended application was submitted on December 18, 2025 to reflect changes to the preliminary site layout, notably a move of the BESS facility farther from Reading.

¹⁸ Minnesota Statutes [216E.01](#), subd. 5.

¹⁹ Minnesota Statutes [216E.01](#), subd. 3.

²⁰ Minnesota Statutes 216B.243, subd. 8(a)(7).

²¹ Minnesota Statutes 216B.243, subd. 8(9).

²² Minnesota Statutes [216E.04](#), subd. 1 and 5; Minn. R. [7850.3700](#), subp. 1. Applicants are free to elect the alternative process if their project qualifies for it.

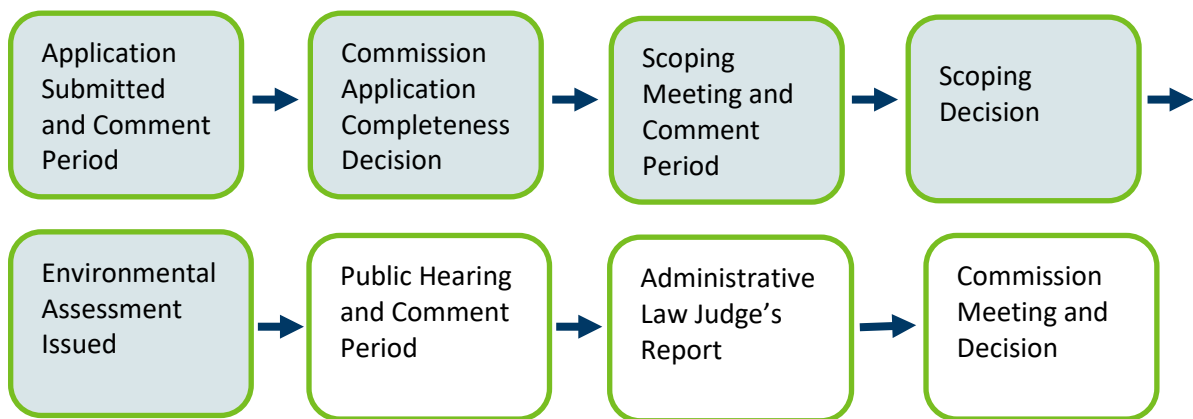
APPLICATION FILING AND ACCEPTANCE

Summit Lake provided the required written notice of its intent to file a joint site permit application on February 5, 2025.²³

Summit Lake filed a joint site permit application on February 21, 2025.²⁴ The Commission accepted the joint site permit application as substantially complete in its order dated April 8, 2025.²⁵ The order also referred the matter to the Office of Administrative Hearings for appointment of an administrative law judge (ALJ) to conduct a public hearing for the project.

Graphic 3.3-1 outlines the permitting process as it has unfolded for this project.

Graphic 3.3-1: Permitting Process Summary



SCOPING PROCESS

Scoping is the first step in the environmental review process. It helps focus the EA on the most relevant information needed by the Commission to make informed decisions.

Scoping includes a public meeting and comment period that provide opportunities for interested persons to help develop the scope (or contents) of the EA.²⁶ The purpose of the public information and scoping meetings is to provide information and answer questions about a proposed project and the permitting process. The meeting and associated comment period also provides an opportunity to gather input regarding potential impacts and mitigative measures that should be studied in the EA.

²³ Summit Lake, Notice of Intent to Submit a Joint Site Permit Application under the Alternative Permitting Process Docket Nos. IP-7153/GS-25-89 and IP-7153/ESS-25-88, February 5, eDockets No. [20252-215005-01](#).

²⁴ Application, February 21, 2025, eDockets No. 20252-215674-01 (through -14).

²⁵ Commission, *Order*, April 8, 2025, eDockets No. [20254-217358-01](#)

²⁶ Minn. R. [7850.3700](#), subp. 2.

Chapter 3

Regulatory Framework

On May 7, 2025, the Commission issued a joint *Notice of Public Information and Environmental Assessment Scoping Meeting* and associated public comment period.²⁷ The notice was sent to those individuals on the project contact list and was also available on Commerce’s webpage for the project.

Commission staff held public information and scoping meetings in in Worthington, Minnesota on May 22, 2025, and an online meeting on May 21, 2025. The comment period closed on June 5, 2025. Approximately 90 people attended the Worthington meeting and fourteen attendees provided public comment. There were no public comments at the online meeting.²⁸ Written comments were received from two state agencies and eleven members of the general public.²⁹

SCOPING DECISION

The scoping decision identifies the issues studied in this EA.

After considering public comments and recommendations by staff, an EA scoping decision was issued on July 17, 2025. An amended scoping decision was issued on January 22, 2026, to acknowledge changes to the site layout proposed by the Applicants (**Appendix B**). The amended scoping decision identifies the issues to be evaluated in this EA.

3.4 Are other permits or approvals required?

Yes, other permits and approvals are required for the project.

A site permit from the Commission is the only state permit required for siting the project. However, various federal, state, and local approvals might be required for activities related to construction and operation of the project. These subsequent permits are referred to as “downstream” permits and must be obtained by the permittee prior to construction.³⁰ **Table 3.4-1** lists potential downstream permits that might be required, several of which are discussed below.

Table 3.4-1: Potential Downstream Permits

Government Agency	Permit	Applicability	Anticipated for project
Federal			
U.S. Army Corps of Engineers	Section 404 Permit for Wetland Impacts	Dredging or filling jurisdictional waters of the United States	Possible
U.S. Environmental Protection Agency	Spill Prevention, Control and Countermeasures Plan	Required if any facility associated with the Project has oil storage of more than 1,320 gallons	Possible
U.S. Fish and Wildlife Service	Threatened and Endangered Species Consultation	Required if federally listed species are identified as potentially	Possible

²⁷ Commission and Commerce *Notice of Public Information and Environmental Review Scoping Meeting*, May 7, 2025, eDocket ID: [20255-218664-01](#).

²⁸ Oral Comments on the Scope of Environmental Assessment, eDockets No. [20256-219916-01](#).

²⁹ Written Comments on the Scope of Environmental Assessment, eDocket ID: [20256-219917-01](#).

³⁰ Appendix C, Section 4.5.2 (stating the permittee “shall obtain all required permits for the project and comply with the conditions of those permits”).

Chapter 3
Regulatory Framework

Government Agency	Permit	Applicability	Anticipated for project
		present in the vicinity of the project area	
State			
Department of Natural Resources	License to Cross Public Lands and Waters	Required for utility line crossings of all Public Waters Watercourses and Basins, or Public Waters Wetlands on MDNR-administered lands.	No
	State Threatened and Endangered Species Consultation	Required if state listed species or other protected resources are identified as potentially present in the vicinity of the project area.	Yes
	Water Appropriation Permit	Required if water withdrawals will occur via well or surface water	Yes
	Work in Public Waters	Required for work within Public Waters Wetlands on Private Lands.	No
Minnesota Pollution Control Agency	Construction Stormwater Permit	Required for stormwater discharges from construction activities with disturbances greater than one acre	Yes
	Section 401 Clean Water Act – Water Quality Certification	Required for filling in jurisdictional waters of the United States	Possible
State Historic Preservation Office	National Historic Preservation Act Section 106 Consultation	Required to prevent impacts to significant cultural resources	Yes
Department of Agriculture	Agricultural Impact Mitigation Plan	Establishes measures for protection of agricultural resources	Yes
Department of Transportation	Utility Accommodation on Trunk Highway ROW Permit	Installing utilities along, across, or within trunk highway right-of-way	Yes
	Oversize/Overweight Permit	Required if vehicles delivering equipment, materials, and supplies will exceed applicable MNDOT height/length limits or weight limits.	Yes
	Access (Driveway) Permit	Required for construction of access roads utilizing MNDOT rights-of-way	Yes
Local			
Nobles County	Septic Permit	Required prior to installation of any septic system in Nobles County.	Possible
	Spring Weight Restrictions	Load weight restrictions on county road system during spring thaw as shown on map. Map is updated annually.	Possible

Chapter 3

Regulatory Framework

Government Agency	Permit	Applicability	Anticipated for project
	Driveway or Entrance Permit	Required for access from county roads.	Yes
	Utility Permit	Required to place facilities within public road right-of-way and/or across public drain tile	Possible
	Moving Permit	Required for overweight or overwidth loads.	Possible
	Intersection Widening Permit	Required if any intersections need to be widened to support the Project' construction.	Possible
	Petition to realign public drain tile	Required if any public drain tile need to be realigned	Yes
Nobles County Soil and Water Conservation District (SWCD)	Minnesota Wetland Conservation Act Approval	Activities affecting water resources	Possible

3.4.1 Federal

The United States (U.S.) Army Corps of Engineers (USACE) “regulates the discharge of dredged or fill material into waters of the United States, including wetlands.”³¹ Dredged or fill material, including material that moves from construction sites into these waters, could impact water quality. A permit is required from USACE if the potential for significant adverse impacts exists. The USACE is also charged with coordinating with Indian tribes regarding potential impacts to traditional cultural properties.

The U.S. Environmental Protection Agency (USEPA) enforces the Spill Prevention, Control and Countermeasures (SPCC) rule. The purpose of this rule is to help facilities prevent a discharge of oil or other hazardous materials into navigable waters or adjoining shorelines. The SPCC rule requires facilities to develop, maintain, and implement an oil spill prevention plan, called an SPCC Plan (SPCCP). If a plan is required for this project, it would help prevent spillage of hazardous materials, as well as control a spill should one occur. This plan may be required for power transformers within the project substation.

A permit is required from the U.S. Fish and Wildlife Service (USFWS) for the incidental taking³² of any threatened or endangered species. As a result, the USFWS encourages project proposers to consult with the agency to determine if a project has the potential to impact federally listed threatened or endangered species. Additionally, consultation can lead to the identification of measures to mitigate potential impacts associated with the project.

³¹ USEPA, *Section 404 Permit Program*, (2015), <http://www.epa.gov/cwa-404/section-404-permit-program>.

³² [16 U.S. § 1532\(19\)](#) (defining “take” to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct).

Chapter 3

Regulatory Framework

3.4.2 State

Potential impacts to state lands and waters, as well as fish and wildlife resources, are regulated by the DNR. Licenses are required to cross state lands or waters.³³ Projects affecting the course, current, or cross-section of lakes, wetlands, and streams that are public waters may require a *Public Waters Work Permit*.³⁴ Utility infrastructure that will be crossing DNR managed lands require the agency to provide a Utility Crossing License.³⁵ Not unlike the USFWS, DNR encourages project proposers to consult with the agency to determine if a project has the potential to impact state-listed threatened or endangered species. Additionally, consultation can lead to the identification of measures to mitigate potential impacts associated with the project.

Construction projects that disturb one or more acres of land require a *National Pollutant Discharge Elimination System (NPDES) / State Disposal System Construction Stormwater Permit* (CSW permit) from the MPCA. This permit is required to prevent stormwater pollution during and after construction. The CSW permit requires use of best management practices, development of a Stormwater Pollution Prevention Plan (SWPPP), and adequate stormwater treatment capacity once the project is complete. Projects must be designed so that stormwater discharged after construction does not violate state water quality standards. Specifically, projects with net increases of one acre or more to impervious surface must be designed to treat water volumes of one-inch times the net increase in impervious surface. PV panels are impervious, and are counted towards total impervious surface along with access roads, buildings, etc. The area beneath the panel, however, is pervious if properly vegetated. To account for this, MPCA developed a solar panel calculator that estimates the amount of stormwater retained by PV solar facilities. This amount can be applied as a credit towards the total amount of stormwater treatment needed for a project.³⁶

A Clean Water Act Section 401 *Water Quality Certification* from MPCA may also be required. Section 401 of the Clean Water Act requires any applicant for a federal license or permit to conduct an activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State in which the discharge originates that the discharge complies the applicable water quality standards.³⁷ The certification becomes a condition of the federal permit.

Additionally, MPCA regulates generation, handling, and storage of hazardous wastes.

The State Historic Preservation Office (SHPO) is charged with preserving and protecting the state's historic resources. SHPO consults with project proposers and state agencies to identify historic and archaeological resources to avoid and minimize impacts to these resources.

The Minnesota Department of Agriculture (MDA) ensures the integrity of Minnesota's food supply while protecting the health of its environment and the resources required for food production. MDA

³³ Minnesota Statutes [84.415](#).

³⁴ DNR, *Requirements for Projects Involving Public Waters Work Permits*, (n.d.), http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/requirements.html.

³⁵ DNR, *Utility Crossing License*, (2023), https://www.dnr.state.mn.us/permits/utility_crossing/index.html.

³⁶ MPCA, *Minnesota Stormwater Manual*, (2022), <https://www.pca.state.mn.us/water/minnesotas-stormwater-manual>.

³⁷ MPCA, *Clean Water Act Section 401 Water Quality Certifications*, (n.d.), <https://www.pca.state.mn.us/water/clean-water-act-section-401-water-quality-certifications>.

Chapter 3

Regulatory Framework

assists in the development of agricultural impact mitigation plans that outline necessary steps to avoid and mitigate impacts to agricultural lands.

A permit from the Minnesota Department of Transportation (MnDOT) is required for construction, placement, or maintenance of utility lines adjacent or across trunk highway rights-of-way.³⁸ Coordination would be required to construct access roads or driveways from trunk highways.³⁹ These permits are required to ensure that use of the right-of-way does not interfere with free and safe flow of traffic, among other reasons.⁴⁰

The Board of Water and Soil Resources (BWSR) oversees implementation of Minnesota's *Wetland Conservation Act* (WCA). The WCA is implemented by local units of government.

3.4.3 Local

Nobles County local permits and approvals may be required as a component of this project, including:

- **A Moving** Permit to transport oversized and overweight loads on county roadways,
- **Driveway or Entrance** Permits in order to move, widen or create a new driveway access to county roads.
- **Spring Weight Restrictions** approval in order to ensure adherence to load weight restrictions on county road systems during spring thaw.
- **An Intersection Widening** Permit for the widening of intersections to support project construction.
- **An approval of a Drain Tile Reroute and Abandonment Plan** to re-align or abandon portions of county drain tile.
- **A Utility** Permit in order to install a utility within the highway right-of-way and / or across public drain tile.
- **A Septic** Permit which must be given prior to the installation of any septic system in Nobles County.

Commission site permits preempt local zoning, building, and land use rules, regulations, or ordinances promulgated by regional, county, local, and special purpose government; however, coordination with local governments may be required for the issues listed below:

- **Access road and driveway** coordination may be required to construct access roads or driveways from county or township roads.
- **Weight restriction** coordination may be required to move prevent damage to county road systems by heavy loads, particularly in the spring.
- **An approval of The Applicants' petition to realign or remove public drain tile will be required from the Nobles County Board of Commissioners to make changes to public drain tile systems.**

³⁸ Minnesota Rules, Part [8810.3300](#), subp. 1.

³⁹ MnDOT, *Land Management*, (2022), <https://www.dot.state.mn.us/utility/forms.html>.

⁴⁰ MnDOT, *Utility Accommodation on Trunk Highway Right of Way: Policy OP002*, (2017), <http://www.dot.state.mn.us/policy/operations/op002.html>.

Chapter 3

Regulatory Framework

3.5 Do electrical codes apply?

Yes, if constructed the project must meet electrical safety code requirements.

The project must meet requirements of the National Electrical Safety Code (NESC).⁴¹ These standards are designed to safeguard human health “from hazards arising from the installation, operation, or maintenance of conductors and equipment in electric supply stations and overhead and underground electric supply lines.”⁴² They also ensure that facilities and all associated structures are built from materials that will withstand the operational stresses placed upon them over the expected lifespan of the equipment, provided operational maintenance is performed.

3.6 Are any issues outside the scope of this EA?

Yes, the scoping decision identified several issues that will not be studied.

The EA will not address following topics:

- Any site other than the project site proposed by the Applicants.
- The manner in which participating landowners are compensated for the project.

⁴¹ Minnesota Statutes [326B.35](#) and Minnesota Rules [7826.0300](#), subp. 1; requiring utilities to comply with the most recent edition of the National Electric Safety Code when constructing new facilities or reinvesting capital in existing facilities.

⁴² IEEE Standards Association, *National Electrical Safety Code Brochure*, (2017), https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/nesc_2017_brochure.pdf.

4 Project Impacts and Mitigation

Chapter 4 describes the environmental setting, affected resources, and potential impacts from the project. It also discusses mitigation of potential impacts.

4.1 How are potential impacts measured?

Potential impacts are measured on a qualitative scale based on an expected impact intensity level; the impact intensity level takes mitigation into account.

A potential impact is the anticipated change to an existing condition caused either directly or indirectly by the construction and operation of a proposed project. Potential impacts can be positive or negative, short- or long-term, and, in certain circumstances, can accumulate incrementally. Impacts vary in duration and size, by resource, and across locations.

Direct impacts are caused by the proposed action and occur at the same time and place. An indirect impact is caused by the proposed action but is further removed in distance or occurs later in time. This EA considers direct and indirect impacts that are reasonably foreseeable, which means a reasonable person would anticipate or predict the impact. Cumulative potential effects are the result of the incremental impacts of the proposed action in addition to other projects in the environmentally relevant area.

4.1.1 Potential Impacts and Mitigation

The following terms and concepts are used to describe and analyze potential impacts:

- **Duration** Impacts vary in length. Short-term impacts are generally associated with construction. Long-term impacts are associated with the operation and usually end with decommissioning and reclamation. Permanent impacts extend beyond the decommissioning stage.
- **Size** Impacts vary in size. To the extent possible, potential impacts are described quantitatively, for example, the number of impacted acres or the percentage of affected individuals in a population.
- **Uniqueness** Resources are different. Common resources occur frequently, while uncommon resources are not ordinarily encountered.
- **Location** Impacts are location dependent. For example, common resources in one location might be uncommon in another.

The context of an impact—in combination with its anticipated on-the-ground effect—is used to determine an impact intensity level, which can range from beneficial to harmful. Impact intensity levels are described using a qualitative scale, which is explained below. These terms are not intended as value judgments, but rather a means to ensure common understanding among readers.

- **Negligible** impacts do not alter an existing resource condition or function and are generally not noticeable to an average observer. These short-term impacts affect common resources.

Chapter 4

Project Impacts and Mitigation

- **Minimal** impacts do not considerably alter an existing resource condition or function. Minimal impacts might, for some resources and at some locations, be noticeable to an average observer. These impacts generally affect common resources over the short- or long-term.
- **Moderate** impacts alter an existing resource condition or function and are generally noticeable to the average observer. Impacts might be spread out over a large area making them difficult to observe but can be estimated by modeling. Moderate impacts might be long-term or permanent to common resources, but generally short- to long-term to uncommon resources.
- **Significant** impacts alter an existing resource condition or function to the extent that the resource is impaired or cannot function. Significant impacts are likely noticeable or predictable to the average observer. Impacts might be spread out over a large area making them difficult to observe but can be estimated by modeling. Significant impacts can be of any duration and affect common or uncommon resources.

Also discussed are opportunities to avoid, minimize, or compensate for potential impacts. Collectively, these actions are referred to as mitigation.

- To **avoid** an impact means to eliminate it altogether, for example, by not undertaking parts or all of a project, or relocating the project.
- To **minimize** an impact means to limit its intensity, for example, by reducing project size or moving a portion of the project.
- To **correct** an impact means to repair, rehabilitate, or restore the affected resource.
- To **compensate** for an impact means replacing it or providing a substitute resource elsewhere, or by fixing it by repairing, rehabilitating, or restoring the affected resource. Compensating an impact can be used when an impact cannot be avoided or further minimized.

Some impacts can be avoided or minimized; some might be unavoidable but can be minimized; others might be unavoidable and unable to be minimized, but compensation can be applied. The level at which an impact can be mitigated might change the impact intensity level.

4.1.2 BESS Operating Scenarios

Potential BESS impacts are affected by the operational status of the BESS. For analysis in this EA, three BESS operating scenarios are used to evaluate project impacts. The three scenarios include: Typical, Atypical, and Accident.

The typical operating scenario (typical) describes the normal, intended system behavior during routine charging, discharging, and standby modes. Under these conditions, the BESS operates within manufacturer-specified limits for voltage, temperature, and state of charge, with all monitoring, control, and safety systems functioning as designed. Routine or expected regulatory reporting requirements and maintenance activities are part of the typical BESS operating scenario.

The atypical operating scenario (atypical) involves abnormal but foreseeable conditions that deviate from normal operation, such as component malfunctions, loss of communication, environmental extremes, or single-point equipment failures. These events are generally addressed through automated protective functions, alarms, and controlled shutdowns in accordance with applicable codes and standards and site operating procedures. Regulatory reporting, if required, is typically

Chapter 4

Project Impacts and Mitigation

limited to incident documentation, corrective actions, and notifications to the applicable regulatory authority (Nobles County, MDH, MPCA), without the need for off-site emergency response. Most of the analysis provided in the EA reflects either a typical or atypical operating scenario.

An accident operating scenario (accident) is expected to involve very rare, low-probability events characterized by severe failures such as thermal runaway, fire, explosion, or structural compromise. These scenarios may exceed normal engineering controls and trigger formal emergency response actions, including system isolation, activation of fire suppression systems, and coordination with local fire departments and Nobles County Emergency Management Services. Regulatory involvement may include immediate notification of applicable state and local regulatory authorities, as well as implementation of an emergency action plan, post-incident investigation, and compliance reporting to applicable state and federal agencies in accordance with permitting conditions and emergency response regulations. Environmental effects and related impacts may be greater under the accident scenario, and are discussed, where relevant, throughout the EA.

4.1.3 Regions of Influence

Potential impacts to human and environmental resources are analyzed within specific geographic areas called regions of influence (ROI). This EA uses the following ROIs:

- Land control area (land control of the solar generating facility, BESS facility, and collection corridors)
- Local vicinity (1,600 feet from the boundary of the solar generating facility)
- Project area (one mile from the boundary of the solar generating facility)
- Region (Nobles County)

Impacts to resources may extend beyond these distances but are expected to diminish quickly. ROIs vary between resources. **Table 4.1.2-1** summarizes the ROIs used in this EA. The ROIs are also depicted in **Figure 2 (Appendix A)**.

Table 4.1.2-1: Regions of Influence for Human and Environmental Resources

Resource Type	Resource Element	Region of Influence
Human Settlement	Displacement, Land Use and Zoning	Land control area
	Noise, Property Values, Tourism	Local vicinity
	Aesthetics, Cultural Values, Recreation, Transportation and Public Services	Project area
	Socioeconomics, Environmental Justice	Region

Chapter 4

Project Impacts and Mitigation

Public Health and Safety	Electric and Magnetic Fields, Implantable Medical Devices, Public Safety and Emergency Services	Land control area
Land-based Economies	Agriculture, Forestry, Mining	Land control area
	Tourism	Project area
Archaeological and Historic Resources	—	Project area
Natural Environment	Geology and Groundwater, Soils, Surface Water and Floodplains, Wetlands, Vegetation, Wildlife and Habitat (except birds)	Land control area
	Wildlife and Habitat (birds), Rare and Unique Resources	Local vicinity
	Air Quality	Region

4.2 Environmental Setting

The Project is in a rural area in Nobles County. The Project is located in Summit Lake and Elk Townships and is directly adjacent to the town of Reading. The Land Control Area abuts the municipal boundary of Reading on the east, north, and west sides. The nearest metropolitan area is Sioux Falls, South Dakota, which is approximately 50 miles southwest of the Project. The project area is dominated by agricultural land uses, farmsteads, and residences, some of which are completely surrounded by the project. County State Aid Highway 25 goes through the land control aream and additional county and township roads also bisect the land control area. The Nobles substation is adjacent to the southern portion of the land control area. The Nobles Wind Farm is located southwest of the land control area, the nearest turbine of which is 0.2 mile south of the land control area.

The proposed solar facility is located in Summit Lake and Elk townships, northwest of the city of Worthington in Nobles County, Minnesota. Residences in the area are intermittently located across the landscape, with larger numbers of residences located in the town of Reading, surrounded by the southern portion of the Land Control Area (LCA). Most of the neighboring residences are at least partially surrounded by woodlands or shelterbelts.

The Project is located within the North Central Glaciated Plains Section of the Prairie Parkland Province (251B). The Project is in the Coteau Moraines ecological subsection of this province (251Bb). Prior to Euro-American settlement, vegetation in this region was almost entirely tallgrass prairie, with wet prairies restricted to narrow stream margins and forests similarly restricted to ravines along a streams. The current land use in the project area is predominately agricultural.

Chapter 4

Project Impacts and Mitigation

4.3 Human Settlement

Large energy projects can impact human settlements. Impacts might be short-term, such as increased local expenditures during construction, or long-term, such as changes to viewshed.

4.3.1 Aesthetics

The ROI for aesthetics is the project area. The project will introduce new manmade structures into the existing landscape. Portions of the project will be visible from local roads, and nearby residences. For most people who pass through the project area on Highway 25 or local roads the impact intensity level is expected to be minimal. For individuals with greater viewer sensitivity and familiarity with the land, such as people who live in the project area, the impact intensity level is anticipated to be moderate to significant. Impacts will be short- and long-term and localized. Potential impacts are unavoidable but can be mitigated in part.

Aesthetics refers to the visual quality of an area as perceived by the viewer and forms the impression a viewer has of an area. Aesthetics are subjective, meaning their relative value depends upon the perception and philosophical or psychological responses unique to individuals. Impacts to aesthetics are equally subjective and depend upon the sensitivity and exposure of an individual. How an individual values aesthetics, as well as perceived impacts to a viewshed, can vary greatly.

A viewshed includes the natural landscape and built features visible from a specific location. Natural landscapes can include wetlands, surface waters, distinctive landforms, and vegetation patterns. Buildings, roads, bridges, and power lines are examples of built features.

Viewer exposure refers to variables associated with observing a viewshed, and can include the number of viewers, frequency and duration of views, and view location. For example, a high exposure viewshed would be observed frequently by large numbers of people. These variables, as well as other factors such as viewing angle or time of day, affect the aesthetic impact.

The existing landscape in the project area is rural and agricultural. The topography is generally flat, with elevations ranging from 1,656 to 1,747 feet above sea level. The landscape is dominated by agricultural crop fields, with the surrounding area also supporting a variety of woodlands, wetlands, and drainages.

The existing Nobles Substation is adjacent to the Land Control Area in Section 23, about 0.3 mile northwest of the town of Reading. Several transmission lines interconnect to the Nobles Substation from the west, south, and east. One of these existing transmission lines bisects the Land Control Area in Sections 23 and 24, as it travels east out of the Nobles Substation.

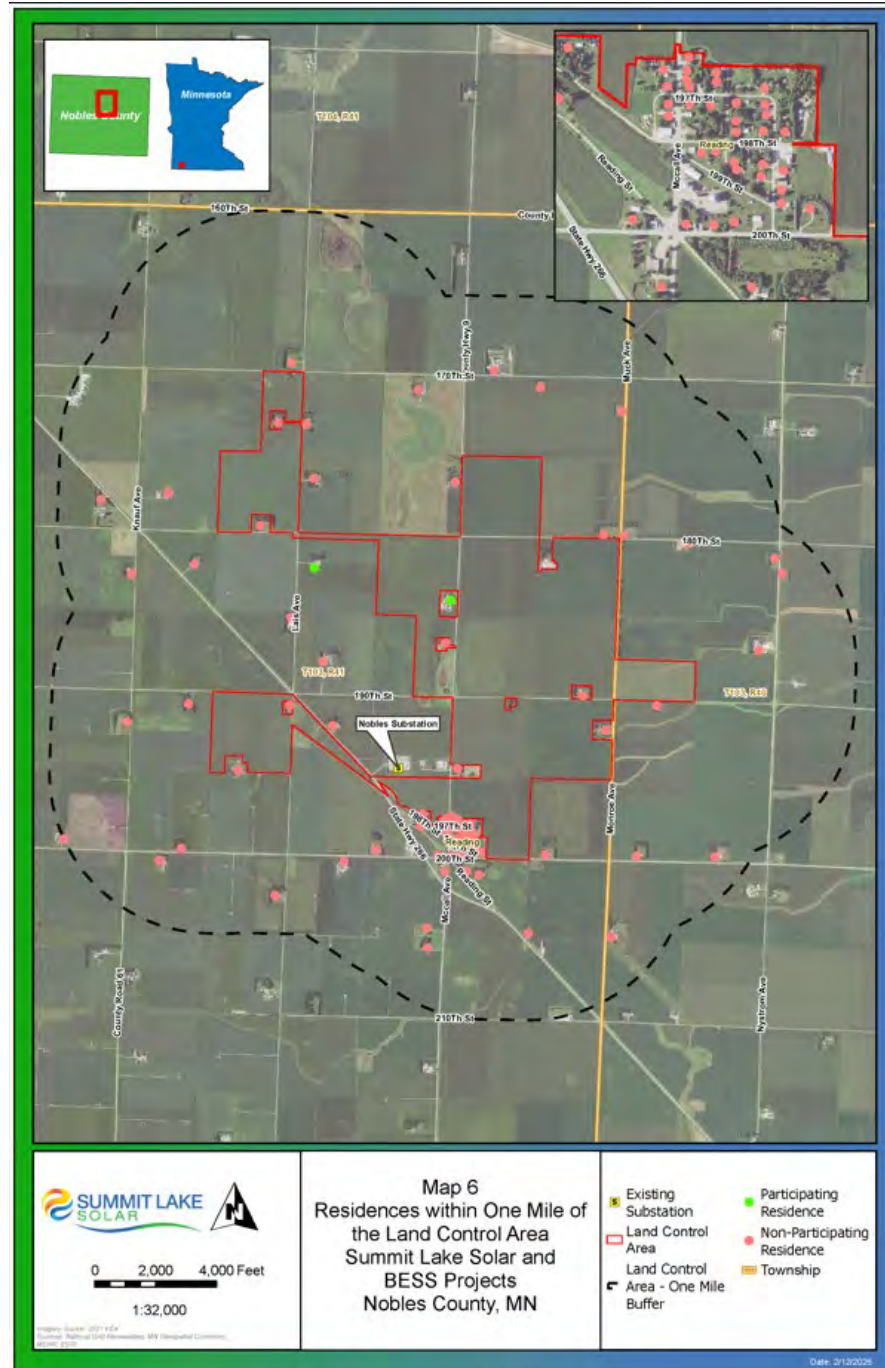
The Nobles Wind Farm is southwest of the Land Control Area. Other than the Nobles Substation and other associated facilities in Section 23, the nearest wind farm facilities are three turbines located between 0.2 and 0.4 mile south/southwest of the Land Control Area in Section 22. The Nobles Wind Farm is a visible feature in the existing landscape of the Study Area. The Nobles Wind Farm has been in operation since 2010 and as such has become a part of the visual landscape in the Study Area.

As shown in **Graphic 4.3.1-1**, there are 85 residences within one mile of the Land Control Area. There are narrow swaths of trees (i.e., windbreaks) surrounding or partially surrounding farmsteads that are adjacent to the Land Control Area boundary, and most farmsteads also include agricultural buildings.

Project Impacts and Mitigation

There are multiple residences within the Land Control Area that are enclosed by the proposed project on three sides.

Graphic 4.3.1-1: Residences within one mile of the Land Control Area



4.3.1.1 POTENTIAL IMPACTS

The visible elements of the solar facility will consist of new PV panel arrays, transformers and inverters, a BESS, weather stations, an O&M facility, a new substation, a short transmission line, and security fencing surrounding the project.

The project will be a noticeable change in the landscape, converting approximately 1,416.5 acres of agricultural fields into energy production. The project will be immediately adjacent to existing transmission line and substation infrastructure. How an individual viewer perceives the change from a field of corn to a field of solar panels depends, in part, on how a viewer perceives solar panels.

For residents outside the project vicinity and for others with low viewer sensitivity, such as travelers through the area, aesthetic impacts are anticipated to be minimal. For these viewers, the solar panels would be relatively difficult to see due to fencing and vegetation or would be visible for a very short period. For residents in the project vicinity and for others with high viewer sensitivity living on or traveling on local roads in the project vicinity, aesthetic impacts are anticipated to be moderate to significant.

Current fields of corn, soybeans, and vegetables will be replaced with solar panels and other industrial fixtures. Panels will have a relatively low profile, with a maximum height of 20 feet off the ground at maximum tilt. Construction of the new project substation, the associated transmission line, the O&M facility, and the BESS facility will also present new visual impacts. Structures for the gen-tie line would be less than 150 feet in height and will be limited to the area between the proposed Project Substation and the Nobles Substation, which are approximately 500 feet apart. Additionally, several transmission lines are already present near the Nobles substation and within the project area.

PV panels are designed to absorb light to convert the light to electricity. Compared to clear glass, which typically reflects approximately eight percent of the sunlight, modern PV panels typically reflect approximately three percent of the sunlight when the panels are directly facing the sun.

Down-lit security lighting will be installed at the locked entrance to the facility as well as outside the O&M facility and project substation. Lighting will be motion-activated and down lit to minimize impacts and effects to people and wildlife.⁴³ Impacts to light-sensitive land uses are not anticipated given the rural project location coupled with minimal required lighting for operations.

4.3.1.2 MITIGATION

Minimizing aesthetic impacts from solar generating facilities is primarily accomplished by locating the facilities so that they are not immediately adjacent to homes, ensuring that damage to natural landscapes during construction is minimized, and shielding the facilities from view by terrain or vegetation. Impacts from facility lighting can be minimized by using shielded and downward facing light fixtures and using lights that minimizes blue hue.

Minimizing the aesthetic impacts of the project was brought up as a topic of concern multiple times by members of the public during scoping. In particular, impacts to residences surrounded by the

⁴³ Jägerbrand and Spoelstra 2023- Effects of anthropogenic light on species and ecosystems.
<https://www.science.org/doi/abs/10.1126/science.adg3173>.

Chapter 4

Project Impacts and Mitigation

project and those in Reading were of concern. Commentors specifically proposed the use of visual screening as a mitigation measure for aesthetic impacts.^{44,45}

Site-specific landscaping plans can minimize visual impacts to adjacent land uses and homes through vegetation screening, berms, or fencing. Aesthetic impacts can also be mitigated through individual agreements with neighboring landowners (sometimes referred to as good neighbor agreements). Such agreements are not within the scope of this EA. The Applicants have included updated visual simulations of what the Project would look like from roadways with incorporated vegetative screening in a draft Visual Screening Plan (VSP) that was included with the Application Amendment.⁴⁶

Aesthetic (and other) impacts are mitigated through standard or special permit conditions. Two draft site permits (DSPs) for the project are included in **Appendix C** (BESS) and **Appendix D** (Solar Facility). **Sections 4.3.8** of the DSPs are a standard condition that requires the permittee to consider landowner input with respect to visual impacts and to use care to preserve the natural landscape. Special Condition 5.4 of the DSPs provides a mechanism for mitigation of aesthetic impacts to properties that are adjacent to or surrounded by the project through the development of a VSP.

The VSP would, at a minimum, include:

1. Objectives for screening of nearby residences; and
2. A description of the types of trees and shrub species to be used, the location of plantings, and plans for installation, establishment, and maintenance.

The Applicants would have to file the following before its pre-construction meeting with PUC staff:

1. The VSP
2. Documentation of coordination between landowners within 500 feet of the site boundary regarding their preferences for the location of shrubs and trees used for screening; and
3. An affidavit of its distribution of the VSP to landowners within 500 feet of the site boundary.

4.3.2 Noise

The ROI for noise is the local vicinity. Distinct noises are associated with the different phases of project construction. The impact intensity level during construction will range from negligible to significant depending on the activity. Potential impacts are anticipated to be intermittent and short-term. These localized impacts may affect nearby residences and might exceed state noise standards. Impacts are unavoidable but can be minimized. Operational impacts have the potential to be long-term, depending on mitigation techniques from the Applicants.

Noise can be defined as any undesired sound. It is measured in units of decibels on a logarithmic scale. The A-weighted scale ("dBA") is used to duplicate the sensitivity of the human ear.⁴⁷ A three dBA change in sound is barely detectable to average human hearing, whereas a five dBA change is clearly

⁴⁴ Written Comments on the Scope of the Environmental Assessment- eDockets No. [20256-219917-01](#)

⁴⁵ Oral Comments on the Scope of the Environmental Assessment- eDockets No. [20256-219916-01](#)

⁴⁶ Application Amendment, Attachment B- Visual Simulations. eDockets No. [202512-226022-04](#)

⁴⁷ MPCA, *A Guide to Noise Control in Minnesota*, (2015), <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf>.

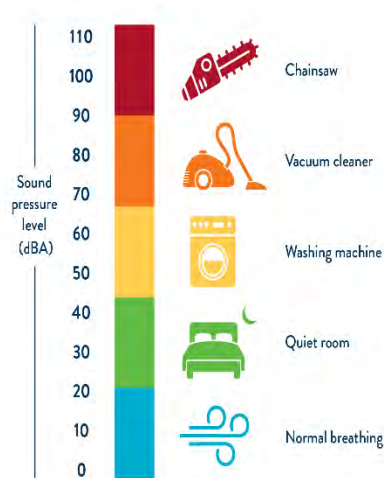
Chapter 4

Project Impacts and Mitigation

noticeable. A 10 dBA change is perceived as a sound doubling in loudness. Noise perception is dependent on a number of factors, including wind speed, wind direction, humidity, and natural and built features between the noise source and the receptor.

Graphic 4.3.2-1 provides decibel levels for common indoor and outdoor activities.

Graphic 4.3.2-1: Decibel levels of common household activities



In Minnesota, noise standards are based on noise area classifications (NAC) corresponding to the location of the listener, referred to as a receptor. NACs are assigned to areas based on the type of land use activity occurring at that location. Household units, designated camping and picnicking areas, resorts and group camps are assigned to NAC 1; recreational activities (except designated camping and picnicking areas) and parks are assigned to NAC 2; agricultural and related activities are assigned to NAC 3.

Noise standards are expressed as a range of permissible dBA over a one-hour period. L_{10} may be exceeded 10 percent of the time, or six minutes per hour, while L_{50} may be exceeded 50 percent of the time, or 30 minutes per hour. Standards vary between daytime and nighttime hours. There is no limit to the maximum loudness of a noise. Table **4.3.2-1** provides current Minnesota noise standards.

Table 4.3.2-1: Noise Area Classifications (dBA)

Noise Area Classification	Daytime (7:00 a.m. – 10:00 p.m.)		Nighttime (10:00 p.m. – 10:00 a.m.)	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀
1 - Residential	65	60	55	50
2 - Commercial	70	65	70	65
3 - Industrial	80	75	80	75
Source: Minnesota Rules 7030.0040				

The MPCA noise standards are public health standards. That is, they protect people from noise generated by all sources at a specific time and place. The total sum of noise at a specific time and location cannot exceed the standards. The MPCA evaluates whether a specific noise source is in violation by determining if the source causes or significantly contributes to a violation of the standards.

POTENTIAL IMPACTS

The primary noise receptors are the local residences. There are 87 residences within one mile of the Land Control Area, including 10 residences surrounded by the project. The proposed project is in a rural, agriculturally dominated area. Rural residential areas are assumed to have an ambient noise level of 45 dBA.⁴⁸ Residences are in NAC 1. Noise receptors could also include individuals working outside in the project vicinity. Potential noise impacts from the project are associated with construction noise and operational noise. Sources of noise from the project are described below.

Construction

During construction, noise will be emitted by construction vehicles and equipment. The amount of noise will vary based on what type of construction is occurring on a given day. Construction associated noise will likely be perceptible at adjacent residences. Large construction equipment is anticipated to emit noise between 76-85 dBA at 50 feet (U.S. Department of Transportation Federal Highway Administration, [USDOT], 2017). Noise associated with this equipment will primarily occur during the initial site preparation, which will include grading and access road construction and is expected to last approximately six weeks. Summit Lake anticipates pile driving of the rack supports to create the most noise measured at 101 dBA at 50 feet (USDOT, 2017). **Table 4.3.2-2** shows the typical sound pressure levels in dBA at 50 feet for various construction equipment (USDOT, 2017).

Table 4.3.2-2: Typical Sound Levels from Construction Equipment

Equipment	Max Sound Pressure Level 50 feet (dBA)
Backhoe	80
Compactor	82
Concrete Mixer	85

⁴⁸ Application, Section 5.2.7.

Chapter 4

Project Impacts and Mitigation

Equipment	Max Sound Pressure Level 50 feet (dBA)
Dozer	85
Generator	81
Grader	85
Loader	85
Pile Driver (Impact)	101
Truck	88
Source: USDOT, 2017	

Installation of each rack support with pile driving takes between 30 seconds to 2 minutes depending on the soil conditions; Summit Lake anticipates this activity will take up to 8 weeks across the site. Finally, installation of the solar panels on the tracking similar would emit noise levels similar to general construction equipment described above. Typically, a forklift is used to place individual panels on the tracking rack system. The noise from any of these construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. Note that construction activities will be sequenced; site preparation may occur at a portion of the site while pile driving occurs at a different location. These noise impacts will be temporary and limited to daytime hours.

Construction noise may exceed state noise standards at select times and locations. Exceedances would be short-term and confined to daytime hours. Even without an exceedance, noise impacts will occur. Rhythmic pounding of foundation posts would be disruptive even if the noise associated with that activity is within state standards.

Operation

The main source of noise from the Project during operation will be from the inverters, which include air conditioners housed in each inverter, and, to a lesser extent, from the transformers and rotation of the tracking system. For the BESS units, the main source of noise will be from the cooling fans.

Noise from the BESS was brought up by multiple commentors during scoping for the project as one of their primary concerns.^{49,50} The Applicants conducted a noise modeling study to determine whether noise from the BESS facility is projected to exceed MPCA regulations of 50 dBA (included as **Appendix F** of this EA). The results of noise modeling conducted by the Applicants for the BESS and solar arrays show that noise levels will be less than 50 dBA (42.2 dBA at the closest receptor) at residences closest to the BESS. Inverters are the main source of noise for the solar facility, and because the inverters are located within the middle of the solar arrays, the noise levels from the solar facility equipment are not expected to be discernible from background noise levels at noise receptors in the vicinity (**Appendix F**).

⁴⁹ Written Comments on the Scope of the Environmental Assessment- eDockets No. [20256-219917-01](#)

⁵⁰ Oral Comments on the Scope of the Environmental Assessment- eDockets No. [20256-219916-01](#)

Chapter 4

Project Impacts and Mitigation

MITIGATION

Sound control devices on vehicles and equipment (e.g., mufflers), conducting construction activities during daylight hours, and running vehicles and equipment only when necessary are common ways to mitigate noise impacts. BESS-specific noise mitigation measures include, but are not limited to, adding baffle kits to BESS units to decrease operational noise, constructing earthen berms or acoustic barriers along the site perimeter, and adjusting operational settings to meet the Minnesota state noise standard.

The Applicants also state that, in their final design of the project, they will implement project attenuation/silencer kits on each battery inverter and construction of a noise barrier wall at the south end of the BESS facility to mitigate noise levels for residences in the town of Reading. The Applicants also indicated that they will conduct modeling and a comprehensive noise study to ensure that operations of the BESS facility do not exceed noise standards once final design for the project has been established.

Sections 4.3.7 of the proposed DSPs (**Appendix C and Appendix D**) are a standard condition that requires the permittee to comply with noise standards established under Minnesota noise standards as defined under Minnesota Rule, part 7030.010 to 7030.0080, and to limit construction and maintenance activities to daytime hours to the extent practicable.

The proposed BESS DSP also includes Special Conditions (Sections 5.5, 5.6, and 5.7) to minimize and mitigate noise impacts from the BESS facility.

- Section 5.5 is a special condition that requires the permittee to file a pre-construction noise modeling and impact assessment summarizing results from noise propagation modeling using the selected equipment and final layout prior to construction of the facility. This condition also requires the permittee to file an updated noise impact assessment prior to modifying the permitted facility.
- Section 5.6 is a special condition that requires the permittee to file a proposed methodology for conduct of a post-construction noise study prior to construction of the project and to file the noise study within 18 months of operation. This section also clarifies that the project must be operated to comply with MPCA noise standards at all times and that the Permittee may be required to modify design or operation of the facility to comply with MPCA noise standards.
- Section 5.7 is a special condition that requires the permittee to notify adjacent landowners detailing the timing of any planned major noise-producing construction activities through written notice and a website that would be updated weekly.

4.3.3 Cultural Values

The ROI for cultural values is the project area. Development of the project will change the character of the area, potentially changing residents' sense of place. There are tradeoffs for rural communities between renewable energy projects and retaining the rural character of an area. Construction and operation of the project is not anticipated to impact or alter the work and leisure pursuits of residents in the project area in such a way as to impact the underlying culture of the area.

Chapter 4

Project Impacts and Mitigation

Cultural values can be defined as shared community beliefs or attitudes that define what is collectively important to the group. These values provide a framework for individuals and community thought and action. Infrastructure projects believed inconsistent with these values can deteriorate community character. Those found consistent with these values can strengthen it. Projects often invoke varying reactions and can, at times, weaken community unity.

Individual and community-based renewable energy is becoming more valued across the nation. Utility scale renewable projects—generally located far from load centers in rural areas—are also valued, but, at times, opposed by residents. The highly visible, industrial look and feel of these projects can erode the rural feeling that is part of a resident’s sense of place.

Cultural values can be informed by ethnic heritage. Fifty-three percent of Nobles County residents derive primarily from European ancestry. Thirty-five percent identify as Hispanic or Latino, and the overall minority population is roughly 47 percent.⁵¹

Cultural values are also informed by work and leisure pursuits, for example, farming and snowmobiling, as well as land use, such as agricultural cropland. Approximately 80 percent of the land in Nobles County is used for agricultural purposes.⁵²

Community events in the project area are usually tied to seasonal/municipal events, and national holidays. The Nobles County Fair is held annually in Worthington, and includes a carnival, food booths, 4-H competitions, and grandstand events. The International Festival also occurs annually in Worthington and includes Irish dancing, Native American fashion exhibitions, Caribbean steel drum performances, mariachi performances, and food and artisan vendors.

POTENTIAL IMPACTS

The project contributes to the growth of renewable energy and is likely to strengthen and reinforce this value in the area. At the same time, the development of the project will change the rural, agricultural character of the area. The value residents put on the character of the landscape within which they live is subjective, meaning its relative value depends upon the perception and philosophical or psychological responses unique to individuals. Because of this, construction of the project might—for some residents—change their perception of the area’s character thus potentially eroding their sense of place. During scoping, many residents voiced their distress associated with potential loss of the rural character of the area that they value.^{53,54}

⁵¹ US Census Bureau, 2025 <https://www.census.gov/quickfacts/fact/table/noblescountyminnnesota/PST045225>

⁵² U.S. Department of Agriculture (USDA). 2022. 2022 Census of Agriculture Publications. https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_2_County_Level/Minnesota.

⁵³ Written Comments on the Scope of the Environmental Assessment- eDockets No. [20256-219917-01](https://www.dockets.dnr.state.mn.us/dockets/2025/20256-219917-01)

⁵⁴ Oral Comments on the Scope of the Environmental Assessment- eDockets No. [20256-219916-01](https://www.dockets.dnr.state.mn.us/dockets/2025/20256-219916-01)

Chapter 4

Project Impacts and Mitigation

MITIGATION

In Minnesota, renewable energy generating facilities are predominantly sited in rural, agricultural communities.⁵⁵ One strategy that can help mitigate the cultural impacts of large-scale renewable energy projects is the development of a community benefits agreement. These agreements can take many forms and are intended to provide affected communities with funds that can be used to improve their community as they, and not the permittee or regulators, see fit. Benefit agreements for renewable energy project host communities have been used in various European countries for over a decade,⁵⁶ and the U.S. Department of Energy recently formalized the development of benefit agreements for projects awarded funding through the 2021 Bipartisan Infrastructure Law.⁵⁷ Benefit Agreements have been adopted for utility development in New Jersey, California, New York, and Michigan. In Michigan, affected local units of government are eligible for funds, between \$2,000 to \$5,000 per MW, provided by the developer through a Host Community Agreement as part of the renewable energy permitting process, and the use of these funds is reported to the permitting authority and made available to the public.⁵⁸

Outside of a formalized community benefits agreement, the creation of partnerships between the project owner and community schools, charities and volunteer associations, religious groups, youth organizations, or other clubs or societies active in the host community provides an avenue to mitigate the impacts of renewable energy projects, and demonstrates the project owner's commitment to being a good neighbor in the host community.

Sections 5.12 of the solar facility DSP (**Appendix D**) is a special condition that requires the permittee to enter into a Community Impact Mitigation Agreement with Nobles County that mitigates impacts to the community of Reading. While the Commission would not dictate how funds are to be used by Nobles County, Nobles County would be required to report how the funds are used in the community five years after the start of construction.

4.3.4 Land Use and Zoning

The ROI for land use and zoning is the land control area. The impact intensity level is anticipated to be moderate due to the conversion of agricultural land to land used for energy generation. Land use impacts are anticipated to be long-term and localized. Constructing the project will change land use from agricultural to solar energy production for a minimum of 30 years. After the project's useful life, the land control area could be restored to agricultural or other planned land uses by implementing appropriate restoration measures. Impacts can be minimized by using best practices to protect land and water quality.

⁵⁵ Commission, Minnesota Wind Farm and Solar Projects-
<https://minnesota.maps.arcgis.com/apps/webappviewer/index.html?id=af93f569169a435cbe07f741c340fedb>

⁵⁶ Glasston, J. (2017). Large Energy Projects and Community Benefits Agreements – Some experience from the UK. <https://doi.org/10.1016/j.eiar.2017.03.009>

⁵⁷ Office of Clean Energy Demonstrations. Guidance for Creating a Community Benefits Plan for the Bipartisan Infrastructure Law Energy Improvement in Rural or Remote Areas Fixed Award Grant Program. <https://www.energy.gov/sites/default/files/2023-08/OCED%20CBP%20101%20Factsheet.pdf>

⁵⁸ Michigan Department of Environment, Great Lakes, and Energy, Renewables Ready Communities Award Dashboard- <https://egle.maps.arcgis.com/apps/dashboards/5d5c6ee565444e02bb7e1734cd18809e>

Chapter 4

Project Impacts and Mitigation

Land use is the characterization of land based on what can be built on it and how the land is used. Zoning is a regulatory tool used by local governments (cities, counties, and some townships) to guide specific land uses within specific geographic areas. Land cover documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types, including wetlands. Construction of solar generating facilities and transmission line will alter current and future land use and land cover.

Pre-settlement vegetation consisted primarily of tallgrass prairie, with many islands of wetland prairie, with wet prairie and forests found near streams and valleys. Little of the natural vegetation from pre-European settlement is present today, as the current land-use in the project area is predominately agricultural.⁵⁹

The National Land Cover Database provides spatially-referenced, descriptive data describing land cover in the United States. As shown in **Table 4.3.4-1**, and **Figure 3 (Appendix A)**, land cover in the Land Control Area is dominated by cultivated agriculture and developed areas around farmsteads, with scattered wetlands and herbaceous areas also present.

Table 4.3.4-1: Land Cover

Land Use Type	Acres in Land Control Area	Percent of Total Acreage
Agricultural ¹	1,888.9	94.9%
Developed	82.4	4.1%
Forested	0.4	< 0.1%
Herbaceous	2.1	0.1%
Emergent Herbaceous Wetlands	14.9	0.8%
Barren Land	0.7	< 0.1%
Open Water	0.2	< 0.1%
¹ Agricultural land consists of the NLCD categories cultivated cropland and hay/pasture. Source: Dewitz and USGS, 2021		

⁵⁹ DNR, *Ecological Classification System: Ecological Land Classification Hierarchy*, (n.d.), <https://www.dnr.state.mn.us/ecs/251Ba/index.html>.

According to Nobles County zoning information, the Land Control Area is zoned as Agricultural Preservation and Rural Residential (Nobles County, 2001). The Nobles County Comprehensive Plan (2001) states that, similar to other counties in southwestern Minnesota, agricultural production will continue to be the predominant industry in the county. However, the plan lists a number of opportunities for industry diversification that would contribute to future economic growth, including opportunities related to renewable and green energy sources.

POTENTIAL IMPACTS

Development of a solar farm in this area will temporarily change the land use from predominantly agricultural uses to energy generation for the life of the project. Approximately 1,416 acres of agricultural land will be converted to solar energy generation and energy storage use for the life of the Project. The conversion of agricultural land within the Preliminary Development Area will have a minimal impact on the availability of agricultural land in Nobles County. Of the 457,658 acres in Nobles County, approximately 80 percent (approximately 366,330 acres) are currently used for agricultural production.⁶⁰ Conversion of 1,416 acres of agricultural land to operate the project would reduce the amount of actively cultivated agricultural land in Nobles county by less than 0.4 percent.

Development of large solar energy and battery storage systems within the Nobles County Agricultural Preservation and Rural Residential Districts are conditionally permitted uses.⁶¹ Because the Project is subject to siting and oversight by the State of Minnesota under the Minnesota Power Plant Siting Act, the site permits are the only land use permits required. However, applicants for site permits are encouraged to consult and coordinate with local planning and zoning offices.

Comments by Kathy Henderscheidt, the Nobles County Planning and Zoning Administrator, highlighted inconsistencies between the Nobles County ordinance and the site plan included in Summit Lake's application. Ms. Henderscheidt specifically highlighted the fact that the Nobles County ordinance mandates 150 foot setbacks from property lines and 200 foot setbacks from road centerlines, a condition which is not met by the proposed site layout included in Summit Lake's site permit application.⁶²

MITIGATION

The project would convert approximately 1,416 acres of cultivated cropland to solar energy production. Summit Lake intends to utilize best practices as feasible to reduce the impact on land use and water resources. There is no mechanism by which conflict between state and local zoning criteria (e.g. setbacks, permitted uses) can be mitigated.

The DSPs (**Appendix C and Appendix D**) have several permit conditions related to the preservation and restoration of agricultural land:

⁶⁰ USDA 2022. Census of Agriculture Publications.

https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1_Chapter_2_County_Level/Minnesota.

⁶¹ Nobles County. 2021. Nobles County Solar Energy Ordinance. <https://www.co.nobles.mn.us/wp-content/uploads/2024/01/Solar-Energy-Ordinance-CB-Approved-11-3-2020.pdf>

⁶² Scoping Comment Letter of Kathy Henderschiedt, Nobles County Planning and Zoning Administrator, eDockets No. [20256-219544-01](#)

- Sections 5.8 of the BESS DSP (**Appendix C**) and 4.3.15 of the solar facility DSP (**Appendix D**) require the permittee to prepare a vegetation management plan to prevent soil erosion and invests in soil health by establishing a plan to protect soil resources by ensuring perennial cover. The Applicants' draft VMP is included as **Appendix E** of this EA.
- Sections 5.9 of the BESS DSP and 4.3.18 of the solar facility DSP require the permittees to prepare an AIMP that details methods to minimize soil compaction, preserve topsoil, and establish and maintain appropriate vegetation to ensure the project is designed, constructed, operated, and ultimately restored in a manner that would preserve soils to allow for the land to be returned to agricultural use. The applicant's draft AIMP is found in Appendix E of the joint site permit application.
- Sections 9.1 of the DSPs require the permittees to prepare a decommissioning plan focused on returning the project site to agricultural use at the end of the project's useful life.
- Sections 9.2 of the DSPs require removal of all project-related infrastructure.

4.3.5 Property Values

The ROI for property values is the local vicinity. Impacts to property values within the local vicinity could occur; however, changes to a specific property's value are difficult to determine. Because of this uncertainty, impacts to specific properties in the project vicinity could be minimal to moderate and decrease with distance and over time.

Impacts to property values can be measured in three ways: sale price, sales volume, and marketing time. These measures are influenced by a complex interaction of factors. Many of these factors are parcel specific, and can include condition, size, acreage, improvements, and neighborhood characteristics; the proximity to schools, parks, and other amenities; and the presence of existing infrastructure, for example, highways or transmission lines. In addition to property-specific factors, local and national market trends, as well as interest rates, can affect all three measures. The presence of a solar facility becomes one of many interacting factors that could affect a specific property's value.

Because each landowner has a unique relationship and sense of value associated with their property a landowner's assessment of potential impacts to their property's value is often a deeply personal comparison of the property "before" and "after" a proposed project is constructed. The landowner's judgments, however, do not necessarily influence the market value of a property. Professional property appraisers assess a property's value by looking at the property "after" a project is constructed. Moreover, potential market participants are likely to see the property independent of the changes brought about by a project; therefore, they do not take the "before" and "after" into account the same way a current landowner might. Staff acknowledges this section does not and cannot consider or address the fear and anxiety felt by landowners when facing the potential for negative impacts to their property's value.⁶³

⁶³ Chalmers, James, *High Voltage Transmission Lines and Residential Property Values in New England* PowerPoint Presentation, (2019), https://www.nhmunicipal.org/sites/default/files/uploads/Annual_Conference/2019/Sessions/Wednesday/market_effects_of_utility_rows_presentation-1045am.pdf; Department of Commerce, *Rights-of-way and Easements for Energy Facility Construction and Operation*, (2022), <https://apps.commerce.state.mn.us/eera/web/project-file/12227>.

Electrical generating facilities can impact property values. Often, negative effects result from impacts that extend beyond the project location. Examples include emissions, noise, and visual impacts. Unlike fossil-fueled electric generating facilities, the project would not generate emissions. Potential impacts from operational noise are to be mitigated. Aesthetic impacts will occur, but because the project is relatively low in height – as compared to a wind turbine or a smokestack – impacts would be localized.

Large solar facilities exist in Minnesota; however, limited sales information is available. A review of the literature identified one peer-reviewed journal article that addressed impacts to property values based on proximity to utility-scale, PV solar facilities. The Lawrence Berkeley National Lab studied over 1,500 large-scale PV solar facilities in six states (including Minnesota) to determine whether home sale prices were influenced within 0.5 miles (from over 1.8 million home sale transactions).⁶⁴

In Minnesota in particular, the study found that homes within one-half mile of large-scale PV solar facilities had a 4 percent reduction in home sale prices compared to homes 2-4 miles away. Additionally, only large-scale PV solar facilities developed on previously agricultural land, near homes in rural areas, and larger facilities (roughly 12 acres or more) were found to be linked to adverse home sale price impacts within one-half mile. The analysis did not include consideration of site features or site design, for example setbacks or landscaping features such as vegetative management and visual screening, which could play a role in nearby property valuation.

Other studies with smaller sample sizes did not find a consistent negative impact to the sales value of properties near large solar facilities. Chisago County Environmental Services and Zoning found that home sales exceeded assessed value near the 100 MW North Star solar facility at a rate comparable to the general real estate market in the area.⁶⁵ Additionally, a study that compared sale prices of properties near six existing large solar facilities (including the North Star project) with comparable properties not located near large solar facilities, and did not find a consistent negative impact to the sales value of properties near large solar facilities.⁶⁶

POTENTIAL IMPACTS

Impacts to the value of specific properties within the project vicinity are difficult to determine but could occur. Based on analysis of other utility-scale solar projects, minimal to moderate property value impacts could occur for properties close to the project. To the extent that negative impacts may occur, they are expected to be within one-half mile of the solar facility and to decrease with distance from the project and with time. Aesthetic impacts that might affect property values would be limited to residences and parcels in the project vicinity where the solar panels are easily visible. Considerations such as setbacks, economic impact, vegetation management practices, and vegetative screening could have an unpredictable range of influence over property values.

⁶⁴ Elmallah, Salma et al. *Shedding light on large-scale solar impacts: An Analysis of Property Values and Proximity to Photovoltaics Across Six U.S. States*, *Energy Policy*, Volume 175, (2023), <https://www.sciencedirect.com/science/article/pii/S0301421523000101>.

⁶⁵ Kurt Schneider, Environmental Services Director, *Email to Commerce staff*, (2017).

⁶⁶ McGarr, Patricia L. et al. *Adjacent Property Value Impact Study A Study Of Six Existing Solar Facilities*, (2021), https://www.nexteraenergyresources.com/content/dam/nextera/us/en/pdf/CohnReznick%20Solar%20Impact%20Study_7.26.21.pdf.

MITIGATION

Impacts to property values can be mitigated by reducing aesthetic impacts and impacts to future land use. Specific mitigation measures related to aesthetics and land use, as well as permit conditions associated with enforcing those mitigation measures, are discussed in sections 4.3.1 and 4.3.4.

4.3.6 Tourism and Recreation

The ROI for tourism is the local vicinity and the ROI for recreation is the project area. Potential impacts to recreational opportunities and tourism are anticipated to be minimal. During construction, unavoidable short-term impacts will occur as construction equipment and vehicle traffic will create noise, dust, and visual impacts. These impacts will be intermittent and localized. There are no anticipated long term impacts from this project.

Primary tourism activities in the vicinity of Project facilities are associated with visitors to local snowmobile trails, wildlife management areas, and other outdoor recreational resources. Visitors also attend local community festivals and events such as the International Festival and the Nobles County Fair, both hosted by the city of Worthington which is about 5.0 miles southeast of the Land Control Area (Explore Southwest Minnesota, 2024).

No federal, state, county, or locally owned or managed parks, forests, refuges, recreation areas, or wildlife conservation areas were identified within the Land Control Area. In addition, a review of recent aerial imagery indicates that no parks are located within the town of Reading. The nearest public recreation area is the Groth Wildlife Management Area, which is about 0.6 mile north of the northernmost portion of the Land Control Area. A segment of the Nobles County Trails snowmobile trail bisects a narrow portion of the Land Control Area in Township 103N, Range 41W, Section 23. This segment of the snowmobile trail travels along the ditch associated with County State Aid Highway 25. Another segment of the Nobles County Trail travels along 200th Street parallel to the Land Control Area boundary in Section 24; the snowmobile trail is shown on the opposite side of 200th Street from the Land Control Area.

POTENTIAL IMPACTS

Impacts to tourism and recreation can be direct or indirect. Direct impacts are impacts that directly impede the use of a recreational resource, for example, closing of a trail to facilitate project construction. Indirect impacts reduce the enjoyment of a recreational resources but do not prevent use, for example, aesthetic impacts visible from a scenic overlook .

Impacts to tourism and recreation are anticipated to be minimal and temporary. Due to construction, there will be short-term increases in traffic and noise that could potentially impact recreational activities in close proximity to the project area, however, impacts will be temporary. No significant long-term impacts to recreational activities are anticipated. The snowmobile trail would not be impacted by project operation, since no fencing will be present where the trail crosses the Land Control Area along County State Aid Highway 25.

MITIGATION

Because impacts to recreational activities are anticipated to be minimal and temporary, no additional mitigation measures are proposed.

4.3.7 Transportation and Public Services

The ROI for transportation and public services is the project area. Potential impacts to the electrical grid, roads and railroads, and other utilities are anticipated to be short-term, intermittent, and localized during construction. Impacts to water (wells and septic systems) are not expected to occur. Overall, construction-related impacts are expected to be minimal, and are associated with possible traffic delays. During operation, negligible traffic increases would occur for maintenance. Impacts are unavoidable but can be minimized.

Public services are services provided by a governmental entity or by a regulated private entity to provide for public health, safety, and welfare.

Water and Wastewater: Rural water systems including Lincoln-Pipestone Rural Water, Red Rock Rural Water, and Rock County Rural Water provide water to residents of Nobles County.⁶⁷ Sewage is serviced by residential septic tanks and/or drain fields. Approximately five telephone service providers and 16 broadband providers operate in Nobles County.⁶⁸

Electric Utilities: The Project is located adjacent to the existing Nobles Substation. There are three transmission lines at least partially within the Land Control Area (**Figure 5, Appendix A**), and two transmission lines that are adjacent to the Land Control Areas (Energy Information Administration, 2022). The transmission lines interconnect to the Nobles Substation from the west, south, and east. Two of the electric lines operate at 345 kV, one operates at 115 kV, one operates at 161 kV, and one does not have its voltage publicly available. Three of the lines are operated by Xcel Energy and two of the lines do not have their operators listed in publicly available data.

Pipelines: There are no pipelines within the project area or within a mile of the project area according to the US DOT National Pipeline Mapping System.⁶⁹

Roads: The major roadways in the area are County State Aid Highway 25 which intersects the Land Control Area, Interstate 90 approximately 4.5 miles south of the Land Control Area, and U.S. Highway 59 approximately 4.5 miles east of the Land Control Area. Other than County State Aid Highway 25, which intersects the southwestern portion of the Land Control Area, roads that surround or bisect the Land Control Area are local county or township roads.

Railroads There are no railroads located within the project area or within a mile of the project area.

Airports The nearest Federal Aviation Administration-registered airport to the Summit Lake Project is the Worthington Municipal Airport located approximately 2.0 miles north of Worthington and 7.0 miles southeast of the Land Control Area. There are no private landing strips within a mile of the Land Control Area based on a review of aerial imagery.

⁶⁷ Nobles County Comprehensive Plan- <https://www.co.nobles.mn.us/wp-content/uploads/2016/12/nobles-county-full-comprehensivesrdc-plan.pdf>.

⁶⁸ Minnesota Telephone Exchange Boundaries- <https://www.arcgis.com/apps/OnePane/basicviewer/index.html?appid=a61fe43236994d43b097d439befb8e70>.

⁶⁹ USDOT- National Pipeline Mapping System Viewer. <https://www.npms.phmsa.dot.gov/>

POTENTIAL IMPACTS

Large energy projects can impact public services, such as buried utilities or roads. These impacts are usually temporary, for example, road congestion associated with material deliveries. Impacts can be long-term if they change the area in a way that precludes or limits public services.

Water and Wastewater The Applicants do not anticipate impacts to water and wastewater systems. One domestic well located within the project area will be located approximately 475 feet from the preliminary development area.⁷⁰ A single domestic-sized water well will be required for the O&M facility, and because of this a well construction permit will be required from the Minnesota Department of Health (MDH).

Roads Access to the Preliminary Development Area will be via existing county and township roads. With the limited possible exception of minor field access or driveway changes depending on final design, no changes to existing roadways will occur. During the construction phase, temporary traffic impacts are anticipated on some public roads near the Preliminary Development Area, primarily from construction personnel traveling to and from the Project and slow-moving construction vehicles.

Construction traffic will use the existing county roadway system to access the Preliminary Development Area and deliver construction materials and personnel. Traffic during construction is estimated to be, on average, 150-180 pickup trucks, cars, and/or other types of employee vehicles onsite for the majority of construction. Eighteen to 49 semi-trucks per day will be used for delivery of facility components. Semi-truck delivery will vary per day depending on stage of construction and delivery timeline of equipment. Overweight or oversized loads are unlikely. If they are required, the Applicants will obtain the appropriate approvals prior to construction.

The functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day. Since the area roadways are well below that capacity, this increased traffic may be perceptible to area residents, but the slight increase in volume is not expected to affect traffic function. Slow-moving construction vehicles may cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest. However, these delays should be minimal for the relatively short construction delivery period.

After construction is complete, traffic impacts during the operations phase of the Project will be negligible. A small maintenance crew driving through the area in pickup trucks on a regular basis will monitor and maintain the facilities as needed, but traffic function will not be impacted as a result. Additionally, Summit Lake is coordinating with Nobles County and the townships to protect local roads.

Railroads No impacts to railroads are anticipated as there are no railroads within the project area.

Electric Utilities The Project will interconnect into the Nobles Substation, which is associated with the Nobles Wind Farm and adjacent to the Land Control Area. The Project is not expected to affect existing transmission lines that interconnect to this substation. However, during the actual interconnection process, there is a slight possibility that customers may experience brief flickering or very short outages as the Nobles Substation is temporarily shut down and service is being restored. The timing

⁷⁰ Application, Section 5.4.4.1.

and duration of any service interruptions would be determined and communicated to consumers by the interconnecting utility.

Pipelines No impacts to pipelines are anticipated as there are no pipelines within the project area.

Air Safety There are no FAA-registered airports that will be affected by the project, as the nearest airport is approximately 7 miles away.

MITIGATION

Water and Wastewater The Applicants indicate that underground utilities will be marked prior to construction start. A well construction permit from the MDH would be required if a well is installed at the facility.

Utilities Sections 4.3.5 of the DSPs (**Appendix C and Appendix D**) are standard permit conditions that require the permittee to minimize disruptions to public utilities.

Impacts to electrical infrastructure that cross the project can be mitigated by appropriate coordination with the owners of the existing infrastructure and following industry best practices.

The location of underground utilities can be identified using the Gopher State One Call system during engineering surveys and marking the underground utility locations prior to construction. If a utility is identified, the project component or the utility itself might need to be relocated if it cannot be successfully crossed. Relocation, as well as any necessary crossing, would need to be coordinated with the affected utility.

Roads Changes or additions to driveways from county roads will require permits from and coordination with MnDOT and Nobles County.

Sections 4.3.20 of the DSPs require permittees to inform road authorities of roads that will be used during construction and acquire necessary permits and approvals for oversize and overweight loads. Permitted fencing and vegetative screening cannot interfere with road maintenance activities, and the least number of access roads shall be constructed.

In addition to permit requirements for driveway access and the conditions of the draft site permit, the following practices can mitigate potential impacts:

- Pilot vehicles can accompany movement of heavy equipment.
- Deliveries can be timed to avoid traffic congestion and dangerous situations on the roadway.
- Traffic control barriers and warning devices can be used as necessary.
- Photographs can be taken prior to construction to identify pre-existing conditions. Permittees would be required to repair any damaged roads to preconstruction conditions.

4.3.8 Socioeconomics

The ROI for socioeconomics is the region. The impact intensity level is anticipated to be minimal to significant, with both negative and positive effects. Effects associated with construction will, overall, be short-term and minimal. Significant positive and negative effects may occur for individuals. Impacts from operation will be long-term and significant.

Socioeconomic information for the Project Study Area is based on data from the U.S. Census Bureau. Socioeconomic statistics that characterize the demographic and economic context of the Project Study Area and represent the socioeconomic characteristics that potentially could be affected by construction and operation of the Project include total population in 2020 and 2023, percent population change, per capita income, the percentage of the population below poverty level, the unemployment rate, and the top three industries (see **Table 4.3.8-1**).

