NORTHERN CRESCENT SOLAR AND STORAGE PROJECT

Joint Application to the Minnesota Public Utilities Commission for a Solar Energy Generating System Site Permit and a Battery Energy Storage System Site Permit

PRIMERGY

Alternative Permitting Process
Solar Facility MPUC Docket No. IP- 7135/GS-22-57
BESS Facility MPUC Docket No. IP-7135/GS-24-238

August 2024

Joint Application to the Minnesota Public Utilities Commission for a Solar Energy Generating System Site Permit and a Battery Energy Generating System Site Permit

Northern Crescent Solar and Storage Project

Faribault County, Minnesota

Solar Facility MPUC Docket Number: IP-7135/GS-22-57
BESS Facility MPUC Docket Number: IP-7135/GS-24-238

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August 2024

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Project Location:	Faribault County, MN
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Acronym/Term	Definition
AADT	Annual Average Daily Traffic
AC	Alternating Current
AIMP	Agricultural Impact Mitigation Plan
AM	Amplitude Modulation
AMA	Aquatic Management Area
Applicant or Northern Crescent Solar	Northern Crescent Solar LLC (formerly known as Winnebago Solar and Storage LLC)
Application	Joint Site Permit Application
AQI	Air Quality Index
ARMER	Allied Radio Matrix for Emergency Response
ASIS	Aggregate Source Information System Map
ASTM	American Society for Testing and Materials
BERW	Blue Earth River Watershed
BESS	Battery Energy Storage System
BESS Facility	The 50 MWac battery energy storage system associated with the Project
BMPs	Best Management Practices
BMS	Battery Management System
BWSR	Minnesota Board of Water and Soil Resources
CAA	Clean Air Act
CIA	Critical Issues Analysis
CN	Certificate of Need
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Commercial Operations Date
Commission or MPUC	Minnesota Public Utilities Commission
County or Faribault County	Faribault County, Minnesota
CREP	Conservation Reserve Enhancement Program
CSW	Construction Stormwater
CUP	Conditional Use Permit
CWA	Federal Clean Water Act
CWI	County Well Index
dB	Decibel
dBA	A-weighted decibel
DC	Direct Current
DEED	Minnesota Department of Employment & Economic Development

Acronym/Term	Definition
DOC	Minnesota Department of Commerce
DWSMA	Drinking Water Supply Management Area
ECS	Ecological Classification System
EDR	Environmental Records Data Request
EERA	Energy Environmental Review and Analysis
EJ	Environmental Justice
EJScreen	Environmental Justice Screening and Mapping Tool
EMF	Electromagnetic Field
EPA	U.S. Environmental Protection Agency
EPC	Engineering, Procurement, and Construction
ERP	Emergency Response Program
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FM	Frequency Modulation
Gemini	Gemini Solar + Storage
Gen-Tie Line	Overhead 161 kV Project Gen-Tie Line
GHG	Greenhouse Gas
GIA	Generator Interconnection Agreement
GIS	Geographic Information System
HVTL	High Voltage Transmission Line
IEC	International Electrotechnical Commission
IFC	International Fire Code
IPaC	Information for Planning and Consultation
kV	Kilovolt
kV/m	Kilovolts per meter
L_{10}	10% of any hour
L_{50}	50% of any hour
L_{eq}	Equivalent Sound Level
LEF	Large Energy Facility
LEGF	Large Electric Generating Facility
LEPGP	Large Electric Power Generating Plant

Acronym/Term	Definition
LFP	Lithium Iron Phosphate Lithium-ion Battery
LGU	Local Government Unit
LSRW	Le Sueur River Watershed
MBS	Minnesota Biological Survey
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
mG	MilliGauss
MGS	Minnesota Geological Survey
Minn. Stat.	Minnesota Statutes
Minn. R.	Minnesota Administrative Rules
MISO	Midcontinent Independent System Operator
MLRA	Major Land Resource Area
MnDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MV	Medium Voltage
MW	Megawatt
MWh	Megawatt hours
NFPA	National Fire Protection Association
NHD	National Hydrography Dataset
NHIS	Natural Heritage Information System
NIEHS	National Institute of Environmental Health Sciences
NLCD	National Land Cover Database
NLEB	Northern Long-eared Bat
NMC	Nickel Manganese Cobalt Oxide Lithium-ion Battery
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NPC	Native Plant Community
NPMS	National Pipeline Mapping System
NRCS	Natural Resources Conservation Service, formerly known as the Soil Conservation Service
NRHP	National Register of Historic Places
NSAs	Noise Sensitive Receptors/Areas
NWI	National Wetlands Inventory
O_3	Ozone

Acronym/Term	Definition
O&M	Operations and Maintenance
OPs	Observation Points
OSA	Office of the State Archaeologist
PCSs	Power Conversion Systems
PM	Particulate Matter
POI	Point of Interconnect
Preliminary Development Area	Approximate 929-acre area where Northern Crescent Solar LLC proposes to build the Project facilities.
Primergy	Primergy Solar LLC
Project	The up to 150 megawatt alternating current photovoltaic solar energy generating system, associated 50 MWac battery energy storage system, and other associated systems Project in Verona and Prescott Townships, Faribault County, Minnesota
Project Area	Approximately 1,179-acre area of privately-owned land for which Northern Crescent Solar LLC has leases and purchase options to allow siting and construction of the Project
PV	Photovoltaic
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
RGP	Regional General Permit
RIM	Reinvest in Minnesota Reserve
Rule	Minnesota Rule 7850.4400, subparagraph 4
SCADA	Supervisory Control and Data Acquisition
SDS	State Disposal System
SDWA	Safe Drinking Water Act
SEIA	Solar Energy Industries Association
SHPO	Minnesota State Historic Preservation Office
SNAs	Scientific and Natural Areas
SO_2	Sulfur Dioxide
Solar Facility	The up to 150 MWac PV solar energy generating system associated with the Project
Solar module (module)	A set of solar PV modules electrically connected and mounted on a supporting structure. Also referred to as solar panel or array.
SPCC	Spill Containment and Countermeasure Plan
SSURGO	Soil Survey Geographic Database
SWCD	Faribault County Soil and Water Conservation District
SWPPP	Stormwater Pollution Prevention Plan
TCBA	Tricolored Bat

Acronym/Term	Definition
TCLP	Toxicity Characteristic Leaching Procedure
THPO	Tribal Historic Preservation Office
UL	Underwriters Laboratories
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMP	Vegetation Management Plan
WCA	Minnesota Wetland Conservation Act
Westwood	Westwood Professional Services, Inc.
WHPA	Wellhead Protection Area
WMA	Wildlife Management Area
WPA	Waterfowl Production Area
WQC	Water Quality Certification
Xcel Energy	Northern States Power Company d/b/a Xcel Energy
Xcel Switchyard	A new Switchyard to be constructed to interconnect the Project to the existing Xcel Huntley–Blue Earth 161 kilovolt high voltage transmission line that transects the Project Area. To be permitted, constructed, owned, and operated by Xcel Energy.