Table 4.3.8-1: Socioeconomic Characteristics of the Project Study Area

Demographic Category	Minnesota	Nobles County
2020 Census Population (April 1, 2020) ¹	5,706,804	22,289
Population Estimates July 1, 2023 ¹	5,737,915	21,727
Percent Change in Population 2010 - 2023 ¹	+0.5%	-2.5%
Per Capita Income (U.S. Dollars) ¹	\$44,947	\$29,786
Unemployment Rate (%) ²	3.9	3.0
Persons in Poverty (%) ¹	9.3	11.1
Top Three Industries ^{2,3}	E, M, R	M, E, R
¹	U.S. Census Bureau, 2023	
²	U.S. Census Bureau, 2022	
³	Industries are defined under the 2012 North American Industry Classification System and abbreviated as follows: E = Educational, Health and Social Services; M = Manufacturing; R = Retail Trade;	

The Project is in a rural area within Summit Lake and Elk Townships and no incorporated communities are located within the Land Control Area. The nearest metropolitan area is Sioux Falls, South Dakota which is approximately 50 miles southwest of the Project. The Land Control Area is directly adjacent to the boundary of the unincorporated community of Reading; because Reading is unincorporated, U.S. Census Bureau information is not available for this community.

Based on the U.S. Census Bureau data, the population of Nobles County is 21,727 people. The per capita income of Nobles County is \$29,786, which is significantly lower than the state average. The unemployment rate in Nobles County (3.0 percent) is lower than the state average of 3.9 percent; however, the percentage of individuals classified as living below the poverty level in Nobles County is higher than the state average at 11.1 percent and 9.3 percent, respectively. The primary industries in Nobles County are classified as manufacturing (24.6 percent), followed by educational services, and health care and social assistance (20.8 percent), and retail trade (10.7 percent) (U.S. Census, 2022).

Fifty-seven hotels and motels, three bed and breakfasts, and five campgrounds are available in the greater Sioux Falls area (Experience Sioux Falls, 2024). These residence and temporary housing statistics suggest the local area could support an influx of construction workers, if needed. In addition, there are three hotels and one motel in the city of Worthington and two hotels in the city of Luverne, both of which are closer to the Project, that could provide lodging for construction personnel (Booking.com, 2025).

POTENTIAL IMPACTS

Potential economic impacts associated with construction will be positive, but minimal and short-term. Significant positive effects might occur for individuals. Impacts from operation will be long-term, positive, and moderate for some in Nobles County. There is also potential for negative impacts to those in agribusiness. If the project is constructed, approximately 1,416 acres will be removed from agricultural production that are currently used to produce corn, soybeans, and vegetables. The removal of cultivated land is likely to result in an incremental decrease to agricultural-related businesses, such as farm dealerships, seed dealers, and dealers of agricultural inputs such as fertilizer and pesticides, in the area. The extent of any decrease in sales is difficult to determine, but the removal of approximately 0.4 percent of the approximately 366,330 acres of cropland in Nobles County represents a marginal, negative impact to agricultural-related businesses. The project would not disproportionately impact low-income or minority populations (see discussion of environmental justice in **Section 4.3.9**), so adverse impacts to these communities are not anticipated.

Construction of the Project would provide temporary increases to the revenue of the Study Area through increased demand for lodging, food services, fuel, transportation and general supplies. Temporary construction jobs will generate indirect economic benefits for the Study Area, as employees spend their income on local goods and services and pay local sales tax. During peak construction, an estimated 250 jobs will be created, with an average of 175 jobs throughout the period of construction. The Applicants indicate that procurement of construction resources will give preference to local, union construction craft employees. The Applicants anticipate supporting an average of 130 union temporary construction and installation jobs for this project.

General skilled labor is expected to be available in Nobles County or Minnesota to serve the Project's basic infrastructure and site development needs. Specialized labor will be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of Minnesota or neighboring states because the relatively short construction duration often precludes special training of local or regional labor and much of the workforce needed to construct a solar facility and BESS must be comprised of Minnesota licensed electricians because most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code.

The Project will provide production tax payments to Nobles County of approximately \$400,500 annually over 30 years. Additionally, Summit Lake and Elk Townships will receive approximately \$100,100 annually over 30 years. In addition, lease payments paid to participating landowners will offset potential financial losses associated with removing a portion of their land from agricultural production.

MITIGATION

Section 8.5 of the DSPs require quarterly reports concerning efforts to hire Minnesota workers. Consistent with Minn. Stat. 216E.03, subd. 10 (c). Section 8.6 of the DSPs require the permittee, as well as its construction contractors and subcontractors, to pay no less than the prevailing wage rate. No additional mitigation is proposed.

4.3.9 Environmental Justice

The ROI for economic justice analysis is the region. The project will not have disproportionately high and adverse human health or environmental effects on low-income, minority, or tribal populations.

Environmental justice (EJ) is “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”⁷¹ The goal of this “fair treatment” is not to shift risks among populations, but to identify potential disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.⁷²

As defined by Minnesota Statute 216B.1691, subd. 1(e), “Environmental justice area” means an area in Minnesota that, based on the most recent data published by the United States Census Bureau, meets one or more of the following criteria:

- (a) 40 percent or more of the area's total population is nonwhite;
- (b) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;
- (c) 40 percent or more of residents over the age of five have limited English proficiency; or
- (d) the area is located within Indian country, as defined in United States Code, title 18, section 1151.

“Environmental justice community” or “EJ community” means a people group or geographic location that experiences environmental justice related harms and risks.

POTENTIAL IMPACTS

Utility infrastructure can adversely impact low-income, minority or tribal populations. To identify potential EJ concerns in the project area, the MPCA’s Environmental Justice Areas map was queried. The Land Control Area is within Census Tract 1051 (**Figure 6, Appendix A**). Review of the MPCA’s EJ areas indicates that there are no areas of environmental justice concern in Census Tract 1051 (MPCA, 2025).

Information relevant to the Minnesota definition of an environmental justice area is provided in **Table 5.2.4-1** for Census Tract 1051, the State of Minnesota, and Nobles County. Census Tract 1051 has a lower percent of low-income households, minorities, and residents with limited English proficiency relative to Nobles County, but these proportions are higher than average across Minnesota. The project is also approximately 5.3 miles northwest of the nearest EJ area for people of color and those in poverty near Worthington, MN. The proposed project is not within the exterior boundaries of a federally recognized tribal reservation or community; the Lower Sioux Indian Community is approximately 62 miles northeast of the project.

⁷¹ USEPA, *Environmental Justice*, (2024), <https://www.epa.gov/environmentaljustice>.

⁷² USEPA, *Guidance for Incorporating Environmental Justice Concern in EPA’s NEPA Compliance Analyses*, (1996), https://www.epa.gov/sites/default/files/2014-08/documents/ej_guidance_nepa_epa0498.pdf.

Table 5.2.4-1: Environmental Justice Review

Minn. Statutes § 216B.1691, Subd. 1(e) Criteria				
County/Census Tract	Percent Non-white Population	Percent of Households with Income Equal to or Below 200 Percent of Poverty Level	Percent of Residents with Limited English Proficiency	Within Indian Country?
Project Census Tract				
Census Tract 1051	18.6%	28.0%	4.1%	No
Regions of Comparison				
Minnesota	22.5	21.8%	2.2%	N/A
Nobles County	41.2	38.4%	16.1%	N/A
Source: https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page/?views=EJ-areas				

While the project is not within an EJ community, there are EJ communities in Nobles County. The project would impact an area that is relatively less diverse, has greater English proficiency, and has fewer households in poverty when compared to the rest of Nobles County. No impacts to EJ communities are anticipated, and impacts to nearby EJ communities, which are centered in Worthington, may be positive, as Worthington would see financial benefits due to increased demand for commodities and lodging during project construction.

MITIGATION

The project will not create disproportionate or adverse impacts to low-income or minority populations because no environmental justice areas are present within the project area. Additional mitigation is not proposed.

4.4 Human Health and Safety

Construction and operation of a solar facility and BESS has the potential to impact human health and safety. However, health and safety impacts are not anticipated as a result of the project.

4.4.1 Electric and Magnetic Fields

The ROI for EMF is the area of land control. Impacts to human health from possible exposure to EMFs are not anticipated.

Electric and magnetic fields (EMFs) are invisible forces that result from the presence of electricity. They occur naturally and are caused by weather or the geomagnetic field. They are also caused by all electrical devices and found wherever people use electricity. EMFs are characterized and distinguished by their frequency, that is, the rate at which the field changes direction each second.

Electrical lines in the United States have a frequency of 60 cycles per second or 60 hertz, which is extremely low frequency EMF (“ELF-EMF”). The strength of an electric field decreases rapidly as it travels from the conductor and is easily shielded or weakened by most objects and materials.

Voltage on a conductor creates an electric field that surrounds and extends from the wire. Using water moving through a pipe as an analogy, voltage is equivalent to the pressure of the water moving through the pipe. The strength of the electric field is measured in kilovolts per meter (kV/m). Electric fields decrease rapidly as they travel from the conductor and are easily shielded or weakened by most objects and materials.

Current moving through a conductor creates a magnetic field that surrounds and extends from the wire. Using the same analogy, current is equivalent to the amount of water moving through the pipe. The strength of a magnetic field is measured in milligauss (mG). Like electric fields, the strength of a magnetic field decreases rapidly as the distance from the source increases; however, unlike electric fields, magnetic fields are not easily shielded or weakened.

Table 4.4.1-1 provides examples of electric and magnetic fields associated with common household items. “The strongest electric fields that are ordinarily encountered in the environment exist beneath high voltage transmission lines. In contrast, the strongest magnetic fields are normally found very close to motors and other electrical appliances, as well as in specialized equipment such as magnetic resonance scanners used for medical imaging.”⁷³

Table 4.4.1-1: Electric and Magnetic Field Strength of Common Household Objects⁷⁴

Electric Field*		Magnetic Field**			
Appliance	kV/m	Appliance	mG		
	1 foot		1 inch	1 foot	3 feet
Stereo	0.18	Circular saw	2,100 to 10,000	9 to 210	0.2 to 10
Iron	0.12	Drill	4,000 to 8,000	22 to 31	0.8 to 2
Refrigerator	0.12	Microwave	750 to 2,000	40 to 80	3 to 8
Mixer	0.10	Blender	200 to 1,200	5.2 to 17	0.3 to 1.1
Toaster	0.08	Toaster	70 to 150	0.6 to 7	< 0.1 to 0.11
Hair Dryer	0.08	Hair dryer	60 to 200	< 0.1 to 1.5	< 0.1
Television	0.06	Television	25 to 500	0.4 to 20	< 0.1 to 1.5
Vacuum	0.05	Coffee maker	15 to 250	0.9 to 1.2	< 0.1

* German Federal Office for Radiation Safety

** Long Island Power Institute

⁷³ World Health Organization, *Radiation: Electromagnetic Fields, What are typical exposure levels at home and in the environment?*, (2016), <https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields>.

⁷⁴ Id.

Health Studies Many studies have examined possible links between ELF-EMF exposure and health effects. To date, no mechanism by which ELF-EMFs or radiofrequency radiation could cause cancer has been identified. EMFs, unlike some types of radiation, are in the non-ionizing part of the electromagnetic spectrum and do not damage DNA or cells directly.⁷⁵ Nevertheless, they are fields of energy and thus have the potential to produce some effects.

Studies of EMF impacts on adults show no evidence of a link between EMF exposure and adult cancers, such as leukemia, brain cancer, and breast cancer.”⁷⁶ There is no evidence that exposure to ELF magnetic fields alone causes tumors. The evidence that ELF magnetic field exposure can enhance tumor development in combination with carcinogens is not supported by scientific literature.⁷⁷

The Minnesota State Interagency Working Group on EMF Issues, comprised of staff from state agencies, boards, and the Commission, was tasked to study issues related to EMF. In 2002, the group published *A White Paper on Electric and Magnetic Field Policy and Mitigation Options*, and concluded the following:

“Some epidemiological results do show a weak but consistent association between childhood leukemia and increasing exposure to EMF.... However, epidemiological studies alone are considered insufficient for concluding that a cause and effect relationship exists, and the association must be supported by data from laboratory studies. Existing laboratory studies have not substantiated this relationship..., nor have scientists been able to understand the biological mechanism of how EMF could cause adverse effects. In addition, epidemiological studies of various other diseases, in both children and adults, have failed to show any consistent pattern of harm from EMF.

The Department of Health concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of a health risk cannot be dismissed.”⁷⁸

Regulations and Guidelines Currently, there are no federal regulations regarding allowable ELF-EMF produced by power lines in the United States; however, state governments have developed state-specific regulations. For example, Florida limits electric fields to 2.0 kV/m and magnetic fields to 150

⁷⁵ National Cancer Institute. *Magnetic Field Exposure and Cancer*. (2016). <http://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/magnetic-fields-fact-sheet>.

⁷⁶ National Institute of Environmental Health Sciences. *Electric and Magnetic Fields*, (2024). <http://www.niehs.nih.gov/health/topics/agents/emf/index.cfm>.

⁷⁷ World Health Organization. *Extremely Low Frequency Fields*. (2007). http://www.who.int/peh-emf/publications/Comple DEC_2007.pdf?ua=1, page 10.

⁷⁸ Id., page 36.

mG at the edge of the ROW for 161 kV transmission lines.⁷⁹ Additionally, international organizations have adopted standards for exposure to electric and magnetic fields (**Table 4.4.1-2**).

Table 4.4.1-2: International Electric and Magnetic Field Guidelines

Organization	Electric Field (kV/m)		Magnetic Field (mG)	
	Public	Occupational	Public	Occupational
Institute of Electrical and Electronics Engineers	5.0	20.0	9,040	27,100
International Commission on Non-Ionizing Radiation Protection	4.2	8.3	2,000	4,200
American Conference of Industrial Hygienists	—	25.0	—	10,000/ 1,000 ^a
National Radiological Protection Board	4.2	—	830	4,200

^a For persons with cardiac pacemakers or other medical electronic devices

POTENTIAL IMPACTS

Potential impacts are anticipated to be negligible and are not expected to negatively affect human health. Impacts will be long-term and localized but can be minimized. Project facilities that would generate electric and magnetic fields include the electrical collection lines and transformers installed at each inverter associated with the Solar Facility, BESS, and the gen-tie line. Electric and magnetic fields from electrical collection lines, regardless of whether they are below-ground or above-ground, transmission lines, and transformers dissipate rapidly with distance from the source (National Institute of Environmental Health Sciences [NIEHS], 2002).

MITIGATION

The nearest residence to the solar arrays is 228 feet away; the nearest residence to an inverter, electrical collection line, and transformer is approximately 609 feet away; the nearest residence to the gen-tie line is 835 feet away; and the nearest residence to the BESS is approximately 261 feet away (see **Appendix F- Noise Study**). At this distance, both electric and magnetic fields would have dissipated to background levels before reaching the residence. As such, impacts will be negligible and no mitigation measures are proposed.

4.4.2 Public Safety and Emergency Services

The ROI for public and work safety is the land control area. Like any construction project, there are risks for injuries from falls, equipment and vehicle use, electrical accidents, etc. Public risks involve electrocution. Electrocution risks could also result from unauthorized entry into the fenced area.

⁷⁹ Florida Department of State. *Rule 62-814.450 Electric and Magnetic Field Standards*. (2008). <https://www.flrules.org/gateway/ruleNo.asp?id=62-814.450>.

The main safety hazard of a BESS is battery failure leading to thermal runaway and fire. Emergency response to fires or thermal runaway events at BESS facilities require specialized response. Potential impacts from construction are anticipated to be minimal. Potential impacts during operation are anticipated to be moderate to significant. Impacts would be short- and long-term and can be minimized.

Construction crews must comply with local, state, and federal regulations when installing the project. This includes standard construction-related health and safety practices. This generally includes safety orientation and training, as well as daily/weekly safety meetings.

Emergency services in the project area are provided by local law enforcement and emergency response agencies located in nearby communities. Law enforcement in the project area is provided by the Nobles County Sheriff's Office. Fire service and search and rescue is provided by the city of Wilmont Fire Department and Worthington Fire Department. The nearest hospital offering emergency care is the Sanford Regional Hospital in Worthington. Nobles County has an emergency manager that coordinates an emergency management program of the areas of the county that do not have emergency management organizations, including Summit Lake and Elk Townships

The primary operational safety hazard associated with a BESS is battery failure that could lead to thermal runaway and fire. Thermal runaway events may require specialized emergency response due to the potential for high heat, smoke, and hazardous gases. While such events are infrequent, their consequences could be more severe than typical or atypical electrical facility incidents. As a result, operational impacts to public health and safety are anticipated to range from moderate to potentially significant, depending on the nature and severity of an incident. These impacts could be short- or long-term but can be minimized through facility design, operational protocols, emergency planning, and coordination with local responders.

Potential Impacts

Construction Phase Impacts

Worker safety issues are primarily associated with construction, and public safety concerns would be most associated with unauthorized entry to the project.

The inflow of temporary construction personnel could increase demand for emergency and public health services. On the job injuries of construction workers requiring assistance due to slips, trips or falls, equipment use, or electrocution can create a demand for emergency, public health, or safety services that would not exist if the project were not to be built. Although no road closures are anticipated during construction, any temporary closures could impede police, fire, and other rescue vehicles access to the site of an emergency.

Operational Impacts under Typical and Atypical Scenarios

The BESS facility is designed to operate in compliance with applicable safety standards and to minimize potential impacts to public health, safety, and the environment during emergency conditions or equipment failures. The Applicants have incorporated automated monitoring, control, and protection systems intended to detect abnormal operating conditions and to initiate appropriate response measures.

Thermal management systems are provided to regulate battery temperatures during normal operation and under abnormal conditions. If elevated temperatures are detected, cooling systems may be adjusted, or a controlled system shutdown may be initiated. Affected system components would remain offline until inspected and determined to be safe for return to service.

Overall, the design and operation of the BESS emergency and system failure contingencies are intended to avoid or minimize potential adverse environmental impact, including risks to public safety, air quality, and surrounding land uses, and to ensure consistency with applicable local, state, and federal requirements. These systems are developed and with input and coordination with applicable emergency services. Under these operating scenarios, adverse environmental impacts are not anticipated.

Operational Impacts under Accident Scenarios

As with other industrial facilities, there is the potential for falls, fire or other industrial accidents once the solar facility and BESS are operational. The main safety hazard of a BESS, relative to the solar facility and other electrical systems, is battery failure leading to thermal runaway which has the potential to spread to nearby batteries and containers. The movement of electrons and lithium ions within the battery cell produces electricity as well as heat. Lithium-ion batteries are designed to allow heat to dissipate from the cell to maintain a controlled reaction. Thermal runaway is a phenomenon when a battery cell generates heat at a greater rate than the heat can dissipate from the cell, resulting in a cascading chemical reaction which produces additional heat. Thermal runaway events can result in extremely high temperatures, smoke, fire, and potentially ejection of gas, shrapnel, and particulates.⁸⁰

There are two major types of lithium-ion battery technology used in BESS facilities; Nickel Manganese Cobalt (NMC) batteries and Lithium Ion Phosphate (LFP) batteries. The chemistry of NMC batteries allows them to charge and discharge at higher rates (referred to as “energy density”) than LFP batteries. The ability to charge and discharge at high rates made them a popular choice in early BESS projects. However, compared to LFP batteries, the NMC batteries have a lower thermal runaway temperature, creating increased risks and requiring enhanced monitoring. In comparison, LFP batteries have a higher thermal runaway temperature, making them more stable and less prone to fire. As a result of the relative thermal stability compared to NMC technology as well as decreased costs as the LFP technology matured, the energy storage industry has more recently pivoted to LFP technology. The Applicants indicate that this project will use LFP technology.⁸¹

Emergency response to fires or thermal runaway events at BESS facilities are characterized as accident scenarios and require specialized response and pose potentially significant environmental impacts. BESS fires present unique challenges to firefighters; unlike other utilities or industrial sites, they do not have a single point of disconnect. Although separate parts of the system can be disconnected, the batteries will remain energized.⁸² During a thermal runaway event or fire, gases

⁸⁰ UL Research Institutes, “What Is Thermal Runaway,” 2021, accessed December 5, 2025, <https://tinyurl.com/bdfdymmp>

⁸¹ Application, pp. 26-27

⁸² American Clean Power, Energy Storage Emergency Response Plan Template, accessed December 3, 2025, https://cleanpower.org/wp-content/uploads/gateway/2022/11/ACP_Energy_Storage_Emergency_Response_Plan_Template.pdf, 14–17.

can build up inside battery containers, making it unsafe for first responders to approach or enter them. Because these fires may be difficult to put out, some batteries may continue to hold energy, and toxic gases may be present.

Currently, industry guidance recommends that responders keep a safe distance, monitor the situation, and allow the fire to burn out naturally as the batteries release their stored energy. While each situation is unique, active thermal runaway scenarios can last hours to days.⁸³ Under this scenario, environmental impacts are potentially significant in the short-term, but largely confined to the project site, and reversible through emergency service response and related remediation activities, as needed.

In Minnesota, unless solar panels discarded by commercial entities are specifically evaluated as non-hazardous, the panels are assumed to be hazardous waste due to the possible presence of heavy metals. Heavy metals in solar panels can include arsenic, cadmium, lead, and selenium. If hazardous waste, they must be properly disposed of in a special facility or recycled if recyclers are available.⁸⁴

MITIGATION

The project will be designed and constructed in compliance with applicable electric codes. Electrical inspections will ensure proper installation of all components, and the project will undergo routine inspection. Electrical work will be completed by trained technicians.

Construction is bound by federal and state Occupational Safety and Health Administration (OSHA) requirements for worker safety, and must comply with local, state, and federal regulations regarding installation of the facilities and qualifications of workers. Established industry safety procedures will be followed during and after construction of the project. The Applicants indicate that the project will be fenced and locked to prevent unauthorized access, and signs will be posted to warn unauthorized persons not to enter fenced area due to the presence of electrical equipment.

In addition to the use of the more stable LFP technology, the BESS facility design uses modular containers that are tested by the manufacturer to ensure fire resistance. Modern BESS containers include explosion prevention systems to remove flammable gases during a thermal runaway event and relieve pressure to limit gas levels within the containers from reaching levels that can be flammable or explosive. The containers are spaced to minimize the potential for fire to spread to other containers. The BESS equipment is monitored remotely, tracking cell voltage and temperature to identify and isolate potential issues before they occur.

The National Fire Protection Association issued updated NFPA 855 Standard for the Installation of Stationary Energy Storage Systems in 2023. The standard includes fire detection and suppression, explosion control, exhaust ventilation, gas detection, and thermal runaway requirements.⁸⁵ NFPA

⁸³ AEGIS Loss Control. "White Paper: Lithium-Ion Battery Energy Storage System (Li-ion BESS)." AEGIS Loss Control, 2023, accessed on February 5, 2026, [https://www.aegislink.com/content/dam/aegislink/resources/publications/public/LossControl/Lithium-Ion Battery Energy Storage Systems %28Li-ion BESS%29 112023.pdf](https://www.aegislink.com/content/dam/aegislink/resources/publications/public/LossControl/Lithium-Ion%20Battery%20Energy%20Storage%20Systems%20Li-ion%20BESS%20112023.pdf)

⁸⁴ MPCA, *2017 Toxics and Pollution Prevention Evaluation Report*, (2018), <https://www.lrl.mn.gov/docs/2018/mandated/180453.pdf>.

⁸⁵ National Fire Protection Association, NFPA 855: Standard for the Installation of Stationary Energy Storage Systems, accessed December 5, 2025, <https://tinyurl.com/2n7c5r6d> The standard is available for purchase, the website highlights details of the updated edition.

standards require BESS facilities to prepare a hazard mitigation analysis (HMA) detailing the results of the equipment testing and the risks associated with the technology prior to installation of the BESS. Some BESS developers indicated that HMAs are typically prepared during the financing phase of a project, while other sources indicate that HMAs are typically provided to jurisdictional units for approval of a BESS project.

Public safety is addressed in several sections of the DSPs (**Appendix C and Appendix D**):

- Section 4.3.27 requires the permittee to take several public safety measures, including landowner educational materials, appropriate signs and gates, etc.
- Sections 8.11 and 8.12 require permittees file an *Emergency Response Plan* with the Commission and local first responders prior to operation.
- Sections 8.12 requires disclosure of extraordinary events, such as fires, etc.
- Section 9.1 requires a decommissioning plan prior to construction and updated every five years. Periodic updates of the plan will address the developing information on end-of-life issues related to PV panels.
- Section 5.14 of the BESS Site Permit (**Appendix C**) requires the permittee to file a Hazard Mitigation Analysis detailing the testing results for the selected equipment and the risks associated with the technology at least 30 days prior to the pre-construction meeting.
- Section 5.15 of the BESS Site Permit requires regular training on lithium-iron batteries and associated facility technology for local firefighting crews.

4.5 Land-based Economies

Solar facilities impact land-based economies by precluding or limiting land use for other purposes.

4.5.1 Agriculture

The ROI for agriculture is the land control area. Potential impacts to agricultural producers are anticipated to be minimal to moderate — lost farming revenues will be offset by lease or easement agreements. A loss of farmland in Nobles County would occur for the life of the project. Potential impacts are localized and unavoidable but can be minimized.

Agricultural use dominates the area of land control, with approximately 96.5 percent (1,137.6 acres) of the area used for cultivated row crops (corn, soybeans, and vegetables are the dominant crops).

In 2022, there were approximately 366,330 acres of farmland in Nobles County, approximately 80 percent of the land coverage in the county. There are a total of 938 individual farms located in Nobles County, with an average farm size of 391 acres. The top crops (in acres) cultivated in Nobles County include corn, foraging crops and oats. Cattle tops the list of livestock inventory in Nobles County, followed by hogs and pigs, poultry, and sheep and lambs. The market value of agricultural production in Nobles County in 2022 was approximately \$761 million. Livestock, poultry, and their products

accounted for approximately 62 percent of the total value of agricultural production, while crop sales accounted for the remaining 38 percent⁸⁶.

Prime farmland is defined by Federal regulation at 7 C.F.R.657.5(a)(1) as “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.” Approximately 40.8 percent of the preliminary development area is designated as prime farmland if drained (812.1 acres), 56.7 percent is designated as prime farmland (1,128.0 acres) and 2.5 percent is designated as farmland of statewide importance (49.6 acres).⁸⁷ With respect to prime farmland, the Applicants indicate that no feasible or prudent alternatives to the project exist.

POTENTIAL IMPACTS

The impact intensity level will range from minimal to moderate. The intensity of the impact is likely to be subjective. For example, conversion of farmland to solar energy production can be viewed as a conversion from one type of industrial use to another. Conversely, the conversion of farmland to solar energy production can be viewed as a negative impact to agricultural production. Restoring the site with native grasses and forbs will reduce soil erosion, provide pollinator and wildlife benefits, and improve soil health. This EA acknowledges that the perceived impacts to prime farmland are subjective and may be difficult to assess given the trade-offs associated with utility scale solar projects.

Rural areas, with large parcels of relatively flat, open land, are ideal for solar development, which require six to eight acres of land to generate one MW of electricity. The project will result in up to 1,479.4 acres of farmland being removed from agricultural production for the life of the project. This change in land use would take productive farmland out of production for the life of the project, representing approximately 0.4 percent of existing agricultural land in Nobles County. The Applicants indicate that the land could be returned to agricultural uses after the project is decommissioned and the site is restored.

Impacts to drain tile were a concern raised during the scoping process. If drainage systems are damaged when driving piles for construction of the solar facility, farmers adjacent to the Land Control Area could be impacted and no longer serviced by the tile system, which would result in negative impacts to their agricultural production. The Applicants have also proposed to abandon and reroute sections of county drain tile, which likely has connections to private tile systems that are not mapped in the county system.

A potential impact raised by members of the community is the potential for the solar facility to support agricultural pest species, such as soybean aphid and different grasshopper species, which could impact surrounding farms. Common pest species of aphids, such as soybean aphids and cereal aphids, can impact crop harvests in Minnesota, through consumption and by transmitting viruses.⁸⁸

⁸⁶ USDA 2022. 2022 Census of Agriculture Publications.

https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1_Chapter_2_County_Level/Minnesota.

⁸⁷ Application, Table 5.5.4-2.

⁸⁸ University of Minnesota Southwest Research and Outreach Center- <https://swroc.cfans.umn.edu/ipm-stuff-23-02>

With the possible exception of Bird cherry-oat aphids in a very warm winter, cereal aphids cannot winter in Minnesota, so it is unlikely vegetation management at the solar facility would support cereal aphids. For soybean aphids in the Midwest, buckthorn is the primary host where soybean aphid eggs overwinter and adults reproduce.⁸⁹ Soybeans then serve as the secondary host where soybean aphids feed and reproduce during the summer. The VMP would use native, herbaceous vegetation to manage the site, which would not provide habitat for soybean aphids. This could, however, provide habitat for grasshopper species, which are generally associated with undisturbed grassy areas.⁹⁰

Construction of the project has the potential to damage agricultural soils through compaction or erosion if BMPs are not implemented to minimize damage.

MITIGATION

Several sections of the DSPs (**Appendix C and Appendix D**) address agricultural mitigation and soil-related impacts:

- Sections 4.3.9 require protection and segregation of topsoil.
- Sections 4.3.10 require measures to minimize soil compaction.
- Sections 4.3.11 require the permittee to “implement erosion prevention and sediment control practices recommended by the [MPCA]” and to “obtain a [CSW Permit].” A CSW Permit requires both temporary and permanent stormwater controls to ensure that stormwater does not become a problem on or off-site.
- Sections 4.3.16 require that “site restoration and management” practices enhance “soil water retention and reduces storm water runoff and erosion”.
- Sections 5.8 and 4.3.17 of the DSPs require the permittee to develop a VMP that defines how the land control area will be revegetated and monitored over the life of the project. Appropriate seeding rates and timing of revegetation will stabilize soils and improve overall soil health. The draft VMP is included as **Appendix E** of this EA.
- Sections 5.9 and 4.3.18 require the permittee to develop an AIMP with MDA. The Applicants’ draft AIMP (Appendix E of the original joint site permit application) details methods to minimize soil compaction, preserve topsoil, control noxious weeds and invasive species, maintain the existing drainage conditions through appropriate maintenance and repair of existing drain tile, and establish and maintain appropriate vegetation to ensure the project is designed, constructed, operated and ultimately restored in a manner that would preserve soils to allow for the land to be returned to agricultural use.
- Sections 5.10 and 5.6 require the permittee to develop a site-specific Drain Tile Reroute and Abandonment Plan (DTRAP) in coordination with the Nobles County Drainage Authority Board. The DTRAP would have to be filed with the Commission and would adhere to the following requirements;

⁸⁹ Iowa State University Extension and Outreach- <https://crops.extension.iastate.edu/encyclopedia/soybean-aphid>

⁹⁰ University of Minnesota Extension- <https://extension.umn.edu/soybean-pest-management/grasshoppers-minnesota-soybean>

- Damage done to drain tile will be repaired immediately by a contractor, based in Nobles County, that is mutually agreed on prior to the pre-construction meeting by the Permittee and the Nobles County Drainage Authority Board;
 - Permittees will use a third party to conduct a survey for drain tile within and adjacent to the Site using methods agreed upon with the Nobles County Drainage Authority Board. The results of this survey shall be filed with the Commission at least 14 days prior to the pre-construction meeting;
 - Any private drain tile that is disconnected from county drain tile must be reconnected to the county drain tile following relocation; and;
 - The Permittee shall provide evidence of outreach and correspondence with participating and adjacent landowners to obtain maps of private drain tile within and bordering the Site.
- Sections 4.3.18 and 4.3.20 require the permittee to develop an Invasive Species Management Plan to prevent introduction and spread of invasive species during construction of the project.
 - Sections 4.3.17 and 4.3.19 of the BESS DSP and Sections 4.3.19 and 4.3.21 require the permittee to take reasonable precautions against the spread of noxious weeds.
 - Sections 4.3.27 require the permittee to fairly restore or compensate landowners for damages to crops, fences, drain tile, etc. during construction.

The Applicants indicate that BMPs would be implemented during construction in order to minimize and mitigate long-term impacts to agricultural lands, including project design that minimizes infrastructure to the degree practicable, preventing soil profile mixing, halting construction during wet weather conditions, ensuring proper site drainage and erosion control, and limiting the spread of noxious weeds and invasive species by cleaning construction equipment.

The Applicants have presented draft plans for drain tile abandonment and reroute to the Nobles County Board of Commissioners, but no plan has been accepted. The Applicants are still coordinating with local authorities on experts to identify the best methods to identify the location of private drain tile within the Land Control Area. Other mitigation strategies, such as collection line routing, vegetative screening placement, and drain tile centerline setbacks, will be identified in the Drain Tile Reroute and Abandonment Plan (DTRAP) as required by Sections 5.6 and 5.10 of the DSPs.

Reports of increased pest outbreaks have not been received from farms adjacent to other solar facilities permitted by the Commission, but if local farmers see an increase in outbreaks of grasshoppers or other pest species, they are encouraged to file a complaint, and management practices at the Site can be appropriately adjusted to manage pests.⁹¹ Following construction, the

⁹¹Minnesota Public Utilities Commission- File a Complaint about your Utility Service.
<https://mn.gov/puc/consumers/complaint/>

Applicants indicate that disturbed areas would be repaired and restored to pre-construction contours and characteristics to the extent possible.⁹²

4.5.2 Tourism

The ROI for tourism is the project area. Impact intensity is expected to be minimal, and short-term in duration. There may be potential for impacts to local recreational activities during construction, however impacts will be temporary.

Tourism in the local area includes festivals, fairs, markets, celebrations, and outdoor recreation like camping, fishing, bicycling, and hiking.

POTENTIAL IMPACTS

All project facilities will be located on privately-owned land, therefore impacts to tourism and recreation are anticipated to be minimal. Short-term impacts to outdoor recreational activities could occur during construction due to noise and traffic increase, however these impacts will be temporary and short-term in duration.

MITIGATION

Because significant impacts are not anticipated, no additional mitigation measures are proposed.

4.6 Archeological, Cultural, and Historic Resources

The ROI for archeological and historic resources is the project area. The impact intensity level is anticipated to be negligible to minimal. Impacts would be localized. Impacts can be mitigated through prudent siting.

Archeological resources are locations where objects or other evidence of archaeological interest exist, and can include aboriginal mounds and earthworks, ancient burial grounds, prehistoric ruins, or historical remains.⁹³ Historic resources are sites, buildings, structures, or other antiquities of state or national significance.⁹⁴

The Summit Lake Project is subject to the Minnesota Historic Sites Act, which requires state agencies to consult with the Minnesota State Historic Preservation Office (SHPO) regarding any potential impacts on state or federal designated or listed historic properties.

Tetra Tech, on behalf of the Applicants, conducted a Phase I investigation of the Land Control Area to identify archaeological sites and historic structures that could be affected by the Project. No previously documented archaeological sites were identified within the Land Control Area; however, one archaeological site was identified within a one-mile buffer of the Land Control Area. The site is a Pre-Contact isolated find and is recommended as not eligible for listing in the National Register of Historic Places.

No previously inventoried architectural resources were identified within the Land Control Area; however, six previously inventoried farmsteads are present within one mile of the Land Control Area

⁹² Application, Section 5.3.2.1.

⁹³ Minnesota Statutes, Section. [138.31](#), subd. 14.

⁹⁴ Minnesota. Statutes, Section [138.51](#).

at distances between 0.4 and 1.0 mile from the Land Control Area boundary. None of these farmsteads have been evaluated for National Register of Historic Places (NRHP) listing.

POTENTIAL IMPACTS

The Applicants report contacting the eleven federally recognized Tribal Nations in Minnesota and the Minnesota Indian Affairs Council for additional information or comment on the project, and received no response.⁹⁵

The Applicants submitted the Phase I inventory report to the Minnesota SHPO on February 12, 2025. The SHPO provided comment on the report on April 3, 2025, and agreed with the Applicants' recommendations regarding site eligibility for listing in the National Register of Historic Places. In particular, SHPO agreed that one resource, Site NO0093, should be avoided or evaluated for eligibility. The Applicants indicate that the Project design has been updated to avoid this site.⁹⁶ SHPO agreed that if Site NO0093 is avoided, the Project will not affect properties listed in or eligible for the National or State Registers of Historic Places, or within the Historic Sites Network.⁹⁷

MITIGATION

Prudent siting to avoid impacts to archaeological and historic resources is the preferred mitigation. Sections 4.3.21 and 4.3.23 of the DSPs (**Appendix C and Appendix D**), address archeological resources and require the permittee to avoid impacts to archaeological and historic resources where possible and to mitigate impacts where avoidance is not possible. If previously unidentified archaeological sites are found during construction, the permit requires the permittee to stop construction and contact SHPO to determine how best to proceed. Ground disturbing activity will stop, and local law enforcement will be notified should human remains be discovered.

Additionally, Sections 5.11 and 5.7 of the DSPs require preparation of an Unanticipated Discoveries Plan outlining steps to be taken if previously unrecorded cultural resources or human remains are encountered during construction. The Applicants indicate that before construction begins, an Unanticipated Discoveries Plan will be prepared, and should any previously unknown cultural resources or human remains be encountered, work will stop, and the discovery will be examined by an archaeologist. If the discovery is determined to be a significant cultural resource, SHPO and the Office of the State Archaeologist will be notified. With regard to a discovery of potential human remains, procedures would be followed to verify if the remains are human and that the appropriate authorities would become involved quickly and in accordance with local and state guidelines.⁹⁸

4.7 Natural Resources

Solar facilities impact the natural environment. Impacts are dependent upon many factors, such as how the project is designed, constructed, maintained, and decommissioned. Other factors, for example, the environmental setting, influence potential impacts. Impacts can and do vary significantly both within, and across, projects.

⁹⁵ Application, Table 6.0-1

⁹⁶ Application Amendment, Table 2.1-1

⁹⁷ Application Amendment, Agency Correspondence. eDockets No. [202512-226022-08](#)

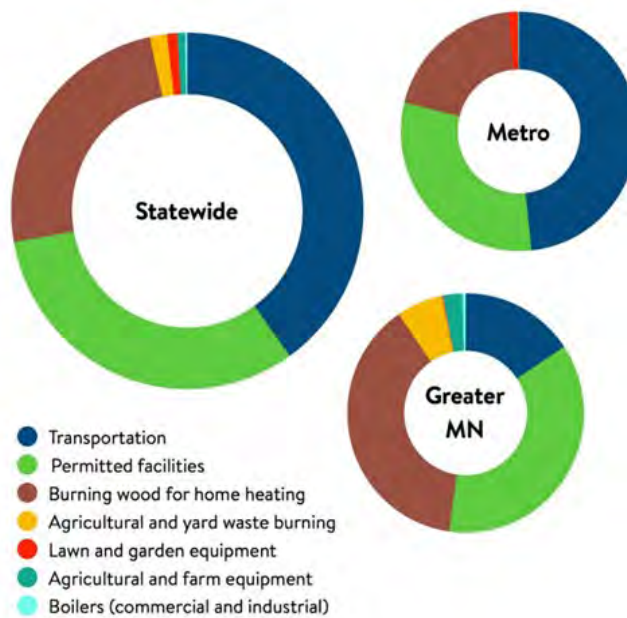
⁹⁸ Id.

4.7.1 Air Quality

The ROI for air quality is the region. Potential impacts to air quality during construction would be intermittent, localized, short-term, and minimal. Impacts are associated with fugitive dust and exhaust. Impacts can be mitigated. Once operational, the solar array will not generate criteria pollutants or carbon dioxide. Negligible fugitive dust and exhaust emissions would occur as part of routine maintenance activities. Impacts are unavoidable and do not affect a unique resource. Impacts can be minimized.

Air quality is a measure of how pollution-free the ambient air is and how healthy it is for humans, other animals, and plants. Emissions of air pollutants will occur during construction and operation of new infrastructure for the project. Overall air quality in Minnesota has improved over the last 20 years, but current levels of air pollution still contribute to health impacts. As illustrated in **Graphic 4.7.1-1**, today, most of our air pollution comes from smaller, widespread sources. The rest comes from a wide variety of things we use in our daily lives: our vehicles, local businesses, heating and cooling, and yard and recreational equipment.⁹⁹

Graphic 4.7.1-1: Air Pollution Sources by Type



The nearest air quality monitor to the project is in Marshall, Minnesota, approximately 54 miles north of the project area. Air quality has been considered good or moderate for the majority of the past five reported years in Marshall. Since 2019, the largest number of days classified as moderate occurred in 2023. Thirteen days in 2021 and 2023, combined, were considered unhealthy for sensitive groups. Each of these days occurred between May and September and were likely the result of wildfire smoke.

⁹⁹ MPCA, *The Air We Breathe The State of Minnesota's Air Quality in 2021, (2023)*, <https://www.lrl.mn.gov/docs/2022/mandated/221697.pdf>.

Two days each were classified as unhealthy in 2021, 2022, and 2023, most of which were confirmed to be the result of wildfires in Canada. No days have been classified as very unhealthy.

Table 4.7.1-1 Days in Each Air Quality Index Category (Marshall, Minnesota)

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2023	206	142	10	2	0
2022	303	51	0	2	0
2021	263	91	3	2	0
2020	309	51	0	0	0
2019	305	53	0	0	0
Source: MPCA¹⁰⁰					

POTENTIAL IMPACTS

Impacts on air quality from construction of the project would be minimal and limited to the period of construction. When necessary, dust from construction traffic will be controlled using standard construction practices such as watering of exposed surfaces, covering of disturbed areas, and reduced speed limits. Overall, dust emissions currently experienced annually in the area through farming activities will be reduced for the life of the Project through the establishment of perennial vegetative cover.

Air emissions during construction would primarily consist of emissions from construction equipment and would include carbon dioxide, nitrogen oxides, and particulate matter. Dust from earthmoving activities would also contribute to particulate matter emissions. Impacts from the Project are expected to be negligible because of the temporary nature of the emissions and dust producing construction phases. Applicable BMPs will be used during construction and operation of the Project to minimize dust emissions if the wind erosion becomes an issue. Estimated construction emissions are summarized below in Table 5.5.1-2.

Table 5.5.1-2 Construction Related Criteria Pollutant Emissions

Construction Activity	CO (tpy)	NO _x (tpy)	VOC (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)
Off-Road Engines	130.26	28.52	7.16	4.55	4.55	0.06
Unpaved Road	-	-	-	0.76	0.08	-
Earthmoving	-	-	-	182.53	19.33	-
PROJECT TOTAL	130.26	28.52	7.16	188.53	23.96	0.06

¹⁰⁰ Minnesota Air Quality Index.

[https://public.tableau.com/app/profile/mpca.data.services/viz/MinnesotaAirQualityIndex_0/AQIE xternal](https://public.tableau.com/app/profile/mpca.data.services/viz/MinnesotaAirQualityIndex_0/AQIE%20external).

Note: CO = carbon monoxide, NO_x = nitrogen oxides, VOC = volatile organic compounds, PM₁₀ = particulate matter less than 10 microns in diameter, PM_{2.5} = particulate matter less than 2.5 microns in diameter, SO₂ = sulfur dioxide, and tpy = tons per year.

MITIGATION

Exhaust emissions can be minimized by keeping vehicles and equipment in good working order, and not running equipment unless necessary. The Applicants indicate that BMPs will be used during construction and operation of the project to minimize dust and emissions.

As a component of the construction stormwater permit that will be obtained for the project, an NPDES and State Disposal System CSW permit, and an associated SWPPP, will be developed and implemented prior to construction in order to minimize the potential for fugitive dust emissions.

Watering exposed surfaces, covering disturbed areas, and reducing speed limits on-site are all standard construction practices.

The AIMP identifies construction BMPs related to soils and vegetation that will help to mitigate against fugitive dust emissions. Several sections of the draft plan indirectly mitigate impacts to air quality, including sections related to construction and vegetation removal, soils, erosion and sediment control, and restoration of the site to pre-construction conditions.¹⁰¹ Furthermore, Sections 5.3 of the DSPs detail procedures for dust control.

4.7.2 Geology and Groundwater

The ROI for geology and groundwater is the land control area. Impacts to domestic water supplies are not expected. Impacts to geology are not anticipated. Localized impacts to groundwater resources, should they occur, would be intermittent and can be mitigated through use of BMPs for stormwater management.

Groundwater in Minnesota is largely a function of local geologic conditions that determine the type and properties of aquifers. Minnesota is divided into six groundwater provinces based on bedrock and glacial geology. The Land Control Area is located in Province 5 (Western), which is characterized by fine-grained (e.g., clay and silt) glacial sediment. Limited extents of surficial and buried sand aquifers are located within the province and fractured bedrock is commonly buried deeply beneath the glacial sediment and is of limited use as an aquifer.¹⁰²

Pollution sensitivity of near surface materials in the project area is in the “very low” category.¹⁰³ The sensitivity to pollution of near-surface materials is an estimate of the time it takes for water to travel through the unsaturated zone to reach the water table, which for the purposes of the model was assumed to be 10 feet below the land surface.¹⁰⁴ This means that the project area is generally

¹⁰¹ Application, Attachment E.

¹⁰² DNR, Minnesota Groundwater Provinces 2021, (n.d.), https://www.dnr.state.mn.us/waters/groundwater_section/mapping/provinces.html.

¹⁰³ Minnesota Natural Resource Atlas, (n.d.), <https://mnatlas.org/gis-tool/>.

¹⁰⁴ Adams, Roberta, *Pollution Sensitivity of Near-Surface Materials*, (2016), <https://www.leg.state.mn.us/docs/2017/other/170839.pdf>.

expected to have very low potential for groundwater pollution sensitivity where contaminants from the land surface would not reach groundwater for months to a year.¹⁰⁵ Low sensitivity does not guarantee protection. Leakage from an unsealed well for example, may bypass the natural protection, allowing contamination to directly enter an aquifer.

Depth to bedrock beneath the project is estimated to be 150 to 250 feet below ground level. Depth to water table in the preliminary development area ranges from just below the surface to more than 200 centimeters depending on the soil type.¹⁰⁶ Depth to water table is shallower in the mapped hydric soils and areas delineated as wetland, and deeper in the non-hydric soil units.

The land control area was reviewed for wells listed on the Minnesota Well Index (MWI) and MDH Wellhead Protection Areas (WHPAs).¹⁰⁷ The MDH maintains the Minnesota Well Index (MWI), which provides basic information (e.g., location, depth, geology, construction, and static water level) for wells and borings drilled in Minnesota. The MWI identifies one documented well within the project site, and 25 additional wells within one mile of the project area (**Figure 7, Appendix A**).¹⁰⁸

Under the Safe Drinking Water Act, each state is required to develop and implement a Wellhead Protection Program to identify the land and recharge areas contributing to public supply wells and prevent the contamination of drinking water supplies. Each Wellhead Protection Area (WHPA) encompasses the area around a drinking water well where contaminants could enter and pollute the well. Public and non-public community water supply source-water protection in Minnesota is administered by the MDH through the Wellhead Protection program. WHPAs for public and community water-supply wells are delineated based on a zone of capture for 10-year groundwater time-of-travel to the well and are available through a database and mapping layer maintained by MDH (2023b). A search for WHPAs in the MDH database indicated that the land control area is located entirely inside of a WHPA for a drinking water well where contaminants could enter and pollute the well.

During scoping, many members of the public voiced concern over the potential for pollutants to enter groundwater in the Land Control Area if solar panels were to be impacted by severe weather events. Commentors stated that some adjacent landowners rely on augered wells for their supply of fresh water, and that these wells may be impacted if pollutants, such as heavy metals, leach from the solar panels into the ground. The sections below address potential sources of groundwater pollution

POTENTIAL IMPACTS

Potential impacts to geology and groundwater can occur directly or indirectly. Impacts to geological resources are likely to be minimal due to the absence of karst features. Geotechnical soil borings will

¹⁰⁵ DNR, *Methods to Estimate Near-Surface Pollution Sensitivity*, (2016), https://files.dnr.state.mn.us/waters/groundwater_section/mapping/gw/gw03_ps-ns.pdf.

¹⁰⁶ United States Department of Agriculture, *Web Soil Survey*, (n.d.), <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.

¹⁰⁷ Application, Section 5.5.3.

¹⁰⁸ MDH, *Minnesota Well Index*, (2024), <https://www.health.state.mn.us/communities/environment/water/mwi/index.html>.

be completed by the Applicants as Project design and engineering advances; this information will be assessed for potential impacts to geologic resources.

Direct impacts to groundwater are generally associated with construction, such as structure foundations that could penetrate shallow water tables or groundwater usage. Indirect impacts could occur through spills or leaks of petroleum fluids or other contaminants that contaminate surface waters which could ultimately contaminate groundwater. The disturbance of soil and vegetative cover could affect water quality in groundwater resources. Impacts to groundwater resources, including aquifers, are not anticipated as water supply needs will be limited and the thickness of surface materials (approximately 550 feet) mean no bedrock would be impacted.

The variables from the Applicants' geotechnical study will be used to engineer the solar array foundation system. Typically, the foundation is a steel pile, which is driven into the ground with a hydraulically powered high-frequency hammer mounted on a tracked carrier. The piles are installed at pre-defined locations throughout the array area to a depth depending on soil properties and other factors such as wind and snow loads.

Construction of the project is not likely to require subsurface blasting, and newly fractured bedrock causing groundwater flow is not anticipated. A domestic well is likely to be installed as a component of the O&M building. The construction of a solar project will create an increase in impervious and semi-impervious surfaces within the Land Control Area. This could lead to an increase of stormwater runoff, and in turn reduce groundwater recharge, which is the process by which water moves from soil, through rock, and into groundwater. Once perennial vegetation is established, it encourages water infiltration and reduces surface runoff, which would increase groundwater recharge.

The project is not anticipated to require the use or storage of large quantities of hazardous materials that might otherwise have the potential to spill or leak into area groundwater. An SPCC Plan will be required for the transformer substation. The Applicants state that transformers would be contained per USEPA requirements.¹⁰⁹

The potential for pollutants to leach from the solar panels to impact groundwater in the project area is minimal. Leaching typically occurs when rainwater is filtered through industrial wastes and draws out chemicals and other pollutants. A small number of metals used in some solar panel models, particularly lead and cadmium, can be harmful to humans and the environment at high concentrations. Studies of solar farms have shown no differences in lead and cadmium levels between soils in solar facilities, adjacent agricultural fields, and distant agricultural fields.¹¹⁰ Solar panel components are also contained by tempered glass, which prevents exposure of interior components to water or being released into the air.

The US EPA uses its Toxicity Characteristic Leaching Procedure (TCLP) protocols to determine the potential for pollutants, such as heavy metals and volatile compounds, to leach from waste into groundwater. Essentially, testers break down solar panels, bury the fragments in the ground, then monitor the soil following exposure to water to determine whether any pollutants present in the

¹⁰⁹ Application, Section 5.5.3.3.

¹¹⁰ Robinson and Meindl 2019, *Potential for leaching of heavy metals and metalloids from crystalline silicon photovoltaic systems* <https://journals.ub.uni-koeln.de/index.php/JNRD/article/view/774>

panel are transported into the soil and potential groundwater beneath. The Applicants have stated that they would only select panels that have been certified as non-toxic by the EPA's TCLP program, which would mean that the panels would not leach hazardous materials into soils and groundwater.¹¹¹

MITIGATION

Stormwater management is important to ensure that structure foundations maintain their integrity and that rainwater and surface runoff drain away from the project structures and roads in a way that does not adversely affect existing drainage systems, roads, or nearby properties. Appropriate permanent stormwater management measures, including minimizing the area of impervious surfaces at the site to reduce the volume and velocity of the stormwater runoff and the establishment of multiple stormwater ponds, will address drainage from the newly established impervious areas. Summit Lake indicates that solar panels will be mounted above the ground with vegetation underneath, allowing water to filter into vegetation and soil prior to discharging.

Summit Lake plans to install a well to supply water to the O&M building. Any new wells require notification to MDH and would be constructed by a well borer licensed by MDH. If any previously unmapped wells are discovered, the Applicants should cap and abandon the well in place in accordance with MDH requirements.

Because the project will disturb more than one acre, Summit Lake must obtain a CSW Permit from the MPCA. The CSW Permit will identify BMPs for erosion prevention and sediment control. As part of the CSW Permit, the Applicants will also develop a SWPPP that describes construction activity, temporary and permanent erosion and sediment controls, BMPs, permanent stormwater management that will be implemented during construction and through the life of the project. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion and detail stormwater management methods during construction and operation of the facility. **Sections 4.3.11** of the DSPs (**Appendix C and Appendix D**) require the permittee to obtain a MPCA CSW Permit and implement the BMPs within for erosion prevention and sediment control. Impacts to groundwater can also be minimized by mitigating impacts to and soils and surface waters as discussed in Section **4.7.4** of this EA.

An NPDES permit application to discharge stormwater from construction facilities may also be acquired by Summit Lake from the MPCA. BMPs will be used during construction and operation of the project to protect topsoil and adjacent resources and to minimize soil erosion, whether the erosion is caused by water or wind. Practices may include containment of excavated material, protection of exposed soil, stabilization of restored material, and treating stockpiles to control fugitive dust.

4.7.3 Soils

The ROI for the soils is the land control area. Impacts to soils will occur during construction and decommissioning of the project. The impact intensity level is expected to be minimal. Potential impacts will both positive and negative, and short- and long-term. Isolated moderate to significant negative impacts associated with high rainfall events could occur. Because the soil at the solar

¹¹¹ Oral Comments on the Scope of the Environmental Assessment.

<https://efiling.web.commerce.state.mn.us/documents/%7B00B57997-0000-CF31-B0F2-51623EE2E618%7D/download?contentSequence=0&rowIndex=26>

facility will be covered with native perennial vegetation for the life of the project, soil health is likely to improve.

The soils deposited in the area (**Table 4.7.3-1**) are primarily composed of silt and clay loams. Approximately 41 percent of the soil is designated as hydric or contains hydric inclusions. The soils within the site may be susceptible to compaction or rutting during wet conditions due to the hydric texture of the soil. Ninety-seven percent of the soils within the Land Control Area are designated prime farmland or prime farmland if drained (**Figure 8, Appendix A**).

Table 4.7.3-1: Summary of Soils Within the Land Control Area¹¹²

Map Unit Symbol	Map Unit Name	Land Control Area (acres / %)	Farmland Designation	Hydric Soil
L78A	Canisteo clay loam, 0 to 2 percent slopes	138.7 / 7.0%	Prime farmland if drained	Yes
L107A	Canisteo-Glencoe complex, 0 to 2 percent slopes	11.0 / 0.6%	Prime farmland if drained	Yes
L79B	Clarion loam, 2 to 6 percent slopes	645.6 / 32.4%	All areas are prime farmland	No
L134B	Clarion-Crooksford complex, 1 to 5 percent slopes	8.4 / 0.4%	All areas are prime farmland	No
L102C2	Clarion-Storden complex, 6 to 10 percent slopes, moderately eroded	18.5 / 0.9%	Farmland of statewide importance	No
L136A	Crooksford silty clay loam, 1 to 3 percent slopes	15.9 / 0.8%	All areas are prime farmland	No
L170B	Estherville-Round lake complex, 2 to 6 percent slopes	24.9 / 1.3%	Farmland of statewide importance	No
L146A	Glencoe silty clay loam, 0 to 1 percent slopes	38.7 / 1.9%	Prime farmland if drained	Yes
L152B	Lowleyn-Round lake complex, 1 to 6 percent slopes	5.1 / 0.3%	All areas are prime farmland	No
L85A	Nicollet clay loam, 1 to 3 percent slopes	421.3 / 21.2%	All areas are prime farmland	No
L140A	Ocheda silty clay loam, 1 to 3 percent slopes	9.0 / 0.5%	All areas are prime farmland	No
L135A	Okabena silty clay loam, 1 to 3 percent slopes	19.1 / 1%	All areas are prime farmland	No
L163A	Okoboji silty clay loam, 0 to 1 percent slopes	11.6 / 0.6%	Prime farmland if drained	Yes
L158B	Round lake sandy loam, 1 to 6 percent slopes	6.2 / 0.3%	Farmland of statewide importance	No

¹¹² Application, Table 5.5.4-1.

L129B	Terril loam, 2 to 6 percent slopes	3.6 / 0.2%	All areas are prime farmland	No
L133A	Waldorf silty clay loam, 0 to 2 percent slopes	2.0 / 0.1%	Prime farmland if drained	Yes
L83A	Webster clay loam, 0 to 2 percent slopes	610.2 / 30.7%	Prime farmland if drained	Yes
PROJECT TOTAL		1,989.6 / 100.0%		

POTENTIAL IMPACTS

The impact intensity level is expected to be low to moderate. Primary impacts to soils include compaction from construction equipment, soil profile mixing during grading and pole auguring, rutting from tire traffic, and soil erosion. Impacts to soils are likely to be greatest with the below-ground electrical collection system. Potentials impacts will be positive and negative, and short- and long-term. Isolated moderate to significant negative impacts associated with high rainfall events could occur. Because the soil at the solar facility would be covered with native perennial vegetation for the operating life of the project, soil health would likely improve over the operating life of the project.¹¹³

Summit Lake estimates that construction of the solar facility will require grading approximately 1,000 acres within the Land Control Area (pers. Comm. August 19, 2025). As with any ground disturbance, there is potential for soil compaction and erosion. Heavy rainfall events during construction or prior to establishment of permanent vegetation, increase the risk that significant sedimentation and erosion could occur.

The soils within the Land Control Area are generally loamy in texture and susceptible to compaction or rutting during wet conditions due to the hydric texture of the soil. The soils are less susceptible to wind erosion during dry periods due to the level nature of the Land Control Area; however, areas with higher slopes may be more susceptible. Existing drain tiles may be used or new tiles installed to ensure proper drainage.

Soil cover and management at the solar facility will change from cultivated cropland to a mixture of pervious areas with native groundcover plantings and semi-impervious surfaces. Once permanent vegetation is properly established, stormwater management, as well as general soil health, would improve due to use of native plants¹¹⁴. The location and amount of stored topsoil will be documented to facilitate re-spreading of topsoil after decommissioning. These benefits could extend beyond the life of the project if they are preserved through decommissioning practices, and if the site is returned to agricultural use.

MITIGATION

Several sections of the DSPs (**Appendix C and Appendix D**) address soil-related impacts

¹¹³ Walston et al. 2021- *Modeling the ecosystem services of native vegetation management practices at solar energy facilities in the Midwestern United States*.

<https://www.sciencedirect.com/science/article/pii/S2212041620301698>

¹¹⁴ Carvalho et al. 2024- *Enhancing soil carbon in solar farms through active land management: a systematic review of the available evidence*. <https://iopscience.iop.org/article/10.1088/2752-664X/ad8ce4/meta>

- Sections 4.3.9 require protection and segregation of topsoil;
- Sections 4.3.11 require the permittee to obtain a MPCA CSW Permit and implement the BMPs within for erosion prevention and sediment control.
- Sections 4.3.24 and 4.3.26 require that “site restoration and management” practices enhance “soil water retention and reduces storm water runoff and erosion”.
- Sections 5.8 and 4.3.17 require the permittee to develop a VMP that defines how the land control area will be revegetated and monitored over the life of the project. Appropriate seeding rates and timing of revegetation will stabilize soils and improve overall soil health. The Applicants’ draft VMP is included as **Appendix E**).
- Sections 5.9 and 4.3.18 require the permittee to develop an AIMP which details methods to minimize soil compaction, preserve topsoil, and establish and maintain appropriate vegetation to ensure the project is designed, constructed, operated, and ultimately restored in a manner that would preserve soils to allow for the land to be returned to agricultural use. The Applicants’ draft AIMP is included as Appendix F of the original joint site permit application¹¹⁵.

4.7.4 Surface Water Resources

The ROI for surface water resources is the land control area. The impact intensity level is anticipated to be minimal. Direct impacts to surface waters are not expected. Indirect impacts to surface waters might occur. These impacts will be short-term, of a small size, and localized. Impacts can be mitigated.

Solar farm projects have the potential to impact surface water resources and floodplains. These projects could directly impact water resources and floodplains if these features cannot be avoided through project design. Projects also have the potential to adversely impact surface waters through construction activities which move, remove, or otherwise handle vegetative cover and soils. Changes in vegetative cover and soils can change runoff and water flow patterns.

The Project is located in the Des Moines River – Headwaters (HUC8: 07100001) and Rock River (HUC8: 10170204) watersheds (MDNR, 2023). Agricultural use is the dominant land use in both watersheds.¹¹⁶

4.7.4.1 Lakes and Ponds

Publicly available datasets, including the National Wetlands Inventory (NWI) and DNR Hydrography dataset, suggest the presence of two small, freshwater ponds in the Land Control Area. Aerial imagery and site visits do not support the presence of these ponds, although one pond seems to be part of a larger, emergent wetland.

4.7.4.2 Rivers and Streams

NWI, NHD, and DNR Hydrography data support the presence of two intermittent streams in the Land Control Area in the northern and eastern portions of the Project Area. During on-site wetland

¹¹⁵ Application- Attachment F. eDockets No. [20252-215674-08](https://www.pca.state.mn.us/eDockets/20252-215674-08)

¹¹⁶ MPCA. Minnesota Watershed Information. <https://www.pca.state.mn.us/business-with-us/watershed-information>

delineation surveys, the eastern stream was recorded as an emergent wetland, while the northern stream was recorded as upland habitat.

4.7.4.3 Public Waters

There are no Public Waters Inventory watercourses or basins located within the Land Control Area. The nearest Public Waters Inventory (PWI) watercourse is an unnamed stream that abuts the eastern border of the Land Control Area along Monroe Avenue. A delineated wetland located within the Land Control Area is connected to this unnamed stream, but not listed in the PWI dataset. There are also two unnamed streams designated as PWI watercourses located approximately 0.2 miles east of the Land Control Area.¹¹⁷ The nearest PWI water basin is Groth Marsh, located approximately 0.6 miles north of the Land Control Area.

4.7.4.4 Impaired Waters

Under Section 303(d) of the Clean Water Act, states are required to assess all waters of the state to determine if they meet water quality standards, list waters that do not meet standards and update the list biannually and conduct total maximum daily load studies to set pollutant-reduction goals needed to restore waters to the extent that they meet water quality standards for designated uses. The list, known as the 303(d) list, is based on violations of water quality standards. The MPCA has jurisdiction over determining 303(d) waters in the State of Minnesota. There are no waters listed by the MPCA as impaired waters within the project site. Jack Creek and the Little Rock River are the closest impaired waters to the Land Control Area at 2.4 and 3.5 miles from the Land Control Area, respectively.¹¹⁸

4.7.4.5 Floodplains

Floodplains are flat, or nearly flat, land adjacent to a river or stream that experiences occasional or periodic flooding. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which includes areas covered by the flood, but which do not experience a strong current. Floodplains prevent flood damage by detaining debris, sediment, water, and ice. The Federal Emergency Management Agency (FEMA) delineates floodplains and determines flood risks in areas susceptible to flooding. The base flood that FEMA uses, known as the 100-year flood, has a one percent chance of occurring during each year.

At the state level, the DNR oversees the administration of the state floodplain management program by promoting and ensuring sound land use development in floodplain areas in order to promote the health and safety of the public, minimize loss of life, and reduce economic losses caused by flood damages. The DNR also oversees the national flood insurance program for the state of Minnesota. Floodplains are also regulated at the local level.

According to the FEMA website, the project area is mapped as Zone X, which is an area of minimal flood hazard.¹¹⁹ Due to Minnesota's warmer and wetter climate projected by climate change models,

¹¹⁷ Application- Appendix I. eDockets Nos. [20252-215674-11](#) and [20252-215674-12](#)

¹¹⁸ MPCA, *Impaired Waters Viewer*, (2014), <https://gisdata.mn.gov/dataset/impaired-waters-viewer>.

¹¹⁹ FEMA, *FEMA Flood Map Service Center*, (n.d.), <https://msc.fema.gov/portal/home>.

there is increased risk for damaging rain events and more frequent flooding. These events could impact the project (**Section 4.7.8**).

4.7.4.6 Wetlands

Wetlands are areas with hydric (wetland) soils, hydrophilic (water-loving) vegetation, and wetland hydrology (inundated or saturated during much of the growing season).¹²⁰ Wetlands are important to the health of waterways and communities that are downstream. Wetlands can be one source of hydrology in downstream watercourses and water bodies, detain floodwaters, recharge groundwater supplies, remove pollution, and provide fish and wildlife habitat. Wetland health also has economic impacts because of their key role in fishing, hunting, agriculture, and recreation. These large infrastructure projects could temporarily or permanently impact wetlands if these features cannot be avoided through project design. During construction, temporary disturbance of soils and vegetative cover could cause sediment to reach wetlands which could in turn affect wetland functionality.

The Applicants assessed the potential for wetlands within the solar farm footprint through a formal wetland delineation in October, 2022. The wetland delineation used desktop methods that assessed publicly available data to identify likely wetland areas through analysis of soils, aerial imagery, and databases such as National Wetlands Inventory data, the National Hydrography Dataset, and the DNR's Public Waters Inventory.¹²¹ After likely wetland areas were identified, a formal wetland delineation was completed following USACE guidance.

A total of 23 wetlands comprising 9.54 acres of the Land Control Area were identified by the wetland delineation, all of which were designated as having emergent (herbaceous) vegetation, such as marshes and flooded basins (**Figure 9**, Appendix A). A majority of the delineated wetlands were largely roadside ditches and drainage swales. One of the wetlands identified is a marsh complex that extends beyond the Land Control Area, with only 0.59 acres of the complex located in the Land Control Area and 18.547 acres located outside the Land Control Area.

4.7.4.7 Impacts

The project is designed to avoid direct impacts to surface waters by avoiding placement of project components such as access roads, solar arrays, inverters, or transmission structures in surface waters. While no rivers or streams are present in the Land Control Area, a PWI watercourse runs up to the eastern boundary of the Land Control Area. There are no lakes or ponds present in the Land Control Area.

Although wetlands have been identified within the project area, the preliminary site layout for the solar facility entirely avoids locating solar arrays and associated facilities in wetlands. There may be potential for temporary, indirect, short-term impacts to wetlands that occur during installation of the electrical collection lines and temporary access roads through stormwater runoff. Direct impacts to wetlands, such as dredging, filling, or staging of construction equipment, are not expected to occur.

¹²⁰ USEPA, *What is a Wetland*, (2024), <https://www.epa.gov/wetlands/what-wetland>.

¹²¹ DNR, Public Waters Inventory Maps.

https://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html

Construction of the project creates a potential for indirect impacts if sediment or fugitive dust created by excavation, grading, vegetation removal, and construction traffic reaching nearby surface waters.

4.7.4.8 Mitigation

Standard construction management practices, including, but not limited to containment of excavated soils, protection of exposed soils, stabilization of restored soils, and controlling fugitive dust, would minimize the potential for eroded soils to reach surface waters.

A 300-foot buffer is planned around the PWI watercourse that abuts the eastern boundary of the Land Control Area. This buffer is consistent with the Nobles County Shoreland Zoning Ordinance and would occupy 2.4 acres of the Land Control Area.

The project site layout has been designed to avoid all wetlands and other surface waters delineated to date. If wetland impacts are required for the final layout, coordination with the appropriate agency, such as the USACE under Section 404 and 401 of the Federal Clean Water Act (CWA) and the Nobles County Soil and Water Conservation District under the Minnesota Wetland Conservation Act (WCA), would occur prior to construction. If unavoidable wetland impacts take place, impacts will be replaced in accordance with Section 404 of the Federal CWA and the Minnesota CWA.

Best management practices to minimize the impact on surface waters will be utilized as a part of a SWPPP, including but not limited to sediment control, revegetation plans, and management of exposed soils to prevent sediment from entering waterbodies.¹²²

The DSPs (**Appendix C and Appendix D**) have two standard conditions that address potential impacts to surface waters:

- Sections 4.3.11 of both DSPs require the permittee to “implement erosion prevention and sediment control practices recommended by the [MPCA]” and to “obtain a [CSW Permit].” A CSW Permit requires both temporary and permanent stormwater controls. This section also requires implementation of erosion and sediment control measures, contours graded to provide for proper drainage, and all disturbed areas be returned to pre-construction conditions. Summit Lake will also develop a SWPPP that complies with MPCA rules and guidelines. The SWPPP describes construction activity, temporary and permanent erosion and sediment controls, BMPs, permanent stormwater management that will be implemented during construction and through the life of the project. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.
- Sections 4.3.24 of both DSPs require that “site restoration and management” practices enhance “soil water retention and reduces storm water runoff and erosion”.
- Sections 4.3.13 of the DSPs generally prohibit placement of the solar energy generating system or associated facilities in public waters and public waters wetlands. The permit condition does allow for electric collector or feeder lines to cross or be placed in public waters or public waters wetlands subject to permits and approvals by the DNR and the USACE, and local units of government as implementers of the WCA

¹²² Application, Section 5.5.6.1.

4.7.5 Vegetation

The ROI for vegetation is the land control area. The solar facility will convert row crop farmland to perennial vegetation for the life of the project. Potential impacts of the solar facility can be mitigated through development of a VMP.

The proposed project is located in the Coteau Moraines Subsection of the Prairie Parkland Province (MDNR, 2024b). Pre-European settlement vegetation in the Coteau Moraines Subsection consisted primarily of tallgrass prairie; wet prairies and forested areas were restricted to narrow stream margins and riparian areas. Little of the natural vegetation from pre-European settlement is present today, as the current land-use in the project area is predominately agricultural.

POTENTIAL IMPACTS

Construction of the solar facility will eliminate vegetative cover and create impermeable surfaces at access roads and inverter skids. Removal of vegetative cover exposes soils and could result in soil erosion. Temporary or permanent removal of vegetation also has the potential to affect wildlife habitat.

Agricultural land within the solar facility would be converted to perennial, low growing vegetative cover for the life of the project, resulting in a net increase in vegetative cover for the life of the project. Summit Lake will utilize a shorter prairie seed mix within the panel footprint, taller prairie plantings in the open spaces between the fence and array, and a wet seed mix for wet areas including wetlands. The mixes are designed to be native and are developed with prairie specialists in coordination with the Minnesota Interagency Working Group to design a mix that will promote pollinator habitat, establish stable ground cover, reduce erosion, reduce runoff, and improve infiltration. Control of invasive and noxious weeds will be ongoing during the construction and operation of the Project by mowing and selectively applying herbicides when applicable.

Construction activities at the solar facility could introduce or spread invasive species and noxious weeds and the early phases of site restoration and seeding of native species can result in populations of non-native and invasive species on site.

MITIGATION

Several sections of the DSPs (**Appendix C and Appendix D**) address impacts to vegetation:

- Sections 5.8 and 4.3.17 of the DSPs require the permittee to develop a VMP in coordination with state agencies and to file the VMP prior to construction. The Applicants' draft VMP is included as **Appendix E** of this EA. The VMP must include the following:
 - Management objectives addressing short term (Year 0-3, seeding and establishment) and long term (Year 4 through the life of the permit) goals.
 - A description of planned restoration and vegetation management activities, including how the site will be prepared, timing of activities, how seeding will occur (broadcast, drilling, etc.), and the types of seed mixes to be used.
 - A description of how the site will be monitored and evaluated to meet management goals.

- A description of the management tools used to maintain vegetation (e.g., mowing, spot spraying, hand removal, fire, grazing, etc.), including the timing and frequency of maintenance activities.
 - Identification of the third-party (e.g., consultant, contractor, site manager, etc.) responsible for restoration, monitoring, and long-term vegetation management of the site.
 - Identification of on-site noxious weeds and invasive species (native and non-native) and the monitoring and management practices to be utilized.
 - A site plan showing how the site will be revegetated and that identifies the corresponding seed mixes. Best management practices should be followed concerning seed mixes, seeding rates, and cover crops.
- Sections 5.9 and 4.3.18 of the DSPs require the permittee to develop an AIMP which details methods to minimize soil compaction, preserve topsoil, and establish and maintain appropriate vegetation to ensure the project is designed, constructed, operated, and ultimately restored in a manner that would preserve soils to allow for the land to be returned to agricultural use. Summit Lake included a draft AIMP as Appendix E of its joint site application.
- Sections 4.3.15 of the DSPs require the permittee to minimize the number of trees removed and to leave existing low growing species in the ROW undisturbed to the extent possible, or to replant to blend in with adjacent areas following construction.

4.7.6 Wildlife and Habitat

The ROI for non-avian wildlife and their habitats is the land control area, the ROI for birds is the local vicinity. Potential impacts may be positive or negative and are species dependent. Long-term, minimal positive impacts to small mammals, insects, snakes, etc. would occur. Impacts to large wildlife species, for example, deer, will be negligible. Significant negative impacts could occur to individuals during construction and operation of the project.

Once restored, the land control area will provide native habitat for the life of the project. The project does not contribute to significant habitat loss or degradation or create new habitat edge effects. The introduction of PV panels and fencing creates the potential for bird collisions and funneling wildlife towards roads in certain areas. Potential impacts can be mitigated in part through design and BMPs. The impact intensity level is expected to be minimal.

The project landscape is dominated by agriculture, also including roads, homes, and farmsteads. Landscape types and vegetation communities vary throughout the local vicinity. Fencerows and woodlots, as well as small pockets of wetlands and grassland, provide habitat for terrestrial and avian wildlife.

Wildlife utilizing the land control area are common species associated with disturbed habitats and are accustomed to human activities (e.g., agricultural activities and road traffic) occurring in the area. Mammals, reptiles, and amphibians are present. These species include raccoon, coyote, red fox, striped skink, white tailed deer, woodchuck, American toad, common garter snake, and the northern leopard frog. There are no DNR Wildlife Management Areas (WMAs) in the Land Control Area. The

Groth Wildlife Management Area is the closest WMA to the project, located 0.6 mile north of the Land Control Area (**Figure 10, Appendix A**).

Avian species common to the site include the killdeer, red-winged blackbird, ring-necked pheasant, various small songbirds and common raptors such as red-tail hawks. There are no Important Bird Areas (IBA) designated by the National Audubon Society within the site; the Heron Lake IBA is located approximately 14.5 miles northeast of the project, and the Prairie Coteau Complex IBA is located approximately 16 miles northwest of the project.¹²³ There are also no USFWS Waterfowl Production Areas within the Land Control Area; the Nobles County Waterfowl Production Area is located 3.7 miles Northwest of the Land Control Area.

POTENTIAL IMPACTS

The impact intensity level is expected to be minimal. Impacts could be positive or negative and depend on species type. Potential impacts will be short- and long-term and can be mitigated.

Non-Avian Wildlife Individuals will be displaced to adjacent habitats during construction. The majority of the Land Control Area does not provide critical habitat, and construction of the project should not impact species at the population level. Direct significant impacts to individuals might occur, that is, small species might be crushed or otherwise killed during construction.

The largest impact to wildlife associated with solar facilities is fencing. Project fencing will consist of an agricultural woven wire fence and will extend approximately seven feet above grade. One foot of three to four strands of smooth wire will be placed atop of the woven wire fence for a total height of approximately eight feet above grade. Gates will be strategically installed at corners for deer egress.

Plastic erosion control netting is frequently used for erosion control during construction and landscape projects and can negatively impact wildlife populations. Wildlife entanglement and death from plastic netting and other plastic materials has been documented in birds, fish, mammals, and reptiles.¹²⁴

Reduced pesticide use, as compared to agricultural production, has the potential to benefit insects, including pollinators, and smaller wildlife such as rodents, birds, insects, and reptiles. At photovoltaic sites in Minnesota where developers incorporated native vegetation, there was a fivefold increase in native pollinator abundance over the first 5 years following planting.¹²⁵

Birds Bird injuries or mortality may occur due to lack of fencing visibility. Raptors in pursuit of prey may be vulnerable to the nearly invisible wire strands, although other low flying birds such as grouse and owls are also vulnerable to fence collisions.

¹²³ Audubon Minnesota, *Minnesota Important Bird Areas*, (n.d.), <https://mn.audubon.org/node/4281>.

¹²⁴ DNR, *Wildlife-friendly Erosion Control*, (2013), <http://files.dnr.state.mn.us/eco/nongame/wildlife-friendly-erosion-control.pdf>.

¹²⁵ Walston et al. 2023, *If you build it, will they come? Insect community responses to habitat establishment at solar energy facilities in Minnesota, USA*. <https://iopscience.iop.org/article/10.1088/1748-9326/ad0f72/meta>

Risks to birds have been identified near concentrating PV solar facilities in the desert Southwest. Findings in one report, based on limited data, suspected that the facilities mimicked the appearance of water caused migrating birds to attempt to land, consequently incurring trauma and related predation.¹²⁶ This proposed explanation for observed fatalities is commonly referred to as the “Lake Effect.”

Since this study was published, a number of new studies have been conducted to monitor bird activity and fatalities at solar sites. In 2020, researchers re-analyzed the fatality data used to support the lake effect hypothesis and found that most deaths could not be attributed to any direct cause of mortality, and that most carcasses were actually feather spots, making interpretation of any previously reported fatality data difficult.¹²⁷ A 2025 study showed that the change to facilities with tracker panels, which follow the arc of the sun throughout the day, coupled with a transition to anti-reflective coating on panels, is associated with a large decrease in bird deaths. The evidence for bird deaths at solar facilities is largely from a handful of sites that used solar concentrating technologies, or photovoltaic facilities that used fixed-tilt panels without anti-reflective coating.¹²⁸

Studies focused on photovoltaic sites in the midwestern United States have showed that the habitat created by solar facilities that support native vegetation actually leads to an increase in bird diversity. While this habitat is beneficial for most species, some species are, however, negatively impacted as well.¹²⁹ Evidence for increased activity and diversity was also observed in bats across midwestern PV sites.¹³⁰ Camera studies at Midwest solar sites also captured no bird collisions with solar panels, and showed that most deaths at solar facilities are the result of natural predation,¹³¹ which is supported by other studies.¹³²

Habitat There are no DNR WMAs or migratory waterfowl feeding and resting, or USFWS Waterfowl Production areas within one mile of the site.

Wildlife habitat in the area is currently highly fragmented. The row crop habitat at the solar facility being converted is not crucial to wildlife populations, although the land control area may be used as a travel corridor or, occasionally, as a food source (for example, standing corn). Once restored, the developed area within the solar facility will provide herbaceous cover and native habitat for the life of the project. This change might be attractive to some species, and not others. Fencing will restrict ingress and egress of larger wildlife, and native grassland habitat may benefit small mammals,

¹²⁶ USFWS Forensics Lab, *Avian Mortality at Solar Energy Facilities in Southern California*, (2014), <http://www.ourenergypolicy.org/wp-content/uploads/2014/04/avian-mortality.pdf>.

¹²⁷ Kosciuch et al., 2020. A summary of bird mortality at photovoltaic utility scale solar facilities in the Southwestern U.S. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232034>

¹²⁸ Kosciuch et al., 2025. *Lake effect or data mirage? How accounting for technology differences at utility scale solar energy facilities can change data interpretation.* <https://iopscience.iop.org/article/10.1088/1748-9326/ae1e91/meta>

¹²⁹ Walston et al. 2025, *Ecovoltaic solar energy development can promote grassland bird communities.* <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.70208>

¹³⁰ Szoldatits et al. 2025, *Bat activity at ecovoltaic solar energy developments in the Midwestern United States,* <https://www.sciencedirect.com/science/article/pii/S2351989425004652>

¹³¹ Pers. Comm. Hamada, Yuki, Nov. 18, 2025. <https://web.evs.anl.gov/aviansolar>

¹³² Kosciuch et al. 2020, *A summary of bird mortality at photovoltaic utility scale solar facilities in the Southwestern U.S.,* <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232034>

grassland birds, bats, reptiles, and insects. Overall, the project does not contribute to significant habitat loss or degradation or create new habitat edge effects.

4.7.6.1 MITIGATION

Several sections of the DSPs (**Appendix C and Appendix D**) specify measures that will minimize impacts to wildlife:

- Sections 4.3.16 of both DSPs require use of “site restoration and management practices that provide for native perennial vegetation and foraging habitat beneficial to gamebirds, songbirds, and pollinators.”
- Sections 4.3.30 and 4.3.32 of the DSPs requires the permittee to coordinate with the DNR to ensure that the fence used in the project minimizes impacts to wildlife.
- Sections 8.13 of both DSPs require the permittee to report “any wildlife injuries and fatalities” to the Commission on a quarterly basis.
- Sections 5.1 of the DSPs require the permittee to use shielded and downward facing lighting and LED lighting that minimizes blue hue to minimize impacts to wildlife.
- Sections 5.2 of the DSPs require the permittee to use only “bio-netting” or “natural netting” types of erosion control materials and mulch products without synthetic (plastic) fiber additives.
- Sections 5.3 of the DSPs require the permittee to minimize and avoid, if possible, the use or chloride-based dust control chemicals (i.e., calcium chloride, magnesium chloride).

Other potential mitigation measures include:

- Siting facilities away from wildlife movement corridors.
- Checking open trenches and removing any wildlife caught in trenches before backfilling.
- Once permanent vegetation is established, restricting mowing from April 15 to August 15 to improve the potential for ground nesting habitat.
- Using less reflective solar panels with white gridding to reduce glare.
- Using biodegradable erosion control materials.

4.7.7 Rare and Unique Resources

The ROI for rare and unique resources is the local vicinity. The impact intensity level is anticipated to be minimal. Impacts could be both short and long term and could be positive (e.g., through introduction of habitat), or negative (e.g., by removing trees during migratory season). Impacts can be mitigated.

Construction and operation of solar facilities may adversely impact rare and unique resources through the taking or displacement of individual plants or animals, invasive species introduction, and habitat loss. Conversely, in some cases solar sites can be managed to provide habitat. For example, the introduction of native vegetation into a landscape otherwise dominated by cultivated row crops could create habitat for pollinators.

The Minnesota DNR classifies rare plant or animal communities across the state. These include Scientific and Natural Areas, High Conservation Value Forest, Minnesota Biological Survey (MBS) Native Plant Communities, and MBS Sites of Biodiversity Significance

The Division of Ecological and Water Resources within DNR manages the Natural Heritage Information System (NHIS). The NHIS “provides information on Minnesota's rare plants, animals, native plant communities, and other rare features. The NHIS is continually updated as new information becomes available and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. Its purpose is to foster better understanding and conservation of these features.”¹³³ NHIS data includes federally endangered, threatened, or candidate plant species, and endangered or threatened animal species. The system also includes state endangered, threatened, or special concern species. The NHIS database is a source of information, but not the sole source for identifying these resources.

The USFWS provides information regarding rare and unique resources to ensure that impacts to these resources are adequately described, and necessary mitigation is provided. One such resource is the distribution lists of federally listed threatened, endangered, and candidate species by county.

The EA does not map federal- or state-listed species found in the NHIS database, because DNR requires that public display of NHIS data either mask the identity or location of rare features due to the vulnerability of some species to exploitation. Moreover, the NHIS database masks the occurrence of rare species of by randomly incorporating their location into a larger map polygon.

POTENTIAL IMPACTS

Federally listed species and resources

Topeka Shiner

The Topeka shiner is a small minnow, typically less than three inches in length. This species primarily occurs in small to mid-size prairie streams in the central United States (including Minnesota) where it is usually found in pool and run areas containing clear, clean water. Typical Topeka shiner streams are smaller channels that flow perennially to larger streams and rivers, but the species may be found in those which lose flow seasonally, such as ephemeral streams. Suitable streams tend to have good water quality and cool to moderate temperatures.¹³⁴ Field surveys conducted in 2024 indicate that streams which could provide habitat for the Topeka Shiner are not present within the Land Control Area.

Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is proposed to be listed as a Threatened species under the Endangered Species Act (ESA). The species is common throughout Minnesota during summer months and is most frequently found in habitats where milkweed and native plants are common, including roadside ditches, open areas, wet areas, and urban gardens.¹³⁵ Suitable foraging habitat containing

¹³³ DNR, *Natural Heritage Information System*, (n.d.), <http://www.dnr.state.mn.us/nhnrp/nhis.html>.

¹³⁴ Species Status Assessment report for Topeka shiner (*Notropis topeka*). (Version 1.0). <https://ecos.fws.gov/ServCat/DownloadFile/143361>.

¹³⁵ DNR, *Monarch Butterfly*, (n.d.), <https://www.dnr.state.mn.us/insects/monarchbutterfly.html>.

milkweed is likely present within the Land Control Area, but would be limited due to the predominantly agricultural landscape. Proposed species are not protected under the Endangered Species Act. However, federal agencies are required to confer with the USFWS on any agency actions that may be likely to jeopardize a proposed species.

Suckley's Cuckoo Bumble Bee

Suckley's Cuckoo Bumble Bee is proposed to be listed as a Threatened species under the ESA. The species has historically occurred across a large geographic area, extending from northwestern North America to the Great Plains and Midwest all the way to eastern Canada. Females of this species do not collect pollen or build nests to provide for their offspring, so populations depend upon the presence of the host bumble bee species.

Suckley's Cuckoo Bumble Bee is rare in Minnesota, and the species has experienced rapid declines in abundance in recent years, likely due to population declines of their host bumble bee species.¹³⁶ Due to the agricultural landscape, suitable bumble bee habitat is generally limited in the land control area. The three non-array native seed mixes designed for the project include a variety of forb species (see **Appendix E**). Once vegetation has been established the project will provide foraging habitat for bumble bees. If the project eventually supports populations of host bumble bee species, it could also support populations of Suckley's Cuckoo Bumble Bee.

Bald Eagles and Golden Eagles

Bald eagles are afforded additional protection under the Bald and Golden Eagle Protection Act, which is administered by the USFWS. Bald eagle incidental take permits and nest removal permits are considered to be voluntary permits, meaning a project proposer must make the determination to pursue a permit based on the respective risk of their project's potential to take a bald eagle.

In Minnesota, the bald eagle nesting season is generally January through early July. Bald eagles are primarily found near rivers, lakes, and other waterbodies in remote and, more recently, metropolitan areas. Nesting habitat suitable for bald eagles is not present within or adjacent to the Land Control Area.

State-listed species and resources

High Value Areas

The DNR and BWSR protect a number of high value areas, such as Native Plant Communities, native prairie, calcareous fens, Wildlife Management Areas, large block habitats, Reinvest in Minnesota (RIM) conservation easements, and MBS Sites of Biodiversity Significance. The MBS systematically collects, interprets, and provides baseline data on the distribution and ecology of rare plants, rare animals, and native plant communities.¹³⁷ The MBS uses four classifications denoting the level of biological diversity to rank sites:¹³⁸

¹³⁶ Washington Department of Fish & Wildlife, Suckley's Cuckoo Bumble Bee. <https://wdfw.wa.gov/species-habitats/species/bombus-suckleyi#conservation>

¹³⁷ DNR. *Minnesota County Biological Surveys*, (n.d.), <http://www.dnr.state.mn.us/eco/mcbs/index.html>.

¹³⁸ DNR, *Minnesota Biological Survey MBS Site Biodiversity Significance Ranks*, (n.d.), https://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html.

- **Below.** Sites lack occurrences of rare species and natural features or do not meet MBS standards for outstanding, high, or moderate rank. These sites may include areas of conservation value at the local level, such as habitat for native plants and animals, corridors for animal movement, buffers surrounding higher- quality natural areas, areas with high potential for restoration of native habitat, or open space.
- **Moderate.** Sites contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes.
- **High.** Sites contain very good quality occurrences of the rarest species, high-quality examples of rare native plant communities, and/or important functional landscapes.
- **Outstanding.** Sites contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most ecologically intact or functional landscapes.

There are no MBS sites of moderate, high, or outstanding biodiversity significance within the Land Control Area. The nearest MBS Site of Biodiversity Significance is the Bloom 34 Plus site, which DNR characterizes as an MBS site of moderate biodiversity significance. There are no native plant community sites within the project area.¹³⁹

There are no Native Plant Communities, native prairies, calcareous fens, Wildlife Management Areas, large block habitats, or Reinvest in Minnesota (RIM) conservation easements within the Land Control Area. However, the Nobles RIM Easement, a wetland restoration project, is located adjacent to the northern boundary of the Land Control Area.¹⁴⁰

Regal Fritillary

The regal fritillary (*Argynnis idalia occidentalis*) is listed as a species of special concern in the state of Minnesota. The regal fritillary is a non-migratory butterfly that is found in native tallgrass prairie habitats. Regal fritillaries can range widely, with females potentially traveling up to 100 miles searching for three main habitat components: violet hostplants for larvae, nectar plants for adults, and native grasses to provide protection throughout the life cycle. Adults can be found foraging in both upland and wet prairie habitats; however, habitat can only be considered suitable for all life stages if violet species are present to provide shelter and forage for larvae.

MITIGATION

Techniques for minimizing impacts to wildlife and vegetation also minimize impacts to rare species. Avoiding identified areas of species occurrence or preferred habitat is the preferred mitigation measure recommended by the DNR, as well as modifying the timing of project activities, particularly mowing and controlled burns, to avoid the presence of listed species such as regal fritillary and monarch butterfly.

¹³⁹ DNR, MBS Sites of Biodiversity Significance. <https://gisdata.mn.gov/dataset/biota-mcbs-sites-of-biodiversity>

¹⁴⁰ BWSR, State Funded Conservation Easements (RIM Reserve). <https://gisdata.mn.gov/dataset/bdry-bwsr-rim-cons-easements>

4.7.8 Climate Change

The project will help to shift energy production in Minnesota and the upper Midwest toward carbon-free sources. Construction emissions will have a short-term negligible increase in greenhouse gases that contribute to climate change. Overall, the project will generate energy that can be used to displace energy otherwise generated by carbon-fueled sources. The total GHG emissions produced by construction and operation of the project will be minimal when compared to the reduction in GHG emissions long-term. The project's design incorporates design elements that minimize impacts from the increase in extreme weather events such as increase flooding, storms, and heat wave events that are expected to accompany a warming climate.

Climate change refers to any significant change in measures of climate lasting for an extended period. Greenhouse gases (GHG) are gaseous emissions that trap heat in the atmosphere and contribute to climate change. These emissions occur from natural processes and human activities. The most common GHGs emitted from human activities include carbon dioxide, methane, and nitrous oxide. A change in climate can have a wide range of impacts on living species, as well as infrastructure, and may create compounding weather related events. An increase of extreme weather events, such as flooding, storms, and heat waves, is expected to accompany a warming climate.

In 2020, the electricity sector was the third largest source of Minnesota GHG emissions at 26,179,328 million tons of CO₂e, which was 19.1 percent of Minnesota's GHG emissions.¹⁴¹ GHG emissions from electricity generation have decreased by about 54 percent in Minnesota since 2005 due to a shift in generation to lower- and non-emitting sources and an increase in end-use energy efficiency.¹⁴²

POTENTIAL IMPACTS

General

The DNR Minnesota Climate Explorer Tool was used to determine current climate conditions for Nobles County.¹⁴³ Annual average temperature trends show a temperature increase of 0.20 °F per decade from 1895 to the present, and 1.21 °F per decade from 1970 to present. For precipitation, total annual precipitation has increased at a rate of 0.05 inches per decade from 1970 to present.

The DNR Minnesota Climate Explorer tool was also used to project climate conditions for Nobles County. The tool incorporates models from a number of sources. The climate models predict that the average temperature for Nobles County is projected to increase by approximately 3.6 °F by Mid-Century (2040 to 2059) compared to current conditions (1980 to 1999). Late-Century (2080-2099) air temperature is projected to increase by approximately 8.5 °F. Mid-Century annual precipitation is projected to decrease by approximately 0.04 inches. Late-Century annual precipitation is projected to increase approximately 0.14 inches.

¹⁴¹ MPCA, *Greenhouse gas emissions data*, (2024), <https://data.pca.state.mn.us/views/Greenhousegasemissionsdata/GHGsummarystory?%3Aembed=y&%3AsGuestRedirectFromVizportal=y>.

¹⁴² Id.

¹⁴³ DNR, *Minnesota Climate Explorer*, <https://climate-explorer.dnr.state.mn.us/main/historical>

Greenhouse gases

Construction activities will result in short-term increases in GHG emissions from the combustion of fossil fuels in construction equipment and vehicles. The project's construction emissions are an insignificant amount relative to Minnesota's overall emissions of approximately 137 million tons in 2020.¹⁴⁴ Potential impacts due to construction GHG emissions are anticipated to be negligible.

Other GHG emissions will be created by land use change from the loss of existing natural carbon sinks in the area. Once operational, the project will generate minimal GHG emissions. Emissions that do occur would result from vehicle usage to and from the solar array and substation for maintenance and operation of the substation and switchyard. GHG emissions for project construction is expected to be 7,940.14 short tons of CO₂ and operations are estimated to be approximately 18.5 short tons of CO₂ annually. The majority of land-use emissions will occur during construction due to the change from cropland and wetlands to settlement, however the establishment of perennial vegetation reduce this impact.

If electrical energy from the project displaces energy that would otherwise be generated by carbon-fueled power plants (e.g., coal, natural gas), the project could reduce GHG by approximately 262,228 metric tons of CO₂ equivalent annually. Thus, compared to non-renewable energy generation, the project would be beneficial with respect to GHG emissions. Total GHG emissions resulting from construction and operation of the project are anticipated to be minimal when compared to the long-term reduction in GHG emissions facilitated by the project.

Climate and weather

Tree and vegetation loss from construction could eliminate related climate resilience benefits, leading to more intense runoff during storms or flooding (thus increasing erosion and reducing water retention), increased heat extremes, and potential reductions in air quality. Removal of or impacts to wetlands due to construction eliminates the ability for the land to retain and absorb stormwater, leading to more intense stormwater runoff and nutrient loading. Revegetation is expected to offset effects, therefore impacts should be temporary and minimal.

A warming climate is expected to cause increased flooding, storms, and heat wave events. These events, especially an increased number and intensity of storms, could increase risks to the project. More extreme storms also mean more frequent heavy rainfall events, which can cause localized soil erosion or flooding. Flooding could damage the project's electrical collection system including inverters and collection wiring.

Climate and weather impacts are considered in the design of the facility and include impacts from extreme storms such as stormwater runoff, strong winds and hail. Based on local hydrology and topography, there is potential for soils to become rutted due to increased rain events. Rainfall infiltration is calculated to increase once the project is completed. However, native perennial vegetation will replace seasonal row crops across most of the site, creating deep root systems that are able to improve water infiltration and mitigate stormwater runoff.

¹⁴⁴ MPCA, *Greenhouse gas emissions data*, (2024), <https://data.pca.state.mn.us/views/Greenhousegasemissionsdata/GHGsummarystory?%3Aembed=y&%3AsGuestRedirectFromVizportal=y>.

The FEMA National Risk Index¹⁴⁵ rates Nobles County as having “relatively low” risk for hail. The solar panel modules selected for the project are designed to withstand wind and hail events. The tracking systems are also designed to automatically stow the panels in the safest position based on the weather conditions (wind, hail, flooding, deep snow, etc.). For example, panels are stowed in a nearly vertical position during hail events by re-orienting the trackers, which limits direct impacts between hailstones and the panels.

MITIGATION

Mitigation to reduce emissions during construction is discussed in the Air Quality section of this EA. Strategies to reduce emissions include keeping vehicles in good working order, which will reduce the amount GHG emissions from diesel or gasoline.

Project developers can employ location, design, and construction strategies to mitigate impacts resulting from a warmer, wetter, and more energetic climate by:

- Avoiding sites with high probability for extreme weather events to the extent possible.
- Designing solar panels and solar arrays to withstand stronger storms and winds.
- Planning for the potential repair and replacement of solar arrays damaged by storms.
- Designing the project’s stormwater system to prevent flooding during heavy rainfall events.
- Designing the project’s electrical collection system to be resistant to flooding damage.

The Applicants state that erosion during construction activities will be minimized through the implementation of the SWPPP. This will assist in mitigating the additional erosion impacts due to the anticipated increase in 100-year storm intensity. The Applicants also state that the project was designed with consideration of future projected changes in climate, such as increased heavy rainfall, stronger wind gusts, and increased temperatures.¹⁴⁶

4.8 Unavoidable Impacts

Resource impacts are unavoidable when an impact cannot be avoided even with mitigation strategies.

Potential impacts and the possible ways to mitigate against them are discussed in this chapter. However, even with mitigation strategies, certain impacts cannot be avoided. Most adverse unavoidable impacts are associated with construction; therefore, they would be temporary.

Unavoidable adverse effects associated with construction of the project (in some instances a specific phase of construction) would last through construction and include:

- Fugitive dust.

¹⁴⁵ FEMA, *National Risk Index*, (n.d.), <https://hazards.fema.gov/nri/>.

¹⁴⁶ Application, pp. 91-92

- Noise disturbance to nearby residents and recreationalists.
- Visual disturbance to nearby residents and recreationalists.
- Soil compaction and erosion.
- Disturbance and temporary displacement of wildlife, as well as direct impacts to wildlife inadvertently struck or crushed.
- Minor amounts of marginal habitat loss.
- Possible traffic delays.
- Minor GHG emissions from construction equipment and workers commuting.

Unavoidable adverse impacts associated with the operation would last as long as the life of the project, and include:

- Visual impacts of the project.
- Cultural impacts due to a change in the sense of place for local residents.
- Loss of land for agricultural purposes.
- Injury or death of birds and mammals from fencing.

4.9 Irretrievable or Irreversible Impacts

Resource commitments are irreversible when it is impossible or very difficult to redirect that resource to a different future use; an irretrievable commitment of resources means the resource is not recoverable for later use by future generations.

Irreversible and irretrievable resource commitments are primarily related to project construction, including the use of water, aggregate, hydrocarbons, steel, concrete, wood, and other consumable resources. Some, like fossil fuel use, are irretrievable. Others, like water use, are irreversible. Still others might be recyclable in part, for example, the raw materials used to construct PV panels would be an irretrievable commitment of resources, excluding those materials that may be recycled at the end of the panels' useful life. The commitment of labor and fiscal resources to develop, construct, and operate the project is considered irretrievable.

4.10 Resource Topics Receiving Abbreviated Analysis

Resource topics that will have negligible impacts from the project and that do not impact the Commission's site permit decision receive less study and analysis.

Many environmental factors and associated impacts from a project are analyzed during the environmental review process. However, if impacts are negligible and will not impact the permit decision, those resource impacts receive less study and analysis. The following resource topics meet this threshold, which is based on information provided by the Applicants, field visits, scoping comments, environmental analysis, and staff experience with similar projects.

4.10.1 Displacement

Displacement can occur when residences or other buildings are located within a proposed site or right-of-way. If the buildings would potentially interfere with the safe operation of a project, they are typically removed from the site or ROW and relocated. Displacements from large energy facilities are rare and are more likely to occur in heavily populated areas where avoiding all residences and businesses is not always feasible than in rural areas where there is more room to adjust site boundaries or ROWs to accommodate the proposed energy facility.

There are no residences, businesses, or structures such as barns or sheds located within the Land Control Area, and none will be displaced by the project. No mitigation is proposed.

4.10.2 Communications

Summit Lake does not anticipate any impacts to existing utilities, such as public communication towers. If cell tower signal or broadband interference is identified during or after construction of the Project, Summit Lake will address the interference on a case-by-case basis and in accordance with the anticipated conditions of the Site Permits.

While there are ARMER towers within 7.0 miles of the Land Control Area, the project will not impact this communication system as Project facilities are proposed below the typical height of a tower and line-of-sight near the top of these towers (i.e., greater than 150 feet above ground). Summit Lake anticipates the structures for the gen-tie line to be less than 150 feet tall. As such, no mitigation is proposed.

Section 4.3.22 and Section 4.3.24 of DSPs (**Appendix C and Appendix D**), require the permittee to take whatever action is feasible to restore or provide equivalent reception should interference occur to “radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices” as a result of the project. Additional mitigation is not proposed.

4.10.3 Implantable Medical Devices

Electromagnetic fields (EMF) might interfere with implantable electromechanical medical devices, such as pacemakers, defibrillators, neurostimulators, and insulin pumps. Impacts to implantable medical devices and persons using these devices are not expected to occur. Sections 4.3.28 and 4.3.30 of the DSPs require the permittee to provide educational materials about the project to adjacent landowners. Additional mitigation is not proposed.

4.10.4 Forestry

Active forestry operations, including commercial timber harvest, woodlots, or other forestry resources do not occur within the land control area. Impacts to forestry operations will not occur.

4.10.5 Mining

There are no gravel pits within the Land Control Area. Construction of the project will require the use of sand and aggregate for backfill and access roads. The demand for sand and gravel will be temporary and is not expected to require new or expanded sand or aggregate operations.

Impacts to mining will not occur and no mitigation is proposed.

4.11 Cumulative Potential Effects

Cumulative potential effects result from the incremental effects of a project in addition to other projects in the environmentally relevant area.

Minnesota Rule 4410.0200, subpart 11a, defines “cumulative potential effects,” in part, as the “effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same

environmental resources, including future projects ... regardless of what person undertakes the other projects or what jurisdictions have authority over the project.”

The “environmentally relevant area” includes locations where the potential effects of the project coincide with the potential effects of other projects to impact the elements studied in this EA.

Consideration of cumulative potential effects is intended to aid decision-makers so that they do not make decisions about a specific project in a vacuum. Effects that may be minimal in the context of a single project may accumulate and become significant when all projects are considered.

4.11.1 Analysis Background

The ROI for cumulative potential effects varies across elements and is consistent with the ROI identified in potential impacts and mitigation throughout this document. Cumulative potential effects—where they coincide—increase or decrease the breadth of the impact to the resources and elements studied in potential impacts and mitigation. This may or may not change the impact intensity level assigned to the resource or element.

Cumulative potential effects are impacts to the environment that results from “the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects.”¹⁴⁷

The “environmentally relevant area” includes locations where the potential effects of the project coincide with the potential effects of other projects to impact the elements studied in this EA. Generally, this area includes the ROI for the different resource elements.

The Nobles County website and MnDOT District 7 projects were reviewed, but they did not reveal any projects proposed within the area and time of the proposed project.¹⁴⁸ Additionally, EIP staff analyzed the unit’s active project dockets, the Environmental Quality Board’s interactive project database,¹⁴⁹ and the MISO queue.¹⁵⁰ Two reasonably foreseeable projects were identified – the Nobles County Powered Data Park (NCPDP), which would be a data center to be developed near Worthington,¹⁵¹ and a 300 MW BESS Project, designated as “Nobles BESS”.

Cumulative effects are discussed here for projects that are reasonably foreseeable in the next five years in the project area. It is assumed that the construction-related impacts of these projects are short-term, for example, construction impacts will cause local disturbances, such as increased noise

¹⁴⁷ Minnesota Rules 4410.0200, subp. 11a.

¹⁴⁸ Application, Section 5.6

¹⁴⁹ Minnesota EQB. Environmental Review Projects Database & Interactive Map. (n.d.). Retrieved from: <https://www.eqb.state.mn.us/environmental-review/environmental-review-data>

¹⁵⁰ MISO. Generation Interconnection Queue Database & Interactive Map. (n.d.). Retrieved from: https://www.misoenergy.org/planning/resource-utilization/GI_Queue/

¹⁵¹ Geronimo Power- Nobles County Powered Data Park. <https://geronimopower.com/in-development/nobles-county-powered-data-park/>

levels, and traffic delays/and reroutes. Thus, the discussion here is focused on the potential long-term impacts of these projects.

Both of the identified projects within the environmentally relevant area, the NCPDP, proposed by Geronimo, and the Nobles BESS, proposed by Xcel Energy, are likely to result in cumulative potential impacts for Nobles County. As proposed, the NCPDP would require 400 MW for its operation, and would be sited just outside of Reading, immediately east of the Summit Lake project¹⁵². The Nobles BESS would be sited on Xcel-owned property at the Nobles Wind Farm near the Nobles substation.¹⁵³ Based on the MISO queue, Xcel plans for the project to be completed by 2028.

If the Summit Lake project, the Nobles BESS project, and NCPDP are all permitted, the landscape surrounding Reading will experience notable change. This area outside Worthington, currently used for agricultural production and residential development, would now house two BESS facilities, a solar generating facility, and a data center.

Cumulative effects are discussed here for the Summit Lake project, the Nobles BESS project, and NCPDP. Construction of the Nobles BESS Project is anticipated to begin by 2028. Construction of the Summit Lake project is anticipated to begin in 2026. The construction timeline of the NCPDP project is currently unknown. If construction schedules for any of the projects overlap, potential cumulative impacts include increased noise levels and traffic delays and reroutes. It is assumed that the majority of the construction-related impacts for these projects are short-term. The discussion here is focused on the potential long-term impacts of these projects, thus, this section largely focuses on operational impacts, with a few longer-term construction-related impacts included.

Where cumulative effects are anticipated, a written description is provided. Where cumulative potential effects are not anticipated no further analysis is provided. For the purposes of this EA, actions that have occurred in the past and their associated impacts are considered part of the existing environment..

4.11.2 Human Settlement

Cumulative potential effects on human settlements are anticipated to be moderate. The anticipated data center and Nobles BESS projects would pose further replacement of agricultural land with industrial land, so aesthetic and cultural impacts are anticipated to be moderate.

AESTHETICS

The Summit Lake project, the Nobles BESS project, and NCPDP will all result in aesthetic impacts. A new solar facility, two BESS facilities, and the data center buildings, associated substation, switch stations, and administrative facilities will introduce several new visual elements into the landscape. The Nobles BESS project facility will likely consist of batteries housed in enclosures approximately 10 feet tall and 20 feet long; typical specifications for a standard battery enclosure structure. The NCPDP data center buildings heights are unknown, and the sites will include switch stations and a potential

¹⁵² Geronimo Power- Nobles County Powered Data Park- FAQ “What will the data center look like?”
<https://geronimopower.com/in-development/nobles-county-powered-data-park/>

¹⁵³ Xcel Energy- Request for Expedited Resource Addition.
<https://efiling.web.commerce.state.mn.us/documents/%7B30E57C9C-0000-C617-B35F-AA21F65498A4%7D/download?contentSequence=0&rowIndex=59>

substation of unknown dimensions. Thus, aesthetic impacts will increase in the project area as a result of these future projects. The concentrated area in which these projects are proposed to be constructed will significantly alter the current landscape and may cause changes in the viewshed at certain vantage points, even with proposed visual buffer areas.

NOISE

Construction of the projects will create increased noise, through vehicle activity and construction. Once operational, noise from the Summit Lake facilities are anticipated to be negligible ([Section 4.3.2](#)); noise coming from the inverters, transformer, and tracking system will dissipate, falling below L₅₀ dBA standards at the nearest resident to levels similar to those created by a washing machine. Operational noise from the Nobles BESS project facility is anticipated to range from negligible to significant at nearby residences. The notable noise sources from the BESS facility are the cooling system in the BESS enclosures, which intermittently activates during operation, and the noise generated by power transfer in and out of the BESS. Unlike solar facilities, BESS facilities can be expected to operate at all hours of the day, including during the night. As Xcel has not yet designed the BESS facility, operational noise has not been modeled, and potential noise impacts from the facility are unknown. However, even if the Nobles BESS facility falls within state standards, it is possible that the noise may be noticeable to nearby residents.

The primary sources of operational noise from the NCPDP will be the computers and ventilation systems within the buildings, and the use of generators tested once a month and in case of emergency. Operational noise levels have not been modeled for the NCPDP, so potential noise impacts of the NCPDP are unknown. However, given that the data center will operate continuously throughout the day, similar to a BESS facility, it is possible that operational noise from FTP may be noticeable to nearby residents, even if it falls within state standards. The resulting sound environment from all three projects combined has not been estimated. There is potential for additive noise to result in increased cumulative noise impacts for adjacent residences, and noise is expected to occur throughout all hours of the day.

PROPERTY VALUES

Property values may be affected at homes within 0.5 miles of the Summit Lake project compared to homes 2-4 miles away, with a potential reduction in home sale prices of approximately 4 percent ([Section 4.3.5](#)). The Nobles BESS project may negatively impact property values depending on how the battery enclosures affects property aesthetics, whether the operational noise is audible at nearby residences, and if potential buyers have safety concerns regarding the BESS facility. The NCPDP may similarly impact property values depending on how the data center buildings and associated facility components affect property aesthetics and whether the operational noise is audible at nearby residences. Residences within the local vicinity might see some combination of the Summit Lake facilities, the Nobles BESS facility, and the data center facilities in their viewsheds. The overall impact intensity level is anticipated to dissipate with distance. Because of the uncertainty associated with property value impacts, potential impacts to specific properties could be moderate to significant.

CULTURAL VALUES

The construction and operation of these projects will undoubtedly change the character of Reading, impacting residents' sense of place. The intensity of this impact is extremely difficult to assess, as each individual in the area has their own opinions and ideas that influence their sense of place. Although

the impact intensity cannot be explicitly determined, moderate impacts to cultural values are expected. These impacts are unavoidable.

4.11.3 Public Health and Safety

Cumulative potential effects on public health and safety are anticipated to be minimal to moderate. Impacts on public health and safety as a result of the project are anticipated to be minimal under Typical or Atypical operation, but could be moderate to severe under Accident scenarios ([Section 4.4.2](#)).

As an electrical system, the project represents a fire risk ([Section 4.4.2](#)). The Nobles BESS project creates an additional potential fire hazard, similar to that posed by the Summit Lake BESS facility. A fire within the NCPDP site does not pose specific risks to the Summit Lake project or Nobles BESS project aside from the potential for the fire to spread into the solar and/or BESS facility if it is not appropriately contained.

4.11.4 Land-based Economies

Cumulative potential effects on land-based economies are anticipated to be minimal. Additional energy infrastructure in the form of another BESS facility will not result in conversion of agricultural land as the site is already owned by Xcel Energy and is likely not used for agricultural production. Infrastructure related to the data center and associated facilities will result in conversion of agricultural land, but the loss of agricultural land is anticipated to be minimal when compared to the amount of farmland available in Nobles County.

4.11.5 Archaeological and Historical Resources

Because archaeological resources are unidentified, cumulative potential effects are unknown. With proper mitigation measures, impacts to these resources can be minimized.

4.11.6 Natural Resources

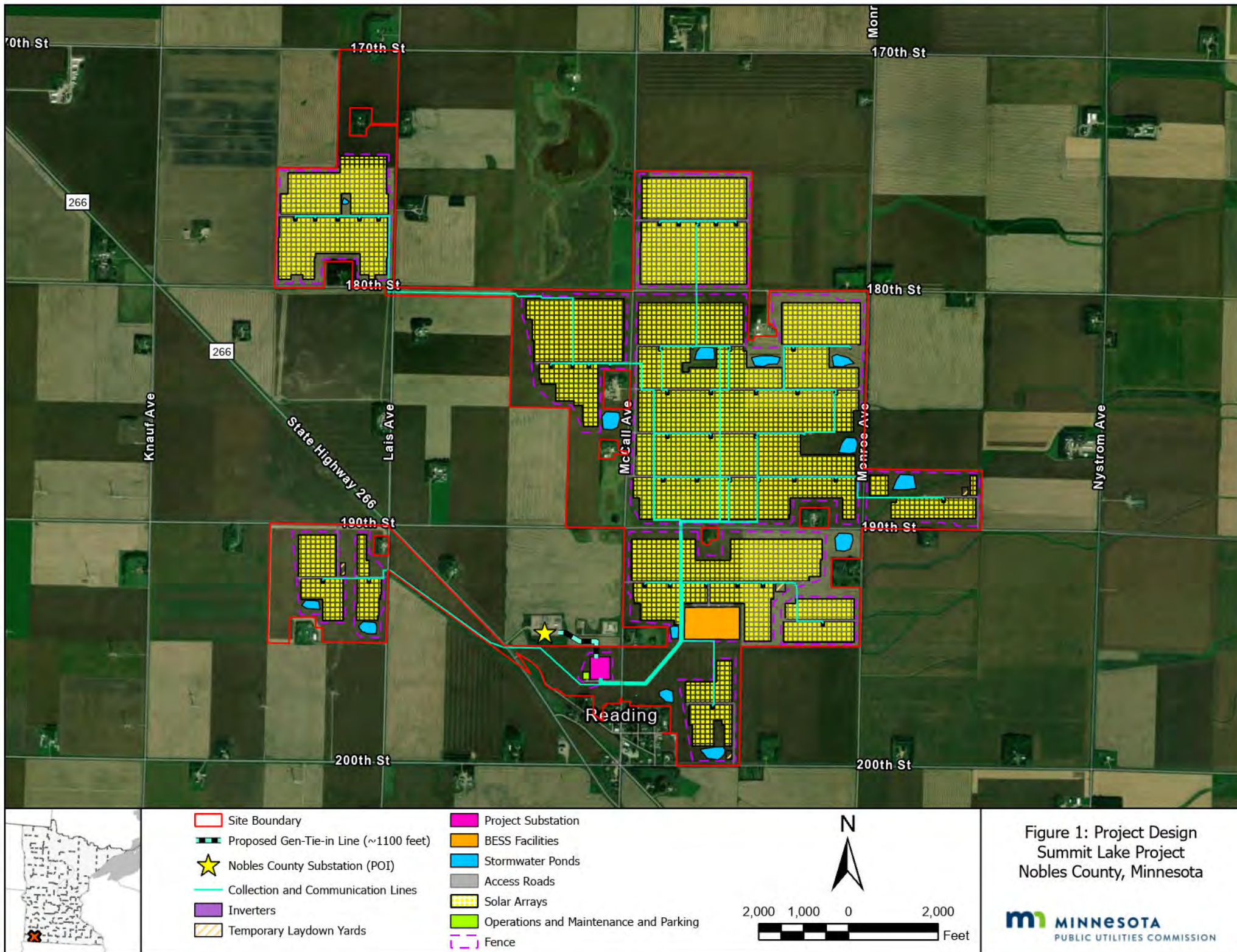
Cumulative potential effects on the natural environment are anticipated to be minimal to moderate. The identified projects would convert agricultural areas into industrial land uses, resulting in minimal loss of high-quality habitat. Wildlife might be inadvertently harmed or killed during construction. Potential impacts can be mitigated. The overall impact intensity level is expected to remain minimal, and the project's generation of native grassland habitat and new water resources (stormwater ponds) would benefit natural resources. All three projects will increase impervious surface area within the respective sites, increasing the runoff rate. Each project will design and install a stormwater management system that will be sized to accommodate projected runoff rates. Employing best practices in facility design and operation, including appropriate setbacks between facility components and designated floodplains and floodway, appropriate design of stormwater management systems, and developing training for emergency responders can mitigate potential impacts.

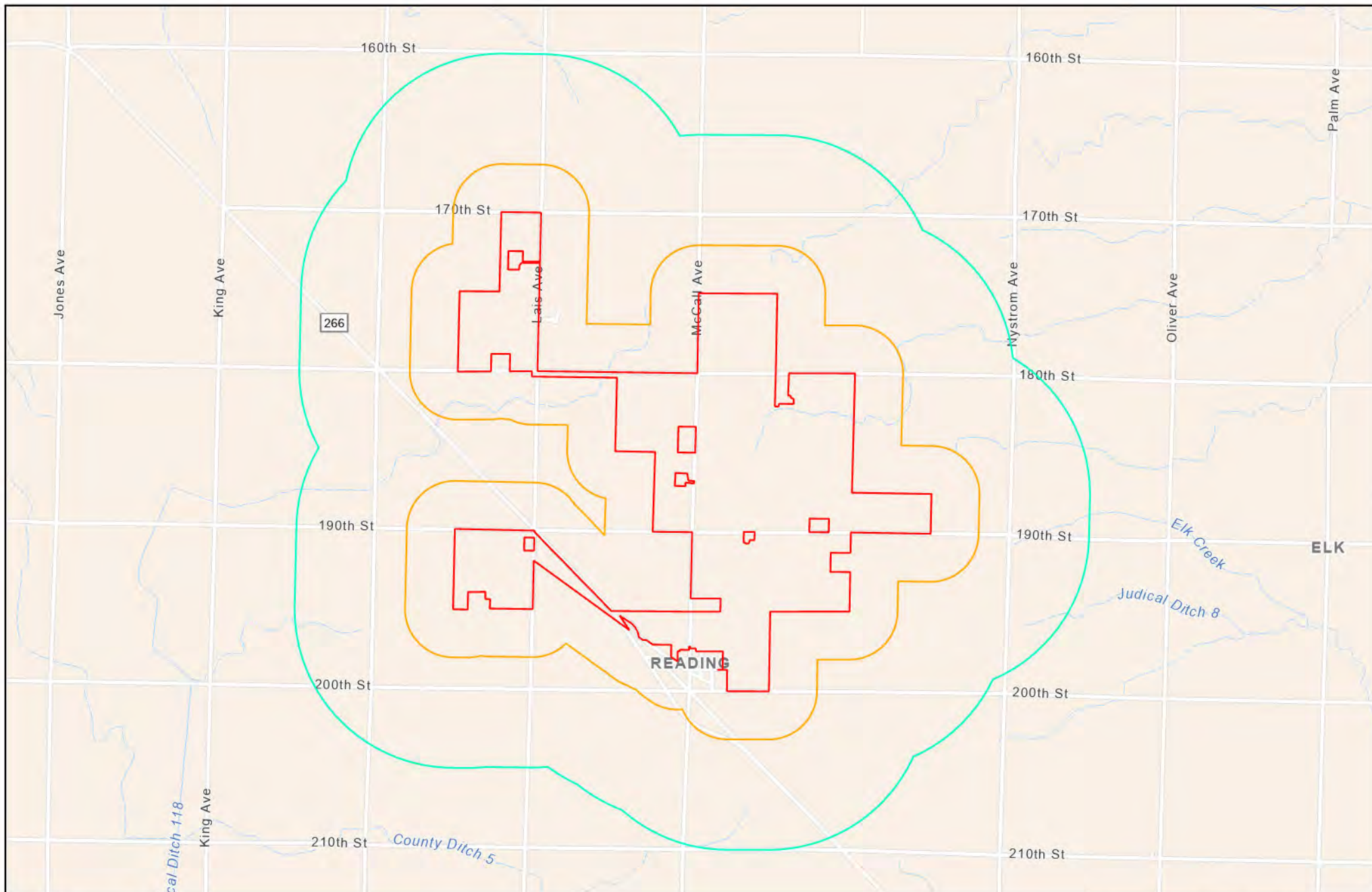
4.11.7 Rare and Unique Resources

Cumulative potential effects on rare and unique natural resources are uncertain. There are relatively few rare and unique species in the project area ([Section 4.7.8](#)). The identified projects would convert agricultural areas into industrial land uses, and neither of these types of land use generally provide habitat for rare and unique species, nor do they typically support rare communities. The effect of the

project's generation of native grassland habitat would be an overall positive impact on rare and unique resources.

Appendix A- Maps

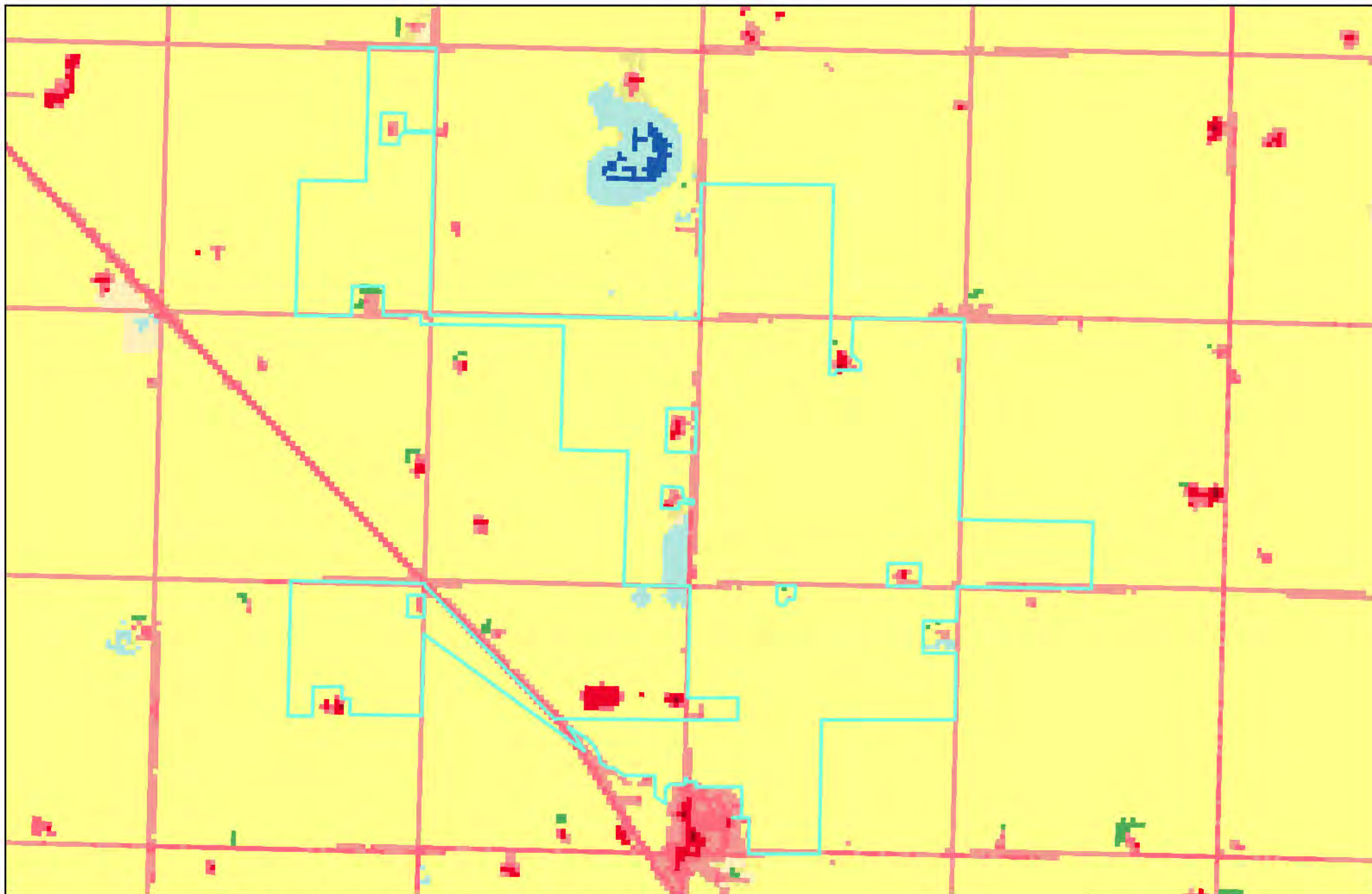




- Project Area (1 Mile)
- Local Vicinity (1600 Feet)
- Land Control Area (Site Boundary)



Figure 2: Regions of Influence
Summit Lake Project
Nobles County, Minnesota



- | | |
|----------------------------|------------------------------|
| Project Boundary | Deciduous Forest |
| Open Water | Grassland/Herbaceous |
| Developed Open Space | Pasture/Hay |
| Developed Low Intensity | Cultivated Crops |
| Developed Medium Intensity | Emergent Herbaceous Wetlands |
| Developed High Intensity | |

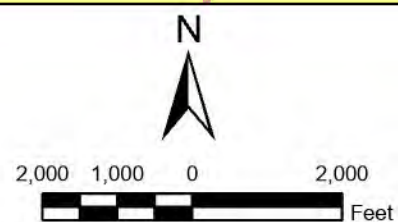
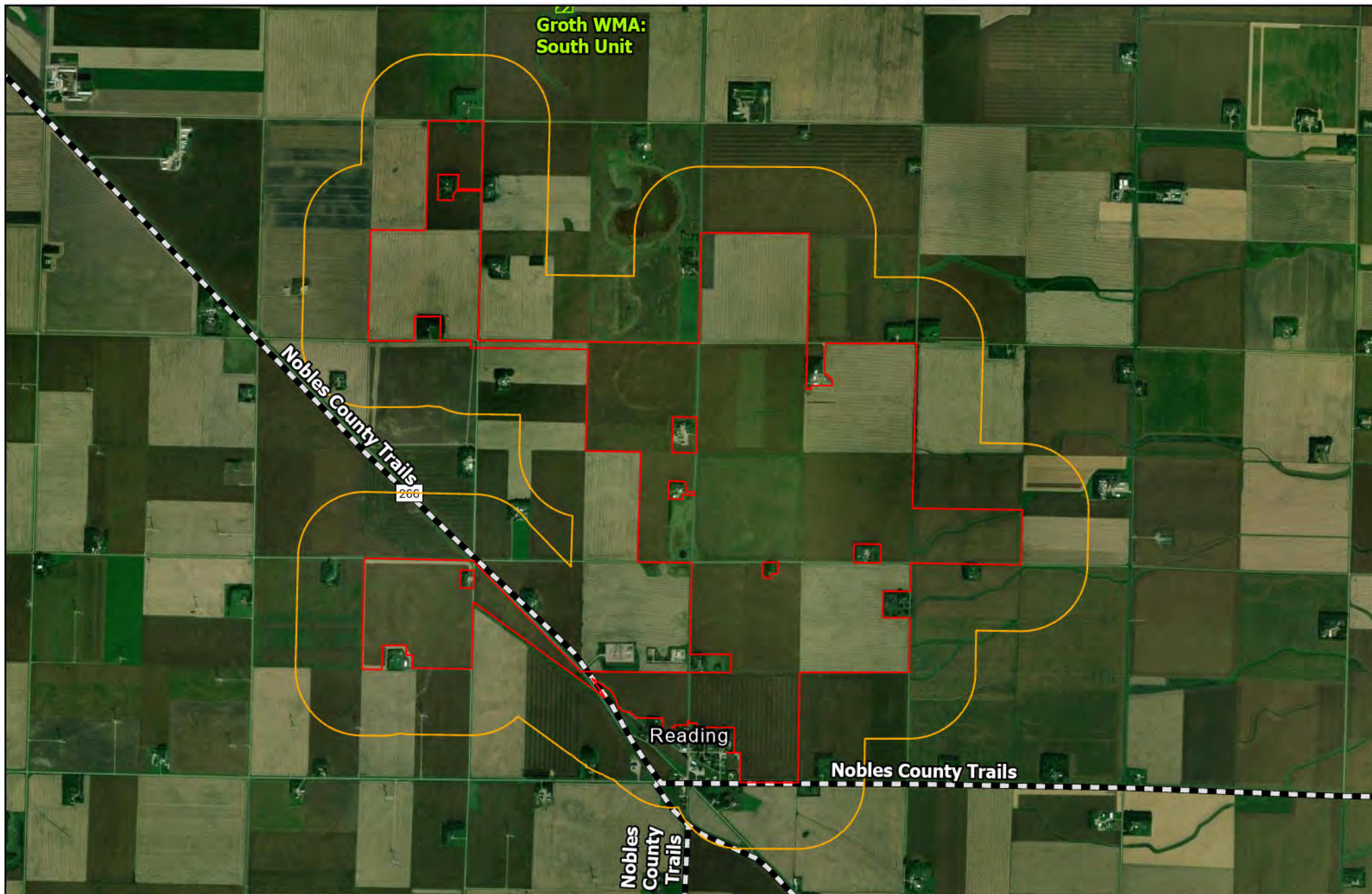


Figure 3: NLCD Land Cover Classifications
Summit Lake Project
Nobles County, Minnesota



- Local Vicinity (1600 Feet)
- Site Boundary
- Snowmobile Trails
- DNR Wildlife Management Areas

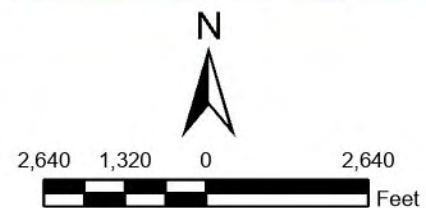
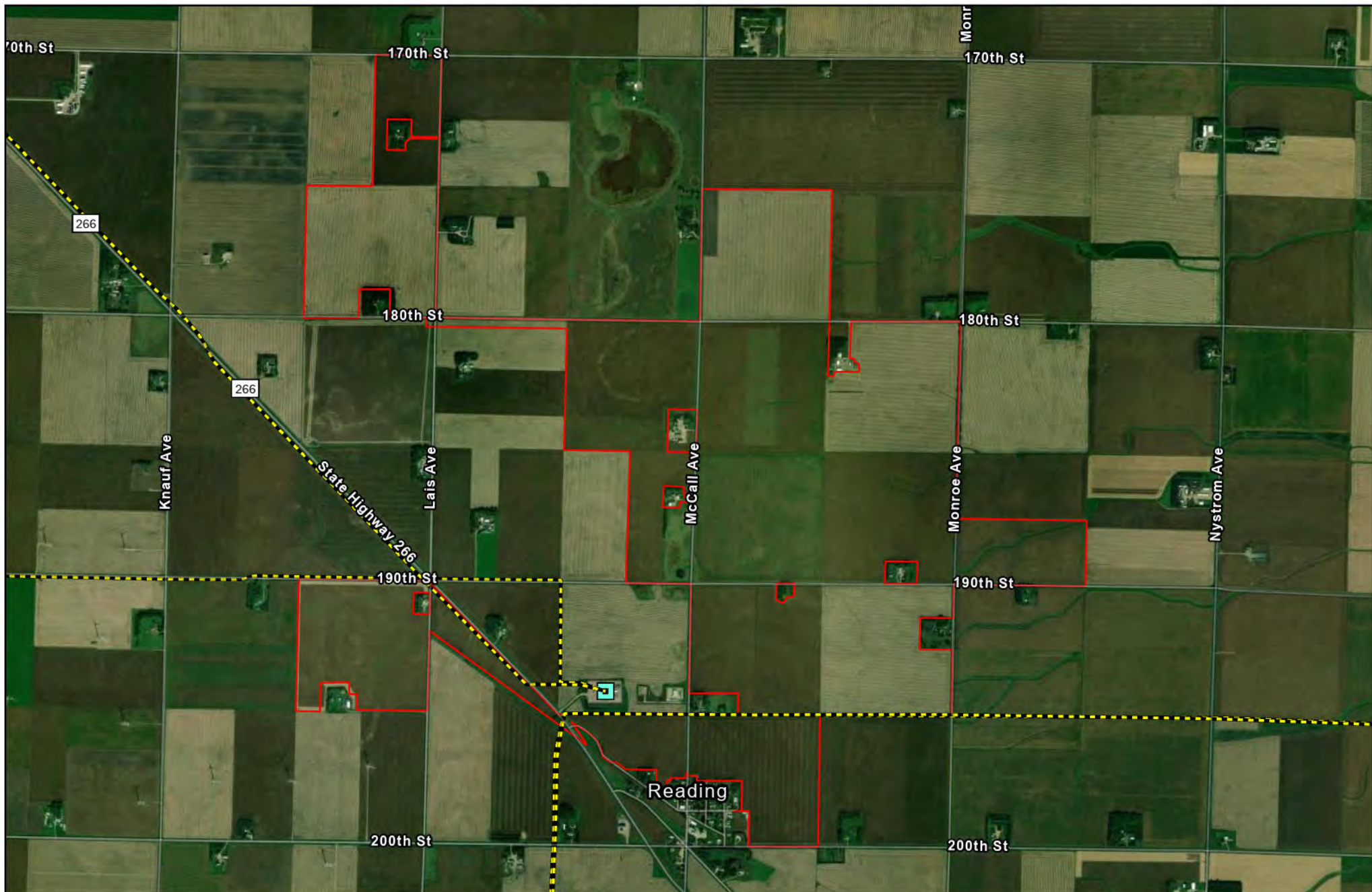


Figure 4: Recreational Resources
Summit Lake Project
Nobles County, Minnesota



-  Site Boundary
-  Substations
-  Transmission Lines (>60 kV)

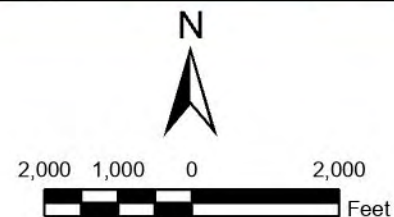
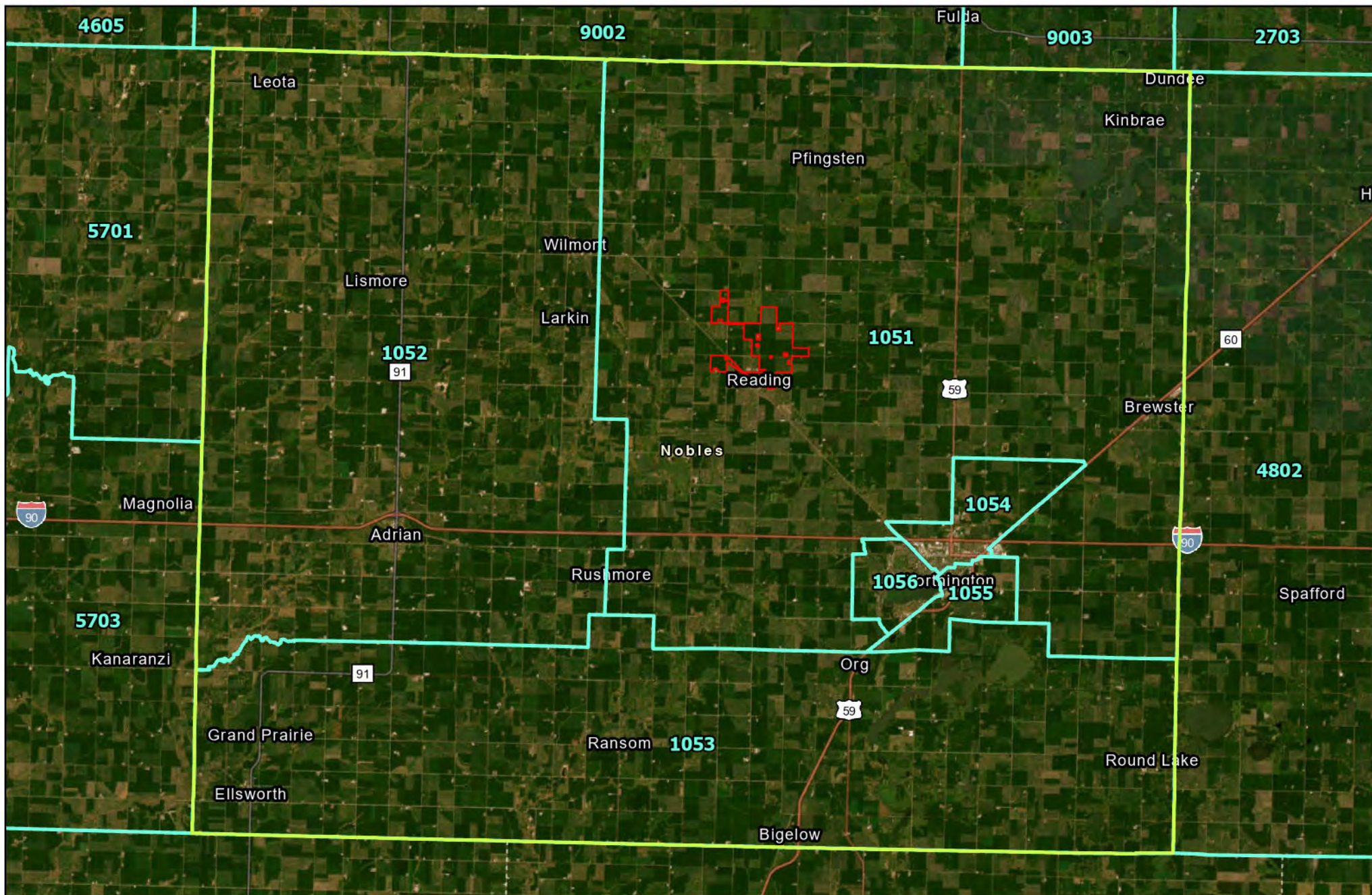


Figure 5: Existing Electrical Infrastructure (2022)
Summit Lake Project
Nobles County, Minnesota



- Region (Nobles County)
- Census Tract Boundaries
- Site Boundary

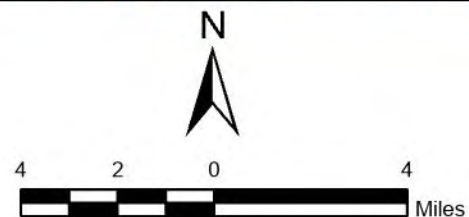
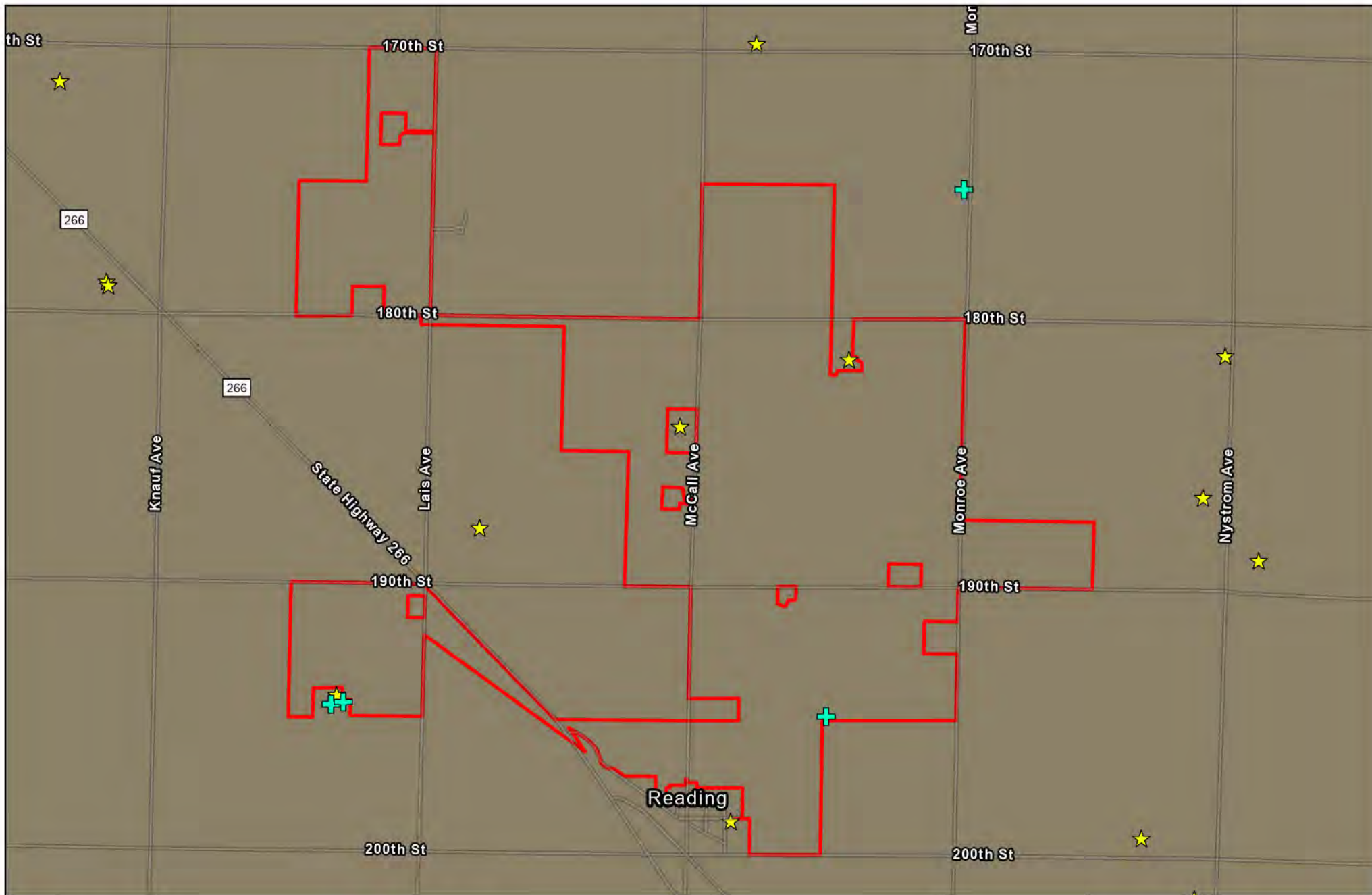