1.0 INTRODUCTION

Northern Crescent Solar LLC (Northern Crescent Solar or Applicant),[1] a wholly owned indirect subsidiary of Primergy Solar LLC (Primergy), proposes to construct and operate an up to 150 megawatt (MW) alternating current (AC) photovoltaic (PV) solar energy generating system (Solar Facility) and associated 50 MWac battery energy storage system (BESS) (BESS Facility), and other associated facilities (combined the Solar Facility and BESS Facility are referred to herein as the Northern Crescent Solar and Storage Project or Project) in Verona and Prescott Townships, Faribault County, Minnesota (Faribault County or County) (**Figure 1**). The Applicant is anticipating construction will begin in the second quarter of 2025 with commercial operation in the fourth quarter of 2026.

Northern Crescent Solar respectfully submits this Joint Site Permit Application (Application) to the Minnesota Public Utilities Commission (Commission or MPUC). Northern Crescent Solar seeks Site Permits for the Solar Facility and BESS Facility pursuant to the Minnesota Power Plant Siting Act (Minnesota Statutes [Minn. Stat.] Chapter 216E) and Minnesota Administrative Rules (Minn. R.) Chapter 7850. The Site Permits are the only site approvals needed for construction of the Project (Minn. Stat. Section [§] 216E.10, subd. 1). The Completeness Checklist for the Site Permits is provided in **Appendix A**. See Section 1.4 for additional information.

Pursuant to Minn. Stat. § 216E.04, subds. 2(8) and 2(9) and Minn. R. 7850.2800 to 7850.3900, Northern Crescent Solar seeks approval of its Application under the alternative review process. The Applicant filed Notice of Intent to Submit a Site Permit Application for the Solar Facility and the BESS Facility under the Alternative Permitting Process to the Commission on January 28, 2022 and July 3, 2024, respectively.[2]

Additionally, Northern Crescent Solar submitted a Solar Size Determination written request to the Minnesota Department of Commerce (DOC), Energy Environmental Review and Analysis (EERA) (together, DOC EERA), for a solar energy generating system size determination on January 28, 2022 in accordance with Minn. Stat. § 216E.021. The size determination response from the DOC EERA was issued on February 7, 2022 and is provided along with the request in **Appendix B**.

The Project encompasses approximately 1,179 acres (Project Area) of predominantly agricultural land. The Project Area refers to all the land under agreements with landowners. Based on the preliminary site plan, the Project is expected to occupy approximately 929 acres (Preliminary Development Area) of the Project Area. The remaining 250 acres are located outside the Preliminary Development Area and are not hosting Project facilities. Portions of the area outside the Preliminary Development Area may continue to be farmed. In portions that are not farmed, Northern Crescent Solar will seed the areas to a permanent perennial low-growing seed mix in accordance with the Project's Vegetation Management Plan (VMP).

[1] On December 11, 2023, Winnebago Solar and Storage LLC legally changed its name to Northern Crescent Solar LLC by filing a certificate of amendment of certificate of formation with the Delaware Secretary of State and an Amendment to Certificate of Authority with the Minnesota Secretary of State.

[2] On January 28, 2022, Northern Crescent Solar, formerly known as Winnebago Solar and Storage LLC, filed its Notice of Intent to Submit a Site Permit Application for the Solar Facility under the Alternative Permitting Process (eDocket ID No. 20221-182145- 01). On July 3, 2024, Northern Crescent Solar filed a Notice of Intent to Submit a Site Permit under the Alternative Permitting Process (eDocket ID No. 20247-208322-01)

The Project Area was selected because development of the land will result in minimal environmental impacts, the area is proximate to the electrical grid, existing transmission infrastructure, and available capacity, and has willing landowners who voluntarily granted lease and easements to the Applicant. As further described herein, references to the Preliminary Development Area apply to the areas hosting the Solar Facility, the BESS Facility or associated systems located within the overall Project Area (**Figure 2**).

Project facilities will be sited on leased land, and the current leaseholds are sufficient to accommodate the proposed up to 150 MW project and the BESS. The currently secured lease agreements ensure ample access for construction and operation of the Project. Additionally, Northern Crescent has identified "Potential Participating Land," as depicted on **Figure 2**. Northern Crescent anticipates this parcel may become participating prior to issuance of the Site Permit and will provide an updated Figure 2 and Project Area description in the event this parcel becomes participating.

Northern States Power Company d/b/a (Xcel Energy) will construct a new switchyard (Xcel Switchyard) to interconnect the Project to the existing Xcel Energy Huntley–Blue Earth 161 kilovolt (kV) high voltage transmission line (HVTL) that transects the Project Area. The Xcel Switchyard and associated infrastructure will be permitted and owned by Xcel Energy (**Figure 3**).

1.1 Purpose and Need

The Project will provide up to 150 MWac of renewable power capacity and 50 MWac of battery storage and approximately 375,369 megawatt hours (MWh) annually of reliable, deliverable on-peak energy. The Project will displace 307 gigawatt hours of regional fossil fuel generation per year and prevent emissions of approximately 247,040 metric tons of carbon dioxide (CO_2) equivalent annually. This is equivalent to CO_2 emissions from 131,086 metric tons of coal burned.[3] By way of example, the Project will produce enough energy to provide electricity for approximately 35,249 households based on the average annual electricity consumption. The Project is being developed, designed, and permitted to meet or exceed applicable state and local requirements, including the prime farmland exclusion rule (discussed below) to the extent practicable.