Figure 6: U.S. Census Tract
Boundaries
Summit Lake Project
Nobles County, Minnesota



-  Site Boundary
-  Active Wells
-  Sealed Wells
-  Very Low Pollution Sensitivity

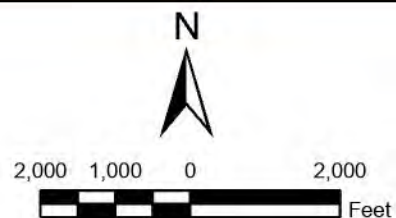
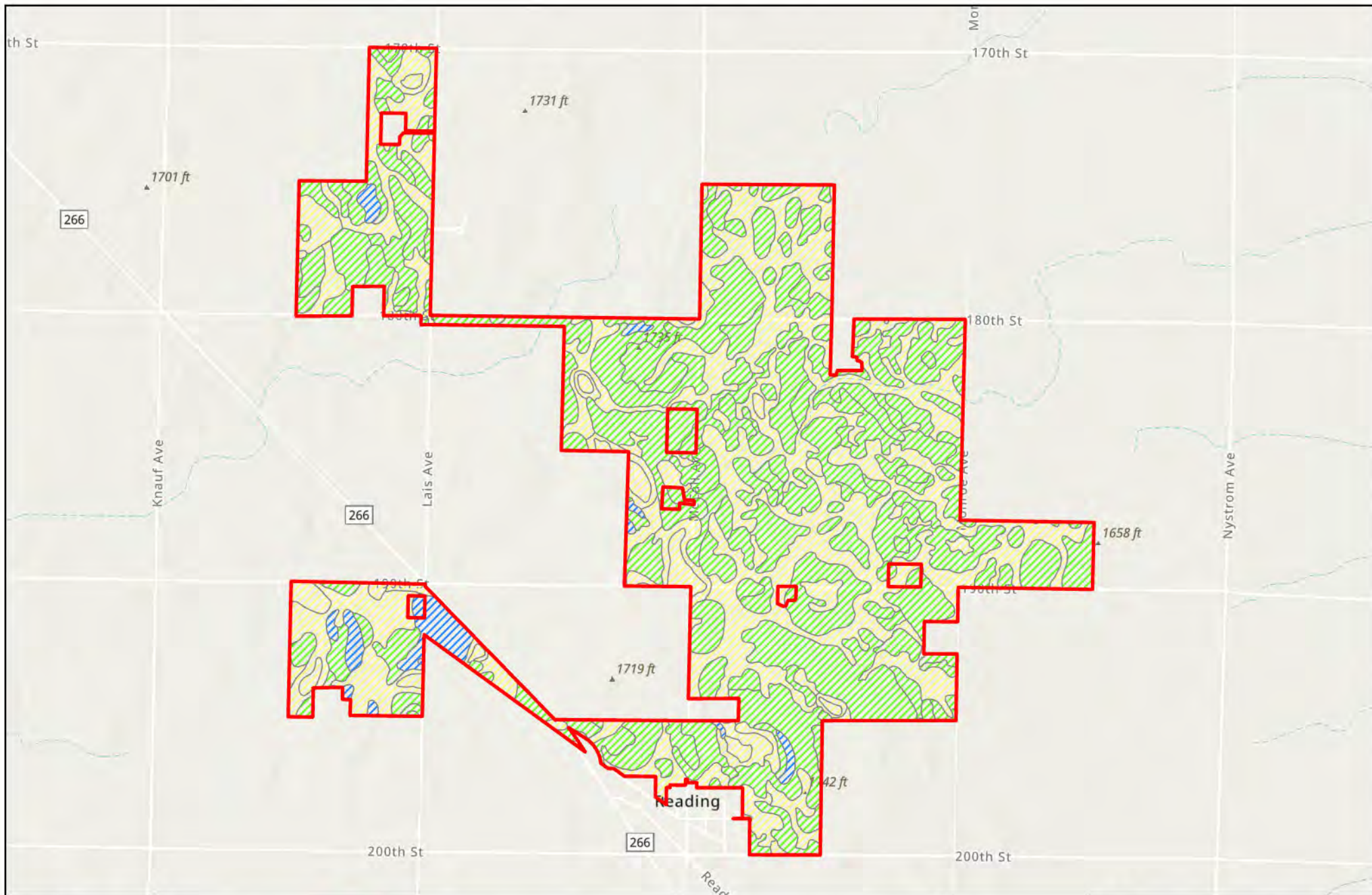


Figure 7: Groundwater Resources
Summit Lake Project
Nobles County, Minnesota



-  Site Boundary
-  Prime Farmland
-  Farmland of statewide importance
-  Prime farmland if drained

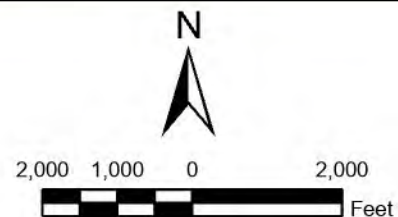
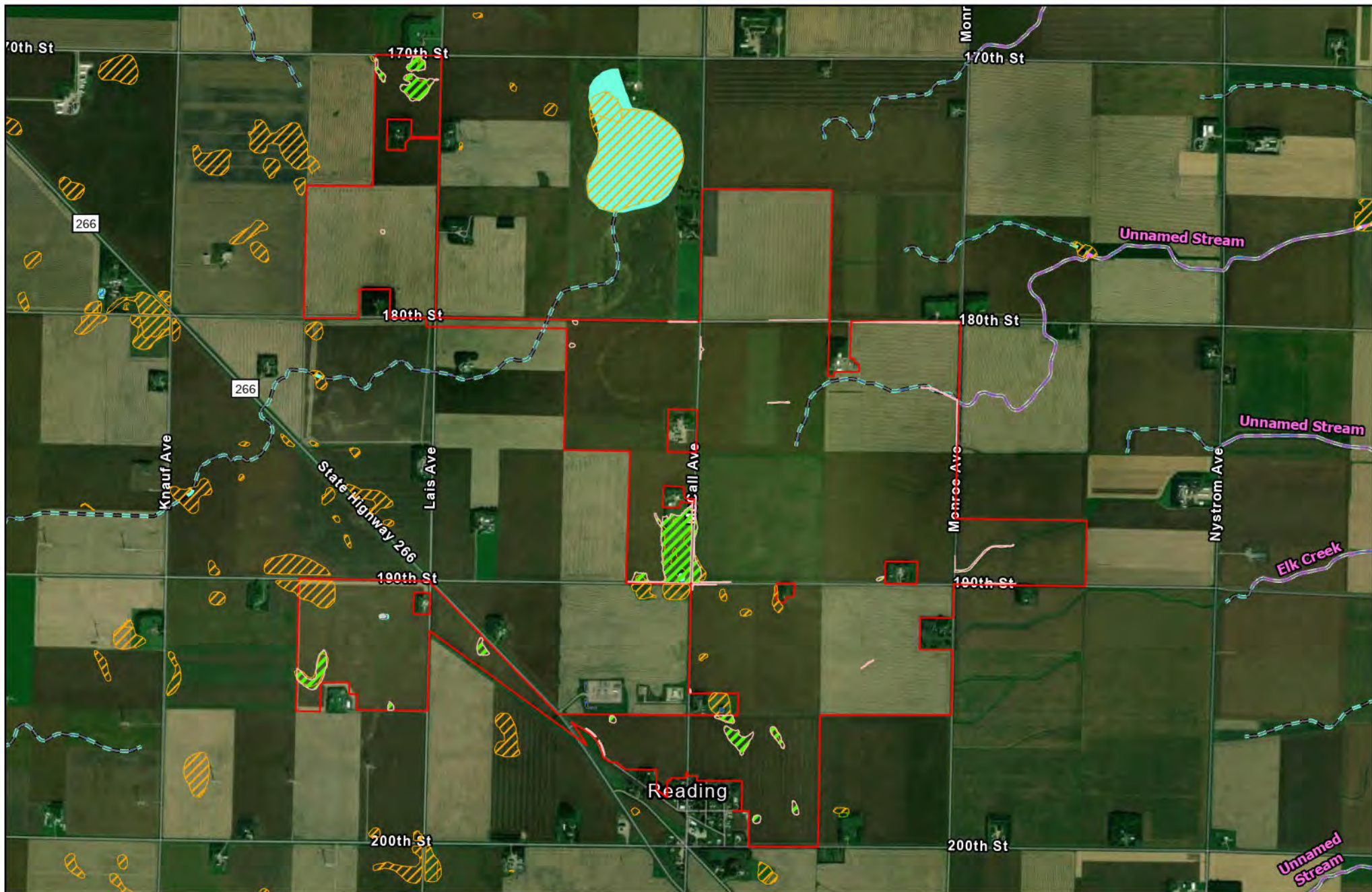


Figure 8: SSURGO Soil Map Units and Farmland Rating
Summit Lake Project
Nobles County, Minnesota



- Site Boundary
- DNR Hydrography Streams
- DNR Hydrography Basins
- DNR PWI Watercourses
- NWI Freshwater Emergent Wetland

- NWI Freshwater Forested/Shrub Wetland
- NWI Freshwater Pond
- NWI Riverine
- 2024 Delineated Emergent Wetlands

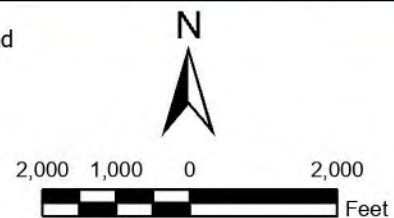
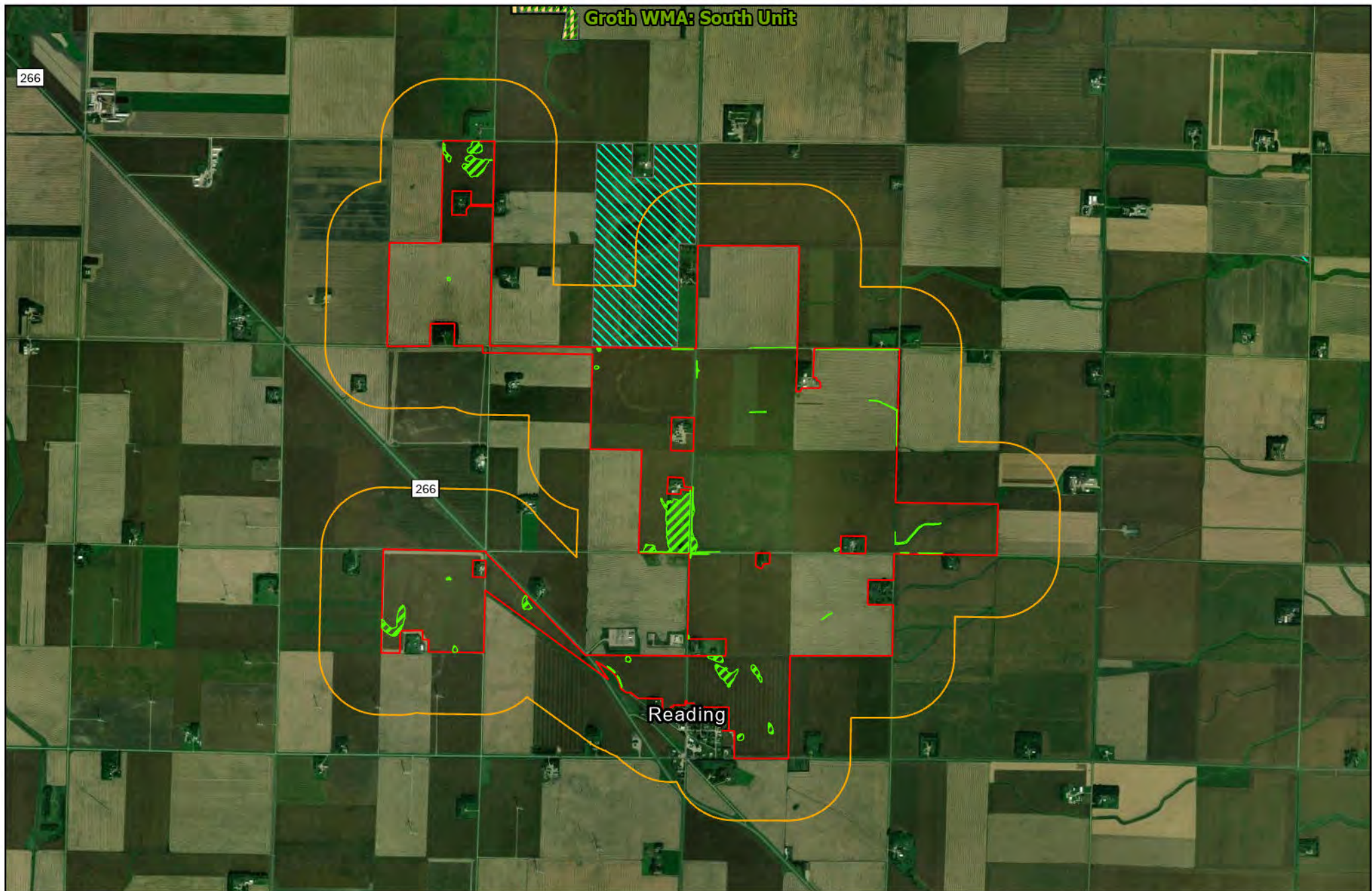


Figure 9: Surface Water Resources
Summit Lake Project
Nobles County, Minnesota



- Local Vicinity (1600 Feet)
- Site Boundary
- BWSR RIM Easement

- DNR Wildlife Management Areas
- MCBS Sites of Biodiversity Significance
- 2024 Delineated Emergent Wetlands

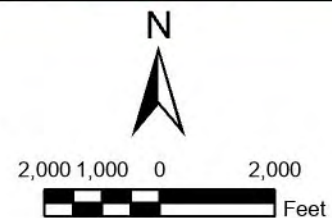
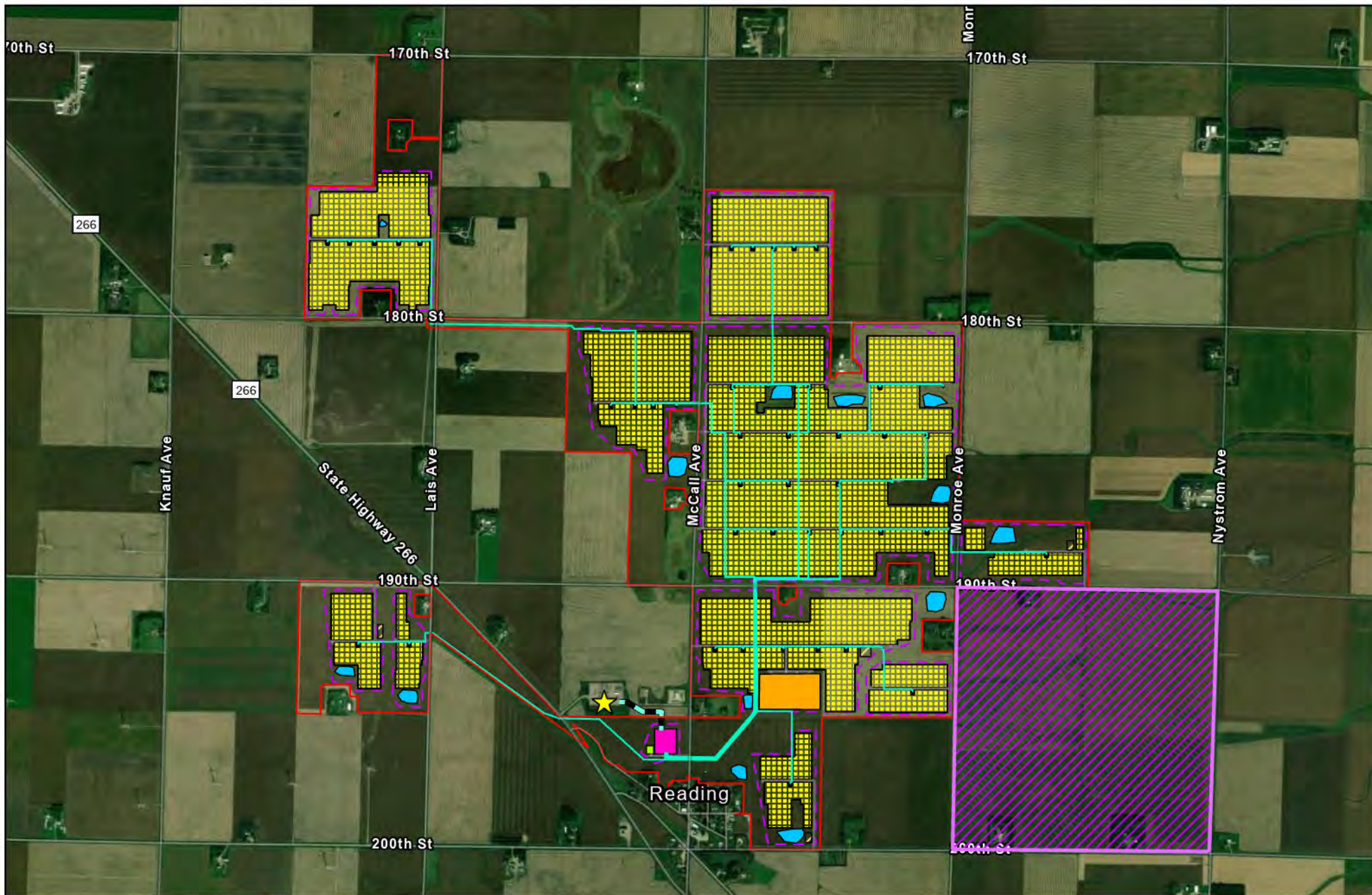


Figure 10: Wildlife Resources
Summit Lake Project
Nobles County, Minnesota



- | | |
|--|---|
| Site Boundary | Project Substation |
| Proposed Data Center | BESS Facilities |
| Proposed Gen-Tie-in Line (~1100 feet) | Stormwater Ponds |
| ★ Nobles County Substation (POI) | Access Roads |
| Collection and Communication Lines | Solar Arrays |
| Inverters | Operations and Maintenance and Parking |
| Temporary Laydown Yards | Fence |

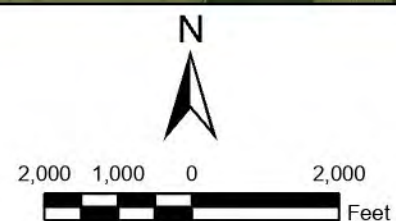


Figure 11: Cumulative
Impacts
Summit Lake Project
Nobles County, Minnesota

Appendix B- Environmental Assessment Scoping Decision



In the Matter of the Joint Application of Summit Lake Solar, LLC for a Site Permit for the 200 MW Solar Energy Generating System and 200 MW Battery Energy Storage System for the Summit Lake Project in Nobles County, Minnesota

**AMENDED ENVIRONMENTAL ASSESSMENT
SCOPING DECISION**

**DOCKET NOS. IP-7153/GS-25-89 and
IP-7153/ESS-25-88**

The above matter has come before the Executive Secretary of the Minnesota Public Utilities Commission (Commission) for a decision on the scope of the environmental assessment (EA) to be prepared for Summit Lake Solar, LLC's proposed 200 megawatt (MW) solar energy project and 200 MW battery energy storage system (BESS) to be located Nobles County, Minnesota. The Commission is reviewing this application under Minnesota Statute 216E (2023).

Project Description

On February 21, 2025, Summit Lake Solar, LLC (Summit Lake) submitted a site permit application to the Minnesota Public Utilities Commission (Commission) to construct and operate the Summit Lake Project (project) – a 200 MW photovoltaic solar energy generating facility and associated BESS facility with an up to 200 MW / 800-megawatt hour (MWh) nameplate capacity.¹ Following public meetings and a public comment period, the Commission issued a scoping decision for the project on July 17, 2025.²

On October 14, 2025, Summit Lake requested a pause in the permitting process to revise the design of its project.³ On December 18, 2025, Summit Lake filed an application amendment reflecting the revised project design and requiring this amended scoping decision for the project.^{4, 5}

The project area is approximately 1,987 acres located in Nobles County, Minnesota. There are approximately 573 acres of the project area for which Summit Lake has site control but are not currently contemplated for occupation by the solar facility or BESS. The solar panels will be installed in a north to south configuration on a tracking system that utilizes steel for the foundations and aluminum for the racking frame. Motors allow the racking to rotate from east to west throughout the day. The electric power generated by the solar panels will be transmitted to inverters and carried through collector system cables to the project substation. The project substation will transform the voltage to 345 kV, and the electrical energy will be transmitted to the existing Nobles Substation via a short (< 1,500 feet) proposed gen-tie line.

Summit Lake has an executed Generator Interconnection Agreement with Xcel Energy and the Midcontinent Independent System Operator, Inc. (MISO) to accommodate up to 200 MW AC from the solar facility. Summit Lake is pursuing an additional, separate Generator Interconnection Agreement for

¹ Summit Lake, Joint Site Permits Application to the Minnesota Public Utilities Commission, February 21, 2025, [eDockets](#) Nos. [20252-215674-01](#) (through -14).

² PUC EIP, Environmental Assessment Scoping Decision, July 17, 2025, eDockets No. [20257-221108-01](#)

³ Summit Lake, Request to Pause Proceedings, October 14, 2025, eDockets No. [202510-223903-01](#)

⁴ Summit Lake Storage and Summit Lake Solar, Summit Lake Site Permit Application Amendment, December 18, 2025, eDockets nos. [202512-226022-01](#) (through -09)

⁵ Minn. Rule 7850.3700, Subp. 3.

the BESS to operate independently and receive and store energy directly from the electric grid. The project substation would provide the BESS with an independent connection to the electrical grid. The BESS could accommodate up to 200 MW of surplus energy and inject it back into the electrical grid during times of increased demand or brief power outages.

Project Purpose

Summit Lake indicates that the project will support the State of Minnesota in meeting its carbon-free standards, renewable energy standards, and solar energy standards. In addition, the BESS will store excess energy from the grid that may have otherwise been curtailed and inject up to 200 MW AC back into the grid during times of increased demand or brief power outages.

Regulatory Background

Large Electric Power Generating Plant Site Permit

In Minnesota, no person may construct a large electric power generating plant without a site permit from the Commission.⁶ A large electric power generating plant is defined as a facility capable of operating at a capacity of 50 MW or more.⁷ The Summit Lake Solar project will be capable of producing up to 200 MW and therefore requires a site permit from the Commission. Because the project is powered by solar energy, the site permit application qualifies for Commission review under the alternative permitting process described in Minnesota Statute 216E.04, Subd. 2.⁸

Energy Storage System Site Permit

In Minnesota, no person may construct an energy storage system (ESS), defined as a facility capable of operating at a capacity of 10 MW or more,⁹ without a site permit from the Commission. Summit Lake's proposed project will have a nominal capacity of up to 200 MW and therefore requires a site permit from the Commission.

Environmental Review

Commission Energy Infrastructure Permitting (EIP) staff is responsible for conducting the environmental review for site and permit applications submitted to the Commission.¹⁰ EIP staff will prepare an environmental assessment (EA) for the project. An EA contains an overview of the resources affected by the project. It also discusses potential human and environmental impacts and possible mitigation measures.¹¹ An EA is the only required state environmental review document for this project.

⁶ Minnesota Statute 216E.03, Edition Year 2023.

⁷ Minnesota Statute 216E.01, Edition Year 2023.

⁸ The Agriculture and Energy Omnibus Bill passed in Minnesota's 2024 legislative session reformed state energy permitting policy. Effective July 1, 2025, environmental review and permitting of solar farms by the Commission will be conducted in accordance with Minnesota Statute 216I. Site permit applications for solar farms submitted prior to July 1, 2025, will be reviewed in accordance with Minnesota Statute 216E. Summit Lake submitted a site permit application before July 1, 2025; as such, the permitting process will continue pursuant to Minnesota Statute 216E.

⁹ Minnesota Statute 216E.01.subd. 3a, Edition Year 2023.

¹⁰ Minnesota Rule 7850.3700, Edition Year 2023.

¹¹ Minnesota Statute 216E.04, subd. 5, Edition Year 2023; Minn. Rule 7850.3700, subp. 4, Edition Year 2023.

Scoping Process

Scoping is the first step in the environmental review process. The scoping process has two primary purposes: (1) to gather public input as to the impacts and mitigation measures to study in the EA and (2) to focus the EA on those impacts and mitigation measures that will aid in the Commission's decision on the site permit application.

Staff use the information gathered during scoping to inform the content of the EA. EIP staff gathered input on the scope of the EA through public meetings and an associated comment period. This scoping decision identifies the impacts and mitigation measures that will be analyzed in the EA.

Public Information and Scoping Meetings

On May 21, 2025, Commission staff held a remote-access public meeting. Approximately fourteen individuals from the public attended this meeting, and there were no comments.¹² On May 22, 2025, Commission staff held an in-person public meeting in Worthington, Minnesota. Approximately 90 people attended this meeting. Several attendees voiced support for the project and Summit Lake's dedication to using local union labor. Many attendees, including local residents and homeowners, had questions and concerns related to proposed setbacks, impacts to wildlife and its habitat, introduction of invasive pest species, crop damage, fire safety, noise pollution, water quality, well integrity, potential damage to drain tile and county drainage systems, aesthetics, potential damage to solar panels from weather, project fencing, funding in the event of project decommissioning, and property value impacts.

Written Public Comments

A comment period ending on June 5, 2025, provided the public with an opportunity to provide input on the scope of the EA. Written comments were received from nineteen local members of the general public, the Minnesota Department of Natural Resources, and the Minnesota Department of Agriculture.¹³

General Public

Nineteen members of the general public provided written comments related to the project. Some commenters expressed their support for the project. Some commenters raised concerns including economic impacts, fire safety and first responder training, environment impacts, solar panel recycling noise pollution, water pollution, impacts to drain tile, decommissioning, and property value impacts.

¹² Summit Lake Project, Oral Comments on the Scope of Environmental Assessment, June 2025, eDockets No. [20256-219916-01](#).

¹³ Summit Lake Project, Written Comments on the Scope of Environmental Assessment, April 2025, eDockets No. [20256-219917-01](#).

Minnesota Agencies

Minnesota Department of Natural Resources (DNR)

The Minnesota Department of Natural Resources (DNR) provided written comments related to several project components and also provided a copy of its National Heritage Review letter.¹⁴ Comments included:

- Recommending the applicant adhere to the DNR-recommended security fence height of ten feet rather than the seven foot height proposed in the application.
- Recommending that the EA discuss project fencing plans, dust control products, lighting, erosion control, and mitigating impacts on wildlife consistent with DNR guidance.¹⁵
- Requesting the EA discuss the construction and vegetation reestablishment phases in order to minimize stormwater runoff, stabilize soil, and support habitat for the solar and BESS facilities, and recommending the utilization of a Vegetation Management Plan (VMP), that is consistent with the DNR's *Prairie Establishment and Maintenance Technical Guidance for Solar Projects*.¹⁶

Minnesota Department of Agriculture (MDA)

The Minnesota Department of Agriculture (MDA) provided written comments related to its role in the development of the project's Agricultural Impact Mitigation Plan (AIMP).¹⁷ The MDA stated that it had reviewed Summit Lake's AIMP, and that the MDA had no concerns or comments regarding the AIMP as it was submitted to the docket.

Scoping Decision

On July 17, 2025, the Commission issued a scoping decision for the project.¹⁸ Subsequently, Summit Lake requested a pause in the permitting process to revise the design of its project.¹⁹ Summit Lake indicated that it was revising the design, in part, to address public comments received during the scoping process.

Application Amendment

On December 18, 2025, Summit Lake filed an application amendment reflecting a revised project design (Figure 1). The amendments to the project include:

- Reducing the size of the Preliminary Development Area by approximately 65 acres.
- Identifying locations where vegetative screening would be used to mitigate aesthetic impacts.
- Moving the BESS location northeast, farther from the town of Reading.

¹⁴ Comments from the Minnesota Department of Natural Resources, eDockets Nos. [20256-219615-01](#) and [20256-219615-02](#)

¹⁵ Minnesota DNR, Commercial Solar Siting Guidance, February 2023. Retrieved from:

https://files.dnr.state.mn.us/publications/ewr/commercial_solar_siting_guidance.pdf.

¹⁶ Minnesota DNR, Prairie Establishment and Maintenance Technical Guidance for Solar Projects, February 2025. Retrieved from: https://files.dnr.state.mn.us/publications/ewr/prairie_solar_tech_guidance.pdf.

¹⁷ Comments from the Minnesota Department of Agriculture, eDockets No. [20252-215789-01](#).

¹⁸ PUC EIP, Environmental Assessment Scoping Decision, July 17, 2025, eDockets No. [20257-221108-01](#)

¹⁹ Summit Lake, Request to Pause Proceedings, October 14, 2025, eDockets No. [202510-223903-01](#)

- Moving the Operations and Maintenance (O&M) facility to be adjacent to the project substation.
- Increasing stormwater pond retainage from 17.2 acres to 28.3 acres.
- Decreasing the length of the gen-tie line by 108 feet.

The application amendment did not propose an increase to the acreage necessary to host the project's facilities, and no new landowners would be impacted. No changes were proposed to the capacities of the solar facility or BESS, to project costs, or to the planned commercial operation date. The amendment application did request a name change for the BESS applicant – from Summit Lake Solar, LLC to Summit Lake Storage, LLC.

HAVING REVIEWED THE MATTER, consulted with EIP staff, and in accordance with Minnesota Rule 7850.3700, I hereby make the following scoping decision:

MATTERS TO BE ADDRESSED

The EA will describe the project and the human and environmental resources of the project area. It will provide information on the potential impacts of the project as they relate to the topics outlined in this scoping decision and possible mitigation measures. It will identify impacts that cannot be avoided and irretrievable commitments of resources, as well as permits from other government entities that may be required for the project. The EA will discuss the relative merits of the proposed project site with respect to the siting factors in Minnesota Rule 7850.4100.

The issues outlined below will be analyzed in the EA for the project. This outline is not intended to serve as a table of contents for the document itself.

I. GENERAL DESCRIPTION OF THE PROJECT

- A. Project Description
- B. Project Purpose
- C. Project Costs

II. REGULATORY FRAMEWORK

- A. Site Permits
- B. Environmental Review
- C. Grid Interconnection
- D. Other Permits and Approvals

III. ENGINEERING, DESIGN, AND CONSTRUCTION

- A. Solar Arrays
- B. BESS Modules
- C. Electrical Collection Systems
- D. Gen-Tie Line
- E. Substation

F. Associated Facilities

IV. OPERATION AND DECOMMISSIONING

- A. Maintenance
- B. Vegetation Management
- C. Augmentation, Repowering and Decommissioning

V. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATIVE MEASURES

The EA will include a discussion of the human and environmental resources potentially impacted by the project. Potential impacts of the project will be described and characterized. Based on the impacts identified, the EA will describe mitigation measures that could reasonably be implemented to reduce or eliminate the identified impacts. The EA will describe any unavoidable impacts resulting from implementation of the project.

Data and analyses will be commensurate with the level of impact for a given resource and the relevance of the information to consider mitigation measures. EIP staff will consider the relationship between the cost of data and analyses and the relevance and importance of the information in determining the level of detail of information to be prepared for the EA. Less important material may be summarized, consolidated, or simply referenced.

If relevant information cannot be obtained within timelines prescribed by statute and rule, the costs of obtaining such information is excessive, or the means to obtain it is unknown, EIP staff will include in the EA a statement that such information is incomplete or unavailable and the relevance of the information in evaluating potential impacts or alternatives.

- A. Environmental Setting
- B. Human Settlements
 - 1. Noise
 - 2. Aesthetics (visual screening)
 - 3. Displacement
 - 4. Property Values
 - 5. Zoning and Land Use Compatibility (setbacks, land use change)
 - 6. Cultural Values
 - 7. Transportation and Public Services (access roads)
- C. Socioeconomics
 - 1. Environmental Justice
 - 2. Local Economies (employment, wages)
- D. Public Health and Safety
 - 1. Electric and Magnetic Fields
 - 2. Emergency Services
- E. Land-Based Economies
 - 1. Agriculture (land impacts)
 - 2. Forestry
 - 3. Mining
 - 4. Recreation and Tourism (aesthetic changes)
- F. Archaeological and Historic Resources

- G. Natural Environment
 - 1. Water Resources (stormwater, groundwater)
 - 2. Soils (erosion control)
 - 3. Geology
 - 4. Flora (vegetation removal and management, weed control, native plant communities)
 - 5. Fauna (wildlife corridors, erosion control, fencing, and lighting)
 - 6. Air Quality (fugitive dust)
 - 7. Climate Change / Climate Resiliency
- H. Threatened / Endangered / Rare and Unique Natural Resources (protected species, DNR-managed lands)
- I. Cumulative Impacts Analysis
- J. Adverse Impacts that Cannot be Avoided
- K. Irreversible and Irretrievable Commitments of Resources

ISSUES OUTSIDE THE SCOPE OF THE EA

The EA will not address following topics:

- Any sites other than those proposed by the applicants in their joint application amendment.
- The manner in which landowners are compensated for the project.

SCHEDULE

The EA is anticipated to be completed and available in March of 2026. Upon completion, it will be noticed and made available for review. Public hearings will be noticed and held in the project area after issuance of the EA. Comments on the EA may be submitted into the hearing record.

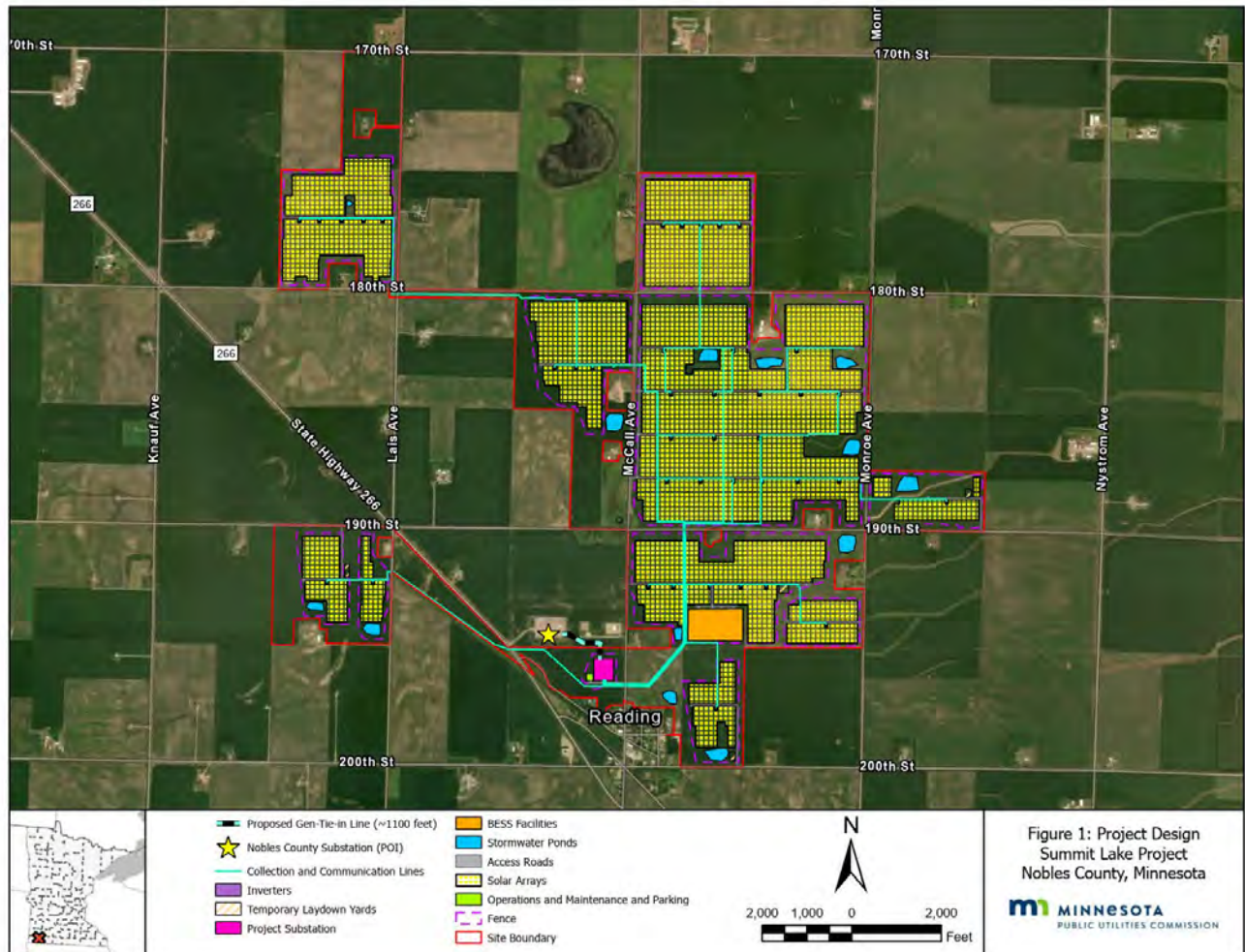
Signed this 22nd day of January, 2026

STATE OF MINNESOTA
MINNESOTA PUBLIC UTILITIES COMMISSION



Sasha Bergman, Executive Secretary

Figure 1: Revised Project Layout



Appendix C- Draft BESS Facility Site Permit

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

SITE PERMIT FOR

~~[PROJECT NAME]~~ SUMMIT LAKE STORAGE PROJECT

AN ENERGY STORAGE SYSTEM

IN

~~[COUNTY]~~ NOBLES COUNTY

ISSUED TO

~~[PERMITTEE]~~ Summit Lake Storage, LLC

PUC DOCKET NO. ~~[Docket Number]~~ IP-7153/ESS-25-88

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850 this site permit is hereby issued to:

~~[Permittee]~~ Summit Lake Storage, LLC

~~[Permittee]~~ Summit Lake Storage, LLC (Summit Lake Storage) is authorized by this site permit to construct and operate ~~[Provide a description of the project authorized by the Minnesota Public Utilities Commission]~~ an up to 200 megawatt battery energy storage system located in Nobles County, Minnesota.

The energy storage system shall be constructed and operated within the site identified in this site permit and in compliance with the conditions specified in this site permit.

This site permit shall expire ~~[xx]~~ 30 years from the date of this approval.

Approved and adopted this ____ day of [Month, Year]

BY ORDER OF THE COMMISSION

Sasha Bergman,
Executive Secretary

To request this document in another format such as large print or audio, call 651-296-0406 or 800-657-3782 (voice). Persons with a hearing or speech impairment may call using their preferred Telecommunications Relay Service or email consumer.puc@state.mn.us for assistance.

CONTENTS

1	SITE PERMIT	1
1.1	Pre-emption	1
2	PROJECT DESCRIPTION	1
2.1	Project Ownership	1
3	DESIGNATED SITE	2
4	GENERAL CONDITIONS	3
4.1	Site Permit Distribution	3
4.2	Access to Property	3
4.3	Construction and Operation Practices.....	3
4.3.1	Field Representative.....	3
4.3.2	Site Manager	4
4.3.3	Employee Training - Site Permit Terms and Conditions	4
4.3.4	Independent Third-Party Monitoring.....	4
4.3.5	Public Services, Public Utilities, and Existing Easements	4
4.3.6	Temporary Workspace	5
4.3.7	Noise.....	5
4.3.8	Aesthetics	5
4.3.9	Topsoil Protection	5
4.3.10	Soil Compaction.....	6
4.3.11	Soil Erosion and Sediment Control.....	6
4.3.12	Public Lands.....	6
4.3.13	Wetlands and Water Resources.....	6
4.3.14	Native Prairie.....	7
4.3.15	Vegetation Removal	7
4.3.16	Beneficial Habitat	8
4.3.17	Application of Pesticides	8
4.3.18	Invasive Species.....	8
4.3.19	Noxious Weeds.....	8
4.3.20	Roads	9
4.3.21	Archaeological and Historic Resources	9
4.3.22	Interference.....	10
4.3.23	Drainage Tiles	10
4.3.24	Restoration	10
4.3.25	Cleanup.....	10
4.3.26	Pollution and Hazardous Wastes	10

4.3.27	Damages	11
4.3.28	Public Safety	11
4.3.29	Site Identification	11
4.3.30	Security Fencing	11
4.4	Feeder Lines	11
4.5	Other Requirements	12
4.5.1	Safety Codes and Design Requirements	12
4.5.2	Other Permits and Regulations	12
5	SPECIAL CONDITIONS	13
5.1	Lighting.....	13
5.2	Wildlife-Friendly Erosion Control.....	13
5.3	Dust Control	13
5.4	Visual Screening Plan	13
5.5	Pre-construction Noise Modeling and Impact Assessment.....	14
5.6	Post-construction Noise Studies and Noise Mitigation	14
5.7	Noise Notification for Adjacent Residences During Construction.....	14
5.8	Vegetation Management Plan	14
5.9	Agricultural Impact Mitigation Plan.....	15
5.10	Drain Tile	15
5.11	Unanticipated Discoveries Plan	16
5.12	Battery Augmentation	16
5.13	Offtake Agreement	16
5.14	Hazard Mitigation Analysis	17
5.15	Local Firefighter Training	17
5.16	Annual Report	17
6	DELAY IN CONSTRUCTION	17
7	COMPLAINT PROCEDURES	18
8	COMPLIANCE REQUIREMENTS	18
8.1	Pre-Construction Meeting	18
8.2	Pre-Operation Meeting.....	18
8.3	Site Plan.....	18
8.4	Status Reports.....	19
8.5	Labor Statistic Reporting.....	19
8.6	Prevailing Wage	20
8.7	In-Service Date	20
8.8	As-Builts	20

8.9	GPS Data.....	20
8.10	Right of Entry	21
8.11	Emergency Response	21
8.12	Extraordinary Events.....	21
8.13	Wildlife Injuries and Fatalities	21
9	DECOMMISSIONING AND RESTORATION	22
9.1	Decommissioning Plan	22
9.2	Site Final Restoration	22
10	COMMISSION AUTHORITY AFTER SITE PERMIT ISSUANCE	23
10.1	Expansion of Designated Site Boundaries	23
10.2	Periodic Review.....	23
10.3	Modification of Conditions	23
10.4	More Stringent Rules	23
11	SITE PERMIT AMENDMENT	23
12	TRANSFER OF SITE PERMIT	24
13	REVOCATION OR SUSPENSION OF SITE PERMIT.....	24
14	EXPIRATION DATE	24

ATTACHMENTS

Attachment 1 – Complaint Handling Procedures for Permitted Energy Facilities

Attachment 2 – Compliance Filing Procedures for Permitted Energy Facilities

Attachment 3 – Site Permit Maps

1 SITE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this site permit to ~~[Permittee Name]~~ Summit Lake Storage, LLC (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850. This site permit authorizes the Permittee to construct and operate a ~~[Provide a description of the project as authorized by the Commission]~~ an up to 200 megawatt battery energy storage system located in Nobles County, Minnesota- ~~[Project Name, if applicable]~~, henceforth known as Project). The energy storage system shall be constructed and operated within the site identified in this site permit and in compliance with the conditions specified in this site permit.

1.1 Pre-emption

Pursuant to Minn. Stat. § 216E.10, this site permit shall be the sole site approval required for the location, construction, and operation of the energy storage system and this site permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose governments.

2 PROJECT DESCRIPTION

~~[Provide a description of the Project as authorized by the Commission]~~

The Summit Lake Storage Project is a battery energy storage system (BESS) with a nominal power rating of up to 200 MW alternating current (AC) with approximately 800 megawatt-hours (MWh) of energy capacity on a site of approximately 20.0 acres in Section 24 of Summit Lake Township in Nobles County. In addition to batteries, racking, and enclosures, the facility will also include inverters and transformers, electrical feeder lines, a project substation, and fencing surrounding the perimeter of the facility. The BESS will be a modular system comprised of lithium-ion batteries encased in stand-alone enclosures. The enclosure dimensions are anticipated to be 40 feet long by 10 feet wide by 9.5 feet high. The facility will be connected to the electric grid through a 902 foot long gen-tie line that will run between the project substation and the existing Nobles Substation.

The Project is located in the following:

County	Township Name	Township	Range	Section
<u>Nobles</u>	<u>Summit Lake</u>	<u>103N</u>	<u>41W</u>	<u>24</u>

2.1 Project Ownership

At least 14 days prior to the pre-construction meeting, the Permittee shall file a description of its ownership structure, identifying, as applicable:

- (a) the owner(s) of the financial and governance interests of the Permittee;
- (b) the owner(s) of the majority financial and governance interests of the Permittee's owners; and
- (c) the Permittee's ultimate parent entity (meaning the entity which is not controlled by any other entity).

The Permittee shall notify the Commission of:

- (a) a change in the owner(s) of the majority* financial or governance interests in the Permittee; or
- (b) a change in the owner(s) of the majority* financial or governance interests of the Permittee's owners; or
- (c) a sale which changes the ultimate parent entity of the Permittee

*When there are only co-equal 50/50 percent interests, any change shall be considered a change in majority interest.

In the event of an ownership change, the new Permittee must provide the Commission with a certification that it has read, understands, and is able to comply with the conditions of this permit.

3 DESIGNATED SITE

The site designated by the Commission for the Project is depicted on the site maps attached to this site permit (Designated Site). The site maps show the approximate location of the energy storage system and associated facilities within the Designated Site and identify a layout that seeks to minimize the overall potential human and environmental impacts of the Project, as they were evaluated in the permitting process.

The Designated Site serves to provide the Permittee with the flexibility to make minor adjustments to the layout to accommodate requests by landowners, local government units, federal and state agency requirements, and unforeseen conditions encountered during the detailed engineering and design process. Any modification to the location of a photovoltaic tracker row or associated facility shall be done in such a manner as to have human and environmental impacts that are comparable to those associated with the layouts on the maps attached to this site permit. The Permittee shall identify any modifications in the Site Plan pursuant to Section 8.3.

4 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction and operation of the solar energy generating system over the life of this site permit.

4.1 Site Permit Distribution

Within 30 days of issuance of this site permit, the Permittee shall provide all affected landowners with a copy of this site permit and the complaint procedures. An affected landowner is any landowner or designee that is within or adjacent to the permitted site. In no case shall a landowner receive this site permit and complaint procedures less than five days prior to the start of construction on their property. The Permittee shall also provide a copy of this site permit and the complaint procedures to the applicable regional development commissions, county environmental offices, and city and township clerks. The Permittee shall file with the Commission an affidavit of its site permit and complaint procedures distribution within 30 days of issuance of this site permit.

4.2 Access to Property

The Permittee shall notify landowners prior to entering or conducting maintenance within their property, unless otherwise negotiated with the landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3 Construction and Operation Practices

The Permittee shall comply with the construction practices, operation and maintenance practices, and material specifications described in the permitting record for this Project unless this site permit establishes a different requirement in which case this site permit shall prevail.

4.3.1 Field Representative

The Permittee shall designate a field representative responsible for overseeing compliance with the conditions of this site permit during construction of the Project. This person shall be accessible by telephone or other means during normal business hours throughout site preparation, construction, cleanup, and restoration.

The Permittee shall file with the Commission the name, address, email, phone number, and emergency phone number of the field representative at least 14 days prior to the pre-construction meeting. The Permittee shall provide the field representative's contact information to affected landowners, local government units and other interested persons at least 14 days prior to the pre-construction meeting. The Permittee may change the field

representative at any time upon notice to the Commission, affected landowners, local government units and other interested persons. The Permittee shall file with the Commission an affidavit of distribution of its field representative's contact information at least 14 days prior to the pre-construction meeting and upon changes to the field representative.

4.3.2 Site Manager

The Permittee shall designate a site manager responsible for overseeing compliance with the conditions of this site permit during the commercial operation and decommissioning phases of the Project. This person shall be accessible by telephone or other means during normal business hours for the life of this site permit.

The Permittee shall file the name, address, email, phone number, and emergency phone number of the site manager with the Commission within 14 days prior to the pre-operation meeting. The Permittee shall provide the site manager's contact information to landowners within or adjacent to the Project Boundary, local government units and other interested persons at least 14 days prior to the pre-operation meeting. The Permittee may change the site manager at any time upon notice to the Commission, landowners within or adjacent to the Project Boundary, local government units, and other interested persons. The Permittee shall file with the Commission an affidavit of distribution of its site manager's contact information at least 14 days prior to the pre-operation meeting and upon changes to the site manager.

4.3.3 Employee Training - Site Permit Terms and Conditions

The Permittee shall train and educate all employees, contractors, and other persons involved in the construction and ongoing operation of the solar energy generating system of the terms and conditions of this site permit. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.4 Independent Third-Party Monitoring

Prior to any construction, the Permittee shall propose a scope of work and identify an independent third-party monitor to conduct Project construction monitoring on behalf of the Commission. The scope of work shall be developed in consultation with and approved by the Commission. This third-party monitor will report directly to and will be under the control of the Commission with costs borne by the Permittee. Commission staff shall keep records of compliance with this section and will ensure that status reports detailing the construction monitoring are filed in accordance with scope of work approved by the Commission.

4.3.5 Public Services, Public Utilities, and Existing Easements

During Project construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these shall be temporary, and the Permittee shall restore service promptly. Where any impacts to utilities have the potential to occur the Permittee shall work with both landowners and local entities to determine the most appropriate mitigation measures if not already considered as part of this site permit.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.6 Temporary Workspace

The Permittee shall select temporary workspace and equipment staging areas that limit the removal and impacts to vegetation. The Permittee shall not site temporary workspace in wetlands or native prairie as defined in sections 4.3.13 and 4.3.14. The Permittee shall site temporary workspace to comply with standards for development of the shorelands of public waters as defined in Section 4.3.13. The Permittee shall obtain temporary easements outside of the authorized Project Boundary from affected landowners through rental agreements. Temporary easements are not provided for in this site permit.

4.3.7 Noise

The Permittee shall comply with noise standards established under Minn. R. 7030.0010 to 7030.0080, at all times and at all appropriate locations during operation of the Project. The Permittee shall limit construction and maintenance activities to daytime working hours to the extent practicable.

4.3.8 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners and the local unit of government having direct zoning authority over the area in which the Project is located. The Permittee shall use care to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the Project during construction and operation.

4.3.9 Topsoil Protection

The Permittee shall implement measures to protect and segregate topsoil from subsoil on all lands utilized for Project construction unless otherwise negotiated with affected landowner.

4.3.10 Soil Compaction

The Permittee shall implement measures to minimize soil compaction of all lands during all phases of the Project's life and shall confine compaction to as small an area as feasible. The Permittee shall use soil decompaction measures on all lands utilized for Project construction and travelled on by heavy equipment (e.g., cranes and heavy trucks), even when soil compaction minimization measures are used.

4.3.11 Soil Erosion and Sediment Control

The Permittee shall implement those erosion prevention and sediment control practices recommended by the Minnesota Pollution Control Agency (MPCA) Construction Stormwater Program. If construction of the Project disturbs more than one acre of land or is sited in an area designated by the MPCA as having potential for impacts to water resources, the Permittee shall obtain a National Pollutant Discharge Elimination System/State Disposal System Construction Stormwater Permit from the MPCA that provides for the development of a Stormwater Pollution Prevention Plan that describes methods to control erosion and runoff.

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the Project shall be returned to pre-construction conditions.

4.3.12 Public Lands

In no case shall photovoltaic tracker rows and associated facilities including foundations, access roads, underground cable, and transformers, be located in the public lands identified in Minn. R. 7850.4400, subp. 1, or in federal waterfowl production areas. Photovoltaic tracker rows and associated facilities shall not be located in the public lands identified in Minn. R. 7850.4400, subp. 3, unless there is no feasible and prudent alternative.

4.3.13 Wetlands and Water Resources

The Permittee shall not place the solar energy generating system or associated facilities in public waters and public waters wetlands, as shown on the public water inventory maps prescribed by Minnesota Statutes Chapter 103G, except that electric collector or feeder lines may cross or be placed in public waters or public waters wetlands subject to permits and

approvals by the Minnesota Department of Natural Resources (DNR) and the United States Army Corps of Engineers (USACE), and local units of government as implementers of the Minnesota Wetlands Conservation Act. The Permittee shall locate the solar energy generating system and associated facilities in compliance with the standards for development of the shorelands of public waters as identified in Minn. R. 6120.3300, and as adopted, Minn. R. 6120.2800, unless there is no feasible and prudent alternative.

The Permittee shall construct in wetland areas during frozen ground conditions, to the extent feasible, to minimize impacts. When construction during winter is not possible, wooden or composite mats shall be used to protect wetland vegetation. The Permittee shall contain and manage soil excavated from the wetlands and riparian areas in accordance with all applicable wetland permits. The Permittee shall access wetlands and riparian areas using the shortest route possible in order to minimize travel through wetland areas and prevent unnecessary impacts.

The Permittee shall restore wetland and water resource areas disturbed by construction activities to pre-construction conditions in accordance with the requirements of applicable state and federal permits or laws and landowner agreements. The Permittee shall meet the USACE, DNR, Minnesota Board of Water and Soil Resources, and local government wetland and water resource requirements.

4.3.14 Native Prairie

The Permittee shall not place the solar energy generating system or associated facilities in native prairie, as defined in Minn. Stat. § 84.02, subd. 5, unless addressed in a prairie protection and management plan and not located in areas enrolled in the Native Prairie Bank Program. The Permittee shall not impact native prairie during construction activities, as defined in Minn. Stat. § 216E.01, unless addressed in a prairie protection and management plan.

The Permittee shall prepare a prairie protection and management plan in consultation with the DNR if native prairie, as defined in Minn. Stat. § 84.02, subd. 5, is identified within the Project Boundary. The Permittee shall file the prairie protection and management plan with the Commission at least 30 days prior to submitting the Site Plan required by Section 8.3 of this site permit. The prairie protection and management plan shall address steps that will be taken to avoid impacts to native prairie and mitigation to unavoidable impacts to native prairie by restoration or management of other native prairie areas that are in degraded condition, by conveyance of conservation easements, or by other means agreed to by the Permittee, the DNR, and the Commission.

4.3.15 Vegetation Removal

The Permittee shall disturb or clear vegetation within the Designated Site only to the extent necessary to assure the safe construction, operation, and maintenance of the Project. The Permittee shall minimize the number of trees removed within the Designated Site specifically preserving to the maximum extent practicable windbreaks, shelterbelts, and living snow fences.

4.3.16 Beneficial Habitat

The Permittee shall implement site restoration and management practices that provide for native perennial vegetation and foraging habitat beneficial to gamebirds, songbirds, and pollinators; and that enhances soil water retention and reduces storm water runoff and erosion. To ensure continued management and recognition of beneficial habitat, the Permittee is encouraged to meet the standards for Minnesota's Habitat Friendly Solar Program by submitting project plans, seed mixes, a completed project planning assessment form, and any other applicable documentation used to meet the standard to the Board of Water and Soil Resources (BWSR). If the Permittee chooses to participate in Minnesota's Habitat-Friendly Solar Program, it shall file documents required to be filed with BWSR for meeting and maintaining Habitat Friendly Solar Certification with the Commission.

4.3.17 Application of Pesticides

The Permittee shall restrict pesticide use to those pesticides and methods of application approved by the MDA, DNR, and the U.S. Environmental Protection Agency (EPA). Selective foliage or basal application shall be used when practicable. All pesticides shall be applied in a safe and cautious manner so as not to damage adjacent properties including crops, orchards, tree farms, apiaries, or gardens. The Permittee shall contact the landowner at least 14 days prior to pesticide application on their property. The Permittee may not apply any pesticide if the landowner requests that there be no application of pesticides within the landowner's property. The Permittee shall provide notice of pesticide application to landowners and beekeepers operating known apiaries within three miles of the pesticide application area at least 14 days prior to such application. The Permittee shall keep pesticide communication and application records and provide them upon the request of Commission staff.

4.3.18 Invasive Species

The Permittee shall employ best management practices to avoid the potential introduction and spread of invasive species on lands disturbed by Project construction activities. The Permittee shall develop an Invasive Species Prevention Plan and file it with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall comply with the most recently filed Invasive Species Prevention Plan.

4.3.19 Noxious Weeds

The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select site appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.20 Roads

The Permittee shall advise the appropriate governing bodies having jurisdiction over all state, county, city, or township roads that will be used during the construction phase of the Project. Where practical, existing roadways shall be used for all activities associated with construction of the Project. Oversize or overweight loads associated with the Project shall not be hauled across public roads without required permits and approvals.

The Permittee shall locate all perimeter fencing and vegetative screening in a manner that does not interfere with routine road maintenance activities and allows for continued safe travel on public roads.

The Permittee shall construct the fewest number of site access roads required. Access roads shall not be constructed across streams and drainage ways without the required permits and approvals. Access roads shall be constructed in accordance with all necessary township, county or state road requirements and permits.

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when accessing construction workspace, unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.21 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to archaeological and historic resources when constructing the Project. In the event that a resource is encountered, the Permittee shall consult with the State Historic Preservation Office (SHPO) and the State Archaeologist. Where feasible, avoidance of the resource is required. Where not feasible, mitigation must include an effort to minimize Project impacts on the resource consistent with SHPO and State Archaeologist requirements.

Prior to construction, the Permittee shall train workers about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented

cultural properties, including gravesites, are found during construction. If human remains are encountered during construction, the Permittee shall immediately halt construction and promptly notify local law enforcement and the State Archaeologist. The Permittee shall not resume construction at such location until authorized by local law enforcement or the State Archaeologist. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.22 Interference

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the Project, the Permittee shall take whatever action is necessary to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the Project. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.23 Drainage Tiles

The Permittee shall avoid, promptly repair, or replace all drainage tiles broken or damaged during all phases of the Project's life unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.24 Restoration

The Permittee shall restore the areas affected by construction of the Project to the condition that existed immediately before construction began to the greatest extent possible. The time period to complete restoration may be no longer than 12 months after the completion of construction, unless otherwise negotiated with the affected landowner. Restoration shall be compatible with the safe operation, maintenance, and inspection of the Project. Within 60 days after completion of all restoration activities, the Permittee shall file with the Commission a Notice of Restoration Completion.

4.3.25 Cleanup

The Permittee shall remove and properly dispose of all construction waste and scrap from the right-of-way and all premises on which construction activities were conducted upon completion of each task. The Permittee shall remove and properly dispose of all personal litter, including bottles, cans, and paper from construction activities daily.

4.3.26 Pollution and Hazardous Wastes

The Permittee shall take all appropriate precautions to protect against pollution of the environment. The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean up and disposal of all waste generated during construction and restoration of the Project.

4.3.27 Damages

The Permittee shall fairly restore or compensate landowners for damage to crops, fences, private roads and lanes, landscaping, drain tile, or other damage sustained during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.28 Public Safety

The Permittee shall provide educational materials to landowners within and adjacent to the Designated Site and, upon request, to interested persons about the Project and any restrictions or dangers associated with the Project. The Permittee shall also implement any necessary safety measures such as placing warning signs and gates for traffic control or restricting public access. The Permittee shall file with the Commission an affidavit of its public safety notifications at least 14 days before the pre-construction meeting.

The Permittee shall submit the location of all underground facilities, as defined in Minn. Stat. § 216D.01, subd. 11, to Gopher State One Call following the completion of the construction of the Project.

4.3.29 Site Identification

The Permittee shall mark the solar energy generating system with a clearly visible identification number and or street address.

4.3.30 Security Fencing

The Permittee shall design the security fence surrounding the solar energy generating system to minimize the visual impact of the Project while maintaining compliance with the National Electric Safety Code. The Permittee shall develop a final fence plan for the specific site in coordination with the Commission and the DNR. The final fence plan shall be submitted to the Commission as part of the Site Plan pursuant to Section 8.3.

4.4 Feeder Lines

The Permittee may use overhead or underground feeder lines to carry power from an internal Project interconnection point to the Project substation or interconnection point on the electrical grid. The Permittee shall place overhead and underground feeder lines that parallel public roads within the public right-of-way or on private land immediately adjacent to the road. The Permittee shall obtain approval from the landowner or government unit responsible for the affected right-of-way.

The Permittee shall locate feeder lines in such a manner as to minimize interference with agricultural operations including but not limited to existing drainage patterns, drain tile, future tiling plans, and ditches. The Permittee shall place safety shields on all guy wires associated with overhead feeder lines. The Permittee shall submit the engineering drawings of all collector and feeder lines with the Site Plan pursuant to Section 8.3.

4.5 Other Requirements

4.5.1 Safety Codes and Design Requirements

The Permittee shall design the solar energy generating system and associated facilities to meet or exceed all relevant local and state codes, the National Electric Safety Code, and North American Electric Reliability Corporation requirements. This includes standards relating to clearances to ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances over roadways, right-of-way widths, and permit requirements. The Permittee shall keep records of compliance with these standards and provide them upon the request of staff.

4.5.2 Other Permits and Regulations

The Permittee shall comply with all applicable state statutes and rules. The Permittee shall obtain all required permits for the Project and comply with the conditions of those permits unless those permits conflict with or are preempted by federal or state permits and regulations.

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission an Other Permits and Regulations Submittal that contains a detailed status of all permits, authorizations, and approvals that have been applied for specific to the Project. The Other Permits and Regulations Submittal shall also include the permitting agency name; the name of the permit, authorization, or approval being sought; contact person and contact information for the permitting agency or authority; brief description of why the permit, authorization, or approval is needed; application submittal date; and the date the permit, authorization, or approval was issued or is anticipated to be issued.

The Permittee shall demonstrate that it has obtained all necessary permits, authorizations, and approvals by filing an affidavit stating as such and an updated Other Permits and Regulations Submittal prior to commencing Project construction. The Permittee shall provide a copy of any such permits, authorizations, and approvals at the request of Commission staff.

5 SPECIAL CONDITIONS

The special conditions shall take precedence over other conditions of this permit should there be a conflict.

5.1 Lighting

The Permittee must use shielded and downward facing lighting and LED lighting that minimizes blue hue at the gate locations, BESS enclosures, and along fence lines. Downward facing lighting must be clearly visible on the plan and profile submitted for the Project.

5.2 Wildlife-Friendly Erosion Control

The Permittee shall use only “bio-netting” or “natural netting” types of erosion control materials and mulch products without synthetic (plastic) fiber additives.

5.3 Dust Control

The Permittee shall minimize and avoid, if possible, the use or chloride-based dust control chemicals (i.e., calcium chloride, magnesium chloride).

5.4 Visual Screening Plan

The Permittee shall develop a site-specific Visual Screening Plan. The Visual Screening Plan shall be designed and managed to mitigate visual impacts to adjacent residences. The Visual Screening Plan shall at a minimum include:

(a) objectives for screening of nearby residences; and

(b) a description of the types of trees and shrub species to be used, the location of plantings, and plans for installation, establishment, and maintenance.

The location of trees and shrubs included in the Visual Screening Plan that are located within the Permittee’s site control shall be included in the Site Plan filed under Section 8.3. The Permittee is required to maintain and ensure the successful growth, health, and maintenance of the vegetation for 3 years. At least 14 days prior to the pre-construction meeting, the Permittee shall file:

(a) the Visual Screening Plan;

(b) documentation of coordination with landowners adjacent to the project site; and

(c) an affidavit of its distribution of the Visual Screening Plan to landowners adjacent to the project site.

5.5 Pre-construction Noise Modeling and Impact Assessment

The Permittee shall file a noise impact assessment at least 14 days prior to the pre-construction meeting. The noise impact assessment shall summarize the results from noise propagation modeling that incorporates noise inputs from the selected equipment and the facility layout shown in the site plans required in Section 8.3 of this permit. The permittee shall file an updated noise impact assessment including any revisions to selected equipment or facility layout prior to any modifications to the facility over its operating life.

5.6 Post-construction Noise Studies and Noise Mitigation

The Permittee shall file a proposed methodology for the conduct of a post-construction noise study at least 14 days prior to the pre-construction meeting. The Permittee shall develop the post-construction noise study methodology in consultation with Commission staff. The Permittee must conduct the post-construction noise study and file with the Commission the completed post-construction noise study within 18 months of commencing commercial operation.

The BESS facilities and associated facilities shall be placed and operated such that the Permittee shall, at all times, comply with noise standards established by the MPCA. Operation of the facility shall be modified, or project components shall be removed from service if necessary to comply with these noise standards.

5.7 Noise Notification for Adjacent Residences During Construction

The Permittee shall provide notice to adjacent residences detailing when major noise-producing construction activities are planned to occur. The Permittee shall maintain a webpage identifying days, times and areas where construction crew will be doing pile driving during construction. The Permittee shall provide all neighboring landowners and the township a link to the website prior to construction and shall update the website frequently during construction to keep landowners informed where pile driving will be occurring.

5.8 Vegetation Management Plan

The Permittee shall develop a vegetation management plan (VMP), in coordination with the Commission, and the Vegetation Management Working Group (VMWG), using best management practices established by the DNR and BWSR. The Permittee shall file the VMP and documentation of the coordination efforts between the Permittee and the coordinating agencies with the Commission at least 14 days prior to the pre-construction meeting.

Landowner-specific vegetation requests resulting from individual consultation between the Company and a landowner need not be included in the VMP. The Permittee shall provide all landowners within the Designated Site copies of the VMP. The Permittee shall file with the Commission an affidavit of its distribution of the VMP to landowners at least 14 days prior to the pre-construction meeting.

The VMP must include the following:

- (a) management objectives addressing short term (year 0-5, seeding and establishment) and long term (year 5 through the life of the Project) goals;
- (b) a description of planned restoration and vegetation management activities, including how the site will be prepared, timing of activities, how seeding will occur (e.g., broadcast, drilling, etc.), and the types of seed mixes to be used;
- (c) a description of how the site will be monitored and evaluated to meet management goals;
- (d) a description of the management tools used to maintain vegetation (e.g., mowing, spot spraying, hand removal, fire, grazing, etc.), including the timing and frequency of maintenance activities;
- (e) identification of the third-party (e.g., consultant, contractor, site manager, etc.) contracted for restoration, monitoring, and long-term vegetation management of the site;
- (f) identification of on-site noxious weeds and invasive species (native and non-native) and the monitoring and management practices to be utilized; and
- (g) a marked-up copy of the Site Plan showing how the site will be revegetated and that identifies the corresponding seed mixes.

Best management practices should be followed concerning seed mixes, seeding rates, and cover crops.

5.9 Agricultural Impact Mitigation Plan

At least 14 days prior to the pre-construction meeting, the Permittee shall develop an agricultural impact mitigation plan (AIMP) in coordination with the Minnesota Department of Agriculture. The plan shall detail methods to minimize soil compaction, preserve topsoil, control noxious weeds and invasive species, maintain the existing drainage conditions through appropriate maintenance and repair of existing drain tile, and establish and maintain appropriate vegetation to ensure the project is designed, constructed, operated and ultimately restored in a manner that would preserve soils to allow for the land to be returned to agricultural use.

5.10 Drain Tile

The Permittee shall develop a site-specific Drain Tile Reroute and Abandonment Plan (DTRAP). In addition to the requirements imposed by Standard Condition 4.3.25, shall obtain approval of its DTRAP to reroute and abandoned public drain tile from the Nobles County Drainage Authority Board. The Permittee shall file the DTRAP with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall adhere to the following requirements;

- (a) Damage done to drain tile will be repaired immediately by a contractor, based in Nobles County, that is mutually agreed on prior to the pre-construction meeting by the Permittee and the Nobles County Drainage Authority Board;
- (b) Permittees will use a third party to conduct a survey for drain tile within and adjacent to the Site using methods agreed upon with the Nobles County Drainage Authority Board. The results of this survey shall be filed with the Commission at least 14 days prior to the pre-construction meeting;
- (c) Any private drain tile that is disconnected from county drain tile must be reconnected to the county drain tile following relocation; and
- (d) The Permittee shall provide evidence of outreach and correspondence with participating and adjacent landowners to obtain maps of private drain tile within and bordering the Site.

5.11 Unanticipated Discoveries Plan

The Permittee shall develop an Unanticipated Discoveries Plan (UDP) to be used in the event previously unrecorded archeological or historic properties, or human remains, are encountered during construction, or if unanticipated effects to previously identified archaeological or historic properties occur during construction. The UDP shall describe how previously unrecorded cultural resources or human remains found during construction shall be protected and examined. The Permittee shall file the UDP with the Commission at least 14 days prior to the pre-construction meeting.

5.12 Battery Augmentation

The Permittee shall notify the Commission of scheduled augmentation at least 30 days prior to commencing augmentation activities. In its filing, the Permittee shall describe the number and types of batteries included in the augmentation. The Permittee shall indicate the location of the augmentation on the project Site Plan. In its filing the Permittee shall demonstrate compliance with the noise impact assessment submitted to the Commission as required in Section 5.2 of this permit.

5.13 Offtake Agreement

In the event the Permittee does not have an offtake agreement, or some other enforceable mechanism for sale of energy capacity provided by the Project at the time this site permit is issued, the Permittee shall provide notice to the Commission when it obtains a commitment for the energy capacity. This site permit does not authorize construction of the Project until the Permittee has obtained an offtake agreement, or some other enforceable mechanism for energy capacity provided by the Project. In the event the Permittee does not obtain an offtake agreement or some other enforceable mechanism for the energy capacity provided by the Project within two years of the issuance of this site permit, the Permittee must advise the Commission of the reason for not having such commitment. In such event, the Commission may determine whether this site permit should be amended or revoked. No amendment or revocation of this site permit may be undertaken except in accordance with Minn. Stat. § 216I.09 or Minn. Stat. § 216I.14.

5.14 Hazard Mitigation Analysis

The Permittee shall file a Hazard Mitigation Analysis detailing the results of the equipment testing, and the risks associated with the technology, along with an affidavit of distribution of the Hazard Mitigation analysis to emergency responders with jurisdiction over the project, at least 30 days prior to the pre-construction meeting

5.15 Local Firefighter Training

The Permittee shall provide regular training on battery technology used in the BESS and associated facility technology for local firefighting crews and emergency services personnel. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

5.16 Annual Report

The Permittee shall, by February 1st following each complete or partial year of Project operation, file a report with the Commission on the monthly availability of the facility including:

- (a) the installed nameplate capacity of the permitted facility;
- (b) the monthly and annual availability of the facility;
- (c) the operational status of the facility and any major outages, major repairs, incidents that required an emergency response, battery augmentation, or performance improvements occurring in the previous year; and
- (d) any other information reasonably requested by the Commission.

The Permittee shall file this information in a format recommended by the Commission. This information shall be considered public and must be filed electronically.

If the Permittee has not commenced construction or improvement of the site within four years after the date of issuance of this site permit the Permittee shall file a Failure to Construct Report and the Commission shall consider suspension of this site permit in accordance with Minn. R. 7850.4700.

7 COMPLAINT PROCEDURES

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission the complaint procedures that will be used to receive and respond to complaints. The complaint procedures shall be in accordance with the requirements of Minn. R. 7829.1500 or Minn. R. 7829.1700, and as set forth in the complaint procedures attached to this site permit.

Upon request, the Permittee shall assist Commission staff with the disposition of unresolved or longstanding complaints. This assistance shall include, but is not limited to, the submittal of complaint correspondence and complaint resolution efforts.

8 COMPLIANCE REQUIREMENTS

Failure to timely and properly make compliance filings required by this site permit is a failure to comply with the conditions of this site permit. Compliance filings must be electronically filed with the Commission.

8.1 Pre-Construction Meeting

Prior to the start of construction, the Permittee shall participate in a pre-construction meeting with Commission staff to review pre-construction filing requirements, scheduling, and to coordinate monitoring of construction and site restoration activities. Within 14 days following the pre-construction meeting, the Permittee shall file with the Commission a summary of the topics reviewed and discussed and a list of attendees. The Permittee shall indicate in the filing the anticipated construction start date.

8.2 Pre-Operation Meeting

At least 14 days prior to commercial operation of the Project, the Permittee shall participate in a pre-operation meeting with Commission staff to coordinate field monitoring of operation activities for the Project. Within 14 days following the pre-operation meeting, the Permittee shall file a summary of the topics reviewed and discussed and a list of attendees with the Commission.

8.3 Site Plan

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission and the counties where the Project will be constructed with a Site Plan that includes specifications and drawings for site preparation and grading; specifications and locations of the energy storage system and associated facilities; and procedures for cleanup and restoration. The documentation shall include maps depicting the Designated Site, energy storage system, and associated facilities layout in relation to that approved by this site permit.

The Permittee may not commence construction until the earlier of (i) 30 days after the pre-construction meeting or (ii) or until the Commission staff has notified the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this site permit.

If the Commission notifies the Permittee in writing within 30 days after the pre-construction meeting that it has completed its review of the documents and planned construction, and finds that the planned construction is not consistent with this site permit, the Permittee may submit additional and/or revised documentation and may not commence construction until the Commission has notified the Permittee in writing that it has determined that the planned construction is consistent with this site permit.

If the Permittee intends to make any significant changes in its Site Plan or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission and county staff at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this site permit.

8.4 Status Reports

The Permittee shall file with the Commission monthly Construction Status Reports beginning with the pre-construction meeting and until completion of restoration. Construction Status Reports shall describe construction activities and progress, activities undertaken in compliance with this site permit, and shall include text and photographs.

If the Permittee does not commence construction of the Project within six months of this site permit issuance, the Permittee shall file with the Commission Pre-Construction Status Reports on the anticipated timing of construction every six months beginning with the issuance of this site permit until the pre-construction meeting. The status updates shall include information on the Project's Midcontinent Independent System Operator (MISO) interconnection process, if applicable.

8.5 Labor Statistic Reporting

The Permittee shall file quarterly Labor Statistic Reports with the Commission within 45 days of the end of the quarter regarding construction workers that participated in the construction of the Project. The Labor Statistic Reports shall:

- (a) detail the Permittee's efforts and the site contractor's efforts to hire Minnesota workers; and
- (b) provide an account of:
 - i. the gross number of hours worked by or full-time equivalent workers who are Minnesota residents, as defined in Minn. Stat. § 290.01, subd. 7;
 - ii. the gross number of hours worked by or full-time equivalent workers who are residents of other states, but maintain a permanent residence within 150 miles of the Project; and
 - iii. the total gross hours worked or total full-time equivalent workers.

The Permittee shall work with its contractor to determine the suitable reporting metric. The report may not include personally identifiable data.

8.6 Prevailing Wage

The Permittee, its contractors, and subcontractors shall pay no less than the prevailing wage rate as defined in Minn. Stat. § 177.42 and shall be subject to the requirements and enforcement provisions under Minn. Stat. §§ 177.27, 177.30, 177.32, 177.41 to 177.435, and 177.45. The Permittee shall keep records of contractor and subcontractor pay and provide them at the request of Commission staff.

8.7 In-Service Date

At least three days before the Project is to be placed into service, the Permittee shall notify the Commission of the date on which the Project will be placed into service and the date on which construction was completed.

8.8 As-Builts

Within 90 days after completion of construction, the Permittee shall submit to the Commission copies of all final as-built plans and specifications developed during the Project construction.

8.9 GPS Data

Within 90 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (*e.g.*, ArcGIS compatible

map files, GPS coordinates, associated database of characteristics) for all structures associated with the Project.

8.10 Right of Entry

The Permittee shall allow Commission designated representatives to perform the following, upon reasonable notice, upon presentation of credentials and at all times in compliance with the Permittee's site safety standards:

- (a) To enter upon the facilities easement of the property for the purpose of obtaining information, examining records, and conducting surveys or investigations.
- (b) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations.
- (c) To sample and monitor upon the facilities easement of the property.
To examine and copy any documents pertaining to compliance with the conditions of this site permit.

8.11 Emergency Response

The Permittee shall prepare an Emergency Response Plan (ERP) in consultation with the emergency responders having jurisdiction over the Project prior to construction. The Permittee shall file the ERP, along with any comments from emergency responders to the Commission at least 14 days prior to the pre-construction meeting and a revised ERP, if any, at least 14 days prior to the pre-operation meeting. At least 14 days prior to the pre-operation meeting the Permittee shall file with the Commission an affidavit of the distribution of the ERP to emergency responders and Public Safety Answering Points (PSAP) with jurisdiction over the Project. The Permittee shall obtain and register the Project address or other location indicators acceptable to the emergency responders and PSAP having jurisdiction over the Project.

8.12 Extraordinary Events

Within 24 hours of discovery of an occurrence, the Permittee shall notify the Commission of any extraordinary event. Extraordinary events include but shall not be limited to fires, acts of sabotage, collector or feeder line failure, and injured worker or private person. The Permittee shall, within 30 days of the occurrence, file a report with the Commission describing the cause of the occurrence and the steps taken to avoid future occurrences.

8.13 Wildlife Injuries and Fatalities

The Permittee shall report any wildlife injuries and fatalities to the Commission quarterly.

9 DECOMMISSIONING AND RESTORATION

9.1 Decommissioning Plan

The Permittee shall comply with the provisions of the most recently filed and accepted Decommissioning Plan. The initial version of the Decommissioning Plan was submitted for this Project as ~~[Identify Decommissioning Plan, e.g., Appendix XX to the Site Permit Application]~~Appendix G of the joint site permit application. The Permittee shall file an updated Decommissioning Plan incorporating comments and information from the permit application process and any updates associated with the final construction plans with the Commission at least fourteen 14 days prior to the pre-construction meeting. The Permittee shall update and file the Decommissioning Plan with the Commission every five years following the commercial operation date.

The Decommissioning Plan shall provide information identifying all surety and financial securities established for decommissioning and site restoration. The Decommissioning Plan shall provide an itemized breakdown of costs of decommissioning all Project components, which shall include labor and equipment.

The Permittee shall also submit the Decommissioning Plan to the local unit of government having direct zoning authority over the area in which the Project is located. The Permittee shall ensure that it carries out its obligations to provide for the resources necessary to fulfill its requirements to properly decommission the Project at the appropriate time. The Commission may at any time request the Permittee to file a report with the Commission describing how the Permittee is fulfilling this obligation.

9.2 Site Final Restoration

Upon expiration of this site permit or upon termination of operation of the Project, the Permittee shall have the obligation to dismantle and remove from the site all Project components in accordance with the most recently filed and accepted decommissioning plan. To the extent feasible, the Permittee shall restore and reclaim the site to pre-project conditions. Landowners may require the site be returned to agricultural production or may retain restored prairie vegetation, or other land uses as agreed to between the landowner and the Permittee. All access roads shall be removed unless written approval is given by the affected landowner requesting that one or more roads, or portions thereof, be retained. All such agreements between the Permittee and the affected landowner shall be filed with the Commission prior to commencing restoration activities. The Permittee shall restore the site in accordance with the requirements of this condition and file a Notification of Final Restoration Completion to the Commission within 18 months of termination of operation of the Project.

10 COMMISSION AUTHORITY AFTER SITE PERMIT ISSUANCE

10.1 Expansion of Designated Site Boundaries

No expansion of the site boundary described in this site permit shall be authorized without the approval of the Commission. The Permittee may submit to the Commission a request for a change in the boundary of the site for the Project. The Commission will respond to the requested change in accordance with applicable statutes and rules.

10.2 Periodic Review

The Commission shall initiate a review of this site permit and the applicable conditions at least once every five years. The purpose of the periodic review is to allow the Commission, the Permittee, and other interested persons an opportunity to consider modifications in the conditions of this site permit. No modification may be made except in accordance with applicable statutes and rules.

10.3 Modification of Conditions

After notice and opportunity for hearing this site permit may be modified or amended for cause, including but not limited to the following:

- (a) violation of any condition in this permit;
- (b) endangerment of human health or the environment by operation of the Project; or
- (c) existence of other grounds established by rule.

10.4 More Stringent Rules

The issuance of this site permit does not prevent the future adoption by the Commission of rules or orders more stringent than those now in existence and does not prevent the enforcement of these more stringent rules and orders against the Permittee.

11 SITE PERMIT AMENDMENT

This site permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this site permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required under Minn. R. 7850.4900.

12 TRANSFER OF SITE PERMIT

The Permittee may request at any time that the Commission transfer this site permit to another person or entity (transferee). In its request, the Permittee must provide the Commission with:

- (a) the name and description of the transferee;
- (b) the reasons for the transfer;
- (c) a description of the facilities affected; and
- (d) the proposed effective date of the transfer.

The transferee must provide the Commission with a certification that it has read, understands and is able to comply with the plans and procedures filed for the Project and all conditions of this site permit.

The transferee must provide the Commission with the name and contact information for the site manager, as described in Section 4.3.2, and either a current version with eDocket reference, or a revised version of the following:

- (a) complaint procedures, as described in Section 7 and Attachment 1;
- (b) ERP, as described in Section 8.12; and
- (c) Decommissioning Plan, as described in Section 9.1.

The Commission may authorize transfer of the site permit after affording the Permittee, the transferee, and interested persons such process as is required under Minn. R. 7850.5000.

13 REVOCATION OR SUSPENSION OF SITE PERMIT

The Commission may initiate action to revoke or suspend this site permit at any time. The Commission shall act in accordance with the requirements of Minn. R. 7850.5100, to revoke or suspend this site permit.

14 EXPIRATION DATE

This site permit shall expire ~~10~~30 years after the date this site permit was approved and adopted.

Appendix D- Draft Solar Facility Site Permit

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

SITE PERMIT FOR

[PROJECT NAME] SUMMIT LAKE SOLAR PROJECT

A SOLAR ENERGY GENERATING SYSTEM

IN

[COUNTY] NOBLES COUNTY

ISSUED TO

[PERMITTEE] Summit Lake Solar, LLC

PUC DOCKET NO. [Docket Number] IP-7153/GS-25-89

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850 this site permit is hereby issued to:

[Permittee] Summit Lake Solar, LLC

[Permittee] Summit Lake Solar, LLC (Summit Lake Solar) is authorized by this site permit to construct and operate an up to 200 megawatt solar energy generating system located in Nobles County, Minnesota. ~~Provide a description of the project authorized by the Minnesota Public Utilities Commission.~~

The solar energy generating system shall be constructed and operated within the site identified in this site permit and in compliance with the conditions specified in this site permit.

This site permit shall expire ~~[xx]~~ 30 years from the date of this approval.

Approved and adopted this ____ day of [Month, Year]

BY ORDER OF THE COMMISSION

Sasha Bergman,
Executive Secretary

To request this document in another format such as large print or audio, call 651-296-0406 or 800-657-3782 (voice). Persons with a hearing or speech impairment may call using their preferred Telecommunications Relay Service or email consumer.puc@state.mn.us for assistance.

CONTENTS

1	SITE PERMIT	1
1.1	Pre-emption	1
2	PROJECT DESCRIPTION	1
2.1	Project Ownership	1
3	DESIGNATED SITE	2
4	GENERAL CONDITIONS	2
4.1	Site Permit Distribution	3
4.2	Access to Property	3
4.3	Construction and Operation Practices.....	3
4.3.1	Field Representative.....	3
4.3.2	Site Manager	4
4.3.3	Employee Training - Site Permit Terms and Conditions	4
4.3.4	Independent Third-Party Monitoring.....	4
4.3.5	Public Services, Public Utilities, and Existing Easements	4
4.3.6	Temporary Workspace	5
4.3.7	Noise.....	5
4.3.8	Aesthetics	5
4.3.9	Topsoil Protection	5
4.3.10	Soil Compaction.....	6
4.3.11	Soil Erosion and Sediment Control.....	6
4.3.12	Public Lands.....	6
4.3.13	Wetlands and Water Resources.....	6
4.3.14	Native Prairie.....	7
4.3.15	Vegetation Removal	7
4.3.16	Beneficial Habitat	8
4.3.17	Vegetation Management Plan	8
4.3.18	Agricultural Impact Mitigation Plan	9
4.3.19	Application of Pesticides	9
4.3.20	Invasive Species.....	9
4.3.21	Noxious Weeds.....	10
4.3.22	Roads	10
4.3.23	Archaeological and Historic Resources	10
4.3.24	Interference.....	11
4.3.25	Drainage Tiles	11
4.3.26	Restoration	11

4.3.27	Cleanup.....	11
4.3.28	Pollution and Hazardous Wastes	12
4.3.29	Damages.....	12
4.3.30	Public Safety	12
4.3.31	Site Identification	12
4.3.32	Security Fencing	12
4.4	Feeder Lines	13
4.5	Other Requirements	13
4.5.1	Safety Codes and Design Requirements	13
4.5.2	Other Permits and Regulations	13
5	SPECIAL CONDITIONS	14
5.1	Lighting.....	14
5.2	Wildlife-Friendly Erosion Control.....	14
5.3	Dust Control	14
5.4	Visual Screening Plan	14
5.5	Noise Notification for Adjacent Residences During Construction.....	15
5.6	Drain Tile	15
5.7	Unanticipated Discoveries Plan	16
5.8	Community Impact Mitigation Agreement.....	16
6	DELAY IN CONSTRUCTION	16
7	COMPLAINT PROCEDURES	16
8	COMPLIANCE REQUIREMENTS	17
8.1	Pre-Construction Meeting	17
8.2	Pre-Operation Meeting.....	17
8.3	Site Plan.....	17
8.4	Status Reports.....	18
8.5	Labor Statistic Reporting.....	18
8.6	Prevailing Wage	19
8.7	In-Service Date	19
8.8	As-Builts	19
8.9	GPS Data.....	19
8.10	Right of Entry	19
8.11	Project Energy Production	20
8.12	Emergency Response	20
8.13	Extraordinary Events.....	21
8.14	Wildlife Injuries and Fatalities	21

9	DECOMMISSIONING AND RESTORATION	21
9.1	Decommissioning Plan	21
9.2	Site Final Restoration	22
9.3	Abandoned Solar Installations	22
10	COMMISSION AUTHORITY AFTER SITE PERMIT ISSUANCE	22
10.1	Final Designated Site Boundaries	22
10.2	Expansion of Designated Site Boundaries	23
10.3	Periodic Review	23
10.4	Modification of Conditions	23
10.5	More Stringent Rules	23
11	SITE PERMIT AMENDMENT	23
12	TRANSFER OF SITE PERMIT	24
13	REVOCATION OR SUSPENSION OF SITE PERMIT.....	24
14	EXPIRATION DATE	24

ATTACHMENTS

Attachment 1 – Complaint Handling Procedures for Permitted Energy Facilities

Attachment 2 – Compliance Filing Procedures for Permitted Energy Facilities

Attachment 3 – Site Permit Maps

1 SITE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this site permit to ~~[Permittee Name Summit Lake Solar, LLC]~~ (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850. This site permit authorizes the Permittee to construct and operate a ~~[Provide a description of the project as authorized by the Commission]~~ an up to 200 megawatt solar energy generating system located in Nobles County, Minnesota (~~[Project Name, if applicable]~~), henceforth known as Project). The solar energy generating system shall be constructed and operated within the site identified in this site permit and in compliance with the conditions specified in this site permit.

1.1 Pre-emption

Pursuant to Minn. Stat. § 216E.10, this site permit shall be the sole site approval required for the location, construction, and operation of the solar energy generating system and this site permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose governments.

2 PROJECT DESCRIPTION

~~[Provide a description of the Project as authorized by the Commission]~~ The 200 MW solar facility will consist of photovoltaic (PV) panels, trackers, inverters, transformers, access roads, security fencing, above-ground and below-ground electric collection lines, a project substation, and associated facilities. The Permittee will locate the project facilities in an area that would occupy approximately 1,416 acres within the 1,990 acres of land under contract or owned by the applicant. The solar facility will be connected to the project substation via 34.5 kilovolt (kV) electric collection lines. A short aboveground 345 kV transmission line will run from the project substation to the Nobles Substation, which is owned and operated by Xcel Energy.

The Project is located in the following:

County	Township Name	Township	Range	Section
<u>Nobles</u>	<u>Elk</u>	<u>103N</u>	<u>40W</u>	<u>18</u>
<u>Nobles</u>	<u>Summit Lake</u>	<u>103N</u>	<u>41W</u>	<u>10, 12-15</u>

2.1 Project Ownership

At least 14 days prior to the pre-construction meeting, the Permittee shall file a description of its ownership structure, identifying, as applicable:

- (a) the owner(s) of the financial and governance interests of the Permittee;
- (b) the owner(s) of the majority financial and governance interests of the Permittee's owners; and
- (c) the Permittee's ultimate parent entity (meaning the entity which is not controlled by any other entity).

The Permittee shall notify the Commission of:

- (a) a change in the owner(s) of the majority* financial or governance interests in the Permittee; or
- (b) a change in the owner(s) of the majority* financial or governance interests of the Permittee's owners; or
- (c) a sale which changes the ultimate parent entity of the Permittee

* When there are only co-equal 50/50 percent interests, any change shall be considered a change in majority interest.

Also, in the event of an ownership change, the new Permittee must provide the Commission with a certification that it has read, understands and is able to comply with the conditions of this permit.

3 DESIGNATED SITE

The site designated by the Commission for the Project is depicted on the site maps attached to this site permit (Designated Site). The site maps show the approximate location of photovoltaic tracker rows and associated facilities within the Designated Site and identify a layout that seeks to minimize the overall potential human and environmental impacts of the Project, as they were evaluated in the permitting process.

The Designated Site serves to provide the Permittee with the flexibility to make minor adjustments to the layout to accommodate requests by landowners, local government units, federal and state agency requirements, and unforeseen conditions encountered during the detailed engineering and design process. Any modification to the location of a photovoltaic tracker row or associated facility shall be done in such a manner as to have human and environmental impacts that are comparable to those associated with the layouts on the maps attached to this site permit. The Permittee shall identify any modifications in the Site Plan pursuant to Section 8.3.

4 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction and operation of the solar energy generating system over the life of this site permit.

4.1 Site Permit Distribution

Within 30 days of issuance of this site permit, the Permittee shall provide all affected landowners with a copy of this site permit and the complaint procedures. An affected landowner is any landowner or designee that is within or adjacent to the permitted site. In no case shall a landowner receive this site permit and complaint procedures less than five days prior to the start of construction on their property. The Permittee shall also provide a copy of this site permit and the complaint procedures to the applicable regional development commissions, county environmental offices, and city and township clerks. The Permittee shall file with the Commission an affidavit of its site permit and complaint procedures distribution within 30 days of issuance of this site permit.

4.2 Access to Property

The Permittee shall notify landowners prior to entering or conducting maintenance within their property, unless otherwise negotiated with the landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3 Construction and Operation Practices

The Permittee shall comply with the construction practices, operation and maintenance practices, and material specifications described in the permitting record for this Project unless this site permit establishes a different requirement in which case this site permit shall prevail.

4.3.1 Field Representative

The Permittee shall designate a field representative responsible for overseeing compliance with the conditions of this site permit during construction of the Project. This person shall be accessible by telephone or other means during normal business hours throughout site preparation, construction, cleanup, and restoration.

The Permittee shall file with the Commission the name, address, email, phone number, and emergency phone number of the field representative at least 14 days prior to the pre-construction meeting. The Permittee shall provide the field representative's contact information to affected landowners, local government units and other interested persons at least 14 days prior to the pre-construction meeting. The Permittee may change the field representative at any time upon notice to the Commission, affected landowners, local

government units and other interested persons. The Permittee shall file with the Commission an affidavit of distribution of its field representative's contact information at least 14 days prior to the pre-construction meeting and upon changes to the field representative.

4.3.2 Site Manager

The Permittee shall designate a site manager responsible for overseeing compliance with the conditions of this site permit during the commercial operation and decommissioning phases of the Project. This person shall be accessible by telephone or other means during normal business hours for the life of this site permit.

The Permittee shall file the name, address, email, phone number, and emergency phone number of the site manager with the Commission within 14 days prior to the pre-operation meeting. The Permittee shall provide the site manager's contact information to landowners within or adjacent to the Project Boundary, local government units and other interested persons at least 14 days prior to the pre-operation meeting. The Permittee may change the site manager at any time upon notice to the Commission, landowners within or adjacent to the Project Boundary, local government units, and other interested persons. The Permittee shall file with the Commission an affidavit of distribution of its site manager's contact information at least 14 days prior to the pre-operation meeting and upon changes to the site manager.

4.3.3 Employee Training - Site Permit Terms and Conditions

The Permittee shall train and educate all employees, contractors, and other persons involved in the construction and ongoing operation of the solar energy generating system of the terms and conditions of this site permit. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.4 Independent Third-Party Monitoring

Prior to any construction, the Permittee shall propose a scope of work and identify an independent third-party monitor to conduct Project construction monitoring on behalf of the Commission. The scope of work shall be developed in consultation with and approved by the Commission. This third-party monitor will report directly to and will be under the control of the Commission with costs borne by the Permittee. Commission staff shall keep records of compliance with this section and will ensure that status reports detailing the construction monitoring are filed with the Commission in accordance with scope of work approved by the Commission.

4.3.5 Public Services, Public Utilities, and Existing Easements

During Project construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these shall be temporary, and the Permittee shall restore service promptly. Where any impacts to utilities have the potential to occur the Permittee shall work with both landowners and local entities to determine the most appropriate mitigation measures if not already considered as part of this site permit.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.6 Temporary Workspace

The Permittee shall select temporary workspace and equipment staging areas that limit the removal and impacts to vegetation. The Permittee shall not site temporary workspace in wetlands or native prairie as defined in sections 4.3.13 and 4.3.14. The Permittee shall site temporary workspace to comply with standards for development of the shorelands of public waters as defined in Section 4.3.13. The Permittee shall obtain temporary easements outside of the authorized Project Boundary from affected landowners through rental agreements. Temporary easements are not provided for in this site permit.

4.3.7 Noise

The Permittee shall comply with noise standards established under Minn. R. 7030.0010 to 7030.0080, at all times and at all appropriate locations during operation of the Project. The Permittee shall limit construction and maintenance activities to daytime working hours to the extent practicable.

4.3.8 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners and the local unit of government having direct zoning authority over the area in which the Project is located. The Permittee shall use care to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the Project during construction and operation.

4.3.9 Topsoil Protection

The Permittee shall implement measures to protect and segregate topsoil from subsoil on all lands utilized for Project construction unless otherwise negotiated with affected landowner.

4.3.10 Soil Compaction

The Permittee shall implement measures to minimize soil compaction of all lands during all phases of the Project's life and shall confine compaction to as small an area as feasible. The Permittee shall use soil decompaction measures on all lands utilized for Project construction and travelled on by heavy equipment (e.g., cranes and heavy trucks), even when soil compaction minimization measures are used.

4.3.11 Soil Erosion and Sediment Control

The Permittee shall implement those erosion prevention and sediment control practices recommended by the Minnesota Pollution Control Agency (MPCA) Construction Stormwater Program. If construction of the Project disturbs more than one acre of land or is sited in an area designated by the MPCA as having potential for impacts to water resources, the Permittee shall obtain a National Pollutant Discharge Elimination System/State Disposal System Construction Stormwater Permit from the MPCA that provides for the development of a Stormwater Pollution Prevention Plan that describes methods to control erosion and runoff.

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the Project shall be returned to pre-construction conditions.

4.3.12 Public Lands

In no case shall photovoltaic tracker rows and associated facilities including foundations, access roads, underground cable, and transformers, be located in the public lands identified in Minn. R. 7850.4400, subp. 1, or in federal waterfowl production areas. Photovoltaic tracker rows and associated facilities shall not be located in the public lands identified in Minn. R. 7850.4400, subp. 3, unless there is no feasible and prudent alternative.

4.3.13 Wetlands and Water Resources

The Permittee shall not place the solar energy generating system or associated facilities in public waters and public waters wetlands, as shown on the public water inventory maps prescribed by Minnesota Statutes Chapter 103G, except that electric collector or feeder lines may cross or be placed in public waters or public waters wetlands subject to permits and

approvals by the Minnesota Department of Natural Resources (DNR) and the United States Army Corps of Engineers (USACE), and local units of government as implementers of the Minnesota Wetlands Conservation Act. The Permittee shall locate the solar energy generating system and associated facilities in compliance with the standards for development of the shorelands of public waters as identified in Minn. R. 6120.3300, and as adopted, Minn. R. 6120.2800, unless there is no feasible and prudent alternative.

The Permittee shall construct in wetland areas during frozen ground conditions, to the extent feasible, to minimize impacts. When construction during winter is not possible, wooden or composite mats shall be used to protect wetland vegetation. The Permittee shall contain and manage soil excavated from the wetlands and riparian areas in accordance with all applicable wetland permits. The Permittee shall access wetlands and riparian areas using the shortest route possible in order to minimize travel through wetland areas and prevent unnecessary impacts.

The Permittee shall restore wetland and water resource areas disturbed by construction activities to pre-construction conditions in accordance with the requirements of applicable state and federal permits or laws and landowner agreements. The Permittee shall meet the USACE, DNR, Minnesota Board of Water and Soil Resources, and local government wetland and water resource requirements.

4.3.14 Native Prairie

The Permittee shall not place the solar energy generating system or associated facilities in native prairie, as defined in Minn. Stat. § 84.02, subd. 5, unless addressed in a prairie protection and management plan and not located in areas enrolled in the Native Prairie Bank Program. The Permittee shall not impact native prairie during construction activities, as defined in Minn. Stat. § 216E.01, unless addressed in a prairie protection and management plan.

The Permittee shall prepare a prairie protection and management plan in consultation with the DNR if native prairie, as defined in Minn. Stat. § 84.02, subd. 5, is identified within the Project Boundary. The Permittee shall file the prairie protection and management plan with the Commission at least 30 days prior to submitting the Site Plan required by Section 8.3 of this site permit. The prairie protection and management plan shall address steps that will be taken to avoid impacts to native prairie and mitigation to unavoidable impacts to native prairie by restoration or management of other native prairie areas that are in degraded condition, by conveyance of conservation easements, or by other means agreed to by the Permittee, the DNR, and the Commission.

4.3.15 Vegetation Removal

The Permittee shall disturb or clear vegetation within the Designated Site only to the extent necessary to assure the safe construction, operation, and maintenance of the Project. The Permittee shall minimize the number of trees removed within the Designated Site specifically preserving to the maximum extent practicable windbreaks, shelterbelts, and living snow fences.

4.3.16 Beneficial Habitat

The Permittee shall implement site restoration and management practices that provide for native perennial vegetation and foraging habitat beneficial to gamebirds, songbirds, and pollinators; and that enhances soil water retention and reduces storm water runoff and erosion. To ensure continued management and recognition of beneficial habitat, the Permittee is encouraged to meet the standards for Minnesota's Habitat Friendly Solar Program by submitting project plans, seed mixes, a completed project planning assessment form, and any other applicable documentation used to meet the standard to the Board of Water and Soil Resources (BWSR). If the Permittee chooses to participate in Minnesota's Habitat-Friendly Solar Program, it shall file documents required to be filed with BWSR for meeting and maintaining Habitat Friendly Solar Certification with the Commission.

4.3.17 Vegetation Management Plan

The Permittee shall develop a vegetation management plan (VMP), in coordination with the Commission and the Vegetation Management Working Group (VMWG), using best management practices established by the DNR and BWSR. The Permittee shall file the VMP and documentation of the coordination efforts between the Permittee and the coordinating agencies with the Commission at least 14 days prior to the pre-construction meeting.

Landowner-specific vegetation requests resulting from individual consultation between the Company and a landowner need not be included in the VMP. The Permittee shall provide all landowners within the Designated Site copies of the VMP. The Permittee shall file with the Commission an affidavit of its distribution of the VMP to landowners at least 14 days prior to the pre-construction meeting.

The VMP must include the following:

- (a) management objectives addressing short term (year 0-5, seeding and establishment) and long term (year 5 through the life of the Project) goals;
- (b) a description of planned restoration and vegetation management activities, including how the site will be prepared, timing of activities, how seeding will occur (*e.g.*, broadcast, drilling, etc.), and the types of seed mixes to be used;
- (c) a description of how the site will be monitored and evaluated to meet management goals;

- (d) a description of the management tools used to maintain vegetation (*e.g.*, mowing, spot spraying, hand removal, fire, grazing, etc.), including the timing and frequency of maintenance activities;
- (e) identification of the third-party (*e.g.*, consultant, contractor, site manager, etc.) contracted for restoration, monitoring, and long-term vegetation management of the site;
- (f) identification of on-site noxious weeds and invasive species (native and non-native) and the monitoring and management practices to be utilized; and
- (g) a marked-up copy of the Site Plan showing how the site will be revegetated and that identifies the corresponding seed mixes.

Best management practices should be followed concerning seed mixes, seeding rates, and cover crops.

4.3.18 Agricultural Impact Mitigation Plan

The Permittee shall develop an agricultural impact mitigation plan (AIMP) in coordination with the Minnesota Department of Agriculture (MDA). The Permittee shall provide landowners within the Designated Site a copy of the AIMP. The Permittee shall file with the Commission the AIMP and an affidavit of the AIMP distribution to landowners at least 14 days prior to the pre-construction meeting.

4.3.19 Application of Pesticides

The Permittee shall restrict pesticide use to those pesticides and methods of application approved by the MDA, DNR, and the U.S. Environmental Protection Agency (EPA). Selective foliage or basal application shall be used when practicable. All pesticides shall be applied in a safe and cautious manner so as not to damage adjacent properties including crops, orchards, tree farms, apiaries, or gardens. The Permittee shall contact the landowner at least 14 days prior to pesticide application on their property. The Permittee may not apply any pesticide if the landowner requests that there be no application of pesticides within the landowner's property. The Permittee shall provide notice of pesticide application to landowners and beekeepers operating known apiaries within three miles of the pesticide application area at least 14 days prior to such application. The Permittee shall keep pesticide communication and application records and provide them upon the request of Commission staff.

4.3.20 Invasive Species

The Permittee shall employ best management practices to avoid the potential introduction and spread of invasive species on lands disturbed by Project construction activities. The Permittee shall develop an Invasive Species Prevention Plan and file it with the Commission at least 14

days prior to the pre-construction meeting. The Permittee shall comply with the most recently filed Invasive Species Prevention Plan.

4.3.21 Noxious Weeds

The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select site appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.22 Roads

The Permittee shall advise the appropriate governing bodies having jurisdiction over all state, county, city, or township roads that will be used during the construction phase of the Project. Where practical, existing roadways shall be used for all activities associated with construction of the Project. Oversize or overweight loads associated with the Project shall not be hauled across public roads without required permits and approvals.

The Permittee shall locate all perimeter fencing and vegetative screening in a manner that does not interfere with routine road maintenance activities and allows for continued safe travel on public roads.

The Permittee shall construct the fewest number of site access roads required. Access roads shall not be constructed across streams and drainage ways without the required permits and approvals. Access roads shall be constructed in accordance with all necessary township, county or state road requirements and permits.

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when accessing construction workspace, unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.23 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to archaeological and historic resources when constructing the Project. In the event that a resource is encountered, the Permittee shall consult with the State Historic Preservation Office (SHPO) and the State Archaeologist. Where feasible, avoidance of the resource is required. Where not feasible, mitigation must include an

effort to minimize Project impacts on the resource consistent with SHPO and State Archaeologist requirements.

Prior to construction, the Permittee shall train workers about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If human remains are encountered during construction, the Permittee shall immediately halt construction and promptly notify local law enforcement and the State Archaeologist. The Permittee shall not resume construction at such location until authorized by local law enforcement or the State Archaeologist. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.24 Interference

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the Project, the Permittee shall take whatever action is necessary to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the Project. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.25 Drainage Tiles

The Permittee shall avoid, promptly repair, or replace all drainage tiles broken or damaged during all phases of the Project's life unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.26 Restoration

The Permittee shall restore the areas affected by construction of the Project to the condition that existed immediately before construction began to the greatest extent possible. The time period to complete restoration may be no longer than 12 months after the completion of construction, unless otherwise negotiated with the affected landowner. Restoration shall be compatible with the safe operation, maintenance, and inspection of the Project. Within 60 days after completion of all restoration activities, the Permittee shall file with the Commission a Notice of Restoration Completion.

4.3.27 Cleanup

The Permittee shall remove and properly dispose of all construction waste and scrap from the right-of-way and all premises on which construction activities were conducted upon completion of each task. The Permittee shall remove and properly dispose of all personal litter, including bottles, cans, and paper from construction activities daily.

4.3.28 Pollution and Hazardous Wastes

The Permittee shall take all appropriate precautions to protect against pollution of the environment. The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean up and disposal of all waste generated during construction and restoration of the Project.

4.3.29 Damages

The Permittee shall fairly restore or compensate landowners for damage to crops, fences, private roads and lanes, landscaping, drain tile, or other damage sustained during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.30 Public Safety

The Permittee shall provide educational materials to landowners within and adjacent to the Designated Site and, upon request, to interested persons about the Project and any restrictions or dangers associated with the Project. The Permittee shall also implement any necessary safety measures such as placing warning signs and gates for traffic control or restricting public access. The Permittee shall file with the Commission an affidavit of its public safety notifications at least 14 days before the pre-construction meeting.

The Permittee shall submit the location of all underground facilities, as defined in Minn. Stat. § 216D.01, subd. 11, to Gopher State One Call following the completion of the construction of the Project.

4.3.31 Site Identification

The Permittee shall mark the solar energy generating system with a clearly visible identification number and or street address.

4.3.32 Security Fencing

The Permittee shall design the security fence surrounding the solar energy generating system to minimize the visual impact of the Project while maintaining compliance with the National

Electric Safety Code. The Permittee shall develop a final fence plan for the specific site in coordination with the Commission and the DNR. The final fence plan shall be submitted to the Commission as part of the Site Plan pursuant to Section 8.3.

4.4 Feeder Lines

The Permittee may use overhead or underground feeder lines to carry power from an internal Project interconnection point to the Project substation or interconnection point on the electrical grid. The Permittee shall place overhead and underground feeder lines that parallel public roads within the public right-of-way or on private land immediately adjacent to the road. The Permittee shall obtain approval from the landowner or government unit responsible for the affected right-of-way.

The Permittee shall locate feeder lines in such a manner as to minimize interference with agricultural operations including but not limited to existing drainage patterns, drain tile, future tiling plans, and ditches. The Permittee shall place safety shields on all guy wires associated with overhead feeder lines. The Permittee shall submit the engineering drawings of all collector and feeder lines with the Site Plan pursuant to Section 8.3.

4.5 Other Requirements

4.5.1 Safety Codes and Design Requirements

The Permittee shall design the solar energy generating system and associated facilities to meet or exceed all relevant local and state codes, the National Electric Safety Code, and North American Electric Reliability Corporation requirements. This includes standards relating to clearances to ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances over roadways, right-of-way widths, and permit requirements. The Permittee shall keep records of compliance with these standards and provide them upon the request of Commission staff.

4.5.2 Other Permits and Regulations

The Permittee shall comply with all applicable state statutes and rules. The Permittee shall obtain all required permits for the Project and comply with the conditions of those permits unless those permits conflict with or are preempted by federal or state permits and regulations.

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission an Other Permits and Regulations Submittal that contains a detailed status of all permits, authorizations, and approvals that have been applied for specific to the Project. The

Other Permits and Regulations Submittal shall also include the permitting agency name; the name of the permit, authorization, or approval being sought; contact person and contact information for the permitting agency or authority; brief description of why the permit, authorization, or approval is needed; application submittal date; and the date the permit, authorization, or approval was issued or is anticipated to be issued.

The Permittee shall demonstrate that it has obtained all necessary permits, authorizations, and approvals by filing an affidavit stating as such and an updated Other Permits and Regulations Submittal prior to commencing Project construction. The Permittee shall provide a copy of any such permits, authorizations, and approvals at the request of Commission staff.

5 SPECIAL CONDITIONS

The special conditions shall take precedence over other conditions of this permit should there be a conflict.

[Add Special Conditions in accordance with the record of the docket]

5.1 Lighting

The Permittee must use shielded and downward facing lighting and LED lighting that minimizes blue hue at the gate locations, BESS enclosures, and along fence lines. Downward facing lighting must be clearly visible on the plan and profile submitted for the Project.

5.2 Wildlife-Friendly Erosion Control

The Permittee shall use only “bio-netting” or “natural netting” types of erosion control materials and mulch products without synthetic (plastic) fiber additives.

5.3 Dust Control

The Permittee shall minimize and avoid, if possible, the use of chloride-based dust control chemicals (i.e., calcium chloride, magnesium chloride).

5.4 Visual Screening Plan

The Permittee shall develop a site-specific Visual Screening Plan. The Visual Screening Plan shall be designed and managed to mitigate visual impacts to adjacent residences. The Visual Screening Plan shall at a minimum include:

(a) objectives for screening of nearby residences; and

(b) a description of the types of trees and shrub species to be used, the location of plantings, and plans for installation, establishment, and maintenance.

The location of trees and shrubs included in the Visual Screening Plan that are located within the Permittee's site control shall be included in the Site Plan filed under Section 8.3. The Permittee is required to maintain and ensure the successful growth, health, and maintenance of the vegetation for 3 years. At least 14 days prior to the pre-construction meeting, the Permittee shall file:

- (a) the Visual Screening Plan;
- (b) documentation of coordination with landowners adjacent to the project site; and
- (c) an affidavit of its distribution of the Visual Screening Plan to landowners adjacent to the project site.

5.5 Noise Notification for Adjacent Residences During Construction

The Permittee shall provide notice to adjacent residences detailing when major noise-producing construction activities are planned to occur. The Permittee shall maintain a webpage identifying days, times and areas where construction crew will be doing pile driving during construction. The Permittee shall provide all neighboring landowners and the township a link to the website prior to construction and shall update the website frequently during construction to keep landowners informed where pile driving will be occurring.

5.15.6 Drain Tile

The Permittee shall develop a site-specific Drain Tile Reroute and Abandonment Plan (DTRAP). In addition to the requirements imposed by Standard Condition 4.3.25, shall obtain approval of its DTRAP to reroute and abandoned public drain tile from the Nobles County Drainage Authority Board. The Permittee shall file the DTRAP with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall adhere to the following requirements:

- (a) Damage done to drain tile will be repaired immediately by a contractor, based in Nobles County, that is mutually agreed on prior to the pre-construction meeting by the Permittee and the Nobles County Drainage Authority Board;
- (b) Permittees will use a third party to conduct a survey for drain tile within and adjacent to the Site using methods agreed upon with the Nobles County Drainage Authority Board. The results of this survey shall be filed with the Commission at least 14 days prior to the pre-construction meeting;
- (c) Any private drain tile that is disconnected from county drain tile must be reconnected to the county drain tile following relocation; and;

- (d) The Permittee shall provide evidence of outreach and correspondence with participating and adjacent landowners to obtain maps of private drain tile within and bordering the Site.

5.15.7 Unanticipated Discoveries Plan

The Permittee shall develop an Unanticipated Discoveries Plan (UDP) to be used in the event previously unrecorded archeological or historic properties, or human remains, are encountered during construction, or if unanticipated effects to previously identified archaeological or historic properties occur during construction. The UDP shall describe how previously unrecorded cultural resources or human remains found during construction shall be protected and examined. The Permittee shall file the UDP with the Commission at least 14 days prior to the pre-construction meeting.

5.25.8 Community Impact Mitigation Agreement

The Permittee shall enter into a Community Impact Mitigation Agreement (CIMA) with Nobles County to mitigate impacts of the project. If Nobles County does not wish to enter into a CIMA, the Permittee shall document this non-interest. The Permittee shall keep records regarding this permit condition and provide them upon request of Commission staff.

6 DELAY IN CONSTRUCTION

If the Permittee has not commenced construction or improvement of the site within four years after the date of issuance of this site permit the Permittee shall file a Failure to Construct Report and the Commission shall consider suspension of this site permit in accordance with Minn. R. 7850.4700.

7 COMPLAINT PROCEDURES

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission the complaint procedures that will be used to receive and respond to complaints. The complaint procedures shall be in accordance with the requirements of Minn. R. 7829.1500 or Minn. R. 7829.1700, and as set forth in the complaint procedures attached to this site permit.

Upon request, the Permittee shall assist Commission staff with the disposition of unresolved or longstanding complaints. This assistance shall include, but is not limited to, the submittal of complaint correspondence and complaint resolution efforts.

8 COMPLIANCE REQUIREMENTS

Failure to timely and properly make compliance filings required by this site permit is a failure to comply with the conditions of this site permit. Compliance filings must be electronically filed with the Commission.

8.1 Pre-Construction Meeting

Prior to the start of construction, the Permittee shall participate in a pre-construction meeting with Commission staff to review pre-construction filing requirements, scheduling, and to coordinate monitoring of construction and site restoration activities. Within 14 days following the pre-construction meeting, the Permittee shall file with the Commission a summary of the topics reviewed and discussed and a list of attendees. The Permittee shall indicate in the filing the anticipated construction start date.

8.2 Pre-Operation Meeting

At least 14 days prior to commercial operation of the Project, the Permittee shall participate in a pre-operation meeting with Commission staff to coordinate field monitoring of operation activities for the Project. Within 14 days following the pre-operation meeting, the Permittee shall file a summary of the topics reviewed and discussed and a list of attendees with the Commission.

8.3 Site Plan

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission and the county where the Project will be constructed with a Site Plan that includes specifications and drawings for site preparation and grading; specifications and locations of the solar energy generating system and associated facilities; and procedures for cleanup and restoration. The documentation shall include maps depicting the Designated Site, solar energy generating system, and associated facilities layout in relation to that approved by this site permit.

The Permittee may not commence construction until the earlier of (i) 30 days after the pre-construction meeting or (ii) or until the Commission staff has notified the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this site permit.

If the Commission notifies the Permittee in writing within 30 days after the pre-construction meeting that it has completed its review of the documents and planned construction, and finds

that the planned construction is not consistent with this site permit, the Permittee may submit additional and/or revised documentation and may not commence construction until the Commission has notified the Permittee in writing that it has determined that the planned construction is consistent with this site permit.

If the Permittee intends to make any significant changes in its Site Plan or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission and county staff at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this site permit.

8.4 Status Reports

The Permittee shall file with the Commission monthly Construction Status Reports beginning with the pre-construction meeting and until completion of restoration. Construction Status Reports shall describe construction activities and progress, activities undertaken in compliance with this site permit, and shall include text and photographs.

If the Permittee does not commence construction of the Project within six months of this site permit issuance, the Permittee shall file with the Commission Pre-Construction Status Reports on the anticipated timing of construction every six months beginning with the issuance of this site permit until the pre-construction meeting. The status updates shall include information on the Project's Midcontinent Independent System Operator (MISO) interconnection process, if applicable.

8.5 Labor Statistic Reporting

The Permittee shall file quarterly Labor Statistic Reports with the Commission within 45 days of the end of the quarter regarding construction workers that participated in the construction of the Project. The Labor Statistic Reports shall:

- (a) detail the Permittee's efforts and the site contractor's efforts to hire Minnesota workers; and
- (b) provide an account of:
 - i. the gross number of hours worked by or full-time equivalent workers who are Minnesota residents, as defined in Minn. Stat. § 290.01, subd. 7;
 - ii. the gross number of hours worked by or full-time equivalent workers who are residents of other states, but maintain a permanent residence within 150 miles of the Project; and
 - iii. the total gross hours worked or total full-time equivalent workers.

Permittee shall work with its contractor to determine the suitable reporting metric. The report may not include personally identifiable data.

8.6 Prevailing Wage

The Permittee, its contractors, and subcontractors shall pay no less than the prevailing wage rate as defined in Minn. Stat. § 177.42 and shall be subject to the requirements and enforcement provisions under Minn. Stat. §§ 177.27, 177.30, 177.32, 177.41 to 177.435, and 177.45. The Permittee shall keep records of contractor and subcontractor pay and provide them at the request of Commission staff.

8.7 In-Service Date

At least three days before the Project is to be placed into service, the Permittee shall notify the Commission of the date on which the Project will be placed into service and the date on which construction was completed.

8.8 As-Builts

Within 90 days after completion of construction, the Permittee shall submit to the Commission copies of all final as-built plans and specifications developed during the Project construction.

8.9 GPS Data

Within 90 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (e.g., ArcGIS compatible map files, GPS coordinates, associated database of characteristics) for all structures associated with the Project.

8.10 Right of Entry

The Permittee shall allow Commission designated representatives to perform the following, upon reasonable notice, upon presentation of credentials and at all times in compliance with the Permittee's site safety standards:

- (a) To enter upon the facilities easement of the property for the purpose of obtaining information, examining records, and conducting surveys or investigations.
- (b) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations.
- (c) To sample and monitor upon the facilities easement of the property.

To examine and copy any documents pertaining to compliance with the conditions of this site permit.

8.11 Project Energy Production

The Permittee shall, by February 1st following each complete or partial year of Project operation, file a report with the Commission on the monthly energy production of the facility including:

- (a) the installed nameplate capacity of the permitted facility;
- (b) the total daily energy generated by the facility in MW hours;
- (c) the total monthly energy generated by the facility in MW hours;
- (d) the monthly capacity factor of the facility;
- (e) yearly energy production and capacity factor for the facility;
- (f) the average monthly and average annual solar strength gradient measured in kWh/m²/Day observed at the facility;
- (g) the operational status of the facility and any major outages, major repairs, or performance improvements occurring in the previous year; and
- (h) any other information reasonably requested by the Commission.

The Permittee shall file this information in a format recommended by the Commission. This information shall be considered public and must be filed electronically.

8.12 Emergency Response

The Permittee shall prepare an Emergency Response Plan (ERP) in consultation with the emergency responders having jurisdiction over the Project prior to construction. The plan developed shall have a process for

- a) identifying any specialized equipment gaps for responding to emergencies at the BESS;
- b) acquiring the equipment; and
- c) providing any training for the specialized equipment at the Permittee's expense.

The plan shall also indicate that the annual training of emergency service personnel with site operators must be done at the Permittee's expense. The Permittee shall file the ERP, along with any comments from emergency responders to the Commission at least 14 days prior to the preconstruction meeting and a revised ERP, if any, at least 14 days prior to the pre-operation meeting.

At least 14 days prior to the pre-operation meeting, the Permittee shall file with the Commission an affidavit of the distribution of the ERP to emergency responders and Public Safety Answering Points (PSAP) with jurisdiction over the Project. The Permittee shall obtain and register the Project address or other location indicators acceptable to the emergency responders and PSAP having jurisdiction over the Project.

8.13 Extraordinary Events

Within 24 hours of discovery of an occurrence, the Permittee shall notify the Commission of any extraordinary event. Extraordinary events include but shall not be limited to fires, solar panel collapse, acts of sabotage, collector or feeder line failure, and injured worker or private person. The Permittee shall, within 30 days of the occurrence, file a report with the Commission describing the cause of the occurrence and the steps taken to avoid future occurrences.

8.14 Wildlife Injuries and Fatalities

The Permittee shall report any wildlife injuries and fatalities to the Commission quarterly.

9 DECOMMISSIONING AND RESTORATION

9.1 Decommissioning Plan

The Permittee shall comply with the provisions of the most recently filed and accepted Decommissioning Plan. The initial version of the Decommissioning Plan was submitted for this Project as ~~[Identify Decommissioning Plan, e.g., Appendix XX to the Site Permit Application]~~Appendix G of the joint site permit application. The Permittee shall file an updated Decommissioning Plan incorporating comments and information from the permit application process and any updates associated with the final construction plans with the Commission at least fourteen 14 days prior to the pre-construction meeting. The Permittee shall update and file the Decommissioning Plan with the Commission every five years following the commercial operation date.

The Decommissioning Plan shall provide information identifying all surety and financial securities established for decommissioning and site restoration. The Decommissioning Plan shall provide an itemized breakdown of costs of decommissioning all Project components, which shall include labor and equipment. The Decommissioning Plan shall identify cost estimates for the removal of solar panels, racks, underground collection cables, access roads, transformers, substations, and other Project components. The Decommissioning Plan may also include anticipated costs for the replacement of panels or repowering the Project by upgrading equipment.

The Permittee shall also submit the Decommissioning Plan to the local unit of government having direct zoning authority over the area in which the Project is located. The Permittee shall ensure that it carries out its obligations to provide for the resources necessary to fulfill its requirements to properly decommission the Project at the appropriate time. The Commission may at any time request the Permittee to file a report with the Commission describing how the Permittee is fulfilling this obligation.

9.2 Site Final Restoration

Upon expiration of this site permit or upon termination of operation of the Project, the Permittee shall have the obligation to dismantle and remove from the site all solar panels, mounting steel posts and beams, inverters, transformers, overhead and underground cables and lines, foundations, buildings, and ancillary equipment in accordance with the most recently filed and accepted decommissioning plan. To the extent feasible, the Permittee shall restore and reclaim the site to pre-project conditions. Landowners may require the site be returned to agricultural production or may retain restored prairie vegetation, or other land uses as agreed to between the landowner and the Permittee. All access roads shall be removed unless written approval is given by the affected landowner requesting that one or more roads, or portions thereof, be retained. All such agreements between the Permittee and the affected landowner shall be filed with the Commission prior to commencing restoration activities. The Permittee shall restore the site in accordance with the requirements of this condition and file a Notification of Final Restoration Completion to the Commission within 18 months of termination of operation of the Project.

9.3 Abandoned Solar Installations

The Permittee shall notify the Commission of any solar equipment that is abandoned prior to termination of operation of the Project. Equipment shall be considered abandoned after one year without energy production and shall be decommissioned and the land shall be restored pursuant to sections 9.1 and 9.2, unless a plan is submitted to and approved by the Commission outlining the steps and schedule for returning the equipment to service.

10 COMMISSION AUTHORITY AFTER SITE PERMIT ISSUANCE

10.1 Final Designated Site Boundaries

After completion of construction the Commission shall determine the need to adjust the final boundary of the Designated Site required for the Project. This site permit may be modified,

after notice and opportunity for hearing, to represent the actual Designated Site required by the Permittee to operate the Project authorized by this site permit.

10.2 Expansion of Designated Site Boundaries

No expansion of the site boundary described in this site permit shall be authorized without the approval of the Commission. The Permittee may submit to the Commission a request for a change in the boundary of the site for the Project. The Commission will respond to the requested change in accordance with applicable statutes and rules.

10.3 Periodic Review

The Commission shall initiate a review of this site permit and the applicable conditions at least once every five years. The purpose of the periodic review is to allow the Commission, the Permittee, and other interested persons an opportunity to consider modifications in the conditions of this site permit. No modification may be made except in accordance with applicable statutes and rules.

10.4 Modification of Conditions

After notice and opportunity for hearing this site permit may be modified or amended for cause, including but not limited to the following:

- (a) violation of any condition in this permit;
- (b) endangerment of human health or the environment by operation of the Project; or
- (c) existence of other grounds established by rule.

10.5 More Stringent Rules

The issuance of this site permit does not prevent the future adoption by the Commission of rules or orders more stringent than those now in existence and does not prevent the enforcement of these more stringent rules and orders against the Permittee.

11 SITE PERMIT AMENDMENT

This site permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this site permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may

amend the conditions after affording the Permittee and interested persons such process as is required under Minn. R. 7850.4900.

12 TRANSFER OF SITE PERMIT

The Permittee may request at any time that the Commission transfer this site permit to another person or entity (transferee). In its request, the Permittee must provide the Commission with:

- (a) the name and description of the transferee;
- (b) the reasons for the transfer;
- (c) a description of the facilities affected; and
- (d) the proposed effective date of the transfer.

The transferee must provide the Commission with a certification that it has read, understands and is able to comply with the plans and procedures filed for the Project and all conditions of this site permit.

The transferee must provide the Commission with the name and contact information for the site manager, as described in Section 4.3.2, and either a current version with eDocket reference, or a revised version of the following:

- (a) VMP as described in Section 4.3.17;
- (b) complaint procedures, as described in Section 7 and Attachment 1;
- (c) ERP, as described in Section 8.12; and
- (d) Decommissioning Plan, as described in Section 9.1.

The Commission may authorize transfer of the site permit after affording the Permittee, the transferee, and interested persons such process as is required under Minn. R. 7850.5000.

13 REVOCATION OR SUSPENSION OF SITE PERMIT

The Commission may initiate action to revoke or suspend this site permit at any time. The Commission shall act in accordance with the requirements of Minn. R. 7850.5100, to revoke or suspend this site permit.

14 EXPIRATION DATE

This site permit shall expire ~~[xx]~~ 30 years after the date this site permit was approved and adopted.

Appendix E- Applicants' Draft Vegetation Management Plan

SUMMIT LAKE SOLAR PROJECT

NOBLES COUNTY, MINNESOTA

VEGETATION MANAGEMENT PLAN



SOLAR FACILITY DOCKET NO. IP-7153/GS-25-89

BESS FACILITY DOCKET NO. IP-7153/ESS-25-88

Prepared for:



8400 Normandale Lake Blvd., Suite 1200
Bloomington, MN 55437

DECEMBER 2025

Prepared by:



EXECUTIVE SUMMARY

Summit Lake Solar, LLC (Summit Lake), a wholly owned subsidiary of National Grid Renewables Development, LLC proposes to construct the Summit Lake Solar Facility (Solar Facility or Project) in Summit Lake and Elk Townships, Nobles County, Minnesota (Project Location) (see Figure 1). The Solar Facility is a solar energy conversion facility with a 200-megawatt (MW) alternating current (AC) nameplate capacity. The Project also includes a Battery Energy Storage System (BESS); land within the BESS will be graveled for operation of the facility and therefore the goals and objectives outlined throughout this plan do not apply to the BESS.

If approved, the Project will operate under a Site Permit issued by the Minnesota Public Utilities Commission in accordance with the Minnesota Power Plant Siting Act (Minnesota Statutes §216E) and Minnesota Administrative Rules Chapter 7850, in addition to other required federal, state and local permits. Currently, the Project is scheduled to commence construction activities in Q2 2026, with commercial operations anticipated to begin in Q4 2027.

The proposed Project is primarily located on agricultural land (95 percent) in a rural landscape. Land use data indicates that the Land Control Area is primarily managed for row-crop production of predominantly corn and forage crops. The Project is located on level to nearly-level topography, which is consistent with the current agricultural production.

A comprehensive Vegetation Management Plan (VMP) has been developed to manage soil and vegetation across all phases of the Project, from site preparation to ongoing long-term maintenance, and to aid qualified contractors. This VMP outlines steps for installing prescribed native seed mixes, controlling invasive and noxious weeds, and mitigating erosion and sedimentation. Summit Lake will focus on the company's long-term commitment to establishing and maintaining low-growing, minimal-mow vegetation, reducing long-term maintenance needs, and promoting consistent site performance.

The VMP covers the Preliminary Development Area (also referred to as the Site; see Figure 2, Land Cover/Land Use), which includes both the solar facility and surrounding lands that may be impacted, with designated zones of perennial native vegetation beneath and between solar panels and in a buffer outside the perimeter fence. The VMP's primary objective is to support Summit Lake's restoration and vegetation propagation goals by establishing resilient, site-specific vegetation that enhances soil stability, biodiversity, and aligns with local ecological goals, while also minimizing long-term maintenance costs.

This document is intended to be a working document, and revisions will be made as new information on vegetation management practices becomes available or if the Project layout changes.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
1.0 GOALS AND OBJECTIVES	1
1.1 Short-Term Goals	1
1.2 Long-Term Goals	1
1.3 Vegetation Management Phases	2
2.0 SITE DESCRIPTION	3
2.1 Project Location and Size	3
2.1.1 Vegetation and Land Use	3
2.1.2 Topography	6
2.1.3 Soil Characteristics.....	8
2.1.4 Hydrological Characteristics	11
3.0 MANAGEMENT UNITS.....	14
4.0 VEGETATION INSTALLATION	14
4.1 Site Preparation and Vegetation Clearing	14
4.1.1 Permanent Seeding Prior to Solar Installation	14
4.1.2 Permanent Seeding After Solar Installation	15
4.2 Temporary Seed Mixes	15
4.3 Seeding Timing	16
4.4 Permanent Seed Mixes	17
4.5 Seed Mix Substitutions.....	18
4.6 Seed Installation	18
4.7 Soil Amendments.....	19
4.8 Wet Weather Considerations	29
4.9 Pesticide Drift.....	29
4.10 Landscape Screening	29
5.0 VEGETATION MANAGEMENT	30
5.1 Undesirable Species	30
5.1.1 Prescribed Treatment for Common Invasive Species and Weeds	30
5.2 Establishment Phase	33
5.2.1 General Tasks for Managing Vegetation.....	35
5.2.2 Herbicide Specifications	36
5.2.3 Reseeding Bare Soil.....	37
5.3 Transition Phase	37
5.4 Long-term Maintenance Phase	37
5.5 Haying	37
5.6 Grazing.....	37
5.6.1 Site Setup for Grazing	38
5.6.2 Stocking Rate and Management	39
6.0 LONG-TERM MONITORING.....	39
6.1 Monitoring Protocol.....	40
6.2 Targets and Projected Outcomes.....	41
6.2.1 Native Vegetation Targets	41
6.2.2 Noxious Weeds and Problem Plants	42
6.3 Reporting	43

6.4	Adaptive Management	43
7.0	REFERENCES	44

LIST OF FIGURES

Figure 1	Project Location	4
Figure 2	Land Cover / Land Use	5
Figure 3	Topographic Map	7
Figure 4	NRCS Soils Map	10
Figure 5	Surface Waters	13
Figure 6	Seeding Plan	20
Figure 7	Transitional Vegetation Growth	34

LIST OF TABLES

Table 2.1.1-1	Land Use within the Preliminary Development Area	6
Table 2.1.3-1	Summary of Soils within the Land Control Area	9
Table 2.1.3-2	Farmland Classifications within the Preliminary Development Area	11
Table 4.2-1	Temporary Cover Crops	16
Table 5.1.1-1	Problematic Annual Cropland Weeds	30
Table 5.1.1-2	Problematic Perennial Cropland Weeds	31
Table 5.1.1-3	Abbreviated List of Minnesota Prohibited/Restricted Noxious Weeds and Invasive Plants	32

LIST OF ATTACHMENTS

Attachment A	Habitat Friendly Solar Site Assessment Forms
Attachment B	Project Historical Climate Data
Attachment C	Seed Mixes

ACRONYMS AND ABBREVIATIONS

AC	alternating current
AIMP	Agricultural Impact Mitigation Plan
AUM	animal unit month
BWSR	Board of Water and Soil Resources
DC	direct current
General Permit	Construction Stormwater General Permit
GIS	geographic information systems
Land Control Area	1,989.6 acres of privately-owned land for which for which Summit Lake Solar, LLC has leases and purchase options to allow siting and construction of the Project.
Merjent	Merjent, Inc.
MNDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
MW	megawatt
NLCD	National Land Cover Database
NRCS	Natural Resources Conservation Service
Owner	Summit Lake Solar, LLC.
Plan	Vegetation and Management Plan
Preliminary Development Area	Approximately 1,567.0-acre area that falls entirely within the Land Control Area where Summit Lake Solar, LLC proposes to build the Summit Lake Solar Project facilities.
Project	Summit Lake Solar Project
Project Area	General area surrounding and including the solar energy facility
USDA	U.S. Department of Agriculture
Site	Approximately 1,567.0 acres of the Land Control Area, also referred to as the Preliminary Development Area
Solar Facility	Summit Lake Solar Facility
SSURGO	Soil Survey Geographic Database
Summit Lake	Summit Lake Solar, LLC
USEPA	U.S. Environmental Protection Agency
VMP	Vegetation Management Plan
MNDNR	Minnesota Department of Natural Resources

1.0 GOALS AND OBJECTIVES

Merjent Inc. (Merjent), on behalf of Summit Lake Solar, LLC (Summit Lake), developed this Vegetation Management Plan (VMP) to guide site preparation, develop and install prescribed seed mixes, manage undesirable species, implement erosion and sediment controls, and establish vegetation goals. This VMP incorporates best practices for establishing native vegetation, guided by the Minnesota Board of Water and Soil Resources (BWSR, 2019) and the Minnesota Department of Commerce (2021). Summit Lake's primary vegetation management goals are outlined below, with corresponding steps to achieve each goal.

1.1 Short-Term Goals

Short-term goals are goals applicable to the post-construction establishment phase of the proposed Summit Lake Solar Project (Project) in Years 1 to 5. The general goal is to establish a sustainable, diverse, perennial grassland community, appropriate to site conditions and safe operation, maintenance, and inspection that complies with all permits and regulations pertaining to the Site. The primary short-term goals are:

- Comply with permit conditions for site revegetation, per the Minnesota Pollution Control Agency (MPCA) Construction Stormwater General Permit (General Permit).
- After the first growing season, vegetate at least 70 percent of the Site, and ideally 80 percent of the Site.
- Establish sustainable, low grow and minimal-mow , diverse, perennial grassland community, appropriate to conditions on 70 percent of the Site and comprised of 90 percent native vegetation by Year 5.
- Implement cover crops to effectively assist in establishment of native vegetation, if practicable.
- Manage invasive species and noxious weeds per Minn. Stat., Sections 18.75 to 18.78, and 18.86.
- Install and establish vegetative screening as requested. The landscaping screening area should be established, with limited ongoing plant mortality, within one year of installation. At the end of the establishment phase, 80 percent of the installed shrubs and trees shall be present in the landscaping/screening area.

1.2 Long-Term Goals

Long-term goals are defined as goals beyond Year 5, following implementation of the short-term goals. Summit Lake will implement adaptive management of vegetation cover, guided by strategic integration of site-specific environmental conditions to maintain a perennial grassland community that keeps the soils on the Site stabilized, improves soil conditions and preserves the Site for agricultural use in the future. The primary long-term goals include:

- Maintain 95 percent of the Site in a vegetated state, and at least 90 percent of the cover comprised of native species.

- Establish six or more species of planted native graminoids and 12 or more species of planted native forbs across the Site.
- Establish a Site that is suitable for haying and/or grazing during facility operations, if determined to be a viable management strategy following construction. Accommodate vegetative management of the Site using traditional vegetative management methods for areas not managed by haying or grazing.
- Prioritize the implementation of all required vegetation management activities for safe and efficient operations support, including woody species control, height control of herbaceous species, wet area management, and landscape/screening management.

The Project's vegetation management program is eligible for the Board of Water and Soil Resources (BWSR) Habitat Friendly Solar Program. The Project meets and in some cases exceeds the minimum habitat friendly standards when scored using the Habitat Friendly Solar Site Assessment Form for Project Planning (see Appendix A).

1.3 Vegetation Management Phases

The VMP describes the Establishment, Maintenance, and Long-term Maintenance and Monitoring Phases in detail.

- The Establishment Phase addresses the initial three years of vegetation installation and management. The first year of establishment is focused on consistent undesirable plant control on a Site-wide basis through a variety of management techniques. The second year of establishment continues undesirable plant control, but generally employs more targeted techniques. In the third and fourth years of the Establishment Phase, undesirable plant control will consist of spot treatment to control the remaining small patches of undesirable species.
- The Maintenance Phase, which generally begins in the fifth year after initial seed mix installation, promotes and maintains the desired vegetation community, controls the reestablishment or spread of any undesired species, and combats the establishment of invading trees and shrubs.
- The Long-term Maintenance and Monitoring Phase includes quantitative and qualitative measures to assess how well the Project goals and performance standards are being achieved. During these years, the frequency of maintenance is greatly reduced and dependent on yearly soil moisture and vegetation growth.

2.0 SITE DESCRIPTION

To understand the ecosystem and landform characteristics surrounding the Project, a baseline Site analysis was conducted to inform the appropriate seed mix composition(s), anticipated period(s) of establishment, and maintenance perspectives required for a successful Establishment Phase. The baseline Site analysis consists of a desktop review of publicly available datasets, such as soil characteristics, land use, landform, historical aerial photos, linear hydrology, wetlands, and historical climate data. Additional considerations, such as annual precipitation, weather, and historical climate data inform the likelihood of adequate establishment of propagated seed mixtures.

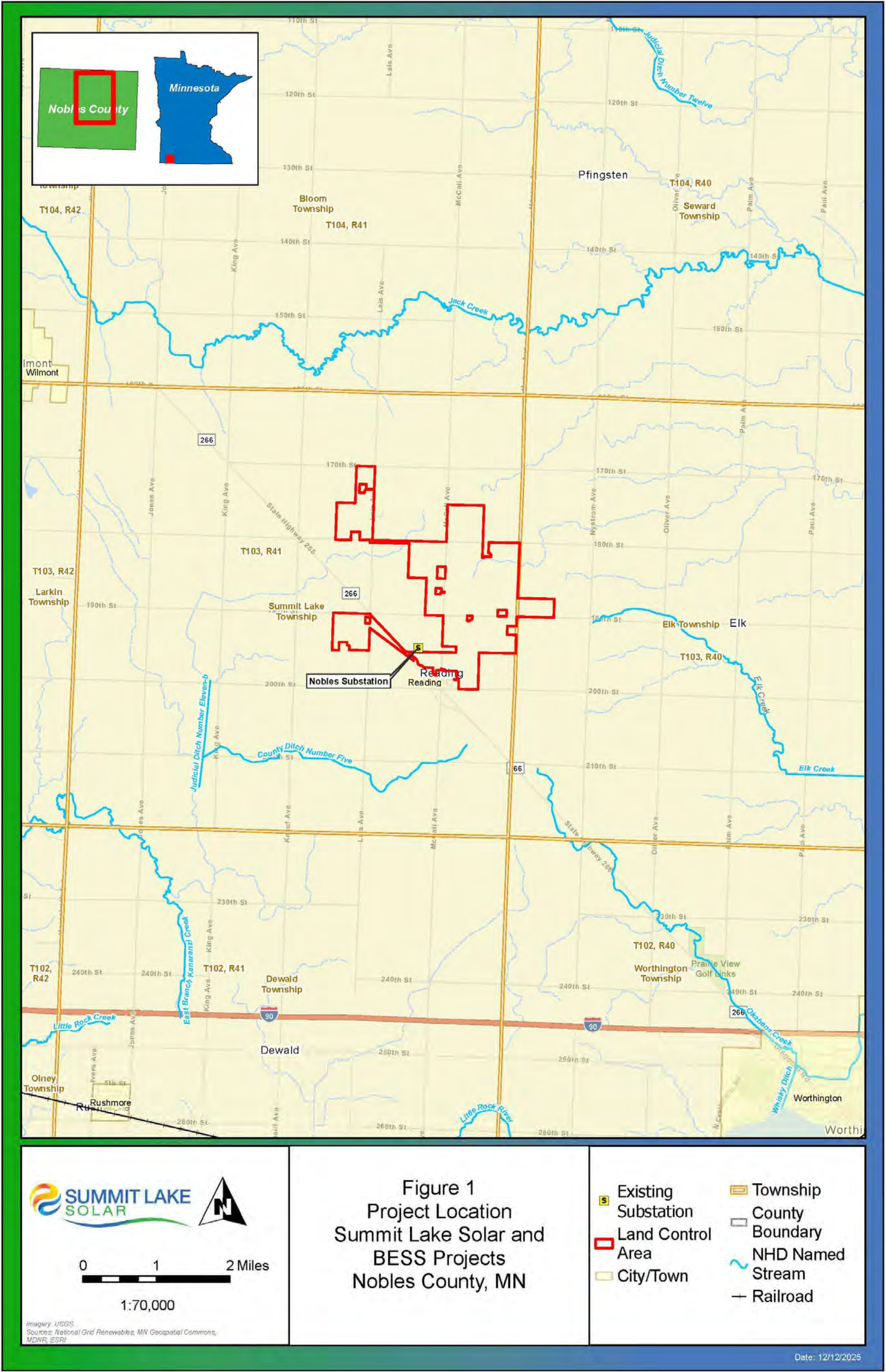
2.1 Project Location and Size

Summit Lake is proposing to build its solar facility in Township 103N, Range 40W, Sections 18 and 19 and Township 103N, Range 41W, Sections 10-15, and 22-24, Nobles County, Minnesota as shown on Figure 1. Summit Lake has obtained leases and purchase options for 1,989.6 acres of privately-owned land (Land Control Area). Based on preliminary design, the Project will cover approximately 1,567.0 acres of the Land Control Area (Preliminary Development Area or Site). There are approximately 422.6 acres of the Land Control Area for which Summit Lake has site control but are not currently contemplated for occupation by the Solar Facility or BESS. The 422.6-acre portion of the Land Control Area that will not be used by the Project is currently under lease with the underlying landowner and will be excluded from the area leased by Summit Lake during operation of the Project. The underlying landowner can then continue to farm the area released from the lease for the life of the Projects. The total nameplate capacity for the Solar Facility is 200 MW and the BESS is 200 MWac.