Under Minnesota's Clean Energy Law, climate legislation establishes a carbon-free energy standard and a renewable energy standard. The carbon-free energy standard requires electrical utilities to achieve 80% carbon-free energy by 2030, 90% by 2035, and 100% by 2040. Carbon-free energy sources are defined as energy sources that do not release CO_2, such as solar. The renewable energy standard requires that 55% of the energy sold to Minnesota customers by electrical utilities come from renewable energy sources, such as solar, by 2035.

The Project will help meet Minnesota's 100% carbon-free energy standard by 2040 and will contribute to meeting the Minnesota Renewable Energy Objectives[4] and other clean energy requirements in Minnesota, neighboring states, and the country at large, including the renewable energy and carbon reduction goals of Xcel Energy. It will serve consumers' growing demand for renewable energy under various utility-

[3] This is based upon the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator, the Avoided Emissions and Generation Tool and 375,368 MWh/year (375,368,000 kWh/year) annual production from the PvSYST model.

[4] *See* Minn. Stat. § 216B.1691, subd. 2g (2023).

sponsored programs and for utilities, independent power purchasers and corporations seeking to use renewable energy for business growth. The Project will also benefit the local community through investment in construction spending, operation of the Project, property and business taxes, and landowner lease payments.

Additionally, the Project is designed to provide up to 50 MWac of energy storage capacity through the BESS Facility. The impact to the grid from the integration of the BESS Facility will be positive as the BESS Facility can act to shift the output of the Solar Facility from the likely peak of solar generation at noon to a potential peak of electrical demand in the early evening. Depending on final design, the BESS Facility can furnish other grid services such as frequency response and voltage support and could act as an electrical "suspension" to smooth the output of the Solar Facility on partly cloudy days.

The Project will provide cost-effective solar energy. The Solar Facility and BESS Facility are expected to operate in tandem. This configuration will reduce the variability of solar energy generation. Northern Crescent Solar is working towards securing a power purchase agreement for the Project, and Build Transfer Agreements, Development Transfer Agreements, or other enforceable offtake agreements to sell the electricity, Renewable Energy Certificates and capacity generated by the Project. The power generated by the Project will be offered to wholesale customers, including Minnesota utilities and cooperatives that have identified a need for additional renewable energy and capacity, and corporate and industrial customers that have set clean energy goals.

1.2 Applicant Information

The following provides information concerning the Applicant, Permittee, and ownership of the Project.

1.2.1 Permittee and Contact Information

The Permittee for the Site Permit will be:

Northern Crescent Solar LLC
1901 Harrison Street, Suite 1600
Oakland, CA 94612

The contact persons regarding this Application are:

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Jeremy P. Duehr, Fredrikson & Byron, P.A.
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1.2.2 Ownership at Time of Filing

Northern Crescent Solar is a limited liability company authorized to do business in Minnesota. Northern Crescent Solar is an independent power producer and wholly owned indirect subsidiary of Primergy. Primergy is a specialist infrastructure investment company, focused on the development, construction, and long-term management of utility-scale solar and battery storage projects. Primergy managed the development, construction, and, now, operations of the flagship utility-scale project, Gemini Solar + Storage (Gemini) located in Clark County, Nevada, which was fully commissioned in early 2024. Gemini is a 690 MWac Solar and 380 MW 4-hour Battery Storage Project that supported approximately 1,300 union and prevailing wage jobs during the construction phase of the facility. Carefully sited on approximately 5,000 acres, Gemini is located on public land and provides electricity sufficient to power approximately 10% of Nevada's peak power demand. Gemini is currently the largest co-located project to ever be constructed as a single phase in the U.S. Primergy has extensive experience permitting and constructing a project of this scale. Primergy has expertise in each aspect of a project's life cycle, such as identifying suitable land, designing and engineering projects, securing energy contracts, and overseeing construction and operational activities of large power plants. .

Northern Crescent Solar has secured all necessary land rights for construction and operation of the Project through lease and purchase agreements. Under the leases, land used for the Project would be returned to the underlying landowners upon completion of the 30-year operational life of the Project. Lease agreements are in place with seven private landowners within the Project Area (Barry and Joy Marsh, Ted Nagel, David P. Nagel Life Estate, Scott & Kristi LaRowe, and Larowe Holdings, LLC). One current landowner has tenant farmers who actively farm the land.

1.2.3 Proposed Ownership after Commercial Operations

Northern Crescent Solar will own, operate, and maintain the Project following the start of the commercial operations date (COD), which is anticipated to be in the fourth quarter of 2026. While not planned at this time, Northern Crescent Solar reserves the right to sell or assign the Solar Facility or BESS Facility to another qualified entity at any time before, during, or after the Project is constructed. Any sale or assignment of one or both of the Site Permits would require approval by the Commission. Any future buyer or assignee will be required to meet Site Permit conditions. As indicated above, Xcel Energy will permit, construct, own, and operate the Xcel Switchyard and associated infrastructure.

1.3 Project Schedule

Northern Crescent Solar anticipates receiving Commission approval of the Project in the second quarter of 2025. Construction is currently anticipated to begin in the second to fourth quarter of 2025 with COD by the fourth quarter of 2026. To meet the COD, the following schedules are anticipated for the various phases of Project development.

- **Land Rights:** Northern Crescent Solar secured land rights and acquired all the necessary lease agreements, purchase agreements (for the entire Project, including the new Project substation, Xcel Switchyard, BESS Facility, and Operations and Maintenance [O&M] facility) and easements for development of the Project. All of the land required for the Project, except for the

facilities under purchase agreements, will be leased. Prior to commencement of construction, the lease and purchase agreements will be exercised and converted into leases and owned property, respectively.