2.1.1 Vegetation and Land Use

Prior to Euro-American settlement, vegetation in this area was almost entirely tallgrass prairie. Wet prairies were restricted to narrow stream margins and forests were similarly restricted to ravines along a few streams, such as the Redwood River. Land in this area is currently used for agricultural activity and there are few remnants of pre-settlement vegetation left (Minnesota Department of Natural Resources [MNDNR], 2024).

Based on the National Land Cover Database (NLCD) land use/cover data as presented in Table 2.1.1-1 and Figure 2, the Preliminary Development Area would affect predominately agricultural land (1,557.6 acres/99 percent). Developed lands make up approximately 8.8 acres/0.06 percent of the Site. Herbaceous and barren lands consist of less than 0.1 percent of Project-related impacts, respectively. In addition, the NLCD data indicate potential wetland impacts; these impacts are further discussed in Section 2.1.4.



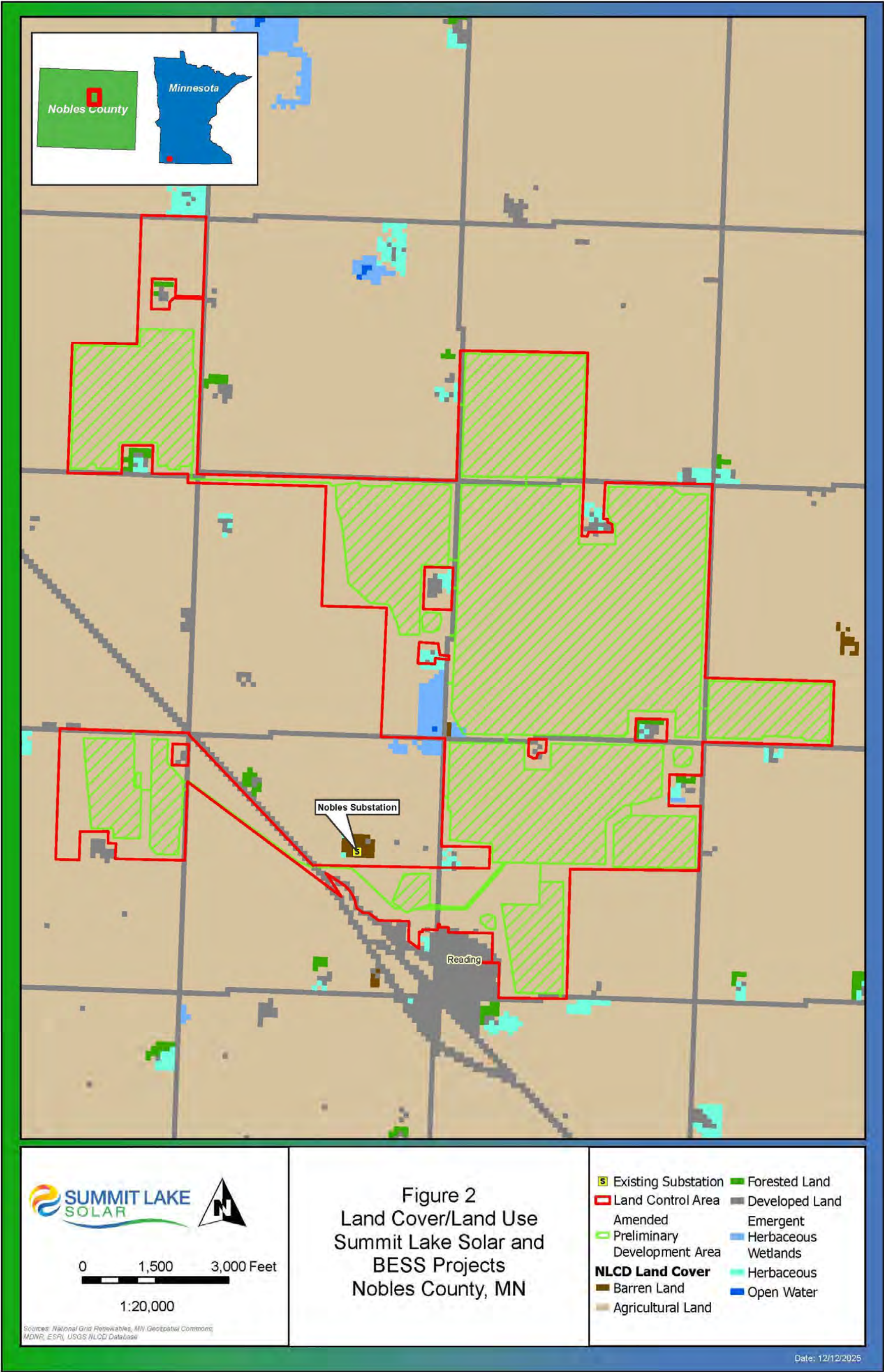


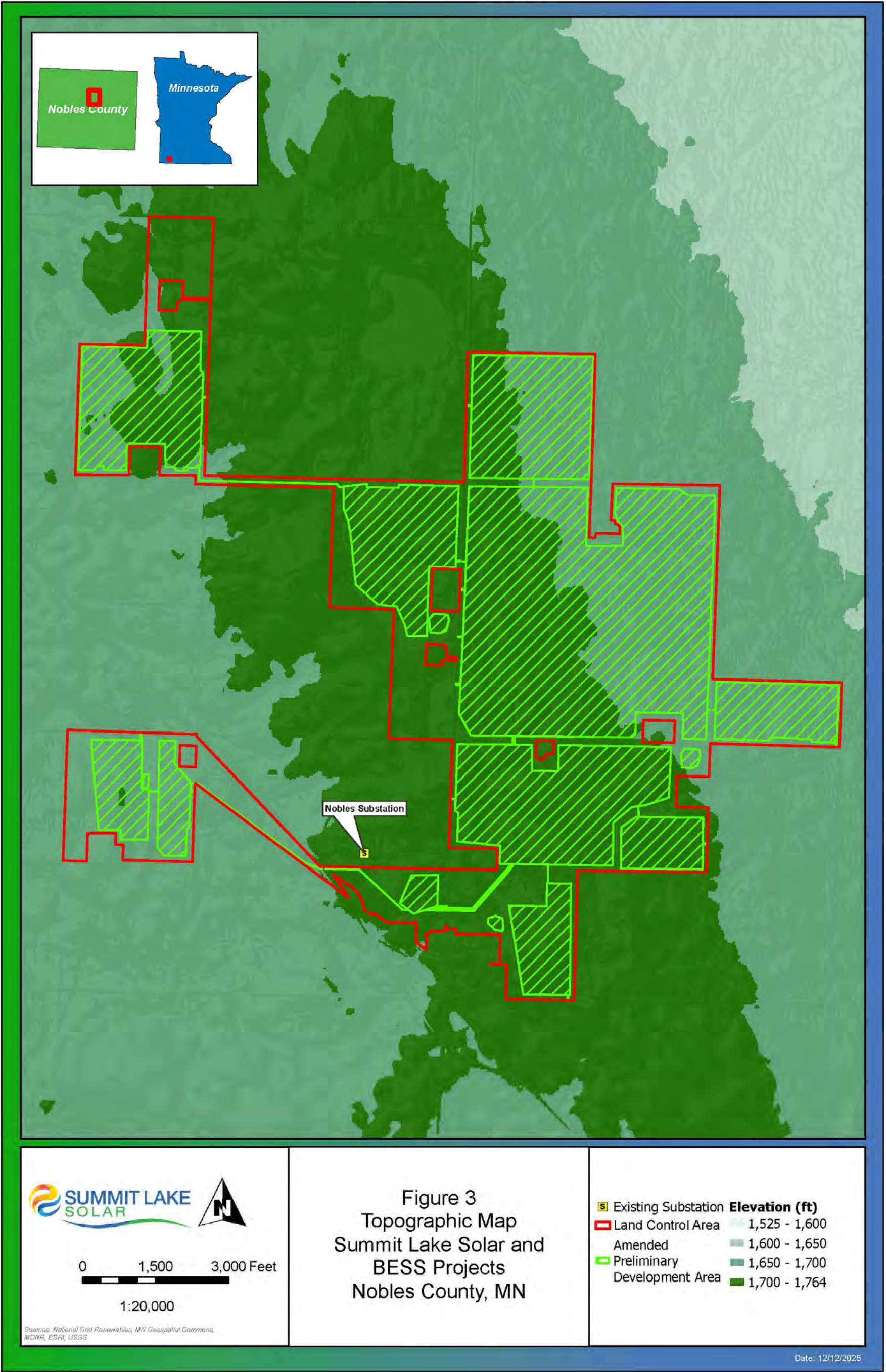
TABLE 2.1.1-1		
Land Use within the Preliminary Development Area		
Land Use Type	Acres in Preliminary Development Area	Percent of Preliminary Development Area
Agricultural ^a	1,557.6	99.4%
Developed	8.8	0.6%
Forested	--	--
Herbaceous	0.1	< 0.1%
Emergent Herbaceous Wetlands	0.5	< 0.1%
Barren Land	< 0.1	< 0.1%
Open Water	--	--
PROJECT TOTAL	1,567.0	100%
^a Agricultural land consists of the NLCD categories cultivated cropland and hay/pasture. Source: Dewitz and U.S. Geological Survey, 2021. Note: A double dash indicates that this land use/cover category is not present in the Preliminary Development Area.		

In the NLCD data used for Summit Lake’s environmental analysis agricultural land is used for row-crop production of predominantly corn and forage crops. Developed land generally consists of public roads, and a few small areas around the municipal boundary of Reading. The small amount of barren land identified in the NLCD data is associated with a roadside ditch along McCall Avenue.

2.1.2 Topography

The Project is located in a region characterized as a transition from shallow deposits of windblown silt (loess) over glacial till to deeper deposits of loess. The depth to bedrock is 600 to 800 feet through most of the Land Control Area. Soils are loamy and well-drained with thick dark surface horizons (MDNR, 2024).

The Land Control Area is relatively flat in gradient (see Figure 3) due to the overall historic topographical range and mass grading operations to facilitate current agricultural practices. The mean annual precipitation of the Land Control Area averages 24 to 32 inches and hosts a frost-free period of 155 to 175 days per year (MDNR, 2024). See Appendix B to reference historical climate data.



2.1.3 Soil Characteristics

An important factor that influences revegetation is the soil characteristics. A full understanding of the affected soil profiles on a project provides insight into vegetative growth, compaction, erosion, and the types of equipment required to implement seeding requirements. A soil analysis determines the ground's slope, hydric and flooding capabilities, and overall vegetative parameters for seed root penetration.

Soil characteristics within the Land Control Area (which is inclusive of the Site) were assessed using the Soil Survey Geographic Database (SSURGO) (Soil Survey Staff, 2024). The SSURGO database is a digital version of the original county soil surveys developed by Natural Resources Conservation Service (NRCS) for use with geographic information system (GIS). It provides the most detailed level of soils information for natural resource planning and management. Soil maps are linked in the SSURGO database to information about the component soils and their properties (U.S. Department of Agriculture [USDA], NRCS, 2024). Table 2.1.3-1 lists the soil types located within the Land Control Area, which are also shown on Figure 4.

Approximately 40.8 percent of the Land Control Area is underlain by hydric soils or soils containing hydric inclusions, indicating some wetlands are likely to be present as one of many wetland characteristics is hydric soil (see Section 2.1.4). All soils in the Land Control Area have low to moderate susceptibility to erosion by water (i.e., K-factors from 0.1 to 0.4). All soils in the Land Control Area are in Wind Erodibility Group (WEG) 3, 4, 4L, 5 or 6. WEG values of 3, 4, 4L, and 5 correspond to Wind Erodibility Indices of 86 tons/acre/year, and WEG values of 6 correspond to 48 tons/acre/year (USDA, NRCS, 2024).

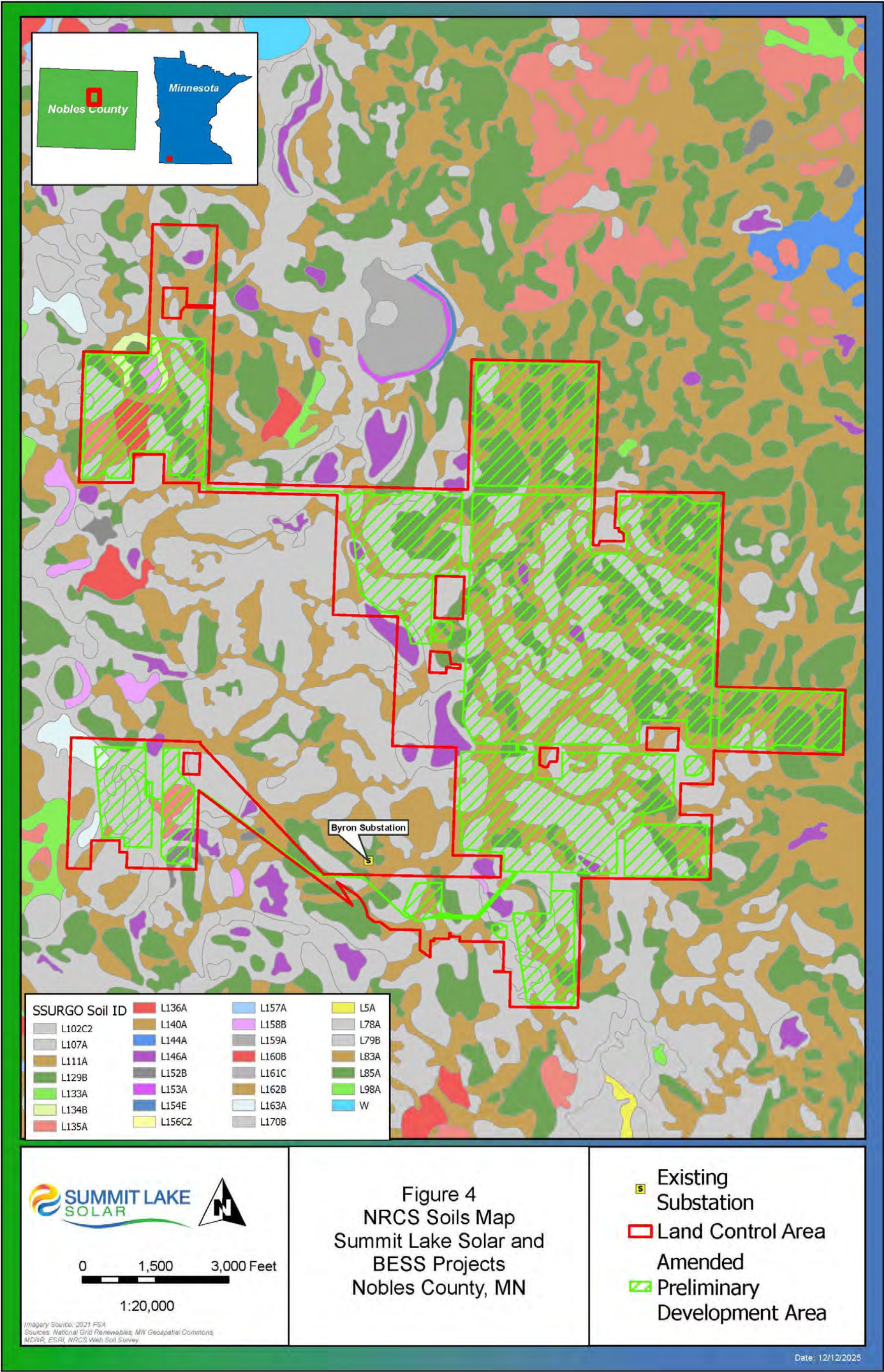
Soils prone to compaction and rutting are subject to dramatic and adverse changes in soil porosity and structure as a result of mechanical deformation caused loading by equipment during construction. Compaction and rutting are related to moisture content and texture and are worse when medium and fine textured soils are subject to heavy equipment traffic when wet. Soils in the Land Control Area are prone to compaction and rutting.

TABLE 2.1.3-1

Summary of Soils within the Land Control Area

Map Unit Symbol	Soil Name	Land Control (acres / %)	Farmland Designation	Hydric Soil	K-Factor	Wind Erodibility Group
L78A	Canisteo clay loam, 0 to 2 percent slopes	138.7 / 7.0%	Prime farmland if drained	Yes	.28	4L
L107A	Canisteo-Glencoe complex, 0 to 2 percent slopes	11.0 / 0.6%	Prime farmland if drained	Yes	.28	4L
L79B	Clarion loam, 2 to 6 percent slopes	645.6 / 32.4%	All areas are prime farmland	No	.24	6
L134B	Clarion-Crooksford complex, 1 to 5 percent slopes	8.4 / 0.4%	All areas are prime farmland	No	.28	6
L102C2	Clarion-Storden complex, 6 to 10 percent slopes, moderately eroded	18.5 / 0.9%	Farmland of statewide importance	No	.28	6
L136A	Crooksford silty clay loam, 1 to 3 percent slopes	15.9 / 0.8%	All areas are prime farmland	No	.32	6
L170B	Estherville-Round lake complex, 2 to 6 percent slopes	24.9 / 1.3%	Farmland of statewide importance	No	.20	3
L146A	Glencoe silty clay loam, 0 to 1 percent slopes	38.7 / 1.9%	Prime farmland if drained	Yes	.28	6
L152B	Lowlein-Round lake complex, 1 to 6 percent slopes	5.1 / 0.3%	All areas are prime farmland	No	.20	5
L85A	Nicollet clay loam, 1 to 3 percent slopes	421.3 / 21.2%	All areas are prime farmland	No	.28	6
L140A	Ocheda silty clay loam, 1 to 3 percent slopes	9.0 / 0.5%	All areas are prime farmland	No	.28	4
L135A	Okabena silty clay loam, 1 to 3 percent slopes	19.1 / 1.0%	All areas are prime farmland	No	.32	6
L163A	Okoboji silty clay loam, 0 to 1 percent slopes	11.6 / 0.6%	Prime farmland if drained	Yes	.32	4
L158B	Round lake sandy loam, 1 to 6 percent slopes	6.2 / 0.3%	Farmland of statewide importance	No	.20	3
L129B	Terril loam, 2 to 6 percent slopes	3.6 / 0.2%	All areas are prime farmland	No	.28	6
L133A	Waldorf silty clay loam, 0 to 2 percent slopes	2.0 / 0.1%	Prime farmland if drained	Yes	.32	4
L83A	Webster clay loam, 0 to 2 percent slopes	610.2 / 30.7%	Prime farmland if drained	Yes	.28	6
PROJECT TOTAL		1,989.6 / 100.0%				

Source: Soil Survey Staff, 2024.



Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pasture, woodland, or other lands). Urbanized land and open water cannot be designated as prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods and is not subject to frequent or prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., by draining or irrigating) (USDA NRCS, 2024).

The NRCS also recognizes farmlands of statewide importance, which are defined as lands other than prime farmland that are used for production of specific high-value food and fiber crops (e.g., citrus, tree nuts, olives, fruits, and vegetables). Farmlands of statewide importance have the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Farmland of statewide importance is similar to prime farmland but with minor shortcomings such as greater slopes or less ability to store soil moisture. The methods for defining and listing farmland of statewide importance are determined by the appropriate State agencies, typically in association with local soil conservation districts or other local agencies.

As shown in Table 2.1.3-2, all of the soils within the Preliminary Development Area (Site) are classified as prime farmland, prime farmland if a limiting factor is mitigated, or farmland of statewide importance; however, it is important to note that the prime farmland designation is independent of current land use (USDA NRCS, 2024).

TABLE 2.1.3-2	
Farmland Classifications within the Preliminary Development Area	
Farmland Classification	Preliminary Development Area (acres / %)
Prime Farmland	933.1 / 59.5%
Prime Farmland if Drained	604.7 / 38.6%
Farmland of Statewide Importance	29.2 / 1.9%
Not Prime Farmland	0.0 / 0.0%
PROJECT TOTAL	1,567.0 / 100.0%
Source: Soil Survey Staff, 2024.	

For additional information regarding soils, best practices for segregation of topsoil and subsoil, as well as decompaction methods that will foster long term soil health and vegetative outcome success, refer to the Agricultural Impact Mitigation Plan (AIMP). The contractor is encouraged to visit the NRCS web soil survey to review detailed information about the soils across the Site in more detail.

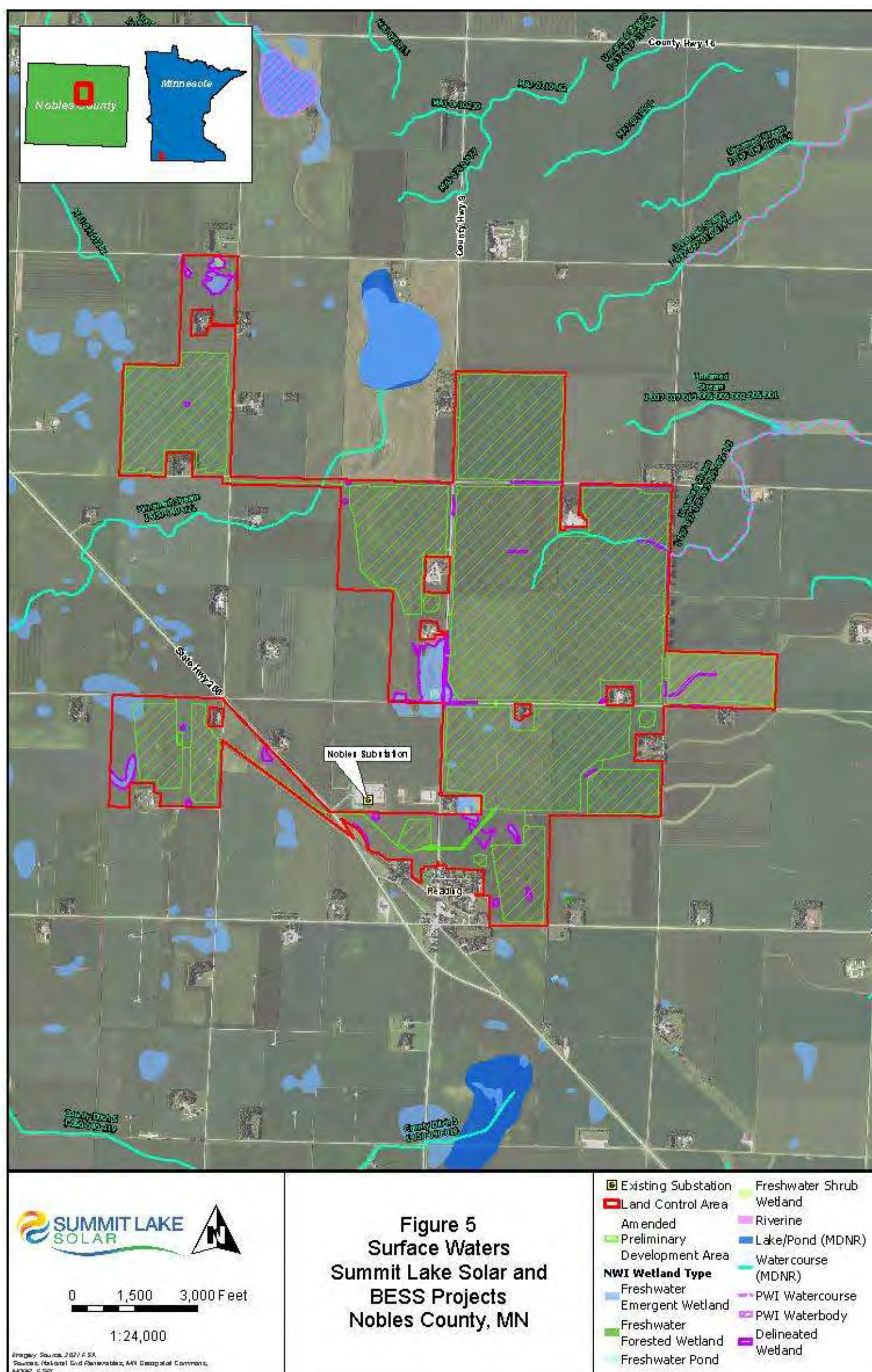
2.1.4 Hydrological Characteristics

The hydrology of a site proposed informs the locations where specific seed mixes may need to be developed, along with the parameters for implementation. Upland and lowland/wetland/riparian seed mixes can greatly differ in seeding species, rates, application techniques, and timing when considering how much water, saturation, or inundation a vegetation species can tolerate.

Hydraulic features within the Land Control Area include wetlands, waterways, and waterbodies. The Project is within the Des Moines River – Headwaters and Rock River Hydrologic Unit Code 8 Watersheds (U.S. Environmental Protection Agency [USEPA], 2023a).

Tetra Tech, Inc, conducted wetland and other waters delineations in 2023 and 2024 within the Land Control Area. Based on field delineations, 34 wetlands totaling approximately 48.66 acres were delineated within the Land Control Area. In addition, Judicial Ditch Number Nine is located in the northeast portion of the Land Control Area and East Fork Beaver Creek is located in the southwestern portion of the Land Control Area (see Figure 5).

The Project has been designed to minimize impacts to surface waters to the extent practicable. Impacts to waterbodies are not anticipated. The electrical collection and communication lines intersect approximately 0.09 acres of wetlands. These wetlands will be bored to avoid impacts. The access roads within the Solar Facility intersect approximately 0.02 acres of delineated wetlands. In addition, 6.2 acres of wetlands are located within the fenced solar facility; however, will not be impacted by any Project components. These wetlands are all currently farmed and will be enhanced through seeding and management as identified in this Plan.



3.0 MANAGEMENT UNITS

The Site is anticipated to be separated into smaller construction and management units for a common point of communication in management. For ease of reference, the management units will likely be designated by the array block numbering system already established as a part of the final engineering process. Each array block, which consists of an approximately 10- to 20-acre area of panels, is designated per the direct current (DC) collection system from the solar modules to a common inverter. Using an array block is a common point of understanding for onsite managers to quickly and effectively communicate the area undergoing final Site stabilization, requiring noxious weed treatment, or other vegetation management needs. As restoration progresses, a more simplified set of management units may be established by aggregating array blocks into larger units. This will be determined by onsite managers based on Site outcomes and monitoring reports.

Generally, three distinct types of management are possible on the Site. These include the possibility of haying, mowing, or grazing, and these methods are laid out in more detail later in the plan. This Plan has been drafted to allow a 'scaling' of each management measure based upon availability at the time such a management measure could be deployed. The goals and objectives for each management unit are the same and are provided in Section 1.0 of this Plan.

4.0 VEGETATION INSTALLATION

4.1 Site Preparation and Vegetation Clearing

Prior to vegetation installation, management techniques can be used that will lead to more successful vegetation establishment for the short- and long-term goals. Most of the soil and vegetation disturbances will occur during the first phase of construction when the grading activities take place. The construction contractor will follow the recommendations of the AIMP to ensure that best practices are used during construction and to prepare the Site for final stabilization. Additionally, to stabilize the soils, existing vegetation or plant material will be retained on the surface in areas that do not need to be graded. Any topsoil that is stripped or otherwise stockpiled during construction will be replaced and spread or otherwise stockpiled prior to seed bed preparation activities. Recommendations for weed control and implementation of cover crops to assist in Site stabilization prior to construction are provided in Section 5.1.

Following soil disturbing activities, any compacted areas, such as laydown areas, heavily travelled corridors, or portions of the access road corridors that were used as temporary roadbeds will be decompacted as described in the AIMP.

4.1.1 Seeding Contractors Qualifications:

Seeding contractors must possess a minimum of five years of experience in native seed installation, with specific expertise in utility-scale solar projects in Minnesota or the Upper Midwest. Contractors are required to provide references that demonstrate their capability to successfully execute similar projects, including vegetation establishment under and around solar panels.

4.1.2 Permanent Seeding Prior to Solar Installation

There are two permanent seeding timing options to consider. One option is to complete seeding prior to the installation of solar infrastructure. This approach offers several advantages.

Establishing vegetation early provides immediate ground cover that helps reduce potential erosion, stabilize soils, and improve stormwater infiltration before construction activity begins. Early establishment also helps suppress early-stage weed growth, reducing long-term vegetation management needs once the site is operational.

Seeding before solar installation also improves construction efficiency. With no racking, panels, or underground electrical components to work around, the restoration contractor can move freely across the site, which shortens implementation time and reduces labor costs. Heavy equipment can operate more safely and effectively without the risk of damaging installed solar components. In areas with highly compactible soils, vegetative establishment ahead of construction can also improve soil structure and root development, providing a better growth medium once permanent vegetation is required under and around panels.

An additional benefit is reduced dust generation during construction, particularly on large sites with sandy or exposed soils. Established vegetation acts as a natural dust suppressant, improving visibility and safety while protecting nearby properties and sensitive resources. Early seeding may also help delineate work zones and minimize off-corridor disturbance by providing a visible, stable surface.

The primary disadvantage is the potential need for supplemental or repeated seeding in areas that experience heavy construction traffic or disturbance during panel installation. However, these areas are typically localized and can be efficiently addressed during final stabilization.

Permanent seeding should occur two to three months ahead of the installation of solar panels to allow the vegetation to establish. Prior to seeding, an herbicide treatment is recommended to treat undesired plant species and noxious or invasive weeds. Soil tillage can create an optimal seed bed and may be required at select locations based on soil profiles. If tillage occurs, rock picking may be required for rock equal to or larger than four inches in diameter. If tillage is necessary, seeding options include Brillion, Trillion, broadcast, or drill seeding. With most of the land currently being farmed, it is anticipated that drill seeding directly after herbicide treatment will be adequate for a large portion of the Site. The seeding method will be determined at the time of installation and will be dependent on soil conditions, weather, and time of year. If tillage is not needed, the vegetation may need to be mowed once depending on the height and density of the vegetation during seed installation.

During solar installation, there is a likelihood that portions of the Site will require reseeding. To minimize seedling disturbance, it is recommended that specialized low-impact equipment and/or construction mats be used on heavily traveled areas during construction to minimize soil compaction.

4.1.3 Permanent Seeding After Solar Installation

The other permanent seeding option occurs after the solar panels are installed. This creates challenging seeding conditions and requires specialized equipment and more time to complete. The advantage of this method is that only one mobilization for the restoration contractor is required and no reseeding due to construction activities will be required.

4.2 Temporary Seed Mixes

A temporary cover crop will help mitigate erosion, decrease the need for erosion control devices, increase soil moisture, and suppress weed growth. Cover crops assist in Site stabilization during

construction activities and are especially helpful in areas that do not require grading activities. Early season cover crop installation is typically seed oats (*Avena sativa*), but Summit Lake will work with the Project Contractor/s to select the best option. A cover crop will not be planted prior to construction unless there is adequate time between the start of the growing season and the start of construction for the cover crop to grow to a sufficient height to provide soil surface protection during construction. Cover crop recommendations vary by location and season; however, oats and/or winter wheat (*Triticum aestivum*) are recommended for Nobles County. Suggested cover crop seeding rates per season are given in Table 4.2-1 below.

TABLE 4.2-1			
Temporary Cover Crops			
Season	Seed	Seeding Rate as Nurse Crop ^a	Seeding Rate as Cover Crop ^a
Spring and Summer	Oats (<i>Avena sativa</i>)	16-32 pounds/acre	96
Fall	Winter Wheat (<i>Triticum aestivum</i>)	10-60 pounds/acre	90-120
Fall	Cereal Rye (<i>Secale cereale</i> L.)	10-60 pounds/acre	90-120
^a Seed rates are based on drill seed application and will vary based on site-specific conditions, final seed mix, and seasonal considerations.			

4.3 Seeding Timing

An optimal planting time for native species is in the fall (October to November). A fall planting allows seeds to naturally go through the cold stratification process, which many native species need to break dormancy (University of Minnesota Extension, n.d.). Spring planting can occur between and early spring (April to early May). In their *Native Vegetation Establishment and Enhancement Guidelines*, BWSR encourages monitoring soil temperatures and adjusting planting schedules based on local conditions (2022).

Below is breakdown of seeding recommendations based on time of year:

- Spring Seeding: May 1 to July 1 when soil temperatures are at least 60 degrees Fahrenheit or higher.
- Fall Seeding: Should occur when soil temperatures fall below 50 degrees Fahrenheit for a consistent period of time (usually around November 1).
 - Fall dormant seedings can help reduce weed pressure during the first year of growth because cool-season grasses and forbs germinate earlier and start competing with weed species right away. Frost seedings are also an option if the snow cover is not too deep.
 - For a frost seeding, seeding rates may need to be increased by 25 percent due to lower germination rates and loss of seed that is consumed by wildlife over the winter months.

If Site preparation and grading is completed between the summer and early fall, dry soils may pose a challenge and require deeper soil tilling to create a good seed bed. If delaying seeding until late fall is an option, a temporary cover crop will be planted after construction is complete (see Section 4.2). Installation of a temporary cover crop will help mitigate erosion, reduce the

requirement for sediment control structures, and suppress weed growth. Recommended applications of temporary cover crops vary by season, as described in Table 4.2-1 above.

A late fall or winter seeding is referred to as dormant seeding. When seeding in late fall the seeding is timed to avoid germination. To prevent seed germination, seeding should occur after soil temperatures fall below 50 degrees Fahrenheit for a consistent period. Seeding that occurs before the soil is frozen is planted with a shallow-seeding drill. When seeding after soils have frozen, a broadcast seeder is used since the freeze-thaw cycle in winter causes soil cracks to open and draw seed into the soil (BWSR, 2022).

4.4 Permanent Seed Mixes

Reestablishing native vegetation can serve multiple purposes, including soil stabilization, reducing erosion, lessening the sediment load to any nearby ditches or streams, increasing nutrient retention through deep root systems, carbon sequestration, and providing wildlife habitat. A mixture of native grasses that includes forbs will produce a high-quality prairie habitat that is more resilient to drought, pests, and disease than monoculture grasslands or low diversity vegetation stands.

An **Array Mix** is used to establish vegetation within the solar arrays, as shown in Figure 6. This seed mix will consist of short-statured (< 24 inches) grasses, sedges, and forbs adapted to full sun and partial shade and may include flowering species that bloom in spring and summer. Outside of the arrays and to the fence line, a **Perimeter Mix** is used (see Figure 6). This seed mix contains greater plant diversity and provides increased benefit to pollinators. A diverse mix of forbs and grasses in the perimeter will provide natural screening of the array and could include flowering species across the spring, summer, and fall. A **Wetland Mix** is used in moist soil conditions and selected species will tolerate damp soil environments (see Figure 6). This seed mix will consist of medium length grasses, sedges, and forbs that are flowering and adapted to full sun and partial shade.

Specific species were selected that align with local climate and particular soil conditions found throughout the Site, as identified in Appendix C, and on the seeding plan (see Figure 6). The seed mixes were tailored to the regional soil conditions, each incorporating a unique selection of low-growing, low-maintenance prairie grasses and forbs adapted to the Project region. The genetic source origin of all native seed must be local, preferably sourced within a 150-mile radius of the Site. Plant species should be native to Nobles County (BWSR, 2019), though considerations of range shifts due to climate change may necessitate adjustments to this guidance. Species shall be true to their scientific name as specified in Appendix C. Seed tags or nursery confirmation of the order must be provided to Summit Lake prior to installation. Any species eliminations, substitutions, or source origin exceptions must be approved by Summit Lake prior to installation. If necessary, seeds shall be properly stratified and/or scarified to break seed dormancy. If applicable, all legumes shall be inoculated with proper rhizobia at the appropriate time prior to planting.

The Array Native Seed Mix includes grasses, sedges, and forbs that are low growing (24 inches and less), will not impact the operation of the solar arrays, and are adaptable to full sun and partial shade. In addition, the Array Native Seed Mix offers a diverse variety of forage species suitable for sheep grazing. Outside of the arrays, a Perimeter Native Pollinator Seed Mix will be used. The Perimeter Seed Mix is more diverse and includes grasses, sedges, and forb species of greater height (30 inches and less) which provide increased benefit for high quality prairie and pollinator habitat. In addition, the Perimeter Native Pollinator Seed Mix offers a diverse variety of forage

species suitable for sheep grazing. Seeding of temporary and permanent sediment basins, as well as contractor laydown yards or other disturbed areas if included in final Contractor design, may require additional seed mixes suitable to those applications to ensure appropriate vegetation coverage and viability. All substitutions shall meet the parameters discussed above in section 4.4.

4.5 Seed Mix Substitutions

Procurement of seeds can be difficult to obtain in quantities necessary for large solar sites. Sourcing of proposed seed mixes should be done as soon as practicable. Substitutions to seed mixes will be completed by a qualified professional with sufficient botanical experience in identifying native plants, native plant communities, invasive species, and non-native species typical of Minnesota. Any substitution will be approved by Summit Lake prior to implementation, and substitutions will have no effect on the short- and long-term goals of this Plan.

For consistency in management across the Site, it is desired that the uniform seed mix recommended in the plan be used. However, should sourcing issues arise, Summit Lake has developed alternative species to use should procurement be problematic. Seed mix substitutions are listed beneath each seed mix shown in Appendix C.

4.6 Seed Installation

Native seeds require special considerations related to planting depth and application method. Many native grasses and larger-seeded forbs require a shallow planting depth of 0.125 inch to a maximum depth of 0.25 inch. For small seeds, 0.125 inch is the maximum depth and surface sowing is the ideal method. Equipment may require modification so the small seed is not drilled at all, but dropped on the surface, as some seeds planted too deep may never be able to emerge. Depending on site conditions and timing of seeding, a variety of specialized seeding methods will be considered on a site-by-site basis; the Contractor shall evaluate the site and determine which technique will produce the best results. Seeding options include drill, Brillion, Trillion, and broadcast seeding. Equipment capable of handling seeds of varying sizes is required. Drill seeding typically produces higher observed plant density, so broadcast seeding may require an increased seeding rate or overseeding during the establishment period to achieve performance standards. Seed installed into a previous cover crop or other vegetation must be installed with a seed drill. Prior to installation, seed shall be divided into two equal parts. The first half shall be installed in one pass, and the second half installed in a second pass (perpendicular to the first pass, where possible). In areas where broadcast seeding is employed, raking, harrowing, or culti-packing of seeded areas shall be used to ensure good seed-to-soil contact. After seeding, an application of mulch will be required to prevent erosion and promote seed germination.

The topography and soil analysis indicate elevated erosion potential across approximately half of the project area, particularly within zones characterized by steeper slopes, high K-factors, and increased wind exposure. To address these conditions, Summit Lake designed targeted stabilization measures to minimize soil loss and promote sustainable vegetative cover. High-risk areas will receive enhanced treatments, including crimping, hydromulching with tackifier, or application of erosion control blankets, as appropriate to site conditions. Seeding activities will be conducted using no-till or conventional drilling methods that follow existing land contours to reduce surface disturbance and runoff potential. Additional measures will be addressed in detail within the Stormwater Pollution Prevention Plan (SWPPP).

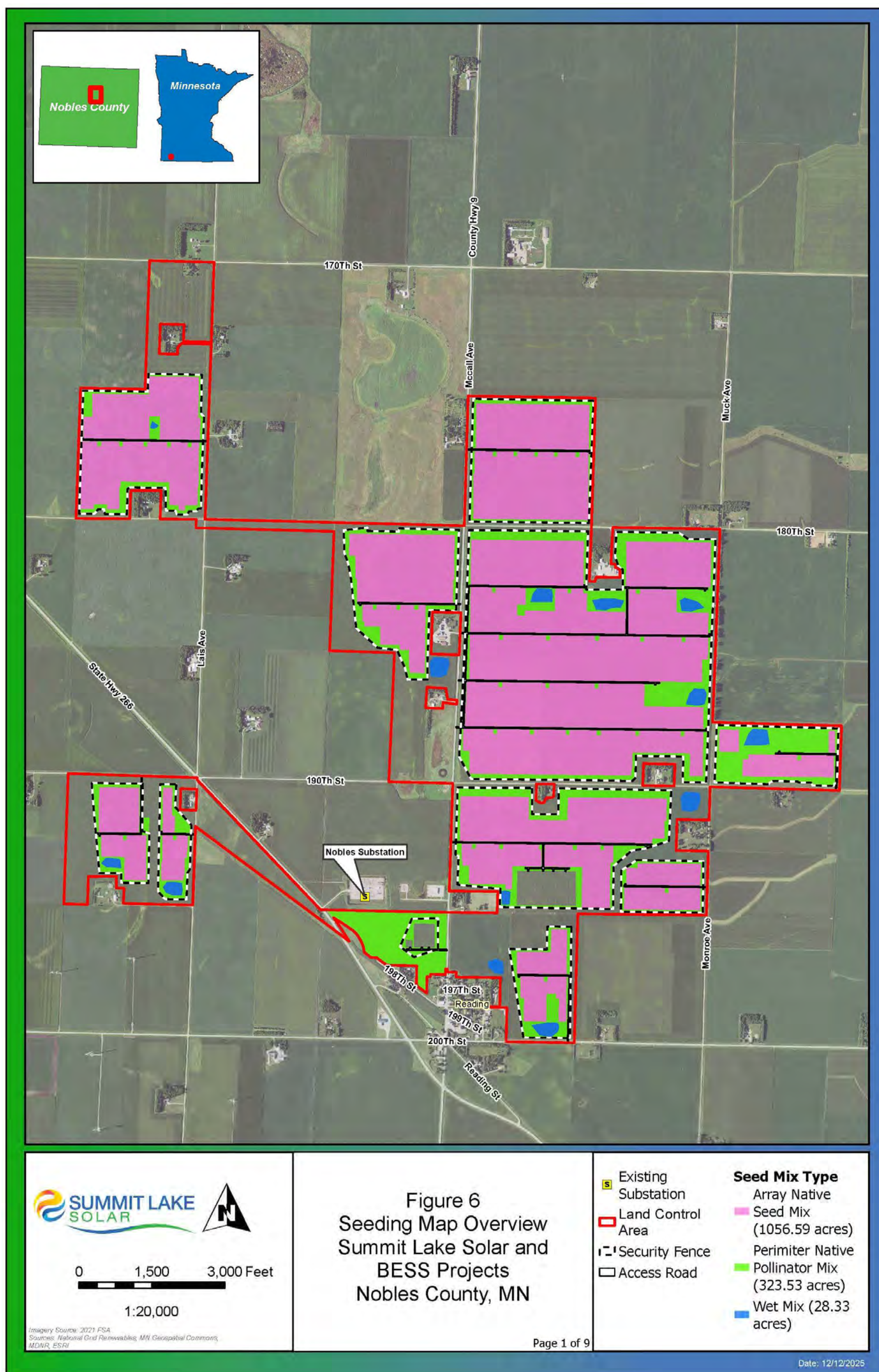
If a cover crop has been installed at any time during the calendar year, native seed mixes must be installed the same year with a fall dormant seeding, unless the Summit Lake gives permission

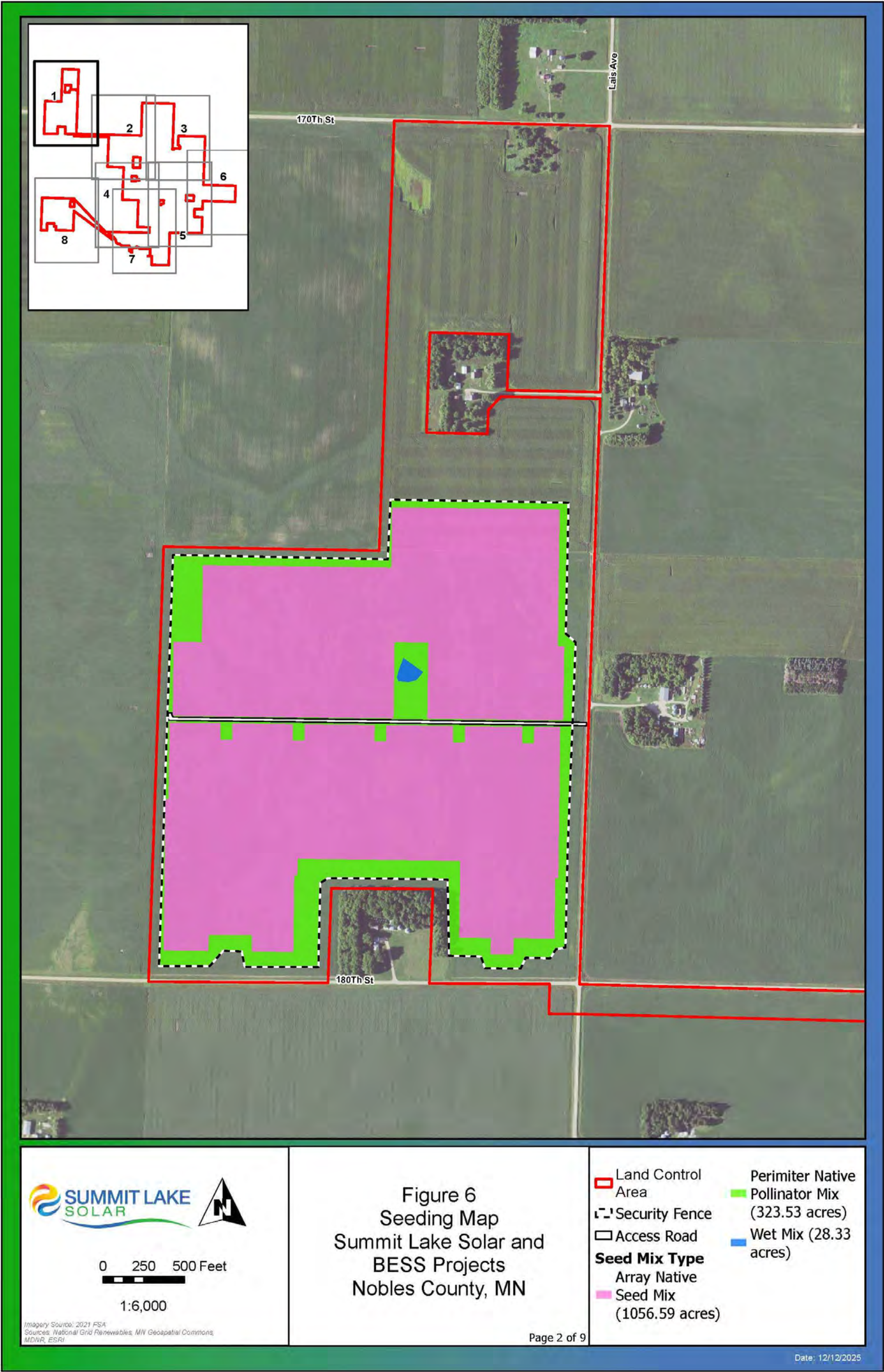
to the Contractor for a spring seeding. Prior to seeding into a cover crop, the Contractor shall evaluate the planting area and determine if any preparation is required prior to installation. Mowing may be required if the cover crop is too dense/robust. All native seeding into a cover crop must be completed by drill seeding.

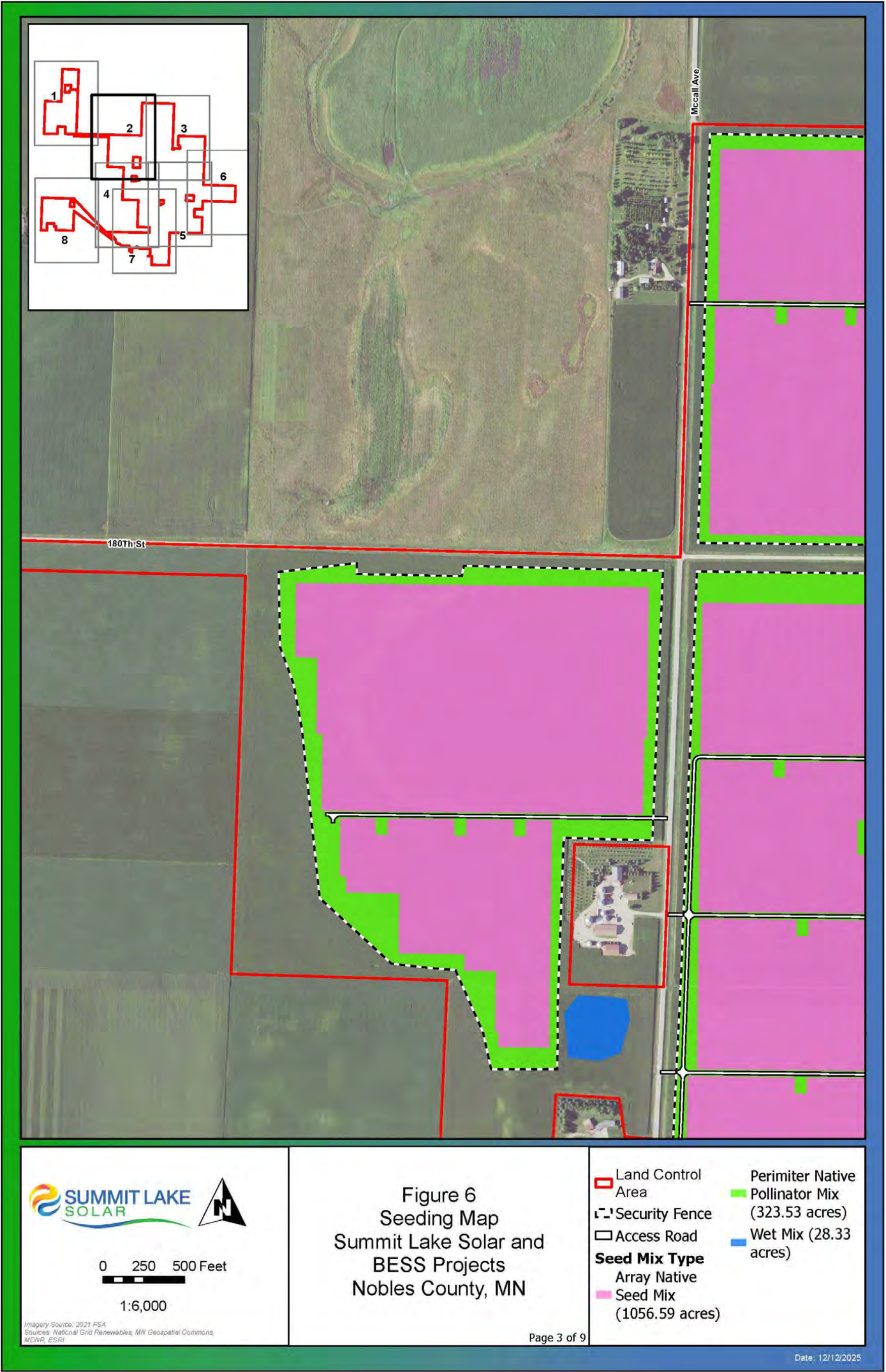
4.7 Soil Amendments

A preliminary desktop evaluation of the soil substrates within the Site determined it was unlikely that lime or fertilized implementation will be required to adequately restore soils and achieve vegetation goals.

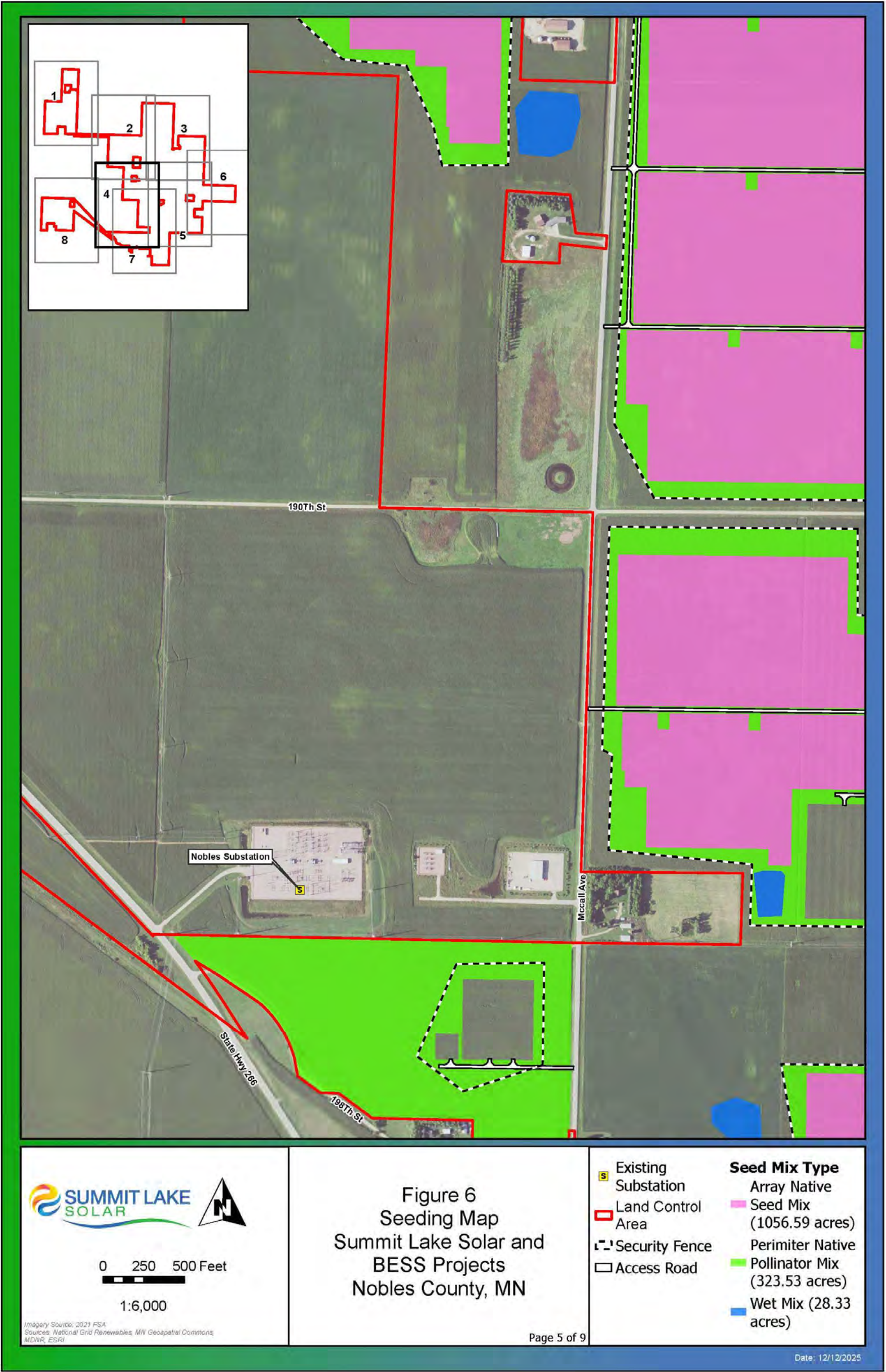
It is recommended to conduct soil sampling to confirm soil profiles and determine if soil amendments are warranted.

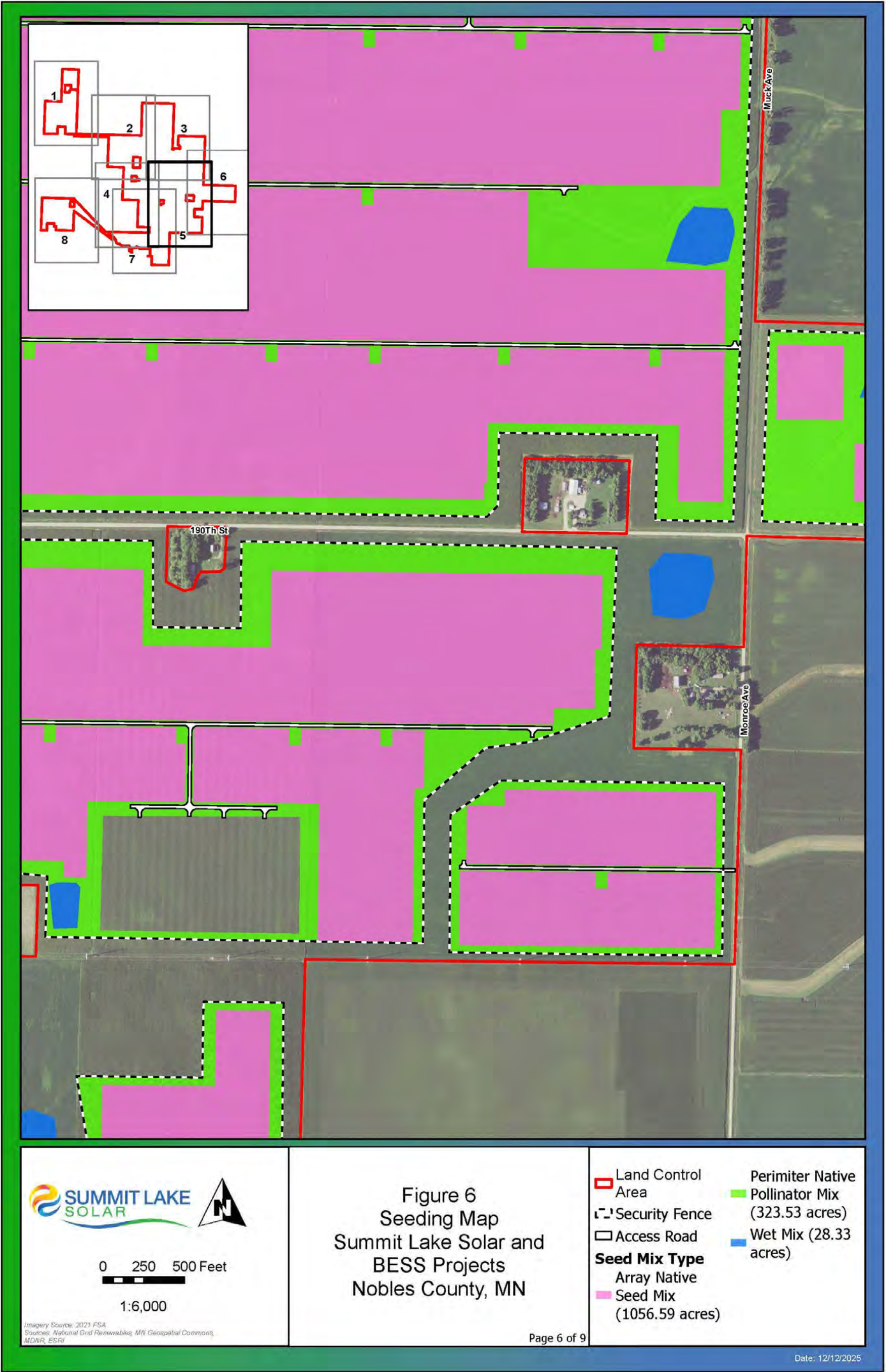






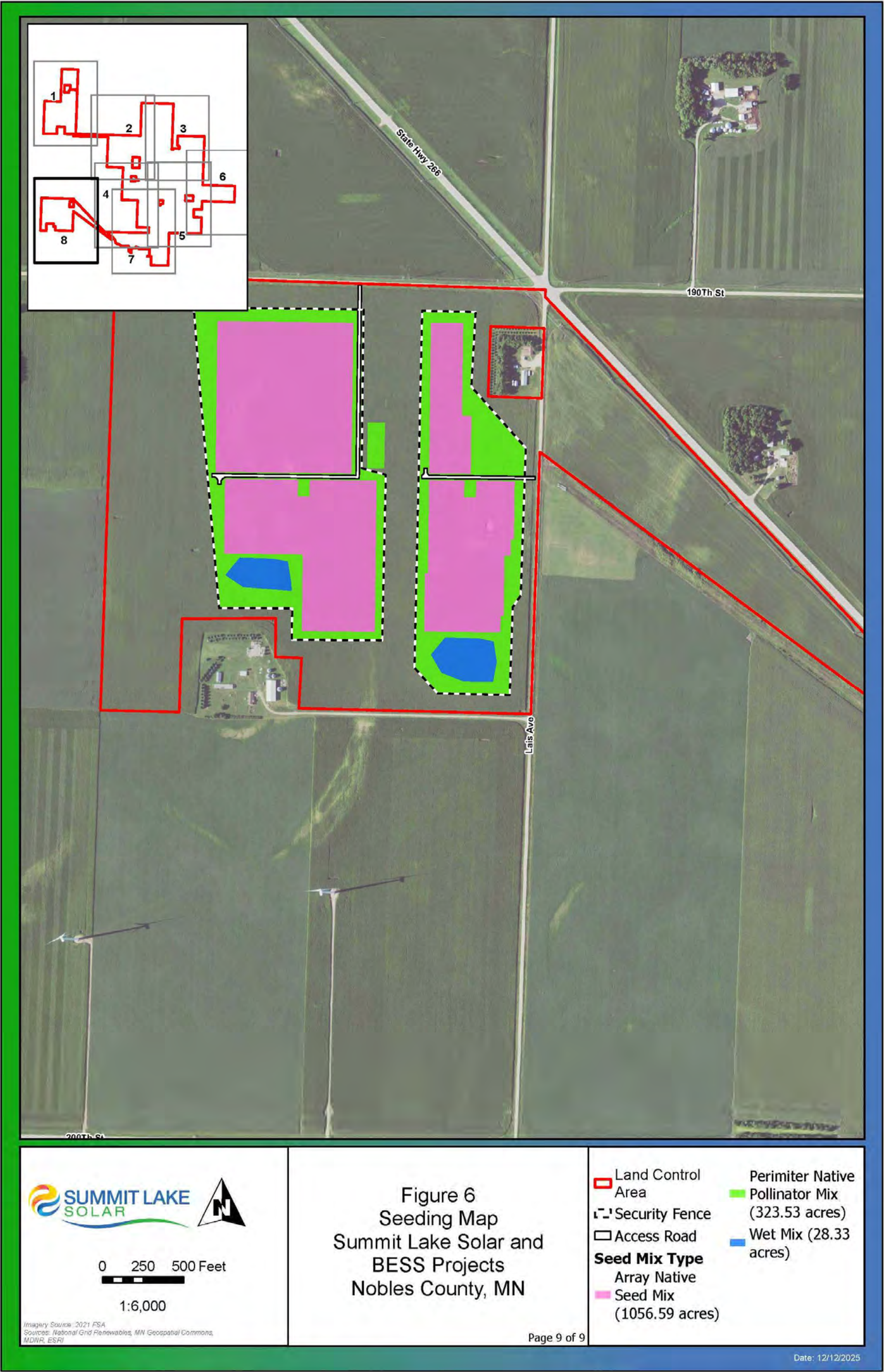












4.8 Wet Weather Considerations

During seed installation, certain activities may be suspended in saturated soil conditions. Rainfalls between 0.25 and 0.5 inch could have the potential to cause soil rutting. If rutting occurs, the contractor will cease work in rutting-prone areas until site conditions improve. Weather forecasts will be monitored daily to help determine if above rainfall amount is anticipated during seed or solar panel installation. Construction site managers will ultimately decide if wet weather shutdown is necessary. Incidental damage, such as tire ruts, should be repaired in accordance with the General Permit.

4.9 Pesticide Drift

During the establishment phase, Summit Lake will contact each owner of land surrounding the Site to inform them of the native plants planted pursuant to this Plan, the likely use of the vegetation by pollinators and the need to avoid and minimize pesticide drift from land that is adjacent to the Land Control Area. The installation of access roads on the periphery of the entire Project Area will operate as a buffer from potential pesticide spraying adjacent to the Land Control Area.

4.10 Landscape Screening

The Project may involve landscape screening as a requirement through the regulatory process or landowner requests. This may include a combination of planted trees and shrubs to block the view from roads or nearby landowners. This Plan will be updated with additional landscape screening requirements once available.

5.0 VEGETATION MANAGEMENT

5.1 Undesirable Species

Following permanent seeding, a variety of undesired species may germinate in the Site as native species are establishing. Summit Lake will manage undesirable species defined as follows:

1. Noxious Weeds according to Section 18.78 of the 2023 Minnesota Statutes
2. Invasive Species according to Part 6216.0250 of the Minnesota Administrative Rules
3. Project-designated “weeds” or undesired plants

Tables 5.1.1-1, 5.1.1-2 and 5.1.1-3 provide lists of invasive and weed species of concern for the Site. Because each site is unique, an adaptive management approach to managing invasive and weedy populations will be used.

Site management will be conducted, as needed, to reduce the spread of invasive and weedy species, improve establishment and success of permanent seed mixes, and minimize vegetation interference with solar infrastructure. This may include cleaning and inspecting equipment prior to use at the Site.

Invasive and weed plant populations must be effectively managed during the Establishment Phase to ensure that the desired species are given the opportunity to establish. Management activities in the first three years strongly determine the success of planting and are referred to as the Establishment Phase, while Long-Term Maintenance Phase refers to management activities occurring after the first three years. Sections 5.2, 5.3 and 5.4 describe the management activities that will be implemented during these three phases, respectively.

5.1.1 Prescribed Treatment for Common Invasive Species and Weeds

This Plan describes common techniques to manage a variety of invasive plants and common weeds growing in the Southwest Minnesota and Nobles County, though actual techniques required are dependent on Project conditions. During each site visit, the site will be photo-documented and general notes collected regarding site conditions, species present, and areas of bare soil. Management techniques for five categories of weeds are described in the following sections.

5.1.1.1 Annual Weeds

Annual weeds include all unwanted species that grow for a single year, set seed, and die. A list of problematic and common annual weeds that may be encountered on the site are shown in Table 5.1.1-1 below.

TABLE 5.1.1-1	
Problematic Annual Cropland Weeds ^a	
Species	Growth Form
Common cocklebur (<i>Xanthium strumarium</i>)	Annual Forb
Common lamb's-quarters (<i>Chenopodium album</i>)	Annual Forb
Common ragweed (<i>Ambrosia artemisiifolia</i>)	Annual Forb

TABLE 5.1.1-1	
Problematic Annual Cropland Weeds ^a	
Species	Growth Form
Common sunflower (<i>Helianthus annuus</i>)	Annual Forb
Eastern black nightshade (<i>Solanum ptychanthum</i>)	Annual Forb
Field pennycress (<i>Thlaspi arvense</i>)	Annual Forb
Giant ragweed (<i>Ambrosia trifida</i>)	Annual Forb
Green foxtail (<i>Setaria viridis</i>)	Annual Grass
Horseweed (<i>Conyza canadensis</i>)	Annual Forb
Kochia (<i>Bassia scoparia</i>)	Annual Forb
Large barnyard grass (<i>Echinochloa crus-galli</i>)	Annual Grass
Redroot pigweed (<i>Amaranthus retroflexus</i>)	Annual Forb
Shepherd's purse (<i>Capsella bursa-pastoris</i>)	Annual Forb
Velvetleaf (<i>Abutilon theophrasti</i>)	Annual Forb
Woolly cupgrass (<i>Eriochloa villosa</i>)	Annual Grass
Yellow foxtail (<i>Setaria pumila</i>)	Annual Grass
^a Source: University of Minnesota Extension	

The goal of treating annual weeds is to prevent seed production. Beginning in spring, inspections will take place to evaluate the need for treating annual weeds (see Section 6.0 for discussion of monitoring protocols). It is recommended sites be mowed as described in Section 5.2.1 to prevent annual weeds from flowering and setting seed.

5.1.1.2 Perennial Weeds

Perennial weeds include all unwanted species that persist for two or more years after germination. Many of these weeds greatly diminish during the Establishment Phase with proper maintenance, but several require special attention when establishing native vegetation due to their highly competitive behavior. A list of common Minnesota perennial weeds that colonize and compete with native vegetation is provided in Table 5.1.1-2 below.

TABLE 5.1.1-2*	
Problematic Perennial Cropland Weeds ^a	
Species	Growth Form
Blackseed plantain (<i>Plantago rugelii</i>)	Perennial Forb
Common yarrow (<i>Achillea millefolium</i>)	Perennial Forb
Curly dock (<i>Rumex crispus</i>)	Perennial Forb
Dandelion (<i>Taraxacum officinale</i>)	Perennial Forb
Field bindweed (<i>Convolvulus arvensis</i>)	Perennial Forb
Ground ivy (<i>Glechoma hederacea</i>)	Perennial Forb
Horsenettle (<i>Solanum carolinense</i>)	Perennial Forb
Perennial sow thistle (<i>Sonchus arvensis</i>)	Perennial Forb
Quackgrass (<i>Agropyron repens</i>)	Perennial Grass
White clover (<i>Trifolium repens</i>)	Perennial Forb
Yellow nutsedge (<i>Cyperus esculentus</i>)	Perennial Sedge
Yellow wood sorrel (<i>Oxalis stricta</i>)	Perennial Forb
Yellow rocket (<i>Barbarea vulgaris</i>)	Perennial Forb
^a Source: University of Minnesota Extension, the Minnesota Department of Agriculture (MDA), and the Minnesota DNR.	

Mowing is important to prevent seed production, but herbicide is generally required to prevent the spread of perennial weeds. Perennial grasses should be treated by spot-spraying or boom spraying, as warranted, with glyphosate or an appropriate grass-selective herbicide. Perennial broadleaf weeds should be treated by spot-spraying or boom spraying, as warranted, with glyphosate, triclopyr, clopyralid, or comparably effective herbicides. All herbicides will be applied by a licensed applicator, following instructions and prohibitions provided by the herbicide label.

5.1.1.3 Problematic Native Plants

Native species present in the soil seed bank or entering the Site from neighboring properties may have the potential to interfere with the functioning of the solar panels or ecological goals. Knotweed colonies can grow in dense clusters that crowd out any native species. Giant ragweed (*Ambrosia trifida*) grows tall enough to shade the panels. Several native vines have the potential to overgrow installations, including wild grape (*Vitis riparia*), wild cucumber (*Echinocystis lobata*), and Virginia creeper (*Parthenocissus* spp.). Giant ragweed and Phragmites or any other native species shading the arrays should be controlled by mowing. If growing under or near the solar panels, wild cucumber and bur cucumber will be pulled and removed manually, but woody vines such as wild grape and Virginia creeper will be cut to within one inch of the ground and the stump treated with glyphosate, triclopyr, or a comparable herbicide by a licensed applicator (BWSR. 2022) following instructions provided on the herbicide label. Other native plants with weedy tendencies will be controlled with the same methods as non-native weeds and invasive plants.

5.1.1.4 Woody Species

Woody species can shade or otherwise interfere with the operation of solar panels. Native tree seedlings of concern are box elder (*Acer negundo*), sugar maple (*Acer saccharum*), and green ash (*Fraxinus pennsylvanica*). During the Establishment Phase, all woody plants require removal. This can be accomplished by mowing, herbicide application, or a combination of both methods. All woody plants over 0.5 inch in diameter at breast height should be cut to within one inch of the ground and the stump treated with triclopyr or a comparable herbicide by a licensed applicator and following instructions provided by the herbicide label. Cut brush will be removed from the Site.

5.1.1.5 State-Listed Noxious Weeds

Each state maintains a list of prohibited noxious plants that must be eradicated and controlled. All state-listed species be treated by manual removal, mowing, herbicide application, or a combination of these methods, with the intention of preventing the weeds from setting seed. If using herbicide, a licensed applicator with knowledge of the herbicide treatments should apply herbicide at appropriately timed windows depending on target species. Table 5.1.1-3 below provides an abbreviated list of prohibited noxious plants in Minnesota.

TABLE 5.1.1-3		
Abbreviated List of Minnesota Prohibited/Restricted Noxious Weeds and Invasive Plants		
Species	Growth Form	Regulatory Category ^a
Amur maple (<i>Acer ginnala</i>)	Tree	SR
Bell's honeysuckle (<i>Lonicera X bella</i>)	Shrub	RN
Black locust (<i>Robinia pseudoacacia</i>)	Tree	RN
Canada thistle (<i>Cirsium arvense</i>)	Perennial Forb	PN
Common barberry (<i>Berberis vulgaris</i>)	Shrub	PN
Common or European buckthorn (<i>Rhamnus cathartica</i>)	Shrub/Tree	RN

TABLE 5.1.1-3

Abbreviated List of Minnesota Prohibited/Restricted Noxious Weeds and Invasive Plants

Species	Growth Form	Regulatory Category ^a
Common reed – non-native subspecies (<i>Phragmites australis</i> subsp. <i>australis</i>)	Grass	PN, PPI
Common tansy (<i>Tanacetum vulgare</i>)	Perennial Forb	PN
Crown vetch (<i>Securigera varia</i>)	Perennial Forb	RN
Garlic mustard (<i>Alliaria petiolata</i>)	Biennial Forb	RN
Glossy buckthorn (<i>Frangula alnus</i>)	Shrub	RN
Japanese barberry (<i>Berberis thunbergii</i>)	Shrub	RN
Leafy spurge (<i>Euphorbia esula</i>)	Perennial Forb	PN
Morrow's honeysuckle (<i>Lonicera morrowii</i>)	Shrub	RN
Norway maple (<i>Acer platanoides</i>)	Tree	SR
Plumeless thistle (<i>Carduus acanthoides</i>)	Biennial Forb	PN
Poison hemlock (<i>Conium maculatum</i>)	Perennial Forb	PN
Purple loosestrife (<i>Lythrum salicaria</i>)	Perennial Forb	PN, PI
Siberian peashrub (<i>Caragana arborescens</i>)	Shrub	RN
Spotted knapweed (<i>Centaurea stoebe</i>)	Biennial Forb	PN
Tatarian honeysuckle (<i>Lonicera tatarica</i>)	Shrub	RN
Wild carrot/Queen Anne's Lace (<i>Daucus carota</i>)	Biennial Forb	RN
Wild parsnip (<i>Pastinaca sativa</i>)	Biennial Forb	PN
Winged burning bush (<i>Euonymus alatus</i>)	Shrub	RN
^a SR = Minnesota Department of Agriculture (MDA) Specially Regulated Plant; RN = MDA Restricted Noxious Weed; PN = MDA Prohibited Noxious Weed; PPI = Minnesota Department of Natural Resources (MNDNR) Proposed Prohibited Invasive Species; PI = MNDNR Prohibited Invasive Species		

5.2 Establishment Phase

Within the Establishment Phase, the first three years of vegetation management will be a concerted effort to remove any undesired species, while helping to establish planted seeds. Native perennial plantings will require several years to establish and will involve frequent site management to limit undesirable species, which could impact the growth of planted native seeds. Site management will ensure a focus on achieving the required Site goals and performance standards. An adaptive management approach is recommended to respond to construction site conditions, challenges, and successes over time. As time progresses, the temporary cover crop will begin to subside, and the native species will start to germinate gradually.

Establishment Years one to five will require the most maintenance and monitoring to control any undesired species. Figure 7 portrays the Site conditions as the vegetation transitions from the establishment phase into the Long-Term Maintenance Phase.

Once the native seeds are fully established, the Site will require less yearly maintenance. Recommendations for Establishment Years one to five are outlined below.

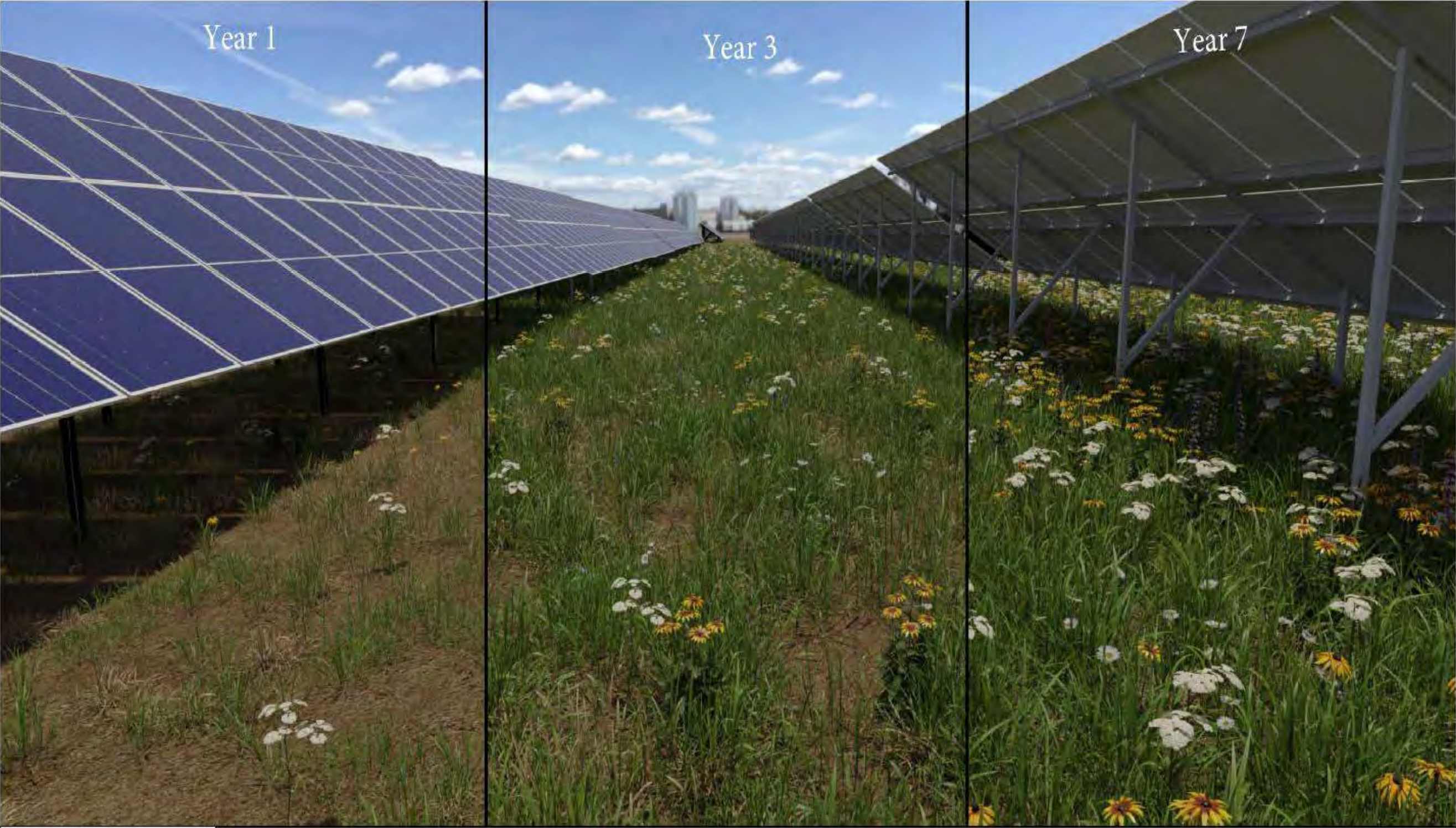


Figure 7
Transitional Vegetation Growth
Summit Lake Solar and BESS Projects
Nobles County, MN

5.2.1 General Tasks for Managing Vegetation

5.2.1.1 Establishment Year 1

The first year of establishment is focused on consistent invasive plant control on a site-wide basis. Mowing the grassland areas during the first year should prevent invasive plants from adding new seeds to the soil and begin to exhaust the soil seed bank (a process that often requires several years to complete). From June 1 of the first establishment year, site-wide mowing to a height of 6 to 9 inches shall occur whenever vegetation reaches a height of 18 to 24 inches. The landscaped/screening area shall be spot sprayed during the establishment phase to control invasive plants. Attempting to mow between the landscaping plants will likely be difficult and may lead to unanticipated damages to the new plants. Mowing in wet areas will also be limited to those periods of time when the wet areas are not susceptible to rutting or compaction (i.e. frozen or dry conditions). Spot-spraying, use of a swing arm, brush saws, weed whips or similar equipment may be used in wet areas as necessary to prevent soil damage when the soils are wet.

Monthly evaluations of the plantings shall be conducted by a botanist employed by the Contractor, during the growing season (May to September) to determine the appropriate treatment techniques to use and the timing of those treatments based on the presence and development stage of both invasive plants and the native plantings. Invasive species should be treated prior to such plants flowering or seeding, with the goal of preventing seed set by noxious and invasive species.

Repeated mowing may produce a buildup of organic thatch, which discourages the development and persistence of diverse native vegetation. To help prevent thatch buildup onsite, mowing shall be conducted with a flail-type mower to mulch the cut vegetation, or the Project Site shall be hayed so that cut vegetation is removed. A swing arm specifically designed for mowing under solar panels is recommended for cutting beneath panels, but spot-mowing with brush saws, weed whips, and similar equipment is also permitted. It may be possible to coordinate with Summit Lake to adjust the orientation of the panels to increase the ease of mowing, but the Contractor should not depend on this coordination to complete its work. Any other techniques must be approved by Summit Lake prior to the start of work. Mowing equipment shall be cleaned prior to use onsite to prevent the introduction and spread of invasive and non-native species. This mowing regime will prevent annual and perennial weeds from flowering and setting seed, prevent weeds from shading out the solar panels, and help control woody plant growth onsite. Additionally, noxious and perennial weeds shall be treated by spot-herbicide treatment, as described below, to prevent roots from resprouting.

5.2.1.2 Establishment Year 2

The second year of establishment continues invasive plant control but generally employs more targeted techniques. Site-wide mowing to a height of 6 to 9 inches shall occur when vegetation height reaches 18 to 24 inches.

Spot-mowing may be employed to treat specific problem areas as needed. Noxious and perennial weeds shall be treated with spot-herbicide during the growing season, typically in late May/early June and late July/early August, with the focus on preventing seed set and achieving the required performance standards (described in Section 5.2.2).

The landscaped/screening area shall be spot sprayed during the establishment phase to control invasive plants. Attempting to mow between the landscaping plants will likely be difficult and may lead to unanticipated damages to the new plants. Mowing in wet areas will also be limited to those

periods of time when the areas are not susceptible to rutting or compaction. Spot-spraying or use of brush saws, weed whips, or similar equipment may be employed in wet areas as necessary to prevent soil damage when the soils are wet.

Monthly evaluations of the plantings shall be conducted by a qualified botanist, during the growing season (May to September) to determine the appropriate treatment techniques to use and the timing of those treatments based on the presence and development stage of both invasive plants and the native plantings. Invasive species should be treated prior to such plants flowering or seeding, with the goal of preventing seed set by noxious and invasive species.

5.2.1.3 Establishment Years 3-5

In the third, fourth, and fifth years of the establishment phase, invasive plant control should consist of spot-herbicide treatment to control the remaining small patches of persistent weeds. Efforts should be focused on achieving the required performance standards (described below).

Site-wide mowing to a height of 6 to 9 inches shall occur when vegetation height reaches 18 to 24 inches. Spot-mowing should be employed as needed to prevent vegetation interference with energy generation and infrastructure. Additional onsite treatment with spot-mowing or hand weeding may be employed at the discretion of the Contractor.

5.2.2 Herbicide Specifications

All herbicide treatments shall be restricted to those pesticides and methods of application approved by the Minnesota Department of Agriculture, MNDNR, and USEPA. Spraying should be conducted by certified applicators holding all necessary permits and licenses. All herbicides shall be applied in accordance with the applicable regulations and the label requirements and in a safe and cautious manner to avoid damaging adjacent properties. Herbicide shall be applied selectively where applicable to avoid damaging existing native vegetation.

Approved pre-emergent herbicides include indaziflam (trade name Esplanade) and aminopyralid/metsulfuron-methyl (trade name Opensight) or equivalent. Additionally, pre-emergent formulations are recommended to include an adjuvant such as trade name Grounded or equivalent. Approved foliar herbicides include glyphosate (trade name Aquaneat), triclopyr (trade name Garlon), and aminopyralid (trade name Milestone) or equivalent. The Contractor shall submit a list of all herbicides to be used on the project to Summit Lake for written approval prior to the start of work.

Pre-emergent herbicides are recommended to be applied in the spring once the temperature is above 55°F. Foliar herbicides shall be applied during the growing season as a control measure to prevent noxious weeds and invasive species from flowering or setting seed. The Contractor shall have knowledge of the phenology of species to treat on site to conduct herbicide treatments at the appropriate time and shall submit a schedule of planned visits each year prior to May 1.

The landowner shall be contacted at least 14 days prior to any application of herbicide on their property. Apiaries known by Summit Lake to be present within three miles of the Project should be notified of any herbicide spraying at least 14 days prior to such application. The herbicide applicator must keep documentation of location and timing of herbicide use, weather conditions on site during application, type of herbicide used, volume of herbicide used, number of acres treated, and species of plants treated, and submit a copy of all herbicide records to Summit Lake to be included in an annual report.

5.2.3 Reseeding Bare Soil

Areas of bare soil are detrimental to successful establishment of native vegetation. Bare soil provides opportunities for the common invasive and weed species described above to colonize and spread. Bare soil is also likely to contribute to soil loss by erosion. Site performance standards and goals may indicate reseeding is required in these areas using the seed mix previously installed and following the timing instructions laid out in Section 4.0.

5.3 Transition Phase

After the establishment phase of vegetation management, yearly management is required to control the spread of invasive species and combat the establishment of undesirable and invading trees and shrubs. Two trips during the growing season are recommended. Some degree of weed whipping and spot-mowing, and/or spot herbicide treatment may be warranted to maintain vegetation quality and achieve the Site goals and performance standards.

5.4 Long-term Maintenance Phase

The long-term maintenance phase follows the end of the Transition Phase of vegetation management. The phase includes yearly management to promote and maintain the desired vegetation community, control the reestablishment, and spread of invasive species, combat the establishment of undesirable and invading trees and shrubs, and reduce biomass/fuel load onsite. The primary tools for this management are weed whipping, spot-mowing, and spot-herbicide treatment, which may be warranted thereafter to maintain vegetation quality and achieve the Project goals. It's likely that these activities may be warranted every other year depending on soil moisture and growth of vegetation.

5.5 Haying

Summit Lake may elect to use haying as a long-term management technique in a portion of the Project that is not otherwise occupied by the solar array. These areas are primarily located around the periphery of the facility (within the fence) and in areas that were used as laydown areas during construction. Annual haying to a height of 6 to 9 inches shall occur each September prior to prairie plants going dormant to maximize forage value of the hay crop.

5.6 Grazing

Grazing can be an effective vegetation management strategy, offering an eco-friendly alternative to mowing or herbicides to control plant growth around solar panels. Grazing animals naturally recycle nutrients back into the soil, which can improve soil health, reduce erosion, and support a more diverse ecosystem. Grazing can also restrict woody vegetation and non-native species encroachment into grasslands, prevent excessive litter accumulation, improve forage production, and accelerate decomposition and nutrient cycling. Managed grazing also supports -pollinator friendly habitats by maintaining a variety of plant species that can thrive under periodic grazing. Additionally, grazing programs can support local farmers by providing a seasonal grazing area. Careful planning is essential to ensure grazing is done at appropriate times and intensities to prevent overgrazing and maintain plant cover, ultimately contributing to both vegetation management goals and sustainability objectives for the solar project.

Summit Lake may decide to use grazing with sheep, as a long-term vegetation management technique in portions of the Project occupied by the solar array or those areas surrounding the

arrays. Grazing using livestock is a developing management approach; therefore, the instructions in this Plan should be considered a guide, and actual practices must adapt year-to-year to the specific vegetation conditions at the Project Site. This Plan describes the grazing methods to be used on a small unit of the overall portion of the Project occupied by the array. These specifications can be scaled appropriately to accommodate grazing in larger or smaller portions of the array depending on the availability of livestock and appropriate partners to conduct the grazing operations. Any area that is not grazed can be managed using mowing or haying management techniques as outlined above. Should grazing be selected as a management technique for some or all of the Project Site, the following methodologies will be followed:

- Grazing should not be started until after the start of the third growing season after vegetation installation.
- Grazing should only be used if the Project is able to identify and form a partnership with a local livestock farmer who is willing and able to use a portion of the Site for grazing in accordance with this Plan. The chosen partner must be able to comply with Site security requirements and Site management processes outlined in this Plan.
- The partner must have sufficient insurance to cover any damages caused during grazing of the Site.
- The seed mix has been formulated to be used for livestock grazing and to also function well if livestock grazing is not used.

5.6.1 Site Setup for Grazing

If an appropriate partner is identified to provide livestock grazing, portions of the Site will be managed with rotational grazing, wherein animals are moved periodically among the four paddocks within each grazing unit, with the aim of maintaining a vegetation height of 10 to 12 inches across the portions of the Site that are grazed. The area of the Site to be grazed will be divided into grazing units of approximately 16 acres each in preparation for grazing, although grazing unit size may change with input from the grazing partner. The number of grazing units used in any given year will be determined at the beginning of each growing season based on the number of acres to be grazed and the number of sheep available for grazing. For best outcomes for pollinator species, it is recommended that no more than 50 percent of the available forage be removed by grazers. The preferred method for dividing the Site is poly-wire or net electric fencing with plastic step-in poles; the grazing operator shall consult with the Summit Lake before other options are installed. Sensitive areas will also be fenced off to avoid inadvertent disturbance. The electric fencing shall be grounded independently of the Project infrastructure, with the grounding stakes at least 66 feet from the Project's grounding systems. The grazing operator shall consult Gopher State One Call before siting the grounding stakes and take underground utilities and travel corridors into consideration when placing the grounding stakes. The energizing unit for the electric fence must be independent of the solar facility infrastructure. The energizer can run on 110 Volt electrical current or be charged from a battery. The grazing operator shall be responsible for any damage to the solar facility infrastructure due to improper setup or maintenance of the electric fence. Fencing for sheep will not be greater than 5 feet in height, which should not significantly impact wildlife movement.

The grazing rotation in each 16-acre grazing unit will be managed by dividing the unit into four, four-acre paddocks (e.g., unit 1, paddocks A-D), which will be grazed over the course of one

month. For the first week of the month, the sheep in each unit will graze Paddock A. For the second week, the sheep will graze Paddock B, and so on. This pattern will result in each paddock being grazed for one week and rested for three weeks each month. Grazing will continue for the entire growing season (approximately May 15 to September 15).

When livestock are grazing each unit, they will need to be provided with drinking water. The method of watering the flock will be left to the grazing operator, with approval from Summit Lake. A mobile watering trough, especially one that does not kill vegetation while it remains in place, is preferred. Moving the watering trough from paddock to paddock as the flock moves will reduce damage to the vegetation under the trough and prevent areas of dead vegetation from forming. Watering shall occur as near to the center of the paddock as possible; water is an attractant, and a trough set too far to a paddock side or corner can lead to uneven grazing of the paddock.

5.6.2 Stocking Rate and Management

The number of sheep in a grazing unit at any time is the stocking rate. The standard way to describe the stocking rate, or grazing pressure, is by animal unit month (AUM). One animal unit is 1,000 pounds of livestock, and one AUM is 1,000 pounds of livestock grazing for one month. AUM is usually calculated on a per acre basis, so the final unit for stocking rate is AUM/acre. If the livestock being used to graze are sheep, depending on the variety of sheep used, 1 animal unit is approximately six ewes. If grazing units are 16 acres each (as described previously), this would mean an initial stocking rate of about 50 sheep per unit. Each 16-acre grazing unit would start with 50 sheep grazing Paddock A for one week, then all 50 sheep will be moved to Paddock B for the second week, then Paddock C in the third week, then Paddock D in the fourth week, and then back to Paddock A to start the rotation over again. Since the Site is anticipated to cover approximately 1,500 acres, grazing the entire Site would require approximately 94 grazing units and 4,700 sheep. The actual number of sheep used will depend on the amount of forage present and will be adjusted by the grazing partner throughout the growing season.

The grazing partner shall be responsible for monitoring the response of the vegetation to grazing. The management goal is to have an average vegetation height of 10 to 12 inches when the livestock are first moved into a paddock and to remove the livestock when the vegetation is an average of 6 to 8 inches. If grazing does not achieve the desired vegetation height and is shading the arrays, the Contractor shall immediately contact Summit Lake and be responsible for mowing the paddock to a uniform height of 4 to 6 inches. The Contractor shall determine with Summit Lake a change in stocking rate to improve the effect of grazing in the future. The grazing partner shall have access to additional livestock in case the stocking rate needs to be increased to achieve the vegetation management goal. Should the entire Site be found to have met the vegetation height and forage removal, the livestock will be relocated offsite until grazing management is once again necessary.

If maintenance by grazing is no longer feasible or desired, vegetation height can be managed by mowing as outlined in Section 5.2.1 of this Plan.

6.0 LONG-TERM MONITORING

Long-term monitoring methods include quantitative and qualitative measures to assess how well the Project goals and performance standards are being achieved.

- Quantitative techniques allow for comparisons of subsequent reporting to understand the progression of vegetation establishment over time. Vegetation is

sampled using standardized techniques with fixed sample locations and photo points and includes percent vegetation cover and estimated species richness.

- Qualitative monitoring consists of documentation of onsite vegetation through visual inspections.

Long-term monitoring will evaluate seed mixes and associated planting areas for establishment including the number of species present and percent cover; presence of invasive species, and subsequent management activities needed, to include both species on site and early detection of new invasions. Three monitoring visits will generally occur in the spring, summer, and fall.

6.1 Monitoring Protocol

Vegetation monitoring shall occur three times per year during the Establishment Phase (Years 1 to 5) and annually thereafter over the lifetime of the Project. During the Establishment Phase, inspections shall occur three times in the growing season to accurately document the presence of installed native species: late May/early June, mid-July, and late August/early September. After the Establishment Phase has concluded, inspections shall occur once per year, in mid-July. Once every five years during the Management Phase, inspections shall occur three times during the year, on the same schedule as the Establishment Phase, to record the continued presence of native species across the growing season.

The monitoring protocol shall include both microplots and a meander survey. Microplots provide accurate data for the Site but cover a small area. Vegetation can be patchy due to microtopography and other factors, so scattered microplots have the potential to miss species assemblages or new invasive species populations. For this reason, a meander survey shall also be conducted to provide a broad assessment of vegetation across the Site.

Microplot surveys shall be conducted during each inspection in the Establishment Phase. During the Management Phase, surveys should be undertaken at a time when spring- and fall-blooming species can be identified, usually July; the Monitor should assess the best timing for microplot surveys based on the advancement of the growing season. 50 microplots of 1 meter by 1 meter each shall be distributed at locations that represent conditions across the Project Site. For instance, lowland and upland areas should be sampled in proportion to their acreage. Microplots will be first selected using available maps and air photos, with the final location selected in the field on the day of sampling to represent the general area of the microplot. Before entering the field, the Monitor will provide the project with a map of the general locations of the 50 microplots. In each microplot all plant species present shall be recorded and assessed using a 1 to 10 scale (1 = $\leq 10\%$, 2 = $> 10\%$ but $\leq 20\%$, etc.), based on the percent cover of the species in the microplot. The total percentage of vegetative cover and bare ground will also be recorded.

While traversing the Site from microplot to microplot, the Monitor will follow a meandering path, recording all plants species seen. Upon completing the meander survey, each plant species recorded will be assessed on a 1 to 4 scale (1 = $\leq 10\%$, 2 = $> 10\%$ but $\leq 30\%$, 3 = $> 30\%$ but $\leq 50\%$, 4 = $> 50\%$) based on the percent cover of the species across the entire Site along the meander path.

After each survey event, the percent cover of native and noxious plant species in microplots and along the meander survey, the total native and invasive vegetation cover and the total native species richness will be entered in an Excel spreadsheet. Each survey event's data will be compared to past survey event data to detect positive, negative, or neutral trends. A positive trend

would be decreasing cover by invasive plants and increasing cover by native plants from one survey event to the next.

Each monitoring visit shall also conduct a hazard assessment. While on Site and during the meander survey, the Monitor shall record the location of noxious weeds/invasive species, adventive trees/shrubs, large areas of bare soil, areas of significant erosion, and damage to the vegetative screening area. Any observed significant erosion or damage to the vegetative screening area should be reported to the Owner immediately. The remaining hazards will be compiled in an annual report (see Section 6.4). Hazard assessments should also be conducted by the Contractor any time they are on Site performing vegetation management. The Contractor hazard assessments should be submitted to the Monitor for review and inclusion in the annual report.

6.2 Targets and Projected Outcomes

6.2.1 Native Vegetation Targets

A typical best practice for achieving soil stabilization and water quality on solar conversion sites is to include a minimum of 15 native species (graminoids and forbs) when using native vegetation (BWSR, 2019). Vegetation management should result in a diverse plant community dominated by native species and lack noxious and prohibited species, as outlined in this Plan. Construction stormwater permits, local requirements, and regulations may impose additional requirements on the final quality and performance of native plantings.

The following are typical goals for native revegetation and will be revised when targets for the Project are identified. Short-term goals are goals applicable to the post-construction establishment phase of the proposed Project in Years 1 to 5. Long-term goals are defined as goals beyond Year 5, following implementation of the short-term goals.

Short-Term Goals:

- Comply with permit conditions for site revegetation, per the Minnesota Pollution Control Agency (MPCA) Construction Stormwater General Permit (General Permit).
- After the first growing season, vegetate at least 70 percent of the Site, and ideally 80 percent of the Site.
- Establish sustainable, low grow and minimal mow, diverse, perennial grassland community, appropriate to conditions on 70 percent of the Site and comprised of 90 percent native vegetation by Year 5.
- Implement cover crops to effectively assist in establishment of native vegetation, if practicable.
- Manage invasive species and noxious weeds per Minn. Stat., Sections 18.75 to 18.78, and 18.86.
- By the end of the Establishment Phase (approximately 36 to 60 months after vegetation installation), at least 95 percent of the Site shall be vegetated, and at least 90 percent of the cover shall be comprised of native species. Six or more

species of planted native graminoids and 12 or more species of planted native forbs shall be well-established across the Project.

- Install and establish vegetative screening as requested. The landscaping screening area should be established, with limited ongoing plant mortality, within one year of installation. At the end of the establishment phase, 80 percent of the installed shrubs and trees shall be present in the landscaping/screening area.

Long-Term Goals:

- Maintain 95 percent of the Site in a vegetated state, and at least 90 percent of the cover comprised of native species.
- Establish six or more species of planted native graminoids and 12 or more species of planted native forbs across the Site.
- Maintain a mature landscaped screen that minimizes views of the solar array from an adjacent target parcel over the life of the Project.
- Establish a Site that is suitable for haying and/or grazing during facility operations, if determined to be a viable management strategy following construction. Accommodate vegetative management of the Site using traditional vegetative management methods for areas not managed by haying or grazing.
- Prioritize the implementation of all required vegetation management activities for safe and efficient operations support including woody species control, height control of herbaceous species, wet area management, and landscape/screening management.

6.2.2 Noxious Weeds and Problem Plants

All prohibited noxious weeds and other plants previously identified in Tables 5.1.1-1, 5.1.1-2, and 5.1.1-3 will be treated repeatedly with herbicide and/or mowed, where appropriate, at a frequency sufficient to prevent seed set and to remove target weeds over time. The following are typical targets for controlling weeds and problem plants:

- Each treatment will show evidence of at least 90 percent of the target vegetation having been affected by herbicide or removed.
- Two weeks after treatment, at least 95 percent of all plants treated with herbicide will be removed, dead, or dying within any 100 square foot area.
- All herbicides must be approved by the appropriate land management agency and applied by permitted applicators.
- Applications of herbicides must also consider wind drift, which may transfer herbicides to nontarget areas and buffers or setbacks from sensitive locations such as water resources or sensitive habitats.

- By the end of the Establishment Phase (approximately 36 months after vegetation installation), all prohibited noxious and other problem plants will not exceed 5 percent aerial cover within any 100 square foot area across the Site.

6.3 Reporting

An independent third-party inspector, qualified to conduct native plant inspections and assessments and retained by Summit Lake shall prepare a report documenting the status of the established vegetation and hazards encountered during such year (i.e., a report every year for years 1 to 5 and a report for every fifth year thereafter). The report shall include the results of inspection and monitoring activities during the prior year and shall report how the vegetation on the Project Site has achieved or is achieving the goals and objectives set forth in this Plan. The report shall be submitted to the Minnesota Public Utilities Commission by February 1 of the following year in order to provide sufficient time to review the recommended actions for the upcoming growing season.

In addition to the above report content requirements, the reports shall also include descriptions of adaptive management actions to be completed in the upcoming year to meet management objections and management challenges encountered during the reporting period. These recommended actions may include, but are not limited to, mowing, spot-mowing, targeted herbicide application, or overseeding bare soil.

6.4 Adaptive Management

Every year during years 1 to 5 and every fifth year thereafter, a third-party independent monitor will be retained by the Project and produce a report summarizing the status of the vegetation established on site and identifying hazards encountered during the reporting period. This report will address any areas of noncompliance and plan targeted remediation efforts for the upcoming reporting period, including altering the timing or extent of mowing or herbicide application, adjusting the rate or formulation of herbicide applied, or conducting targeted overseeding of appropriate seed mixes. The report will also record the presence and location of any noxious or invasive weeds to be treated, which will both guide the Contractor and document changes in the vegetation establishment and management approach over time. This protocol will ensure that timely management activities reflect reporting from the previous monitoring observations.

7.0 REFERENCES

- Board of Water and Soil Resources (BWSR). 2019. Sample Specifications for the Establishment of Native Vegetation as Part of Habitat Friendly Solar Projects. Available online at: [Solar Project Seeding Specifications-5-9-19_0.pdf](#)
- BWSR. 2022. *Native Vegetation Establishment and Enhancement Guidelines*. Available online at: [Native Vegetation Establishment and Enhancement Guidelines](#)
- Dewitz, J. and U.S. Geological Survey (USGS). 2021. National Land Cover Database (NLCD) 2021 Products. Available online at: <https://www.usgs.gov/data/national-land-cover-database-nlcd-2021-products>. Accessed November 2024.
- Eggers, S.D. and D.M. Reed. 2015. Wetland Plants and Plant Communities of Minnesota and Wisconsin (Version 3.2). Published by the United States Army Corps of Engineers (USACE), St. Paul District. Available online at: <https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801>. Accessed Nov 2024.
- Federal Emergency Management Agency (FEMA). 2021. FEMA National Flood Hazard Layer. Available online at: [National Flood Hazard Layer | FEMA.gov](#). Accessed Nov 2024.
- Google Earth Pro. 2005-2021. Geospatial Aerial Analysis. Available online at: [Google Earth](#). Accessed Nov 2024.
- Minnesota Department of Commerce. 2021. Guidance for Developing a Vegetation Establishment and Management Plan for Solar Facilities. Division of Energy Resources Energy Environmental Review and Analysis.
- MDNR. 2024. Ecological Classification System, North Central Glaciated Plains Section (251B). Available online at: <https://www.dnr.state.mn.us/ecs/251B/index.html>. Accessed November 2024.
- National Oceanic & Atmospheric Administration, National Weather Service Milwaukee/Sullivan 30 Year Average Precipitation. 1981-2010. Available online at: [avg_30_year_precip.png \(800×960\) \(weather.gov\)](#). Accessed Nov 2024.
- Soil Survey Staff. 2024. Soil Survey Staff, Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture (USDA). Web Soil Survey. Available online at <https://websoilsurvey.sc.egov.usda.gov/>. Accessed November 2024.
- University of Minnesota Extension. (n.d.). *Planting native plants: Timing and techniques*. University of Minnesota Extension. <https://extension.umn.edu>
- University of Minnesota Extension. "Annual Broadleaf Weeds." University of Minnesota Extension, n.d., <https://extension.umn.edu>.
- U.S. Department of Agriculture - Natural Resources Conservation Service (USDA - NRCS). 1973. Web Soil Survey. Available online at: [Web Soil Survey \(usda.gov\)](#). Accessed Nov 2024.

USDA - NRCS. 2020. Plants Database. Available online at: [Welcome to the PLANTS Database | USDA PLANTS](#). Accessed Nov 2024.

U.S. Environmental Protection Agency (EPA). 2000. Ecoregion Download Files by State – Region 7. Available online at [wi_eco.pdf \(epa.gov\)](#). Accessed Nov 2024.

EPA. 2021. Antecedent Precipitation Tool. Available online at: <https://www.epa.gov/wotus/antecedent-precipitation-tool-apt>. Accessed Nov 2024.

USGS. 2022. Survey Topographic Maps. Available online at: [The National Map - Advanced Viewer](#). Accessed Nov 2024.

ATTACHMENT A

HABITAT FRIENDLY SOLAR SITE ASSESSMENT



Habitat Friendly Solar Site Assessment Form for Project Planning

For Solar Companies, Local Governments and Other Partners to Meet Habitat Friendly Solar Standards

Updated 12-22-23

Note: The use of state developed [solar seed mixes](#) over 70% of the plantable area of a site will result in automatically meeting the standard.

1) **PLANNED PERCENT OF PLANTABLE AREAS WITHIN PROJECT FOOTPRINT DOMINATED BY NATIVE SPECIES COVER (forbs, grasses, sedges, rushes, ferns). PROJECTS MUST HAVE A GOAL OF AT LEAST 70% COVER OF NATIVE VEGETATION TO MEET HABITAT FRIENDLY SOLAR STANDARDS**

- | | | | |
|---|------------|--------------|---------------------------------|
| ☐ 70-84% | +15 points | | |
| ☒ 85% and above | +20 points | Total Points | <input type="text" value="20"/> |

2) **PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY FORBS (not grasses, sedges and rushes)**

- | | | | |
|--|------------|--------------|--------------------------------|
| ☒ 10-19% | +5 points | | |
| ☐ 20-29% | +10 points | | |
| ☐ 30-39% | +15 points | | |
| ☐ 40 and above | +15 points | Total Points | <input type="text" value="5"/> |

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

3) **PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and moist soil mixes can be combined)**

- | | | | |
|---|------------|--------------|---------------------------------|
| ☒ 10-19 species | +5 points | | |
| ☐ 20-25 species | +10 points | | |
| ☐ 26-39 species | +15 points | | |
| ☐ 40 and above | +20 | Total Points | <input type="text" value="10"/> |

4) **PLANNED SEASONS WITH AT LEAST THREE BLOOMING SPECIES (check all that apply)**

- | | | | |
|--|-----------|--------------|--------------------------------|
| ☒ Spring (April-May) | +4 points | | |
| ☒ Summer (June-August) | +3 points | | |
| ☐ Fall (September-October) | +3 points | Total Points | <input type="text" value="7"/> |

See BWSR [pollinator toolbox](#) about bloom season

5) **SITE PLANNING**

- | | | | |
|---|------------|--------------|---------------------------------|
| ☒ Detailed establishment and management plan (see notes) | +20 points | | |
| ☒ Seed Mixes are composed of at least 40 seeds per square foot | +5 points | | |
| ☐ All seed genetic origin is within 200 miles of site (see notes) | +5 points | | |
| ☐ At least .5% milkweed cover within each seed mix | +5 points | | |
| ☒ Plant species with more than 3 flower colors in mixes (see notes) | +5 points | Total Points | <input type="text" value="30"/> |

6) **INSECTICIDE RISK**

- | | | | |
|--|------------|--------------|---------------------------------|
| ☐ Planned on-site insecticide use (excluding buildings/electrical boxes, etc.) | -30 points | | |
| ☒ Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas. | +10 points | Total Points | <input type="text" value="10"/> |

GRAND TOTAL

Gold Standard 85+ points
Meets Standard 70 points

Project Name: Summit Laker Solar [Array Native Seed Mix]
Project County: Nobles County
Project Size:
Evaluation Date: 12/3/2025

See notes related to the questions on the back side of this form

Notes:

Estimates of percent “cover” should be based on “absolute cover” (the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above).

All project plans must include detailed vegetation establishment and management specifications to ensure the success of projects (see sample specifications on [BWSR’s Habitat Friendly Solar Webpage](#)).

Seed mixes provided for projects need to show seeds per square foot for each species in the mix.

Question 1 - Native plant species provide benefits to a wide range of pollinators and other wildlife species. The [Minnesota DNR List](#) should be used to determine if a species is native. Native species include wildflowers, graminoids (grasses, sedges, rushes), shrubs and trees. The percent areal cover of native vs. non-native species should be estimated based on the seeds per square foot of all species to be used across all seed mixes. As non-native fescues tend to have a high seeding rate, but also small seeds with a lower germination success the number of fescue seeds per square foot in mixes can be decreased by half when calculating native species dominance of mixes. This should result in a more accurate representation of native dominance.

Question 2 - There is a focus on native forbs on this assessment form to maximize benefits to the approximately 500 species of native bees in Minnesota, honeybees and other pollinators. Forbs are (flowering plants that are not woody or graminoids such as grasses and sedges) and can include introduced clovers and other non-native species beneficial to pollinators. No noxious weeds or invasive plants can be included in the total.

Question 3 - Plant diversity adds to wildlife benefits, as well as the resiliency of projects. For this question, planned native and non-native species from all seed mixes can be combined for the total.

Question 4 - Having blooming species throughout the season helps support pollinator species. See BWSR’s [Pollinator Toolbox](#) for a listing of bloom seasons for species.

Question 5 - To meet requirements for a long-term management plan projects must provide information about:

- Timing of yearly inspections,
- A detailed native vegetation establishment plan with detailed instructions for contractors.
- A detailed maintenance schedule for the first three years of the project (establishment period) listing timing of establishment mowing/ trimming, spot herbicide application, prescribed grazing or other management actions.
- Proposed maintenance schedule for year four and beyond.
- List of weed species that may become problematic at the site and how they will be managed if needed.

All mixes being used for the project must include at least 40 seeds per square foot to receive points for the first category. Using seed with a genetic origin within 200 miles helps ensure that species will be adapted to site conditions and decrease the risk of introducing invasive species in seed mixes. Please refer to pages 7-8 of [BWSR’s Native Vegetation Establishment and Enhancement Guidelines](#) for more information about appropriate seed sources. To obtain points for including milkweed in projects mixes must contain at least .5% milkweed seed based on seeds per square foot, or a combination of seed and containerized plugs could be used with a plan to cover .5% of the ground surface with milkweed. Flower colors can include blue, pink, purple, yellow, white, orange, red, green and brown. The Minnesota Wildflowers website allows for searching species based on flower color [Minnesota Wildflowers Categorized by Color](#).

Question 6 - It is important that seeds treated with insecticides are not used at project sites and that insecticides are not being sprayed at the site. To meet requirements for communication/registration with local landowners/applicators about the need to prevent drift from adjacent areas, information provided can be in the form of email communication or copies of letters. Communication must be provided to all landowners adjacent to the property including municipalities.

Send completed forms, project plans, seed mixes (showing seeds per square foot for each species) and any communications with pesticide applicators to BWSR at Dan.Shaw@state.mn.us as well as any local government staff involved in reviewing the project.



Habitat Friendly Solar Site Assessment Form for Project Planning

For Solar Companies, Local Governments and Other Partners to Meet Habitat Friendly Solar Standards

Updated 12-22-23

Note: The use of state developed [solar seed mixes](#) over 70% of the plantable area of a site will result in automatically meeting the standard.

- 1) **PLANNED PERCENT OF PLANTABLE AREAS WITHIN PROJECT FOOTPRINT DOMINATED BY NATIVE SPECIES COVER** (forbs, grasses, sedges, rushes, ferns). **PROJECTS MUST HAVE A GOAL OF AT LEAST 70% COVER OF NATIVE VEGETATION TO MEET HABITAT FRIENDLY SOLAR STANDARDS**

☐ 70-84%	+15 points	Total Points	20
☒ 85% and above	+20 points		

- 2) **PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY FORBS** (not grasses, sedges and rushes)

☐ 10-19%	+5 points	Total Points	10
☒ 20-29%	+10 points		
☐ 30-39%	+15 points		
☐ 40 and above	+15 points		

Note: Projects may have “array” mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

- 3) **PLANNED COVER DIVERSITY** (# of species in seed mixes; numbers from upland and moist soil mixes can be combined)

☐ 10-19 species	+5 points	Total Points	10
☒ 20-25 species	+10 points		
☐ 26-39 species	+15 points		
☐ 40 and above	+20		

- 4) **PLANNED SEASONS WITH AT LEAST THREE BLOOMING SPECIES** (check all that apply)

☒ Spring (April-May)	+4 points	Total Points	7
☒ Summer (June-August)	+3 points		
☐ Fall (September-October)	+3 points		

See BWSR [pollinator toolbox](#) about bloom season

- 5) **SITE PLANNING**

☒ Detailed establishment and management plan (see notes)	+20 points	Total Points	30
☒ Seed Mixes are composed of at least 40 seeds per square foot	+5 points		
☐ All seed genetic origin is within 200 miles of site (see notes)	+5 points		
☐ At least .5% milkweed cover within each seed mix	+5 points		
☒ Plant species with more than 3 flower colors in mixes (see notes)	+5 points		

- 6) **INSECTICIDE RISK**

☐ Planned on-site insecticide use (excluding buildings/electrical boxes, etc.)	-30 points	Total Points	10
☒ Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas.	+10 points		

GRAND TOTAL

Gold Standard 85+ points
Meets Standard 70 points

Project Name: Summit Lake Solar [Perimeter Native Seed Mix (30")]
Project County: Nobles
Project Size:
Evaluation Date: 12/3/2025

See notes related to the questions on the back side of this form

Notes:

Estimates of percent “cover” should be based on “absolute cover” (the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above).

All project plans must include detailed vegetation establishment and management specifications to ensure the success of projects (see sample specifications on [BWSR’s Habitat Friendly Solar Webpage](#)).

Seed mixes provided for projects need to show seeds per square foot for each species in the mix.

Question 1 - Native plant species provide benefits to a wide range of pollinators and other wildlife species. The [Minnesota DNR List](#) should be used to determine if a species is native. Native species include wildflowers, graminoids (grasses, sedges, rushes), shrubs and trees. The percent areal cover of native vs. non-native species should be estimated based on the seeds per square foot of all species to be used across all seed mixes. As non-native fescues tend to have a high seeding rate, but also small seeds with a lower germination success the number of fescue seeds per square foot in mixes can be decreased by half when calculating native species dominance of mixes. This should result in a more accurate representation of native dominance.

Question 2 - There is a focus on native forbs on this assessment form to maximize benefits to the approximately 500 species of native bees in Minnesota, honeybees and other pollinators. Forbs are (flowering plants that are not woody or graminoids such as grasses and sedges) and can include introduced clovers and other non-native species beneficial to pollinators. No noxious weeds or invasive plants can be included in the total.

Question 3 - Plant diversity adds to wildlife benefits, as well as the resiliency of projects. For this question, planned native and non-native species from all seed mixes can be combined for the total.

Question 4 - Having blooming species throughout the season helps support pollinator species. See BWSR’s [Pollinator Toolbox](#) for a listing of bloom seasons for species.

Question 5 - To meet requirements for a long-term management plan projects must provide information about:

- Timing of yearly inspections,
- A detailed native vegetation establishment plan with detailed instructions for contractors.
- A detailed maintenance schedule for the first three years of the project (establishment period) listing timing of establishment mowing/ trimming, spot herbicide application, prescribed grazing or other management actions.
- Proposed maintenance schedule for year four and beyond.
- List of weed species that may become problematic at the site and how they will be managed if needed.

All mixes being used for the project must include at least 40 seeds per square foot to receive points for the first category. Using seed with a genetic origin within 200 miles helps ensure that species will be adapted to site conditions and decrease the risk of introducing invasive species in seed mixes. Please refer to pages 7-8 of [BWSR’s Native Vegetation Establishment and Enhancement Guidelines](#) for more information about appropriate seed sources. To obtain points for including milkweed in projects mixes must contain at least .5% milkweed seed based on seeds per square foot, or a combination of seed and containerized plugs could be used with a plan to cover .5% of the ground surface with milkweed. Flower colors can include blue, pink, purple, yellow, white, orange, red, green and brown. The Minnesota Wildflowers website allows for searching species based on flower color [Minnesota Wildflowers Categorized by Color](#).

Question 6 - It is important that seeds treated with insecticides are not used at project sites and that insecticides are not being sprayed at the site. To meet requirements for communication/registration with local landowners/applicators about the need to prevent drift from adjacent areas, information provided can be in the form of email communication or copies of letters. Communication must be provided to all landowners adjacent to the property including municipalities.

Send completed forms, project plans, seed mixes (showing seeds per square foot for each species) and any communications with pesticide applicators to BWSR at Dan.Shaw@state.mn.us as well as any local government staff involved in reviewing the project.



Habitat Friendly Solar Site Assessment Form for Project Planning

For Solar Companies, Local Governments and Other Partners to Meet Habitat Friendly Solar Standards

Updated 12-22-23

Note: The use of state developed [solar seed mixes](#) over 70% of the plantable area of a site will result in automatically meeting the standard.

- 1) PLANNED PERCENT OF PLANTABLE AREAS WITHIN PROJECT FOOTPRINT DOMINATED BY NATIVE SPECIES COVER (forbs, grasses, sedges, rushes, ferns). PROJECTS MUST HAVE A GOAL OF AT LEAST 70% COVER OF NATIVE VEGETATION TO MEET HABITAT FRIENDLY SOLAR STANDARDS

☐ 70-84%	+15 points	Total Points	20
☒ 85% and above	+20 points		

- 2) PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY FORBS (not grasses, sedges and rushes)

☒ 10-19%	+5 points	Total Points	5
☐ 20-29%	+10 points		
☐ 30-39%	+15 points		
☐ 40 and above	+15 points		

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

- 3) PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and moist soil mixes can be combined)

☐ 10-19 species	+5 points	Total Points	20
☐ 20-25 species	+10 points		
☐ 26-39 species	+15 points		
☒ 40 and above	+20		

- 4) PLANNED SEASONS WITH AT LEAST THREE BLOOMING SPECIES (check all that apply)

☐ Spring (April-May)	+4 points	Total Points	6
☒ Summer (June-August)	+3 points		
☒ Fall (September-October)	+3 points		

See BWSR [pollinator toolbox](#) about bloom season

- 5) SITE PLANNING

☒ Detailed establishment and management plan (see notes)	+20 points	Total Points	30
☒ Seed Mixes are composed of at least 40 seeds per square foot	+5 points		
☐ All seed genetic origin is within 200 miles of site (see notes)	+5 points		
☐ At least .5% milkweed cover within each seed mix	+5 points		
☒ Plant species with more than 3 flower colors in mixes (see notes)	+5 points		

- 6) INSECTICIDE RISK

☐ Planned on-site insecticide use (excluding buildings/electrical boxes, etc.)	-30 points	Total Points	10
☒ Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas.	+10 points		

GRAND TOTAL

Gold Standard 85+ points
Meets Standard 70 points

Project Name: Summit Lake Solar [Wet Native Seed Mix]
Project County: Nobles
Project Size:
Evaluation Date: 12/3/2025

See notes related to the questions on the back side of this form

Notes:

Estimates of percent “cover” should be based on “absolute cover” (the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above).

All project plans must include detailed vegetation establishment and management specifications to ensure the success of projects (see sample specifications on [BWSR’s Habitat Friendly Solar Webpage](#)).

Seed mixes provided for projects need to show seeds per square foot for each species in the mix.

Question 1 - Native plant species provide benefits to a wide range of pollinators and other wildlife species. The [Minnesota DNR List](#) should be used to determine if a species is native. Native species include wildflowers, graminoids (grasses, sedges, rushes), shrubs and trees. The percent areal cover of native vs. non-native species should be estimated based on the seeds per square foot of all species to be used across all seed mixes. As non-native fescues tend to have a high seeding rate, but also small seeds with a lower germination success the number of fescue seeds per square foot in mixes can be decreased by half when calculating native species dominance of mixes. This should result in a more accurate representation of native dominance.

Question 2 - There is a focus on native forbs on this assessment form to maximize benefits to the approximately 500 species of native bees in Minnesota, honeybees and other pollinators. Forbs are (flowering plants that are not woody or graminoids such as grasses and sedges) and can include introduced clovers and other non-native species beneficial to pollinators. No noxious weeds or invasive plants can be included in the total.

Question 3 - Plant diversity adds to wildlife benefits, as well as the resiliency of projects. For this question, planned native and non-native species from all seed mixes can be combined for the total.

Question 4 - Having blooming species throughout the season helps support pollinator species. See BWSR’s [Pollinator Toolbox](#) for a listing of bloom seasons for species.

Question 5 - To meet requirements for a long-term management plan projects must provide information about:

- Timing of yearly inspections,
- A detailed native vegetation establishment plan with detailed instructions for contractors.
- A detailed maintenance schedule for the first three years of the project (establishment period) listing timing of establishment mowing/ trimming, spot herbicide application, prescribed grazing or other management actions.
- Proposed maintenance schedule for year four and beyond.
- List of weed species that may become problematic at the site and how they will be managed if needed.

All mixes being used for the project must include at least 40 seeds per square foot to receive points for the first category. Using seed with a genetic origin within 200 miles helps ensure that species will be adapted to site conditions and decrease the risk of introducing invasive species in seed mixes. Please refer to pages 7-8 of [BWSR’s Native Vegetation Establishment and Enhancement Guidelines](#) for more information about appropriate seed sources. To obtain points for including milkweed in projects mixes must contain at least .5% milkweed seed based on seeds per square foot, or a combination of seed and containerized plugs could be used with a plan to cover .5% of the ground surface with milkweed. Flower colors can include blue, pink, purple, yellow, white, orange, red, green and brown. The Minnesota Wildflowers website allows for searching species based on flower color [Minnesota Wildflowers Categorized by Color](#).

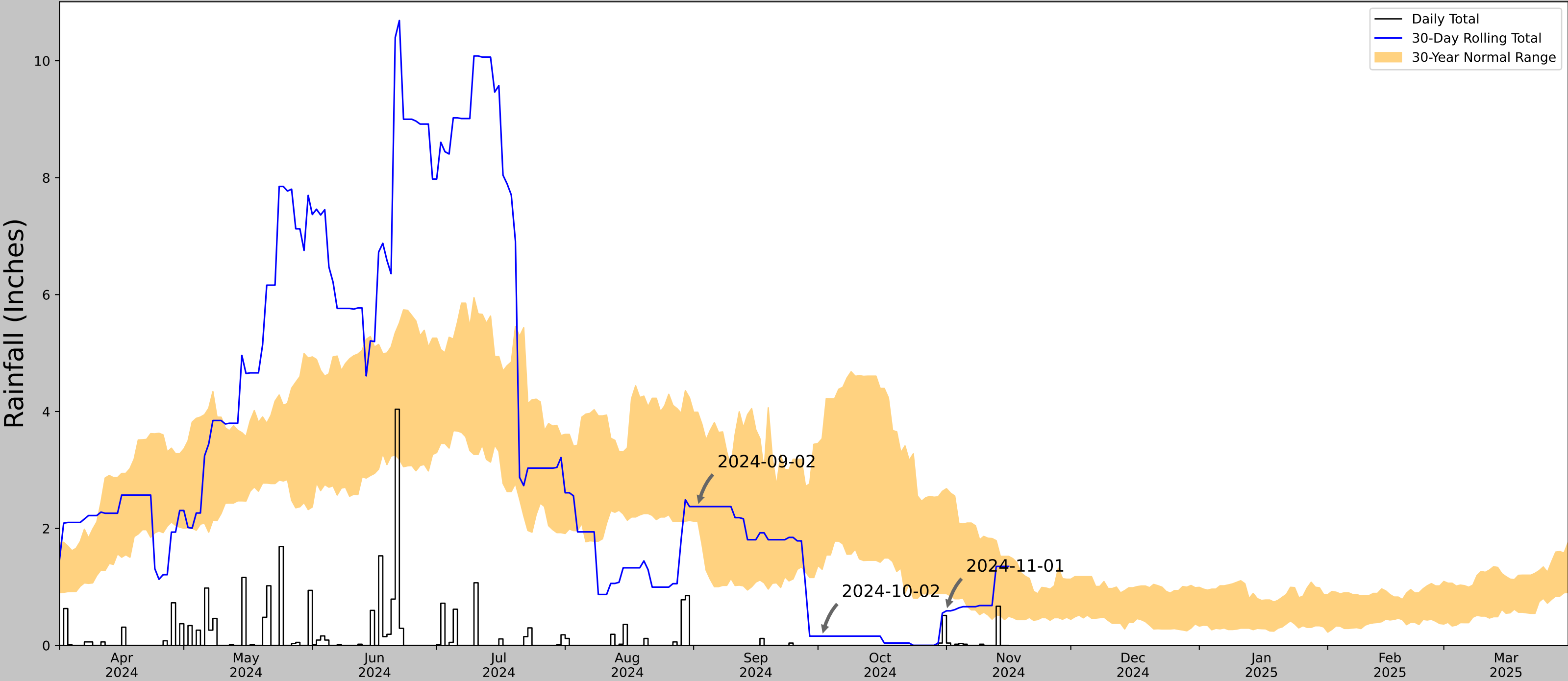
Question 6 - It is important that seeds treated with insecticides are not used at project sites and that insecticides are not being sprayed at the site. To meet requirements for communication/registration with local landowners/applicators about the need to prevent drift from adjacent areas, information provided can be in the form of email communication or copies of letters. Communication must be provided to all landowners adjacent to the property including municipalities.

Send completed forms, project plans, seed mixes (showing seeds per square foot for each species) and any communications with pesticide applicators to BWSR at Dan.Shaw@state.mn.us as well as any local government staff involved in reviewing the project.

ATTACHMENT B

PROJECT HISTORICAL CLIMATE DATA

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-11-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness (2024-10)
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-11-01	0.885039	2.680709	0.590551	Dry	1	3	3
2024-10-02	1.300787	3.536614	0.15748	Dry	1	2	2
2024-09-02	2.12126	3.988583	2.374016	Normal	2	1	2
Result							Drier than Normal - 7



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11193	86
WORTHINGTON 1.9 SW	43.6081, -95.625	1598.097	3.406	30.184	1.636	0	4
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-10-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-10-01	1.367717	3.453937	0.15748	Dry	1	3	3
2024-09-01	2.124803	3.988583	2.374016	Normal	2	2	4
2024-08-02	1.991339	3.609843	2.610236	Normal	2	1	2
Result							Drier than Normal - 9



**US Army Corps
of Engineers®**

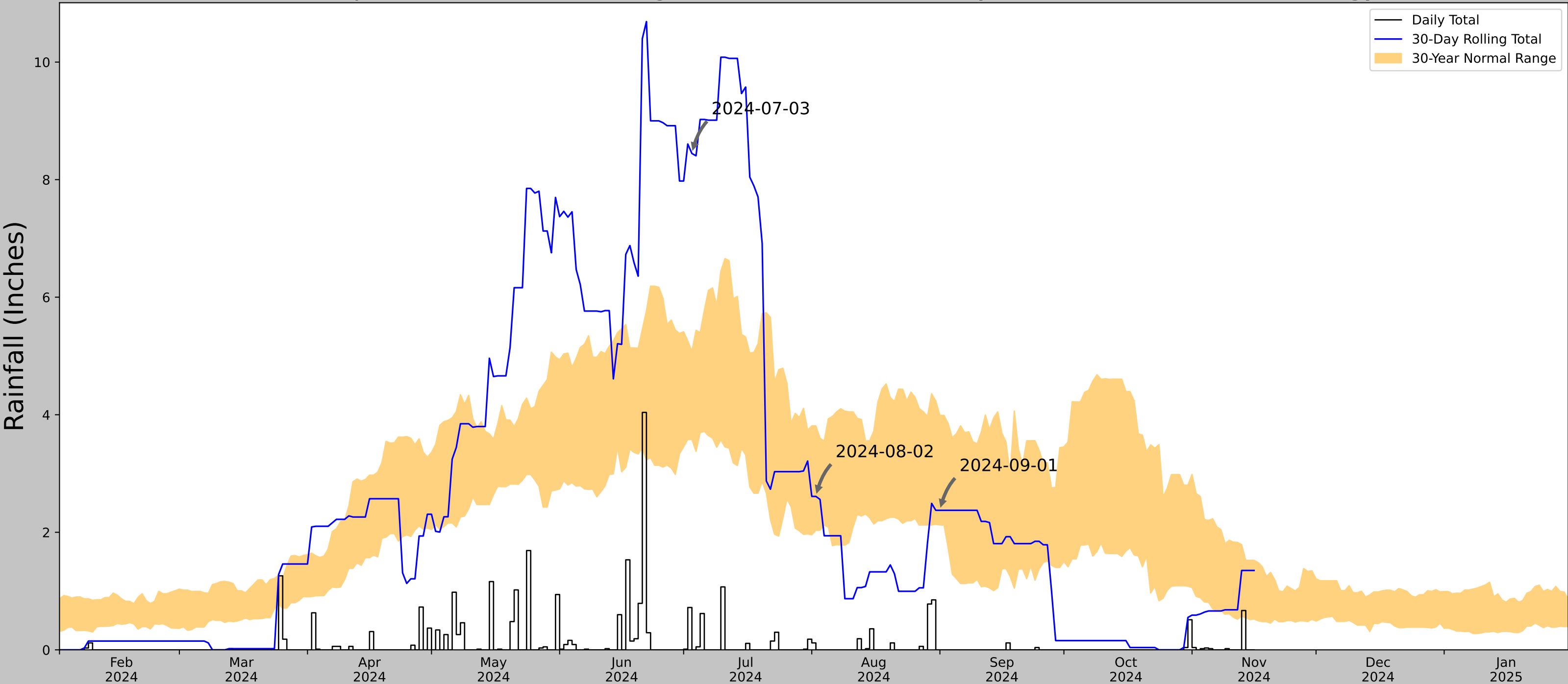
Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11193	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-09-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Moderate wetness
WebWIMP H ₂ O Balance	Dry Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-09-01	2.124803	3.988583	2.374016	Normal	2	3	6
2024-08-02	2.033465	3.81063	2.610236	Normal	2	2	4
2024-07-03	3.579134	5.080709	8.444882	Wet	3	1	3
Result							Normal Conditions - 13



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

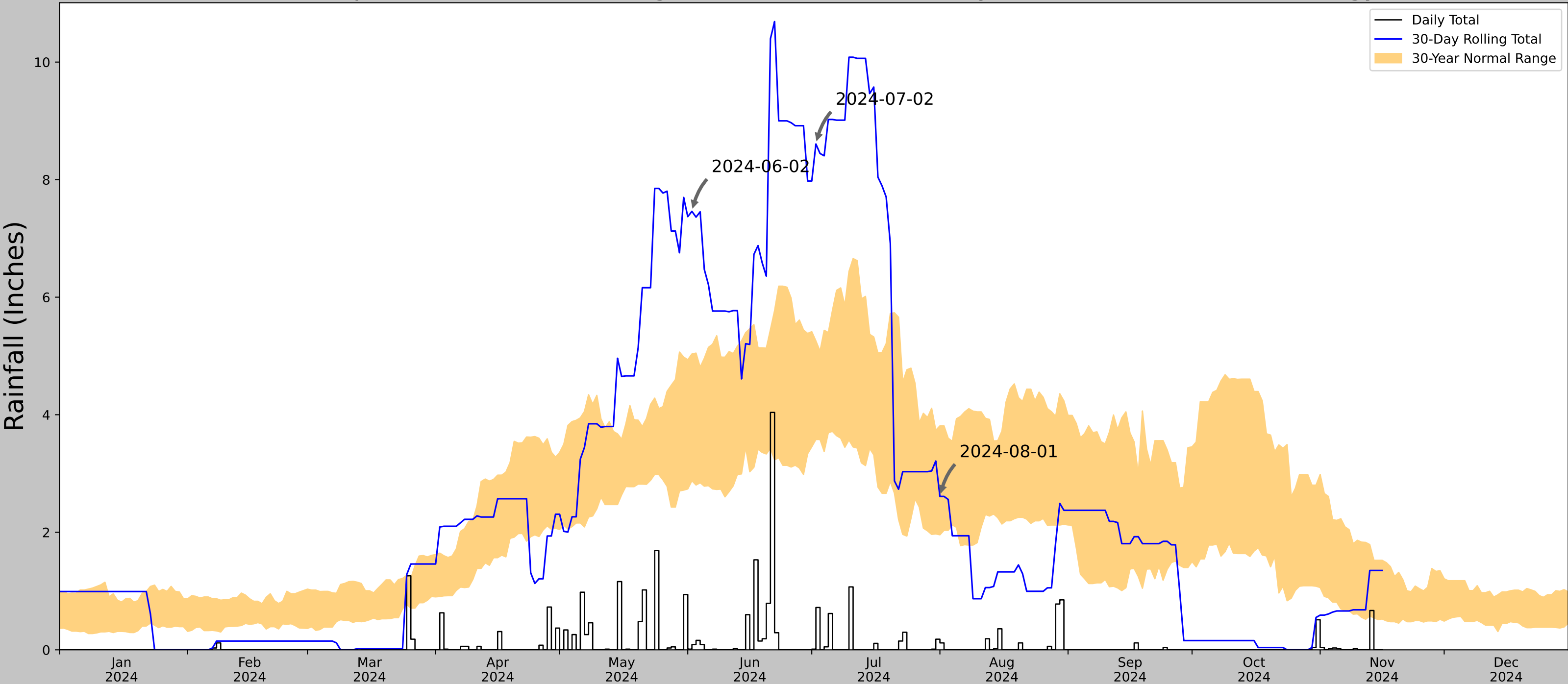
Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC
U.S. Army Corps of Engineers Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-08-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Severe wetness
WebWIMP H ₂ O Balance	Dry Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-01	1.957087	3.81063	2.610236	Normal	2	3	6
2024-07-02	3.579134	5.255512	8.606299	Wet	3	2	6
2024-06-02	2.877559	5.033858	7.46063	Wet	3	1	3
Result							Wetter than Normal - 15



**US Army Corps
of Engineers®**

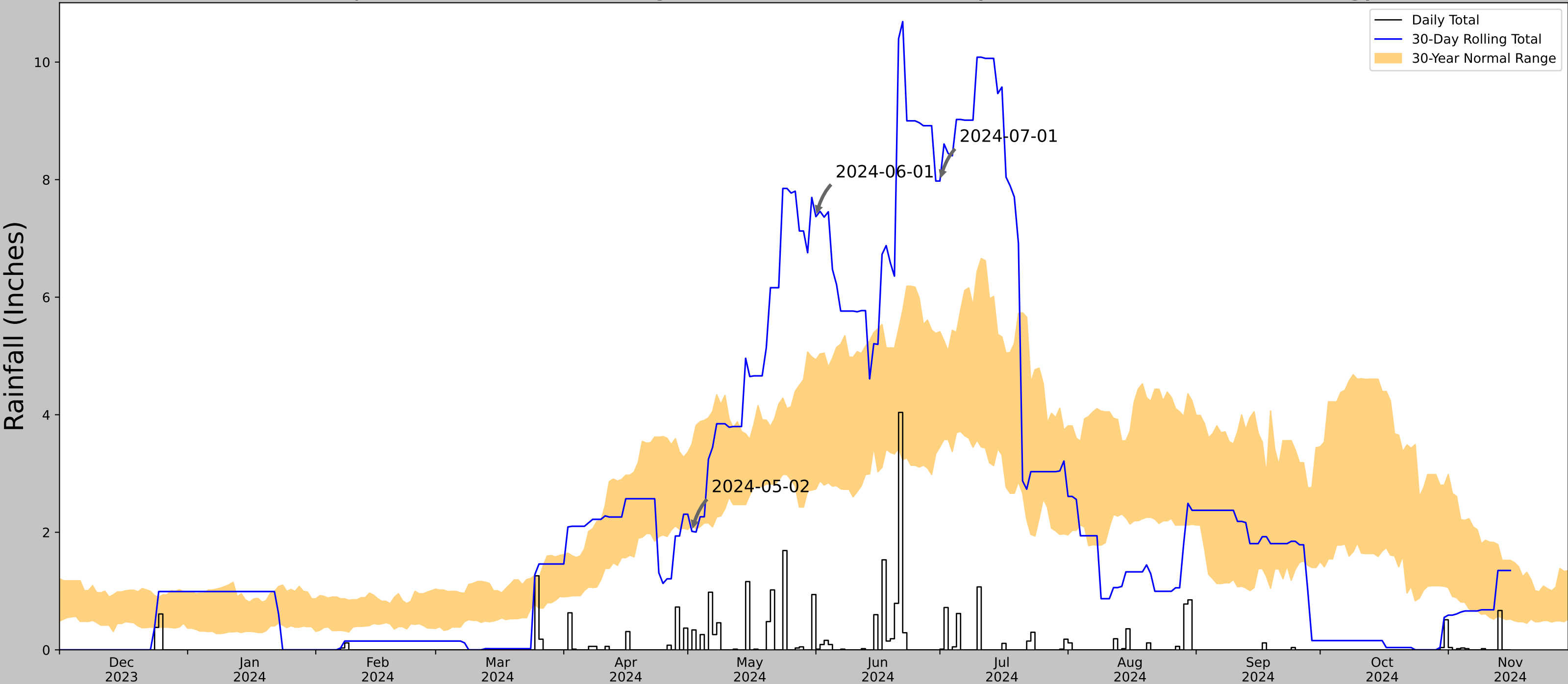
Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-07-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Extreme wetness
WebWIMP H ₂ O Balance	Dry Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-07-01	3.454331	5.412992	7.976378	Wet	3	3	9
2024-06-01	2.737402	4.93504	7.370079	Wet	3	2	6
2024-05-02	2.122835	3.497638	2.015748	Dry	1	1	1
Result							Wetter than Normal - 16



**US Army Corps
of Engineers®**

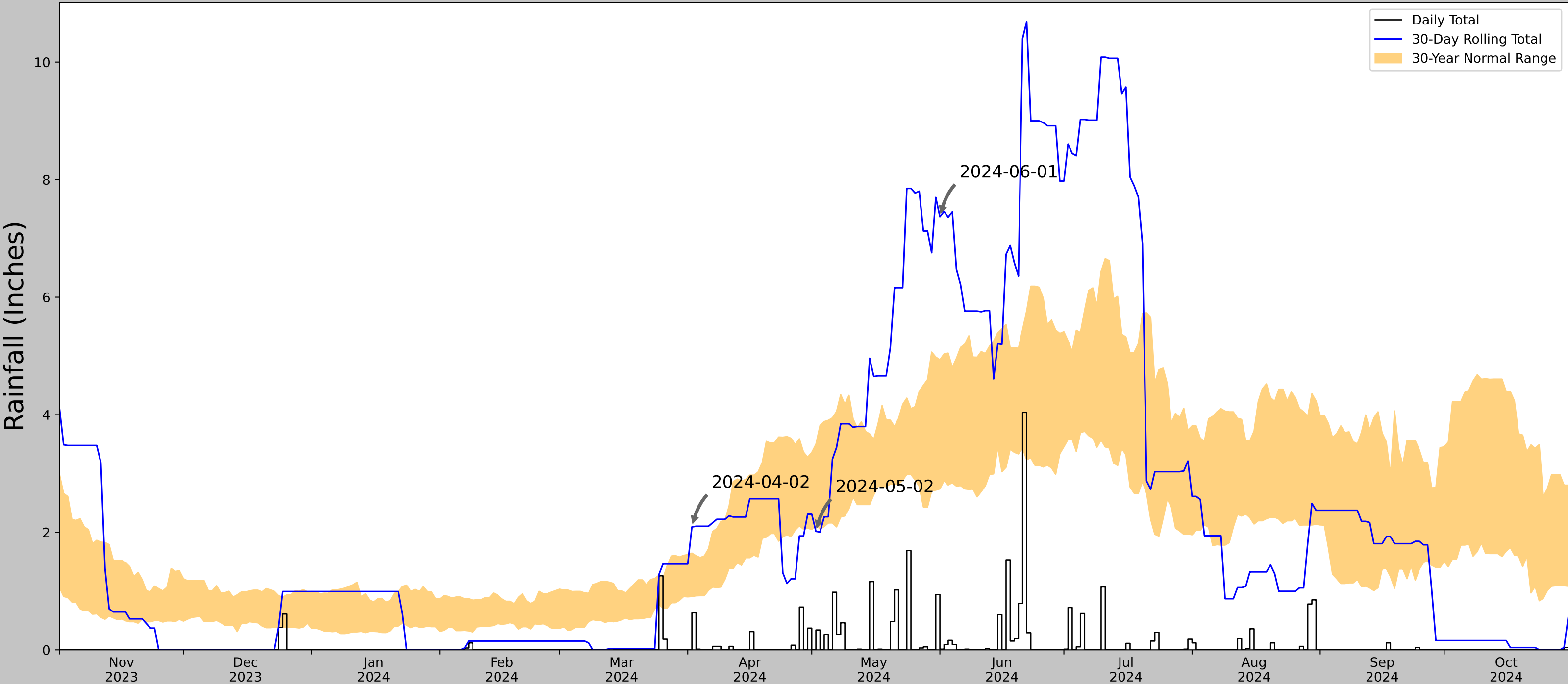
Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-06-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Extreme wetness
WebWIMP H ₂ O Balance	Dry Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-06-01	2.737402	4.93504	7.370079	Wet	3	3	9
2024-05-02	2.122835	3.497638	2.015748	Dry	1	2	2
2024-04-02	0.907087	1.646063	2.090551	Wet	3	1	3
Result							Normal Conditions - 14