- **Site Permits:** Northern Crescent Solar anticipates the Site Permits for the Project will be issued in the second quarter of 2025.
- **Other Permits:** Northern Crescent Solar is responsible for obtaining permits and approvals necessary for construction and operation of the Project. Northern Crescent Solar is working with applicable regulatory staff and anticipates pertinent permits/approvals to be issued by the second quarter of 2025, prior to the start of construction.
- **Equipment Purchase:** Northern Crescent Solar anticipates procuring Project equipment starting in late 2024 and throughout 2025. Final contractor selections will be made contingent on the Application being approved and Site Permits issued by the Commission.
- **Construction:** Northern Crescent Solar will oversee the primary contractors performing construction of the Project. These construction activities will include site preparation, grading, access road building, solar module and racking installation, electrical, transmission, O&M building, and communications installation work. Construction would occur between the second quarter of 2025 to the end of 2026. Northern Crescent Solar anticipates beginning construction of the Project soon after being granted Site Permits by the Commission, fulfilling necessary Site Permit pre-construction compliance requirements, and securing other required approvals. The Solar Facility and BESS Facility will be constructed concurrently.
- **Testing and Commissioning:** Testing and commissioning will occur at the end of construction and prior to the COD. This would occur in the third or fourth quarter of 2026.
- **Operation:** As indicated above, the COD of the Project is anticipated to occur by December 31, 2026 after construction and testing/commissioning activities are completed.

1.4 Required Project Permits

Development of the proposed Project will likely require several federal, state, and local permit approvals prior to starting construction. Potential permits, expected timing, and a discussion of possible applicability, are detailed in Section 1.4.2 below (**Table 1**).

1.4.1 Minnesota Public Utilities Commission Site Permits

Site Permits are required for a solar energy generating system greater than 50 MW and an energy storage system. Accordingly, the Solar Facility and BESS Facility will each require a Site Permit from the Commission prior to construction (Minn. Stat. § 216E.03, subd. 1). Pursuant to Minn. Stat. § 216E.04, subds. 2(8) and 2(9), Northern Crescent Solar seeks approval of its Application under the alternative review process provided under Minn. Stat. § 216E.04 and Minn. R. 7850.2800 to 7850.3900. Northern Crescent Solar filed Notices of Intent to Submit a Site Permit Application under the Alternative Permitting Process to the Commission on January 28, 2022 and July 3, 2024.[5]

[5] Site Permit Application for Solar Facility (eDocket ID No. 20221-182145- 01); Site Permit Application for BESS (eDocket ID No. 20247-208322-01).

1.4.2 Potential Permits and Approvals

Development and construction of the Project will require several federal, state, and local permit approvals prior to construction. Northern Crescent Solar will obtain all permits, licenses, and approvals that are required for the Project concurrent with or following issuance of the Site Permits. Potential permits and approvals, with respect to their prospective applicability and expected timing, are included in **Table 1** below.

Table 1: Potential Permits/Approvals

Agency	Permit / Approval	Applicability	Permit Status and Timing
Federal			
U.S. Army Corps of Engineers (USACE)	Section 404 Permit	Dredging or filling jurisdictional Waters of the United States	To be obtained prior to construction in jurisdictional waters (wetlands/waterways), as needed
State			
Minnesota Public Utilities Commission	Site Permit	Required for Large Energy Facilities 50 MW or greater	To be obtained prior to construction
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification	Required for Section 404 Individual and Nationwide Permits	To be obtained prior to construction in jurisdictional waters, as needed
MPCA	National Pollutant Discharge Elimination System General Permit and Stormwater Pollution Prevention Plan / Spill Containment and Countermeasure Plan	Construction activity that disturbs one or more acre of land	To be obtained/prepared prior to construction
Minnesota Department of Health (MDH)	Well Construction permit	Installation of a water supply well	To be obtained prior to construction of a well (for O&M building), as needed
Minnesota Department of Labor and Industry	Request for electrical inspection	Necessary to comply with State electrical codes	Inspection to be conducted during construction and prior to operation

Agency	Permit / Approval	Applicability	Permit Status and Timing
Minnesota Department of Natural Resources (MnDNR)	Water Appropriation Permit	Required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year (dewatering)	To be obtained prior to dewatering activities, as needed
Minnesota State Historic Preservation Office (SHPO)	Cultural and Historic Resources Review; State and National Register of Historic Sites Review	Projects that require State permits or affect State registered properties or require Section 106 compliance	Obtain concurrence on Phase I inventory prior to construction
Minnesota Department of Transportation (MnDOT)	Application for Utility Accommodation on Trunk Highway Right-of-Way	Installing utilities along, across or within trunk highway right-of-way	To be obtained prior to installation of utilities within MnDOT right-of-way, as needed
	Access (Driveway) Permit	Required for construction of a driveway/access road utilizing MnDOT rights-of-way	To be obtained prior to construction of driveway on MnDOT right-of-way, as needed
	Oversize/Overweight Permit	Vehicles delivering equipment, materials and supplies that exceed applicable MnDOT height/length limits and weight limits	To be obtained prior to equipment deliveries, as needed
County/Local			
Faribault County	Minnesota Wetland Conservation Act Approval (administered by Faribault County Soil and Water Conservation District)	Activities affecting water resources	To be obtained prior to construction in jurisdictional waters, as needed
	Driveway Permit	Required for creation of a new driveway access to county roads	To be obtained prior to construction of new driveway access, as needed
	Utility Permit on County Highway Right-of-Way	Required for installation of utility infrastructure in a county road right-of-way	To be obtained prior to installation, as needed

Agency	Permit / Approval	Applicability	Permit Status and Timing
	Miscellaneous Work Permit	Required to work within public road right-of-way (grading, obstruction, etc.)	To be obtained prior to work within right-of-way, as needed
	Oversize/Overweight Permit	Use of overweight or oversized vehicles on county roadways	To be obtained prior to equipment deliveries, as needed

1.5 Permits Not Required

1.5.1 Certificate of Need

The Project falls into an exception to the certificate of need (CN) requirement, so a CN is not required. A CN is required for all "large energy facilities" (LEFs), as defined in Minn. Stat. § 216B.2421, subd. 2(1), unless the facility falls within a statutory exemption from the CN requirements. Because the Project is a generating plant larger than 50 MW, it meets the definition of an LEF and would require a CN prior to issuance of a Site Permit and construction. However, the Solar Facility is exempt from CN requirements because it is a solar energy generating system, as defined in Minn. Stat. § 216E.01, subd. 9(a) and the Project is being developed and permitted by an independent power producer, Northern Crescent Solar, under Minn. Stat. Chapter 216E.[6] The BESS Facility is also exempt from CN requirements because it is an energy storage system as defined in Minn. Stat. § 216E.01, subd. 3a and is not included in the definition of a LEF in Minn. Stat. § 216B.2421, subd. 2(1).

1.5.2 Local Discretionary Approvals

Pursuant to Minn. Stat. § 216E.10, subd. 1, the issuance of Site Permits is the sole site approval required to be obtained. The Site Permits supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government that would govern the site of the Project. Northern Crescent Solar will still obtain other required local permits, as needed and as detailed in Section 1.4.2.

Northern Crescent Solar has consulted with local officials early in the development process and will continue to strive to incorporate feedback and reasonable recommendations of local stakeholders into the final design of the Project. A summary of agency and public outreach is described in Section 6.0 below.

1.5.3 Transmission Route Permit

No transmission infrastructure exceeding the voltage and length requirements of a "large energy facility" under Minn. Stat. § 216B.2421, subd. 1, are proposed for the Project. Therefore, the proposed Project will

[6] See Minn. Stat. § 216B.243, subd. 8(a)(7).

not trigger the need for a separate Route Permit from the Commission for planned Project interconnection facilities.

2.0 PROJECT INFORMATION

The following sections provide a description of the proposed Project Area and Project infrastructure, including location, interconnection, land control, equipment selections, and costs.

2.1 Overall Project Description

The Project is an up to 150 MWac solar energy generating system and 50 MWac BESS within Verona and Prescott Townships, Faribault County, Minnesota. The Project encompasses approximately 1,179 acres (Project Area) of privately owned, predominantly agricultural land. The final design is expected to occupy approximately 929 acres (i.e., the Preliminary Development Area). Northern Crescent Solar plans to construct the Project on a schedule that facilitates an in-service date in the fourth quarter of 2026.

To allow for optimization, and inadvertent discoveries through the permitting and final design process, Project impacts described in this application are representative of the maximum potential Project footprint (i.e., the Preliminary Development Area) and are therefore greater than what is expected to occur from the construction and operation of the Project (**Figure 2**).

2.2 Project Location

The Project is generally located about one mile southeast of Winnebago, east of U.S. Highway 169, in Faribault County. The Project location is provided in **Table 2** and shown on **Figure 1**.

Table 2: Project Location

Township Name	Township	Range	Section(s)
Verona	103N	28W	11, 12, 13
Prescott	103N	27W	7, 18

A detailed Preliminary Site Plan of the current Project design is included in **Appendix C**. Engineering and design will continue as pending considerations are evaluated and determined. Detailed descriptions of Project facilities and design are provided in Section 4.0.

Northern Crescent Solar has secured site control for the entire proposed Project Area via lease agreements and purchase option agreements (for the Xcel Switchyard, BESS Facility, O&M facility, and Project substation). Because design and engineering are conceptual at this stage of the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design.

Northern Crescent Solar believes that the selected Project location in Faribault County is feasible and prudent for solar development based upon the proximity to existing electric transmission infrastructure,

minimal impact to natural resources, sufficient solar resource, available non-prime farmland, and consistency with existing land uses and local zoning.

2.3 Facility and Interconnection Description

2.3.1 Facilities and Equipment

As further detailed in Section 4.0 below, the Project facilities and equipment include:

- Solar modules (also referred to as panels or arrays);
- Inverters;
- Step-up transformers (connecting inverters to collection lines/Project substation);
- Electrical wiring (connecting solar modules to inverters);
- Tracking rack structures;
- Collection lines (connecting inverters to Project substation);
- Security fencing and gates;
- Access roads;
- Stormwater collection basins (associated with the Project);
- O&M facility;
- Supervisory Control and Data Acquisition (SCADA) system;
- Project substation and power transformer;
- Overhead 161 kV Project HVTL (~300ft within the Project boundary, connecting Xcel Switchyard to Project substation) (Gen-Tie Line);
- Xcel Switchyard/switchgear/line tap;
- Metering equipment;
- BESS Facility and associated equipment; and
- Ancillary equipment or buildings as necessary.

A Detailed Preliminary Site Plan showing Project facilities and related equipment is included in **Appendix C.**

2.3.2 Project Substation, Project Gen-Tie, BESS Facility, and Xcel Switchyard Description

The Project substation is proposed in the western part of the Project Area (**Figures 2, 3, & 4; Appendix C**) and will consist of a 34.5 to 161 kV power transformer and related equipment (Project Substation). Underground 34.5 kV AC collector lines from the Project inverters will deliver solar-generated energy to the Project Substation. The 34.5 kV collector system voltage will then be stepped up to the

interconnection voltage of 161 kV by the transformer located at the Project Substation. The power will then be transmitted from the Project Substation to the Xcel Switchyard via the Gen-Tie Line. A less than 250-foot line tap will connect the Xcel Switchyard to the existing Huntley–Blue Earth 161 kV HVTL. The anticipated connection and layout of the Project infrastructure is shown on **Figure 3**. A separate Route Permit is not required for the Project.[7]

The BESS Facility is proposed to be immediately adjacent to the Project Substation and interconnect via underground 34.5 kV lines to the substation. Components would include commercial-scale lithium-ion (or similar technology) batteries, and inverters.

The Xcel Switchyard is proposed adjacent to the Project Substation and will be used to interconnect the Project to the existing Huntley–Blue Earth 161 kV HVTL that crosses through the northern portion of the Project Area (**Figure 3**). Northern Crescent Solar will acquire the land underlying the new Xcel Switchyard (via a purchase option agreement) and secure any other land rights that are necessary to facilitate the connection of the Xcel Switchyard to the Huntley-Blue Earth 161 kV HVTL. Xcel Energy will install new deadend structures and remove one existing deadend structure to facilitate the interconnection. Xcel Energy will design, engineer, permit, and construct the Xcel Switchyard and the Xcel Energy line tap. Northern Crescent Solar will convey the real property for the Xcel Switchyard and any other land rights necessary to Xcel Energy to facilitate the interconnection to the existing Huntley-Blue Earth 161 kV HVTL. These facilities will be network facilities owned and operated by Xcel Energy.