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

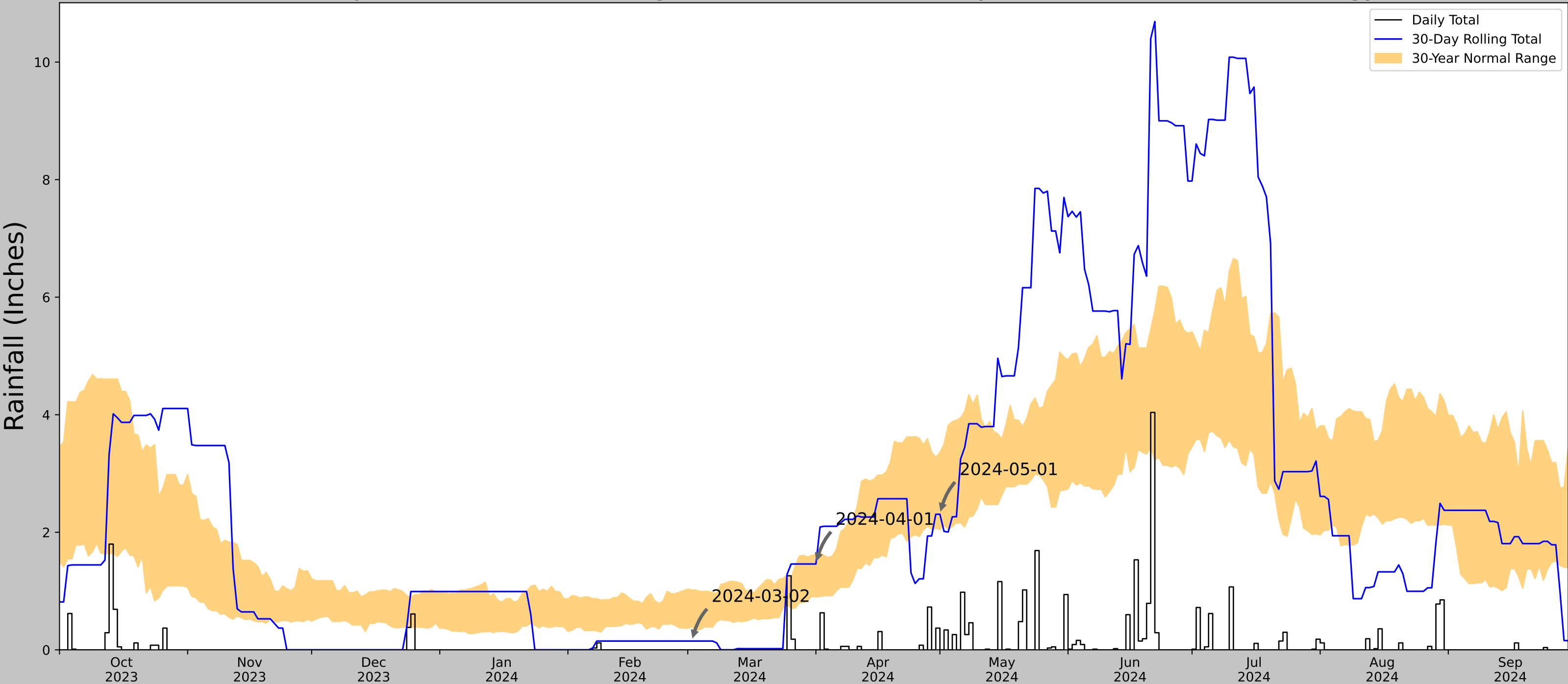
Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC
U.S. Army Corps of Engineers Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-05-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Moderate wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-01	2.047638	3.358662	2.307087	Normal	2	3	6
2024-04-01	0.901575	1.62126	1.46063	Normal	2	2	4
2024-03-02	0.393307	1.016929	0.149606	Dry	1	1	1
Result							Normal Conditions - 11



**US Army Corps
of Engineers®**

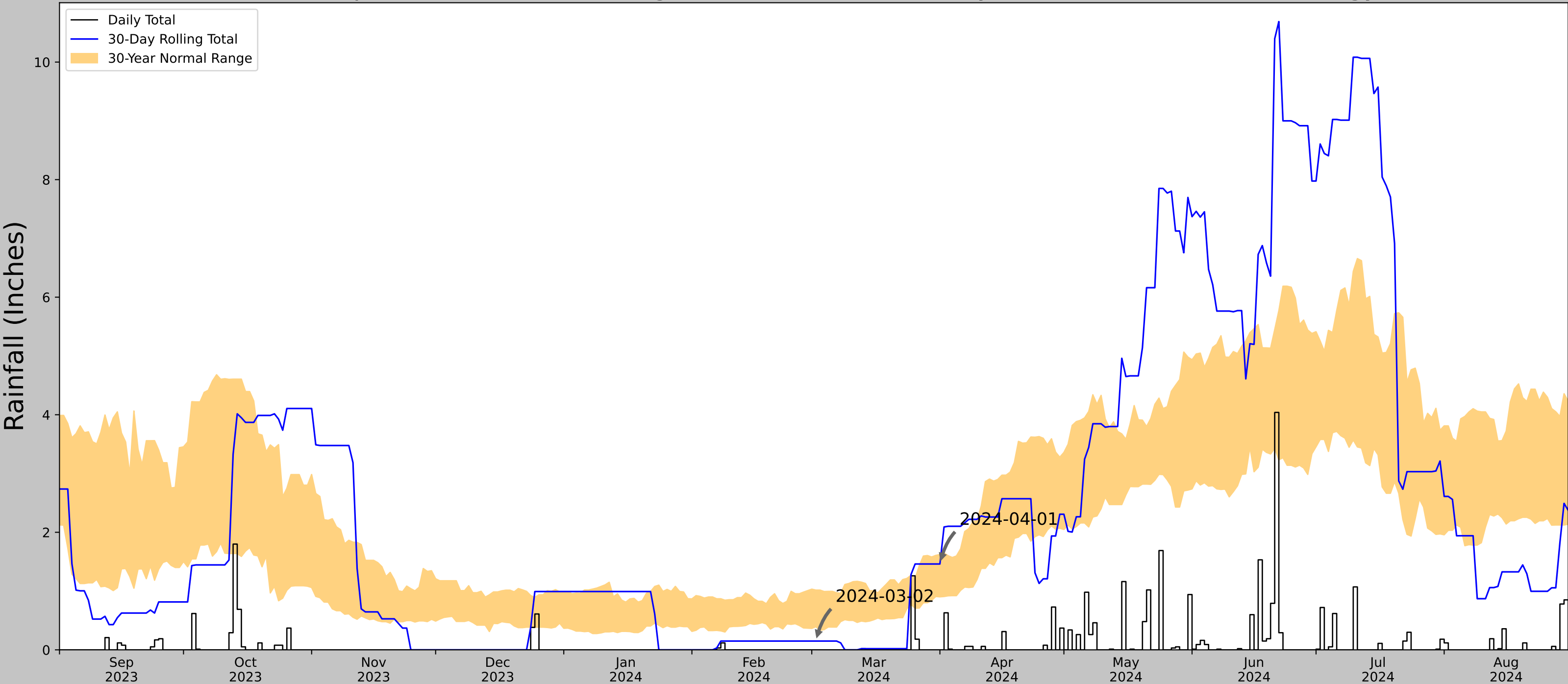
Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-04-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Moderate wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-04-01	0.901575	1.62126	1.46063	Normal	2	3	6
2024-03-02	0.393307	1.016929	0.149606	Dry	1	2	2
2024-02-01	0.31378	0.866929	0.0	Dry	1	1	1
Result							Drier than Normal - 9



US Army Corps of Engineers

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

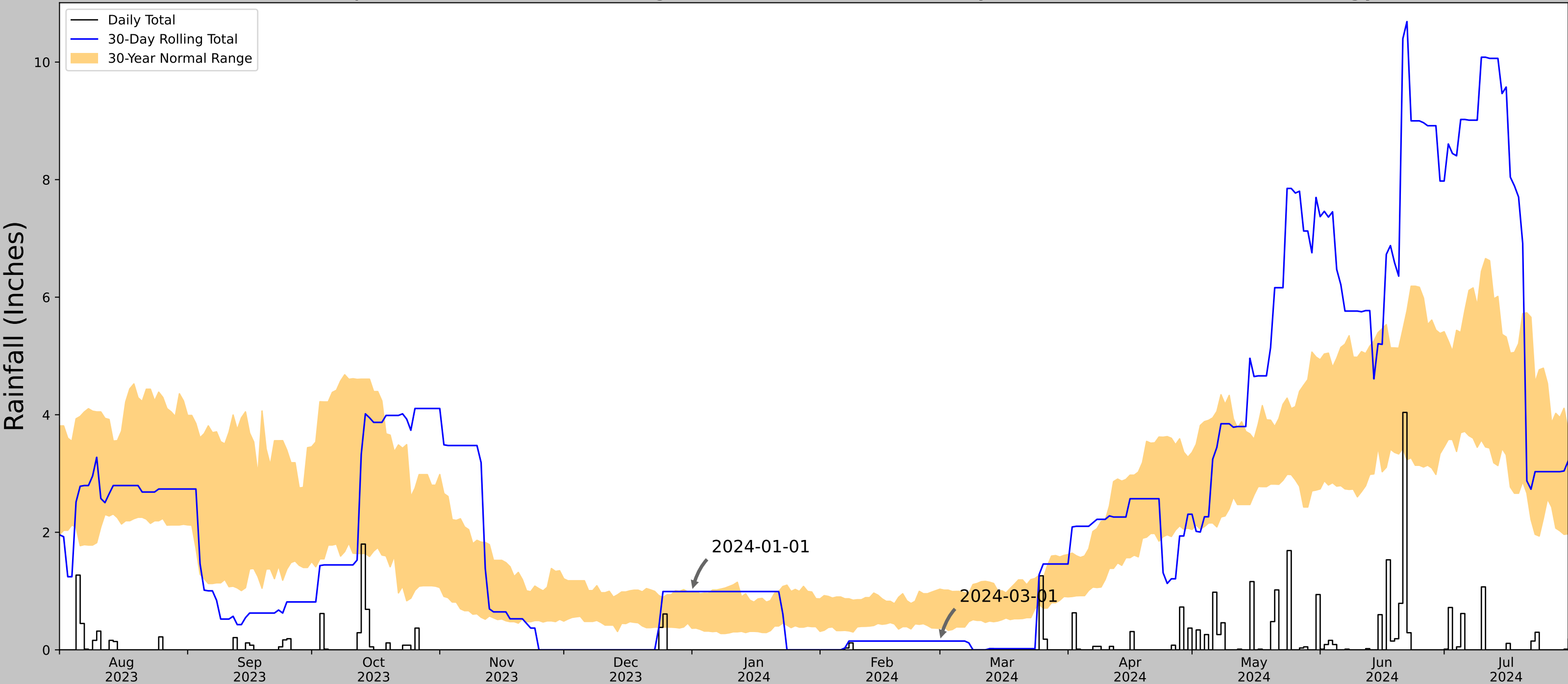
Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-03-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-03-01	0.364567	1.032677	0.149606	Dry	1	3	3
2024-01-31	0.394488	0.870472	0.0	Dry	1	2	2
2024-01-01	0.366535	0.99252	0.992126	Normal	2	1	2
Result							Drier than Normal - 7



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

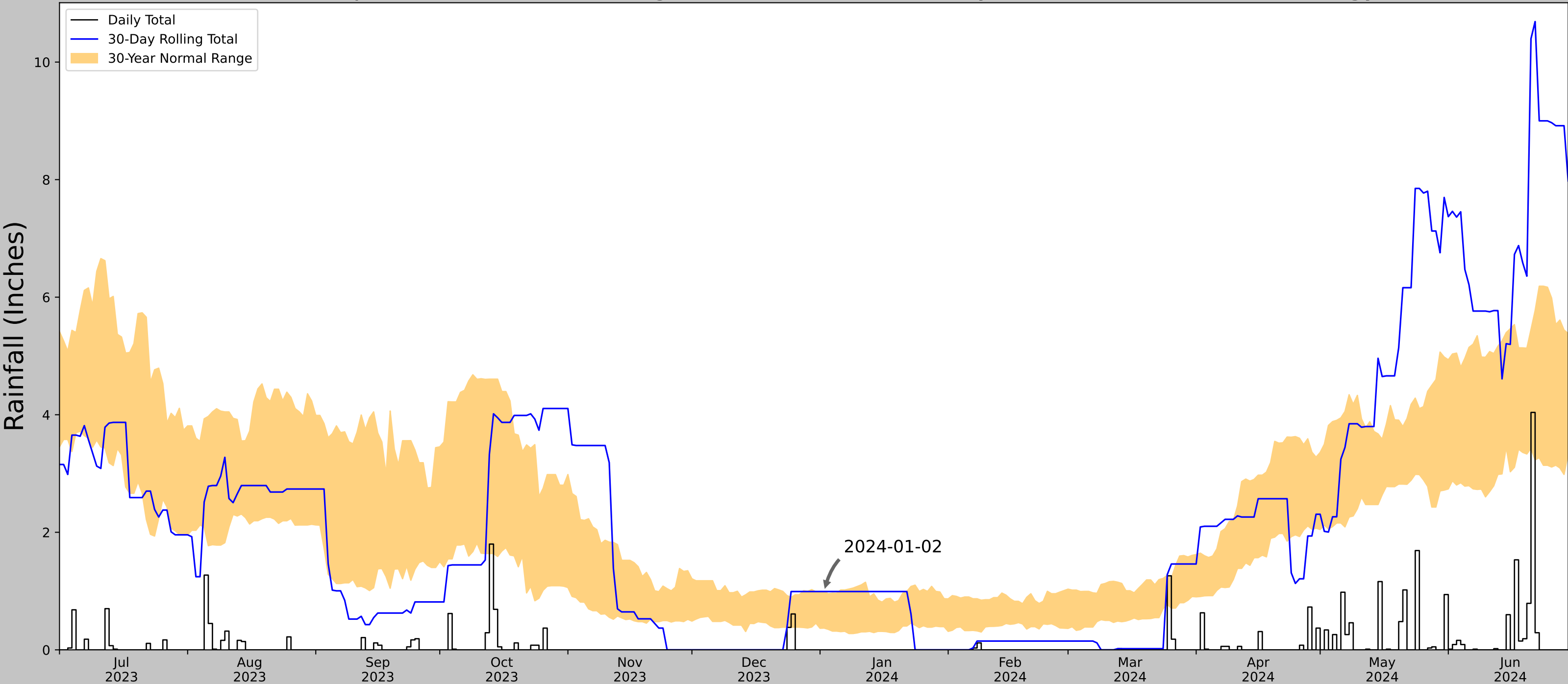
Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC
U.S. Army Corps of Engineers Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-02-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-02-01	0.31378	0.866929	0.0	Dry	1	3	3
2024-01-02	0.369685	0.991339	0.992126	Wet	3	2	6
2023-12-03	0.551181	1.175984	0.0	Dry	1	1	1
Result							Normal Conditions - 10



**US Army Corps
of Engineers®**

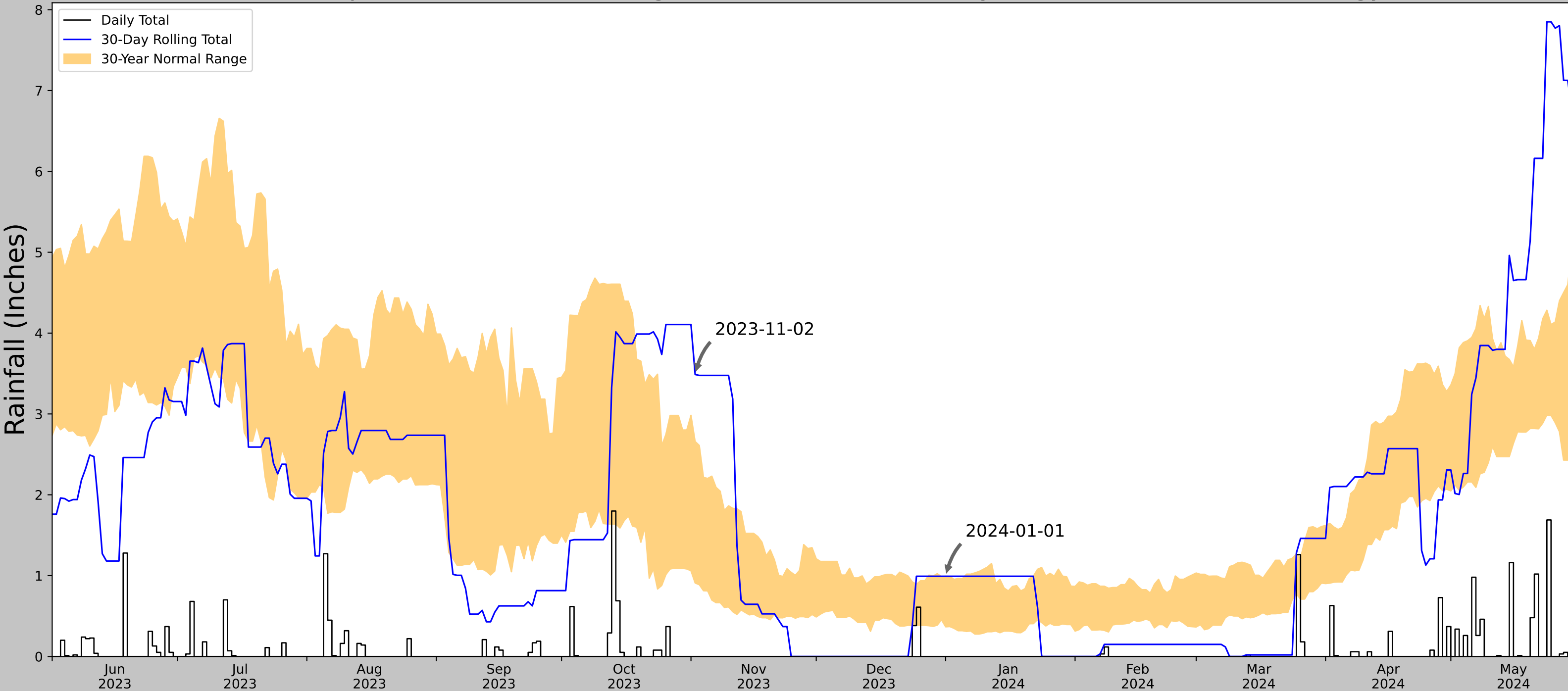
Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-01-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-01-01	0.366535	0.99252	0.992126	Normal	2	3	6
2023-12-02	0.523228	1.175984	0.0	Dry	1	2	2
2023-11-02	0.908661	2.659449	3.488189	Wet	3	1	3
Result							Normal Conditions - 11



**US Army Corps
of Engineers®**

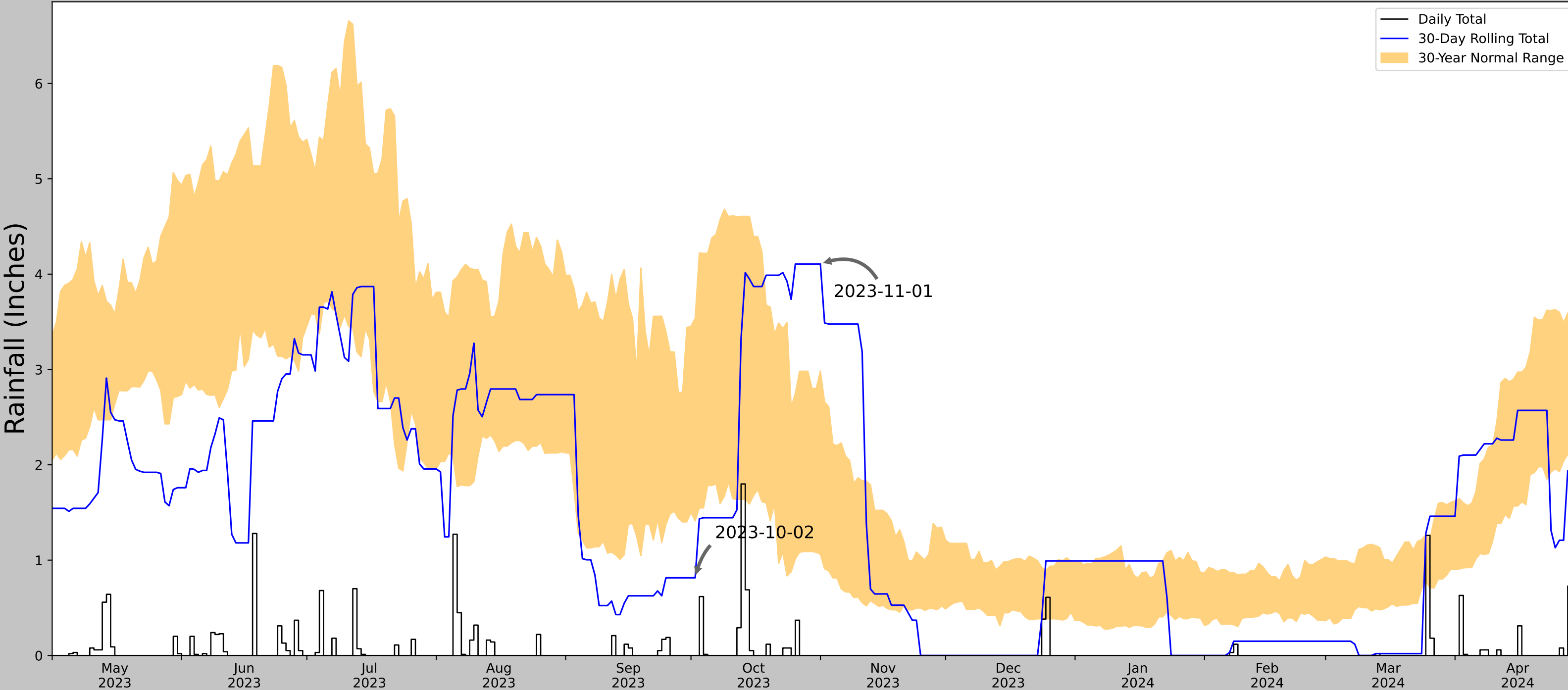
Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2023-12-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-01	0.488583	1.209055	0.0	Dry	1	3	3
2023-11-01	1.060236	2.983858	4.106299	Wet	3	2	6
2023-10-02	1.412205	3.536614	0.814961	Dry	1	1	1
Result							Normal Conditions - 10



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

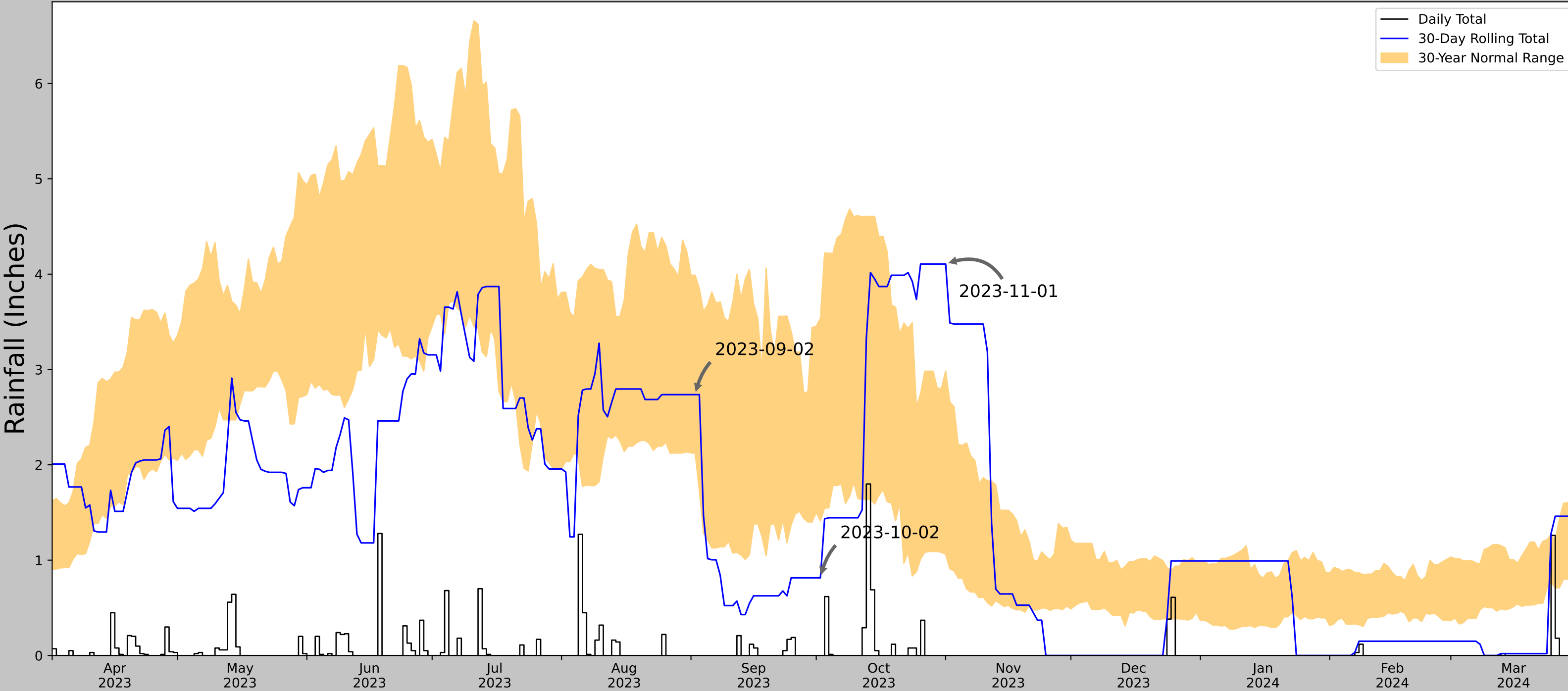
Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC
U.S. Army Corps of Engineers Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2023-11-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Incipient wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-11-01	1.060236	2.983858	4.106299	Wet	3	3	9
2023-10-02	1.412205	3.536614	0.814961	Dry	1	2	2
2023-09-02	2.12126	3.988583	2.736221	Normal	2	1	2
Result							Normal Conditions - 13



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

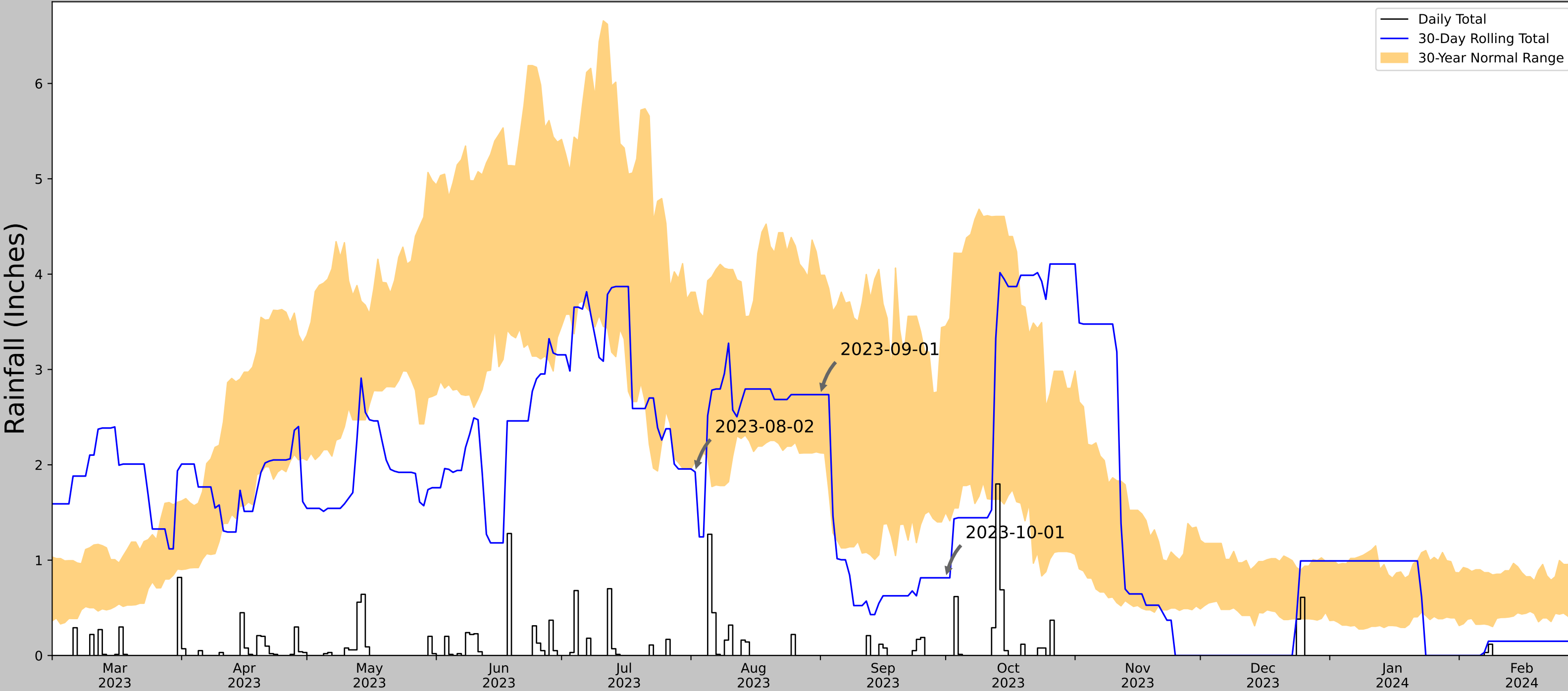
Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC
U.S. Army Corps of Engineers Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2023-10-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-01	1.501969	3.453937	0.814961	Dry	1	3	3
2023-09-01	2.124803	3.988583	2.736221	Normal	2	2	4
2023-08-02	2.033465	3.81063	1.925197	Dry	1	1	1
Result							Drier than Normal - 8



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

ATTACHMENT C

SEED MIXES

Array Native Seed Mix — Moderately Well Drained to Poorly Drained Soils

Nobles County, Minnesota

Cost/acre: \$980 (Drill) | \$1275 (Broadcast)

Scientific Name	Common Name	Height in	Bloom Season Apr – Oct	Drill Rate (PLS) lb/ac seeds/sq ft		Broadcast Rate (PLS) lb/ac seeds/sq ft	
Grasses, Sedges & Rushes							
<i>Bouteloua curtipendula</i>	Sideoats Grama	12–24	A S	3.757	24.17	4.884	31.42
<i>Bouteloua dactyloides</i>	Buffalograss	1–8	M J J A	1.581	3.61	2.055	4.69
<i>Carex blanda</i>	Eastern Woodland Sedge	6–18	M J	0.210	1.10	0.273	1.43
<i>Carex grisea</i>	Inflated Narrow-leaf Sedge	6–24	M J	0.274	1.18	0.356	1.54
<i>Juncus tenuis</i>	Poverty Rush	6–18	J J A S	0.162	157.02	0.211	204.12
<i>Koeleria macrantha</i>	Prairie Junegrass	10–18	J J	0.922	52.04	1.198	67.65
<i>Sporobolus heterolepis</i>	Prairie Dropseed	12–24	A S O	0.126	0.78	0.164	1.02
Grass, Sedge & Rush Total				7.032	240	9.141	312
Forbs							
<i>Allium canadense</i>	Meadow Garlic	6–18	M J J	0.833	0.29	1.083	0.38
<i>Anemone canadensis</i>	Canadian Anemone	12–18	M J	0.010	0.03	0.012	0.04
<i>Chamaecrista fasciculata</i>	Partridge Pea	6–24	J A S	0.627	0.78	0.815	1.01
<i>Gentiana andrewsii</i>	Closed Bottle Gentian	12–24	A S O	0.021	3.61	0.027	4.69
<i>Heuchera richardsonii</i>	Richardson's Alumroot	18–24	M J J	0.010	1.91	0.013	2.49
<i>Oligoneuron album</i>	Prairie Goldenrod	6–18	J J A S	0.173	3.03	0.224	3.93
<i>Osmorhiza claytonii</i>	Clayton's Sweetroot	12–24	M J	0.320	0.36	0.416	0.47
<i>Potentilla arguta ssp. arguta</i>	Tall Cinquefoil	12–24	J J A S	0.242	20.48	0.315	26.62
Forb Total				2.235	30	2.905	40

SEED MIX TOTAL				9.266	270	12.046	352
-----------------------	--	--	--	--------------	------------	---------------	------------

Optional substitutions (may exceed 24"):

<i>Achillea millefolium</i>
<i>Anemone canadensis</i>
<i>Aquilegia canadensis</i>
<i>Blephilia hirsuta</i>
<i>Carex cephalophora</i>
<i>Carex molesta</i>
<i>Dalea candida</i>
<i>Dalea candida</i>
<i>Dichanthelium oligosanthos</i>
<i>Gentiana andrewsii</i>
<i>Muhlenbergia mexicana</i>
<i>Penstemon grandiflorus</i>
<i>Rudbeckia hirta</i>
<i>Stylophorum diphyllum</i>
<i>Verbena stricta</i>
<i>Zizia aurea</i>

Perimeter Pollinator Native Seed Mix — Moderately Well Drained to Poorly Drained Soils

Nobles County, Minnesota

Cost/acre: \$490 (Drill) | \$640 (Broadcast)

Scientific Name	Common Name	Height in	Bloom Season Apr – Oct	Drill Rate (PLS) lb/ac seeds/sq ft		Broadcast Rate (PLS) lb/ac seeds/sq ft	
Grasses, Sedges & Rushes							
<i>Bouteloua curtipendula</i>	Sideoats Grama	12–24	A S	5.123	32.96	6.660	42.85
<i>Bouteloua dactyloides</i>	Buffalograss	1–8	M J J A	0.862	1.97	1.121	2.56
<i>Carex pellita</i>	Woolly Sedge	6–36	J	0.007	0.04	0.009	0.05
<i>Carex scoparia</i>	Broom Sedge	12–30	J J	0.248	6.66	0.322	8.65
<i>Juncus tenuis</i>	Poverty Rush	6–18	J J A S	0.111	107.06	0.144	139.18
<i>Koeleria macrantha</i>	Prairie Junegrass	10–18	J J	0.314	17.74	0.409	23.06
<i>Sporobolus heterolepis</i>	Prairie Dropseed	12–24	A S O	0.172	1.07	0.224	1.39
Grass, Sedge & Rush Total				6.837	167	8.888	218
Forbs							
<i>Allium canadense</i>	Meadow Garlic	6–18	M J J	0.057	0.02	0.074	0.03
<i>Anemone canadensis</i>	Canadian Anemone	12–18	M J	0.007	0.02	0.009	0.03
<i>Chamaecrista fasciculata</i>	Partridge Pea	6–24	J A S	0.429	0.53	0.557	0.69
<i>Dalea candida</i>	White Prairie Clover	12–30	J J A S	0.283	2.23	0.368	2.90
<i>Dalea purpurea</i>	Purple Prairie Clover	9–30	J A S	0.297	1.88	0.386	2.44
<i>Galium boreale</i>	Northern Bedstraw	12–30	J J	0.006	0.10	0.008	0.13
<i>Gentiana andrewsii</i>	Closed Bottle Gentian	12–24	A S O	0.006	1.03	0.008	1.33
<i>Heuchera richardsonii</i>	Richardson's Alumroot	18–24	M J J	0.006	1.05	0.007	1.36
<i>Oligoneuron album</i>	Prairie Goldenrod	6–18	J J A S	0.024	0.41	0.031	0.54
<i>Penstemon grandiflorus</i>	Large Beardtongue	12–30	M J	0.046	0.24	0.060	0.32
<i>Potentilla arguta</i> ssp. <i>arguta</i>	Tall Cinquefoil	12–24	J J A S	0.083	7.00	0.108	9.11
<i>Pycnanthemum tenuifolium</i>	Narrowleaf Mountainmint	12–30	J J A S	0.008	1.12	0.011	1.46
<i>Rudbeckia hirta</i>	Blackeyed Susan	12–30	J J A S O	0.202	7.07	0.263	9.19
<i>Verbena stricta</i>	Hoary Verbena	12–30	J J A S	0.131	1.45	0.170	1.88
<i>Zizia aurea</i>	Golden Zizia	12–30	A M J	0.316	1.52	0.411	1.97
Forb Total				1.901	26	2.471	33

SEED MIX TOTAL	8.738	193	11.359	251
-----------------------	--------------	------------	---------------	------------

Optional substitutions (may exceed 30"):
<i>Agrimonia gryposepala</i>
<i>Allium cernuum</i>
<i>Angelica atropurpurea</i>
<i>Apocynum cannabinum</i>
<i>Baptisia alba</i>
<i>Boltonia asteroides</i>
<i>Carex annectens</i>
<i>Carex bicknellii</i>
<i>Desmanthus illinoensis</i>
<i>Echinacea angustifolia</i>
<i>Gentiana flavida</i>
<i>Helianthus maximiliani</i>
<i>Heuchera richardsonii</i>
<i>Oligoneuron riddellii</i>
<i>Phlox maculata</i>
<i>Phlox pilosa</i>
<i>Rosa arkansana</i>
<i>Silphium perfoliatum</i>
<i>Teucrium canadense</i>
<i>Verbena hastata</i>

Wet Mix — Poorly Drained to Very Poorly Drained Soils

Nobles County, Minnesota

Cost/acre: \$510 (Drill) | \$665 (Broadcast)

Scientific Name	Common Name	Height in	Bloom Season Apr – Oct	Drill Rate (PLS)		Broadcast Rate (PLS)	
				lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Grasses, Sedges & Rushes							
<i>Andropogon gerardii</i>	Big Bluestem	24–78	J J A S	1.594	7.38	2.072	9.59
<i>Bromus ciliatus</i>	Fringed Brome	20–40	J A S	0.336	1.23	0.437	1.60
<i>Bromus kalmii</i>	Arctic Brome	20–36	J A S	0.134	0.49	0.174	0.64
<i>Calamagrostis canadensis</i>	Bluejoint	24–48	J J A	0.010	0.98	0.012	1.27
<i>Carex bebbii</i>	Bebb's Sedge	8–36	J J	0.028	0.54	0.036	0.71
<i>Carex comosa</i>	Longhair Sedge	24–42	J	0.031	0.36	0.040	0.47
<i>Carex cristatella</i>	Crested Sedge	12–36	J J A	0.023	1.10	0.029	1.43
<i>Carex hystericina</i>	Bottlebrush Sedge	10–36	J	0.090	1.97	0.117	2.56
<i>Carex molesta</i>	Troublesome Sedge	12–36	J J	0.082	0.76	0.106	0.99
<i>Carex scoparia</i>	Broom Sedge	12–30	J J	0.039	1.04	0.050	1.35
<i>Carex stipata</i>	Awlfruit Sedge	12–36	J	0.030	0.42	0.039	0.54
<i>Carex stricta</i>	Upright Sedge	24–48	J J	0.009	0.18	0.012	0.24
<i>Carex tribuloides</i>	Blunt Broom Sedge	12–36	J	0.044	2.21	0.058	2.87
<i>Carex vulpinoidea</i>	Fox Sedge	12–36	J J	0.419	12.48	0.545	16.23
<i>Elymus virginicus</i>	Virginia Wildrye	12–48	J A	1.915	3.92	2.490	5.09
<i>Glyceria grandis</i>	American Mannagrass	36–54	J J A S	0.063	1.85	0.082	2.41
<i>Glyceria striata</i>	Fowl Mannagrass	12–36	J J A S	0.071	4.42	0.092	5.75
<i>Juncus dudleyi</i>	Dudley's Rush	8–24	J J A S	0.022	24.40	0.029	31.73
<i>Juncus effusus</i>	Common Rush	16–36	J A S	0.026	14.39	0.033	18.70
<i>Juncus torreyi</i>	Torrey's Rush	12–36	J A S O	0.018	15.34	0.023	19.94
<i>Leersia oryzoides</i>	Rice Cutgrass	24–54	J J A S O	0.064	0.63	0.083	0.81
<i>Panicum virgatum</i>	Switchgrass	36–66	J A S	1.403	11.46	1.823	14.89
<i>Poa palustris</i>	Fowl Bluegrass	12–42	J J A S	0.363	20.63	0.471	26.82
<i>Scirpus atrovirens</i>	Green Bulrush	36–60	J J A	0.284	47.95	0.369	62.33
<i>Scirpus cyperinus</i>	Woolgrass	36–66	A S O	0.114	51.46	0.148	66.90
<i>Spartina pectinata</i>	Prairie Cordgrass	36–84	J A S	0.075	0.37	0.097	0.48
Grass, Sedge & Rush Total				7.284	228	9.469	296
Forbs							
<i>Anemone canadensis</i>	Canadian Anemone	12–18	M J	0.007	0.02	0.010	0.03
<i>Asclepias incarnata</i>	Swamp Milkweed	12–48	J J A	0.049	0.11	0.063	0.14
<i>Astragalus canadensis</i>	Canadian Milkvetch	12–40	J J A	0.161	0.98	0.210	1.28
<i>Bidens cernua</i>	Nodding Beggartick	6–42	J J A S	0.030	0.15	0.039	0.20
<i>Cicuta maculata</i>	Spotted Water Hemlock	36–72	J J A S	0.031	0.14	0.040	0.18
<i>Desmodium canadense</i>	Showy Ticktrefoil	24–66	J A	0.103	0.21	0.134	0.27
<i>Doellingeria umbellata</i>	Parasol Whitetop	24–72	J A S	0.010	0.19	0.013	0.25
<i>Epilobium coloratum</i>	Purpleleaf Willowherb	12–36	J A S	0.005	0.56	0.007	0.72
<i>Eupatorium perfoliatum</i>	Common Boneset	24–48	J A S	0.012	0.71	0.015	0.92
<i>Euthamia graminifolia</i>	Flat-top Goldentop	12–48	J A S	0.003	0.34	0.004	0.44
<i>Eutrochium maculatum</i>	Spotted Joe Pye Weed	24–96	J A S	0.013	0.44	0.017	0.57
<i>Galium boreale</i>	Northern Bedstraw	12–30	J J	0.005	0.09	0.007	0.11
<i>Gentiana andrewsii</i>	Closed Bottle Gentian	12–24	A S O	0.006	1.06	0.008	1.38
<i>Helenium autumnale</i>	Common Sneezeweed	24–54	A S O	0.055	1.85	0.071	2.40
<i>Helianthus grosseserratus</i>	Sawtooth Sunflower	36–156	A S O	0.019	0.14	0.024	0.18
<i>Heliopsis helianthoides</i>	Smooth Oxeye	24–66	J J A S	0.200	0.47	0.260	0.61
<i>Liatris ligulistylis</i>	Rocky Mountain Blazing Star	12–48	A S	0.014	0.06	0.018	0.08
<i>Liatris pycnostachya</i>	Prairie Blazing Star	24–54	J A S	0.021	0.10	0.027	0.13
<i>Lobelia siphilitica</i>	Great Blue Lobelia	12–42	J A S O	0.012	3.69	0.016	4.80
<i>Lycopus americanus</i>	American Water Horehound	6–24	J A S	0.011	0.78	0.015	1.01
<i>Lythrum alatum</i>	Winged Lythrum	12–48	J J A S	0.008	2.67	0.010	3.47
<i>Mimulus ringens</i>	Allegheny Monkeyflower	12–24	J J A S	0.051	52.84	0.066	68.69
<i>Oligoneuron riddellii</i>	Riddell's Goldenrod	12–36	A S O	0.013	0.45	0.017	0.59
<i>Penthorum sedoides</i>	Ditch Stonecrop	6–24	J J A S	0.027	21.51	0.035	27.96
<i>Physostegia virginiana</i>	Obedient Plant	12–48	A S	0.018	0.10	0.024	0.13
<i>Polygonum pensylvanicum</i>	Pennsylvania Smartweed	12–48	J J A S O	0.046	0.13	0.060	0.17
<i>Pycnanthemum virginianum</i>	Virginia Mountainmint	12–36	J J A S	0.017	1.22	0.022	1.59
<i>Silphium perfoliatum</i>	Cup Plant	36–84	J A S	0.057	0.06	0.074	0.08

Scientific Name	Common Name	Height in	Bloom Season Apr – Oct	Drill Rate (PLS)		Broadcast Rate (PLS)	
				lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
<i>Symphyotrichum lanceolatum</i>	White Panicle Aster	12–60	S O	0.012	0.66	0.015	0.86
<i>Symphyotrichum novae-angliae</i>	New England Aster	36–72	A S O	0.013	0.47	0.017	0.61
<i>Symphyotrichum praealtum</i>	Willowleaf Aster	24–60	S O	0.005	0.11	0.006	0.14
<i>Thalictrum dasycarpum</i>	Purple Meadow-rue	24–72	J J	0.032	0.13	0.041	0.17
<i>Verbena hastata</i>	Swamp Verbena	12–66	J A S	0.051	2.32	0.067	3.02
<i>Veronicastrum virginicum</i>	Culver's Root	36–66	J J A	0.009	1.74	0.012	2.27
<i>Zizia aurea</i>	Golden Zizia	12–30	A M J	0.170	0.82	0.221	1.06
Forb Total				1.295	97	1.683	127

SEED MIX TOTAL	8.579	325	11.152	423
----------------	-------	-----	--------	-----

Optional substitutions:
<i>Acorus americanus</i>
<i>Alisma subcordatum</i>
<i>Alisma triviale</i>
<i>Ammannia coccinea</i>
<i>Beckmannia syzigachne</i>
<i>Bidens coronata</i>
<i>Bidens frondosa</i>
<i>Bidens polylepis</i>
<i>Boltonia asteroides</i>
<i>Carex annectens</i>
<i>Carex atherodes</i>
<i>Carex diandra</i>
<i>Carex granularis</i>
<i>Carex haydenii</i>
<i>Carex prairea</i>
<i>Carex scoparia</i>
<i>Carex utriculata</i>
<i>Eleocharis acicularis</i>
<i>Eleocharis erythropoda</i>
<i>Eleocharis obtusa</i>
<i>Eleocharis palustris</i>
<i>Epilobium glandulosum</i>
<i>Juncus balticus</i>
<i>Juncus interior</i>
<i>Lycopus asper</i>
<i>Lysimachia hybrida</i>
<i>Persicaria amphibia</i>
<i>Persicaria pennsylvanica</i>
<i>Persicaria punctata</i>
<i>Physostegia virginiana</i>
<i>Ranunculus sceleratus</i>
<i>Rumex orbiculatus</i>
<i>Sagittaria latifolia</i>
<i>Scirpus acutus</i>
<i>Scirpus fluviatilis</i>
<i>Scirpus pungens</i>
<i>Scirpus validus</i>
<i>Scolochloa festucacea</i>
<i>Scutellaria lateriflora</i>
<i>Sparganium americanum</i>
<i>Sparganium eurycarpum</i>
<i>Spiraea tomentosa</i>
<i>Symphyotrichum puniceum</i>

**In the Matter of Application of Summit
Lake Solar, LLC for an up to 200 MW
Solar Energy Generating System Site
Permit for the Summit Lake Solar Project
in Nobles County, MN.**

MPUC Docket No. IP-7153/GS-25-89

**In the Matter of the Application of Summit
Lake Storage, LLC for an up to 200 MW /
800-MWh Battery Energy Storage System
Site Permit for the Summit Lake Storage
Project in Nobles County, Minnesota**

MPUC Docket No. IP-7153/ESS-25-88

CERTIFICATE OF SERVICE

Breann L. Jurek certifies that on the 28th day of January 2026, she e-filed a true and correct copy of the documents listed below on behalf of Summit Lake Solar, LLC and Summit Lake Storage, LLC via eDockets (www.edockets.state.mn.us):

1. Filing Letter;
2. Joint Site Permits Application Amendment Attachment E, with Appendices A-C;
and
3. Certificate of Service.

Said documents were also served on the Official Service Lists of record on file with the Minnesota Public Utilities Commission and as attached hereto.

Executed on: January 27, 2026

Signed: /s/ Breann L. Jurek

Fredrikson & Byron, P.A.
60 South Sixth Street, Suite 1500
Minneapolis, MN 55402

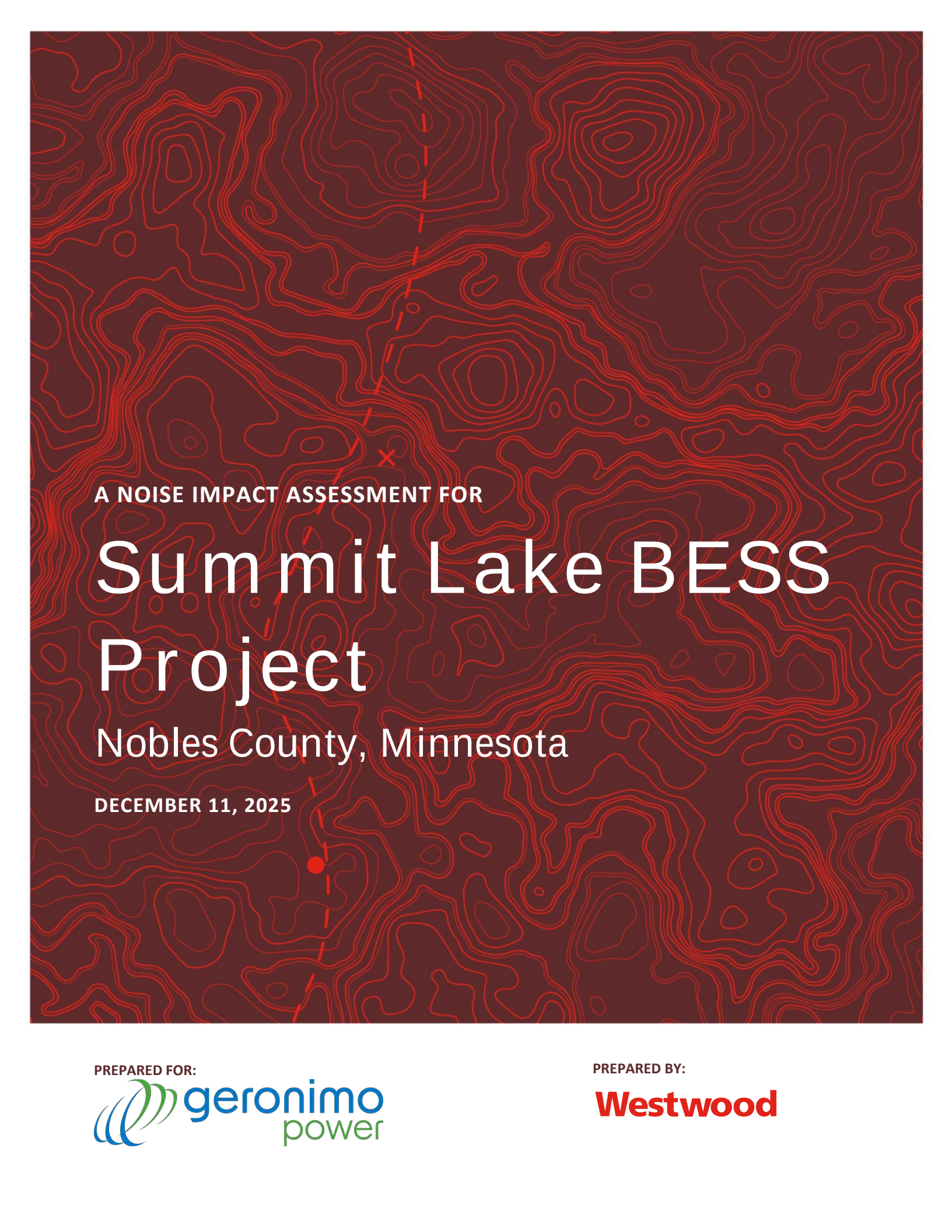
#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
1	Leakhena	Au	lau@fredlaw.com	Fredrikson & Byron, P.A.		60 South Sixth Street, Suite 1500 Minneapolis MN, 55402 United States	Electronic Service		No	25-89 Official CC Service List
2	Tom	Brett	tbrett@fredlaw.com	Fredrikson and Byron, P.A.		60 South 6th St #1500 Minneapolis MN, 55108 United States	Electronic Service		No	25-89 Official CC Service List
3	Mike	Bull	mike.bull@state.mn.us		Public Utilities Commission	121 7th Place East, Suite 350 St. Paul MN, 55101 United States	Electronic Service		Yes	25-89 Official CC Service List
4	Generic	Commerce Attorneys	commerce.attorneys@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		Yes	25-89 Official CC Service List
5	Monika	Davis	monika.davis@merjent.com			1 Main Street Suite 300 Minneapolis MN, 55414 United States	Electronic Service		No	25-89 Official CC Service List
6	Martin	Donovan	martin.donovan@state.mn.us		Department of Natural Resources	500 Lafayette Road St Paul MN, 55155 United States	Electronic Service		No	25-89 Official CC Service List
7	Jeremy	Duehr	jduehr@fredlaw.com	Fredrikson & Byron, P.A.		60 S Sixth St Ste 1500 Minneapolis MN, 55402-4400 United States	Electronic Service		No	25-89 Official CC Service List
8	Sharon	Ferguson	sharon.ferguson@state.mn.us		Department of Commerce	85 7th Place E Ste 280 Saint Paul MN, 55101-2198 United States	Electronic Service		No	25-89 Official CC Service List
9	Breann	Jurek	bjurek@fredlaw.com	Fredrikson & Byron PA		60 S Sixth St Ste 1500 Minneapolis MN, 55402 United States	Electronic Service		No	25-89 Official CC Service List
10	Molly	Leisen	mleisen@fredlaw.com	Fredrikson & Byron P.A.		60 South Sixth Street Suite 1500 Minneapolis MN, 55402 United States	Electronic Service		No	25-89 Official CC Service List
11	Kimberly	Middendorf	kimberly.middendorf@state.mn.us		Office of Administrative Hearings	PO Box 64620 600 Robert St N Saint Paul MN, 55164-	Electronic Service		Yes	25-89 Official CC Service List

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
						0620 United States				
12	Alia	Mohammad	amohammad@nationalgridrenewables.com	Summit Lake Solar, LLC		c/o National Grid Renewables 8400 Normandale Lk, Blvd, #1200 Bloomington MN, 55437 United States	Electronic Service		No	25-89 Official CC Service List
13	Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	1400 BRM Tower 445 Minnesota St St. Paul MN, 55101-2131 United States	Electronic Service		Yes	25-89 Official CC Service List
14	Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix & Associates		7400 Lyndale Avenue South Suite 190 Richfield MN, 55423 United States	Electronic Service		Yes	25-89 Official CC Service List

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
1	Leakhena	Au	lau@fredlaw.com	Fredrikson & Byron, P.A.		60 South Sixth Street, Suite 1500 Minneapolis MN, 55402 United States	Electronic Service		No	25-88 Official CC Service List
2	Tom	Brett	tbrett@fredlaw.com	Fredrikson and Byron, P.A.		60 South 6th St #1500 Minneapolis MN, 55108 United States	Electronic Service		No	25-88 Official CC Service List
3	Mike	Bull	mike.bull@state.mn.us		Public Utilities Commission	121 7th Place East, Suite 350 St. Paul MN, 55101 United States	Electronic Service		Yes	25-88 Official CC Service List
4	Generic	Commerce Attorneys	commerce.attorneys@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		Yes	25-88 Official CC Service List
5	Monika	Davis	monika.davis@merjent.com			1 Main Street Suite 300 Minneapolis MN, 55414 United States	Electronic Service		No	25-88 Official CC Service List
6	Jeremy	Duehr	jduehr@fredlaw.com	Fredrikson & Byron, P.A.		60 S Sixth St Ste 1500 Minneapolis MN, 55402-4400 United States	Electronic Service		No	25-88 Official CC Service List
7	Sharon	Ferguson	sharon.ferguson@state.mn.us		Department of Commerce	85 7th Place E Ste 280 Saint Paul MN, 55101-2198 United States	Electronic Service		No	25-88 Official CC Service List
8	Breann	Jurek	bjurek@fredlaw.com	Fredrikson & Byron PA		60 S Sixth St Ste 1500 Minneapolis MN, 55402 United States	Electronic Service		No	25-88 Official CC Service List
9	Molly	Leisen	mleisen@fredlaw.com	Fredrikson & Byron P.A.		60 South Sixth Street Suite 1500 Minneapolis MN, 55402 United States	Electronic Service		No	25-88 Official CC Service List
10	Kimberly	Middendorf	kimberly.middendorf@state.mn.us		Office of Administrative Hearings	PO Box 64620 600 Robert St N Saint Paul MN, 55164-0620 United States	Electronic Service		Yes	25-88 Official CC Service List
11	Alia	Mohammad	amohammad@nationalgridrenewables.com	Summit Lake Solar, LLC		c/o National Grid Renewables 8400	Electronic Service		No	25-88 Official CC

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
						Normandale Lk, Blvd, #1200 Bloomington MN, 55437 United States				Service List
12	Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	1400 BRM Tower 445 Minnesota St St. Paul MN, 55101-2131 United States	Electronic Service		Yes	25-88 Official CC Service List
13	Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix And Associates		7400 Lyndale Ave S Ste 190 Richfield MN, 55423 United States	Electronic Service		Yes	25-88 Official CC Service List

Appendix F- Applicants' Noise Study



A NOISE IMPACT ASSESSMENT FOR

Summit Lake BESS Project

Nobles County, Minnesota

DECEMBER 11, 2025

PREPARED FOR:



PREPARED BY:

Westwood

Noise Impact Assessment

Summit Lake BESS Project

Nobles County, Minnesota

Prepared For:

Geronimo Power
8400 Normandale Lake Blvd
Suite 1200
Bloomington, MN 55437

Prepared By:

Westwood Professional Services
12701 Whitewater Drive
Suite 300
Minnetonka, MN 55343

Project Number: R0036437.00
Date: December 11, 2025



Executive Summary

Westwood Professional Services, Inc. (Westwood) was contracted by Geronimo Power (Client) to complete a noise assessment for the Summit Lake BESS Project (Project) located in Nobles County, Minnesota. The Project has a proposed nameplate capacity of 200 MW. This noise impact assessment was completed in support of the Site Permit Application (SPA), as required under the Power Plant Siting Act (Minnesota Statutes Chapter 216E) and Minnesota Public Utilities Commission (MPUC).

An operational noise impact evaluation was conducted for the proposed Project layout. Note that this analysis considers end-of-life (EOL) equipment configuration, including augmentation. Project-generated noise levels were predicted at all Noise Area Classification 1 (NAC-1) receptors within 3200' of the Project boundary. Noise level regulations include the noise level limits set forth within Minnesota Rules Chapter 7030.

All NAC-1 receptors within 3200' of the proposed Project boundary modeled at or below the applicable Project noise level limit of 50 dBA, given the equipment assumptions herein; compliance with Minn. R. 7030 is expected.

Table of Contents

Executive Summary i

1.0 Project Background 1

2.0 Regulatory Setting & Noise Level Requirements 2

3.0 Modeling Methodology & Parameters 3

4.0 Noise Level Estimates & Impact Assessment 4

Tables

Table 1 Minnesota Rules Chapter 7030 NAC-1 Noise Level Limits 2

Table 2 Minnesota Rules Chapter 7030 L₅₀ Noise Level Limits Expressed as L_{eq} 2

Table 3 Project Equipment & Layout Configuration 3

Table 4 Project Equipment Spectral & Overall Data 3

Table 5 NAC-1 Receptor Distance Distribution 3

Figures

Figure 1: Project Overview 1

Appendices

Appendix A Project-Generated Noise Level Contours

Appendix B Receptor Locations & Modeling Results

1.0 Project Background

1.1 Site Description

The proposed Project is located in Nobles County, Minnesota. Noise sensitive receptors in the Project vicinity include residences. Existing noise sources in the Project vicinity include local road traffic and nearby wind turbines. The primary land uses in the Project vicinity are residential and agricultural.

1.2 Project Description

The Project is proposed to include battery energy storage systems (BESS) and associated equipment/infrastructure. At the time of this study, the layout has not yet been finalized.



Figure 1: Project Overview

2.0 Regulatory Setting & Noise Level Requirements

Minn. R. 7030.0040 sets forth noise level limits according to different land uses. The most noise sensitive areas in the Project Area are occupied residential homes. Occupied residences are classified as Noise Area Classification (NAC) 1 per MN Rules 7030.0050, Subp. 2. NAC-1 has the lowest (most restrictive) noise limits of the three NACs. Agricultural land is classified as NAC-3, which has the highest noise limits of the three NACs. As the noise level limits for NAC-1 are the most restrictive, they are listed in Table 1 below and are used throughout to confirm compliance with Minn. R. 7030.0040.

Table 1 Minnesota Rules Chapter 7030 NAC-1 Noise Level Limits

Noise Level Metric	Daytime Limit (dBA)	Nighttime Limit (dBA)
L ₅₀	60	50
L ₁₀	65	55

These limits are expressed as L₅₀ and L₁₀, which are statistical noise level metrics representing the noise level that is exceeded 50% and 10% of the measurement period, respectively. However, noise modeling most accurately predicts L_{eq} levels, which is the equivalent continuous noise level or the overall average noise level over the measurement period. L₁₀ levels are, on average, 3 dBA higher than L_{eq} levels, while L₅₀ levels are typically below L_{eq} levels. As such, modeled L_{eq} levels can be used as a conservative metric for ensuring compliance with the L₅₀ levels specified in Minn. R. 7030.0040. Therefore, if L_{eq} limits are assumed to be the same as the L₅₀ limits, any modeled noise level below the L_{eq} limits would be below the L₅₀ limits prescribed by Minn. R. 7030.0040.

Table 2 Minnesota Rules Chapter 7030 L₅₀ Noise Level Limits Expressed as L_{eq}

Noise Level Metric	Daytime Limit (dBA)	Nighttime Limit (dBA)
L _{eq}	60	50

The above limits refer to total noise level, which includes both ambient noise and Project noise. To ensure that the Project-generated noise does not cause or significantly contribute to an exceedance of the limits, if background sound levels are equal to or greater than the applicable state standard at the nearby receptors (or in the absence of site-specific ambient noise measurements), modeled Project-only nighttime noise levels at receptors will be held to a limit of 45 dBA. Given this, if total noise does exceed the limits, it will be primarily the result of non-Project noise contributions. Under these conditions, the contribution of the Project will be less than 3 dBA, which is the generally recognized minimum detectable change in environmental noise levels. This is an accepted practice to show compliance with Minn. R. 7030.

3.0 Modeling Methodology & Parameters

A noise propagation model was developed and run for the Project using CADNA-A (a noise modeling software in compliance with ISO 9613-2). The proposed BESS and medium voltage transformers (MVT) units were modeled as omnidirectional point sources with noise source data from manufacturer-provided test reports. Note that BESS noise source data assumes implementation of manufacturer-provided low noise configuration.

Model parameters were as follows:

- Ground absorption factor of $G=0.0$ over water and large areas of hard ground, $G = 0.5$ everywhere else
- Receptor height of 1.5 m above ground level
- Assumed meteorological conditions of 10°C and 70% humidity
- No other model adjustments

Project equipment and layout configuration details are shown below in Table 3. Note that equipment quantities herein are conceptual and preliminary in nature and will be updated as Project design progresses. Unweighted octave-band sound power levels for Project equipment are listed in Table 4 along with overall A-weighted sound power level.

Table 3 Project Equipment & Layout Configuration

Noise Source	# of Units	Equipment Model/Reference	Est. Source Height Above Ground Level (AGL)
BESS	288	Sungrow PowerTitan 2.0 – Low Noise (ST5015UX-4H-US-LN)	2.9 m
MVT	72	Sungrow MVS5140-LS-US	2.9 m

Table 4 Project Equipment Spectral & Overall Data

Noise Source	Unweighted Octave Band (Hz) Sound Power Levels (dB L _w)								Broadband Sound Power Level
	63	125	250	500	1000	2000	4000	8000	
BESS	88.7	85.8	82.7	79.4	77.8	73.9	69.5	64.5	83 dBA
MVT	84.9	84.4	86.7	81.6	77.2	73.7	67.8	58.9	84 dBA

NAC-1 receptors were identified within 3200' of the Project boundary. Note that receptor locations have not been field verified and are based upon aerial imagery only. Additionally, receptors were categorized by distance from the Project boundary, shown in Table 5 below.

Table 5 NAC-1 Receptor Distance Distribution

Distance from Project Boundary	# of NAC-1 Receptors
<50'	0
50' - 100'	0
100' - 200'	0
200' - 400'	0
400' - 800'	0
800' - 1600'	7
1600' - 3200'	40

4.0 Noise Level Estimates & Impact Assessment

A predictive model was run using the inputs above to predict Project-generated noise at all NAC-1 receptors within 3200' of the Project boundary. All receptors modeled at or below the applicable Project noise level limit of 45 dBA and compliance with Minn. R. 7030 is expected. A Project noise contour figure can be found in Appendix A. Predicted Project-generated noise levels at each NAC-1 receptor can be found alongside receptor location coordinates in Appendix B.

Appendix A Project-Generated Noise Level Contours

© 2025 Westwood Professional Services, Inc.



Data Source(s): Westwood (2025); Esri WMS World Imagery Basemap (Accessed 2025)



Westwood

Toll Free (888) 937-5150 westwoodps.com

Summit Lake BESS Project

Nobles County, Minnesota

Project Noise Contours at 1.5m

Exhibit 1

Legend

 BESS Area

 Receptor

Noise Contour [dB(A)]

 45

Appendix B Receptor Locations & Modeling Results

Receptor ID	UTM NAD83 Zone 15		Elevation AMSL (m)	Predicted Project-generated Sound Pressure Level (dBA)
	Easting (m)	Northing (m)		
R-1	282050.0	4844070.0	528.5	37.7
R-2	282739.0	4844133.0	519.7	31.2
R-3	282969.0	4843789.0	520.1	31.6
R-4	282375.0	4842557.0	532.3	33.9
R-5	281725.0	4842571.0	527.4	31.4
R-6	281674.0	4842583.0	525.1	31.3
R-7	281658.0	4842620.0	525.3	31.6
R-8	281665.0	4842665.0	526.4	32.4
R-9	281610.0	4842650.0	524.2	31.7
R-10	281616.0	4842682.0	525.0	32.1
R-11	281677.0	4842699.0	527.5	35.4
R-12	281613.0	4842709.0	525.3	33.6
R-13	281667.0	4842758.0	527.9	36.1
R-14	281614.0	4842759.0	525.9	35.7
R-15	281622.0	4842803.0	526.3	36.4
R-16	281616.0	4842823.0	526.3	36.6
R-17	281624.0	4842860.0	527.5	37.2
R-18	281549.0	4842828.0	525.5	36.1
R-19	281551.0	4842780.0	525.5	35.6
R-20	281550.0	4842756.0	525.5	35.3
R-21	281504.0	4842825.0	525.5	35.8
R-22	281505.0	4842878.0	525.4	36.3
R-23	281501.0	4842905.0	525.1	36.4
R-24	281555.0	4842710.0	524.2	32.1
R-25	281546.0	4842692.0	524.5	33.1
R-26	281560.0	4842667.0	524.3	31.9
R-27	281500.0	4842710.0	523.8	33.6
R-28	281437.0	4842762.0	524.1	34.4
R-29	281390.0	4842798.0	523.1	31.7
R-30	281389.0	4842831.0	523.6	34.1
R-31	281443.0	4842825.0	525.2	35.2
R-32	281337.0	4842780.0	521.8	31.2
R-33	281384.0	4842868.0	523.8	34.2
R-34	281384.0	4842894.0	523.2	34.0
R-35	281435.0	4842937.0	523.7	34.8
R-36	281433.0	4842911.0	524.1	35.0
R-37	281431.0	4842885.0	524.8	35.2
R-38	281443.0	4842865.0	525.5	35.5
R-39	281549.0	4842541.0	523.5	30.4
R-40	281492.0	4842535.0	522.5	30.0
R-41	281433.0	4842534.0	522.5	31.2
R-42	281340.0	4842475.0	521.5	30.4
R-43	281303.0	4842548.0	520.5	29.0
R-44	281589.0	4842389.0	522.2	29.0
R-45	281117.0	4842854.0	521.0	29.9
R-46	281145.0	4842961.0	523.5	33.2
R-47	281501.0	4843406.0	527.5	42.2