The Applicant filed a Generator Interconnection Agreement (GIA) application with Midcontinent Independent System Operator (MISO) for a hybrid 150 MWac Solar and 50 MWac BESS facility. MISO is an independent not-for-profit organization that delivers electric power across 15 states. Approval from MISO through a GIA is required to connect the Project to the electrical transmission system. The Applicant entered the interconnect request into the MISO Definitive Planning Phase study process in 2020. The Applicant expects to sign a GIA in the second half of 2024.

2.4 Size and Capacity

The Project is proposed within an approximate 1,179-acre Project Area. Northern Crescent Solar estimates that approximately 929 acres are necessary to accommodate the final design and engineering of the proposed Project (i.e., the Preliminary Development Area). The Preliminary Development Area is generally defined as the area containing all Project facilities (i.e., Solar Facility and BESS Facility) located within the Project security fencing (e.g., solar modules, inverters, collection lines, etc.) and includes the access roads extending beyond the security fencing. It also includes the Project Substation, O&M facility, and Xcel Switchyard.

Northern Crescent Solar has 100% land control within the Project Area, which is comprised of private land under either a lease agreement or a purchase option agreement (i.e., for the Xcel Switchyard, Project Substation, O&M facility, and BESS Facility). The Project Area includes land which was secured to provide the acreage needed to complete final design, construction, and operation of the Project as part of

[7] The Project will not require a Route Permit because the transmission line is less than 1,500 feet in length and therefore not a "high-voltage transmission line." Minn. Stat. § 216E.01, subd. 4; Minn. Stat. § 216E.03, subd. 2.

the Site Permit process. The Preliminary Development Area and Project Area are shown on **Figure 2**. The current layout and proposed equipment are preliminary and subject to change as the design advances.

Solar Facility
Northern Crescent Solar is planning to use solar modules with a total equivalent generating capacity of 167.7 MWac. This preliminary design and Project layout takes into account applicable energy loss (approximately 2% AC losses) and would allow for a maximum of 150 MWac of solar energy generation and transmission onto the grid (which is capped at 150 MWac as part of the interconnection request and GIA with MISO that will be signed prior to construction of the Project). Accordingly, this Application is requesting a Site Permit for the nameplate capacity of the Project as measured at the point of interconnection (POI).

BESS Facility
The BESS Facility will utilize lithium-ion battery technology (or similar technology) with a storage capacity of 50 MWac. The location of the BESS Facility is currently planned on 3.2 acres in the western portion of the Project Area, adjacent to and west of the Project Substation and Xcel Switchyard. This Application is requesting a Site Permit for the BESS Facility. See Section 4.1.5 for additional information on the BESS Facility.

2.5 Cost Analysis

Northern Crescent Solar estimates the total installed capital cost for the entire Project will be approximately $337 million, as broken down in **Table 3** below. Actual capital costs depend on various factors such as construction labor, Project equipment and materials, electrical and communication systems, taxes/tariffs, final design considerations (e.g., Project Substation, O&M facility, etc.).

Operating costs are estimated at approximately $4 million per year ($3 million for Solar Facility, $1 million for BESS Facility), which includes labor, materials, and property taxes for the entire Project (solar generation and transmission facilities). The primary costs for operations and maintenance of the Project are associated with vegetation management, solar module maintenance, and applicable inspections. Initial operations and maintenance costs for the Project Gen-Tie Line and electrical system will be nominal for the first few years of operation because the lines will be new and minimal maintenance should be required.

Table 3: Estimated Project Costs

Task	Cost ($)
Solar Facility	
Engineering, Procurement and Construction Contractor	235,000,000
Development Expense	5,000,000
Interconnection	11,500,000
Financing	15,000,000
Project Gen-Tie Line	700,000
BESS Facility	
Engineering, Procurement and Construction Contractor	70,000,000
Project Total	**337,200,000**

3.0 PROJECT SITE SELECTION AND CONSTRAINTS ANALYSIS

3.1 Prohibited and Exclusion Sites

Minn. R. 7850.4400, subp. 1 prohibits large electric power generating plants (LEPGPs) from being sited in certain locations including: national parks; national historic sites and landmarks; national historic districts; national wildlife refuges; national monuments; national wild, scenic, and recreational riverways; state wild, scenic, and recreational rivers and their land use districts; state parks; nature conservancy preserves; state scientific and natural areas (SNAs); and state and national wilderness areas. None of these prohibited sites are located within or near the Project Area as discussed below.

In addition, Minn. R. 7850.4400, subp. 3, prohibits LEPGPs from being located in certain exclusion areas unless there is no feasible and prudent alternative. These exclusion areas include state registered historic sites; state historic districts; state Wildlife Management Areas (WMAs); county parks; metropolitan parks; designated state and federal recreational trails; designated trout streams; and state water trails. None of these exclusion sites are located within or near the Project Area as further discussed below.

Subject to certain exceptions, Minn. R. 7850.4400, subp. 4, prohibits LEPGPs from being sited on more than 0.5 acre of prime farmland per MW of net generating capacity unless there is no feasible and prudent alternative (prime farmland exclusion rule). Given the up to 150 MWac net generating capacity of the Project, the prime farmland exclusion rule would allow use of up to 75 acres of prime farmland for the Project.

Approximately 440 acres of prime farmland and 485 acres of prime farmland if drained are located within the Preliminary Development Area (**Table 20**). These acreages of prime farmland would be temporarily taken out of agricultural production for the 30-year operational life of the Project but would not be permanently removed from agricultural production.

The prime farmland exclusion rule provides an exception if there is no feasible or prudent alternative. The Project Area is partially sited on prime farmland. Northern Crescent Solar completed a detailed evaluation of potential alternative sites in an attempt to avoid prime farmland but was unable to find a feasible or prudent alternative to the Project Area and therefore satisfies the exception to the prime farmland exclusion rule (Section 5.3.3; **Appendix D**). A variety of factors such as Project need, Minnesota statutes and policies regarding energy and transmission facilities, soils, and other environmental components were evaluated to satisfy the prime farmland exclusion rule for the Project Area.

3.2 Alternatives Considered but Rejected

In accordance with Minn. Stat. § 216E.04, subds. 2(8) and 2(9), the Project qualifies for the alternative review process under Minn. R. 7850.2800 to 7850.3900 because it is a LEPGP that is powered by solar energy and an energy storage system. As such, pursuant to Minn. R. 7850.3100, Northern Crescent Solar is not required to analyze alternative sites unless it rejected alternative sites. Northern Crescent Solar did seek and analyze other areas in Minnesota where the Project could be sited to be compliant with the prime farmland exclusion rule (Section 5.3.3; **Appendix D**). However, these areas were determined to not be feasible or prudent for siting the Project and were not carried forward as Project alternatives. Northern Crescent Solar selected the proposed Project Area due to minimal environmental and prime farmland impacts, proximity to the electrical grid and existing transmission infrastructure, willing landowners, and available capacity on the grid to which the Project will interconnect.

3.3 Future Expansion

Northern Crescent Solar has no anticipated plans to expand the proposed Project at this time. As noted above, land planned for development of the Project will be leased from seven landowners for the 30-year operational life of the Project. Additionally, Northern Crescent Solar has made an interconnection request from MISO for up to 150 MWac, which is the planned Project energy output at the POI. This request with MISO was submitted as a hybrid resource of 150 MWac solar plus 50 MWac of BESS, however the total capacity dispatched at any given time is limited to 150 MWac.

4.0 ENGINEERING AND OPERATIONAL DESIGN

The following describes the Project design, facility equipment, Balance of Plant components, O&M facility, security fencing and access to the Project. The Preliminary Site Design is shown on **Figure 4** and on the Detailed Preliminary Site Plan in **Appendix C**.

4.1 Design

The Project's primary components include a Solar Facility (solar modules mounted on a linear axis tracking system (**Image 1**), centralized inverters), a Project Substation, Project Gen-Tie Line, an O&M facility, BESS Facility, fencing, and access roads. The current design considers Solar Hyperion HY-DH144N8 bifacial and dual glass solar modules, Power Electronics FS4200M inverters, and ATI DuraTrack HZ v3 solar tracker system, a horizontal single-axis tracker. The final selection of equipment will be dependent upon equipment that is available at the time of construction; other types of equipment (e.g., First Solar thin film solar modules) may be considered depending on availability and timing. For

descriptive purposes, an individual tracker row is used as a basic unit of the Project. A tracker row is made up of modules mounted on a flat beam-oriented north-south, with a break in the middle where the gear box is located. The tracker rows tilt east-west and use a motor to follow the sun throughout the day. The racking system consists of all the components involved in fastening the modules to the tracker rows, plus the tracker beams, gearboxes, motors, and pier foundations. A new Xcel Switchyard and Xcel Energy line tap will be permitted, constructed, owned, and operated by Xcel Energy.

Solar energy generation begins with the installed solar modules converting energy from sunlight into direct current (DC) electrical power. Blocks of modules are electrically connected in series by DC cabling that terminate at an inverter. Inverters convert the DC power from the modules to 34.5 kV AC power. AC electrical collection cables connect the inverters to the Project Substation where the power is then stepped-up by a transformer from 34.5 kV to 161 kV which is the voltage of the existing transmission infrastructure associated with the Huntley-Blue Earth 161 kV HVTL.

Image 1: Typical Solar Tracker Row Design

4.1.1 Photovoltaic Solar Arrays

The solar array at the Project will consist of solar modules, a racking system, inverter skids, security fencing, and up to four weather stations (**Figure 4** shows ten possible locations, from which four will be selected; **Appendix C**). The weather stations would be up to 10 feet tall. Northern Crescent Solar proposes to use modules affixed to tracking mechanisms that would allow the modules to “track” the sun from east to west on a daily basis. The modules and tracking rack system are generally aligned in rows oriented north and south with the modules 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 modules are rotated by a small motor connected to the tracking rack system to slowly track with the sun throughout the day (**Image 2**). The tracking rack system allows the Project to optimize the angle of the modules in relation to

the sun throughout the day, thereby maximizing production of electricity and the capacity value of the Project.

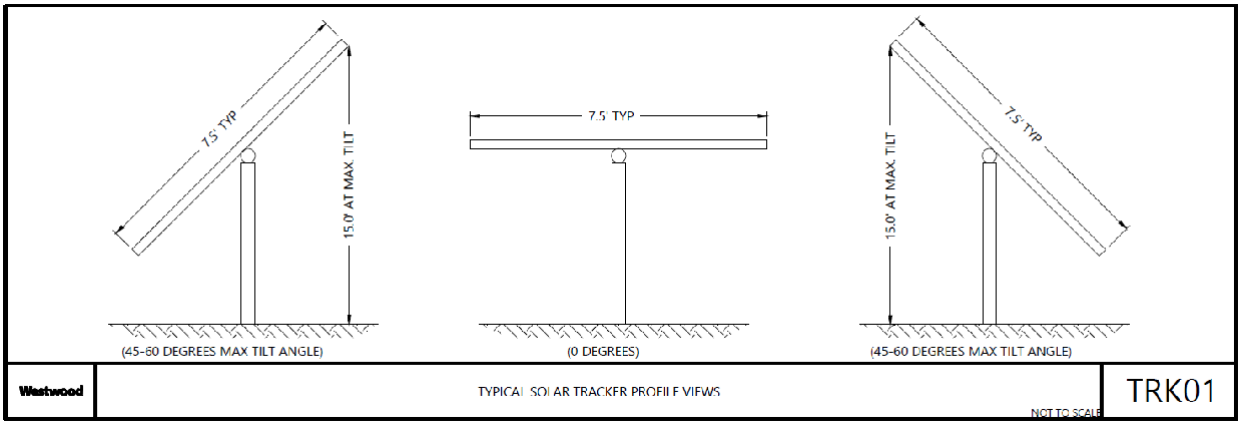

Image 2: Typical Solar Tracker Profile

When the sun is directly overhead, the modules will be at a zero-degree angle (level to the ground) and approximately four to six feet off the ground. The tracker rows will follow the sun from a maximum of approximately 60 degrees east to 60 degrees west through the course of the day (the design tilt may vary). At the approximate maximum tilt of 60 degrees (tilted to the highest position), the edge of the modules will be a maximum of 15 feet off the ground. The design will involve no spinning machinery, no thermal cycle, and no water use (except for infrequent module washing, if needed [minimal to no solar module washing is anticipated to be needed for the Project]).

To the extent practical, the racking system foundations will be a driven pier and will not require concrete, although some concrete foundations may be required depending upon site-specific soil conditions and pending geotechnical analysis. Driven pier foundations are typically driven 8 to 15 feet into the ground depending on site specific soils. The depth at which driven pier foundations will be installed for the Project will be determined in final design.

New solar modules and racking systems are being introduced to the market regularly (e.g., higher efficiency or higher wattage per module options). As such, it is important to maintain as much flexibility in the individual supplier and technology choice as possible until just before procurement. Selection of newer, higher wattage equipment that may become available before the Project goes to construction could potentially reduce the overall footprint of the Project.

Therefore, a specific solar module has not yet been selected for the Project. The proposed modules at the time of the application are Solar Hyperion HY-DH144N8 bifacial and dual glass solar modules. The proposed tracker system is ATI DuraTrack HZ v3. Other solar module manufacturers under consideration include First Solar, and other racking manufacturers under consideration include Nextracker and Gamechange. Northern Crescent Solar will consider the costs and performance of each technology option, as well as environmental and safety standards, when making its final selection. This process has been included in the proposed Project timeline and the final selection should not alter the Project scope, timeframe, or budget.

4.1.2 Project Substation

The Project Substation is proposed in the western part of the Project Area (**Figure 4**). The Project Substation is estimated to occupy approximately 1.3 acres of land and have a footprint of approximately 66,000 square feet (300 feet by 220 feet). The Project Substation will consist of high voltage electrical structures (i.e., pole structures), breakers, a 34.5/161 kV step-up transformer, metering, and related equipment for connecting to the transmission grid, lightning protection, and control equipment according to the specifications of the GIA with MISO and Xcel Energy.

Underground 34.5 kV collector lines from the solar and BESS inverters will deliver solar generated energy to the Project Substation. The 34.5 kV collector system voltage will then be stepped up to the interconnection voltage of 161 kV by the transformer located at the Project Substation and transmitted to the new adjacent Xcel Switchyard via a short (less than 250 feet long) overhead Project Gen-Tie Line in a single span between deadend structures.

The number of poles and length of the Project Gen-Tie Line are pending final engineering and design. The deadend structures will be made of steel and will be 70 feet tall (**Image 3**).

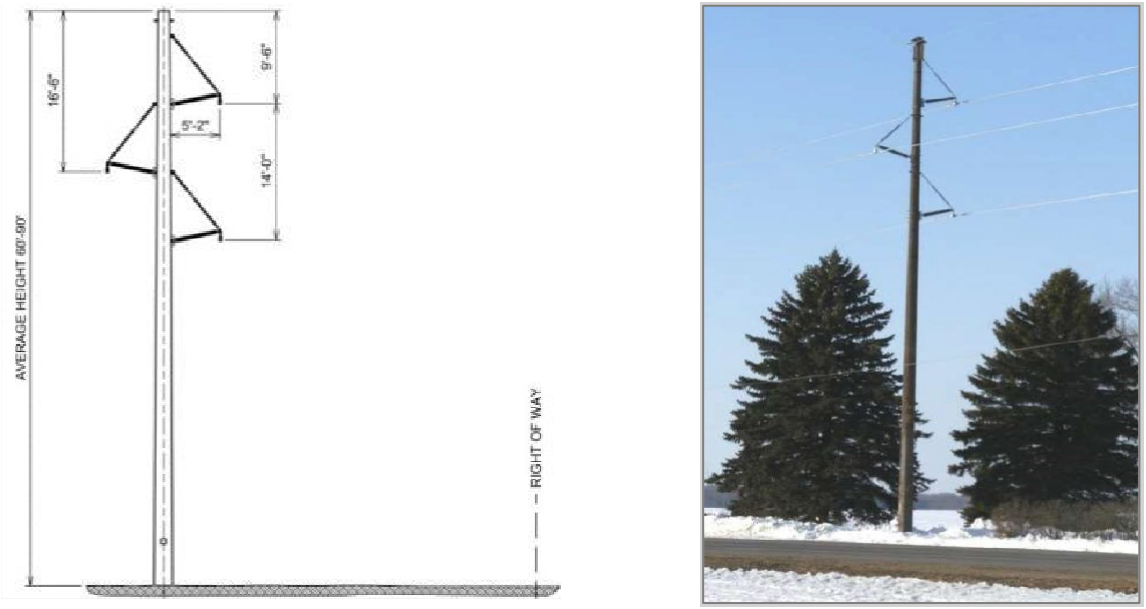

Image 3: Typical Overhead Transmission Line Structure

The Project Substation location will be graded, the ground surface dressed with crushed rock, and secondary containment areas for the transformer will be installed as necessary. The Project Substation will be fenced with a 6-foot-tall chain-link fence topped with one to two feet of barbed wire in accordance with applicable electrical code requirements for security and safety purposes. The area within the Project Substation fence will be graveled to minimize vegetation growth and reduce fire risk. The Project Substation will include a parking area, secured with a lockable gate, and will be accessible to qualified, trained Project operational personnel or those escorted by such personnel at all times using the Project's access roads.

4.1.3 Xcel Switchyard

The Xcel Switchyard will be permitted, constructed, owned, and maintained by Xcel Energy. The Xcel Switchyard and Xcel line tap are not part of the Project, but descriptions of this infrastructure are provided in this Application and shown on the figures for the purposes of characterizing the environmental impacts of the Project and the ancillary facilities that will be constructed to connect the Project to the grid. The Xcel Switchyard is proposed in the western part of the Project Area, adjacent to the Project Substation, and will occupy approximately 1.3 acres of land. The Xcel Switchyard will be a maximum of 250 feet from the existing Huntley-Blue Earth 161 kV HVTL, which crosses through the northern portion of the Project Area (**Figures 3 & 4**).

The Xcel Switchyard design is based on the Phase 2 Facility Study for the interconnection. The Xcel Switchyard will include bus work; bus supports and foundations; three circuit breakers including protective relaying and foundations; new yard, including perimeter security fencing, grading, and grounding; and two sets of primary and secondary line protective relaying. The current design includes three self-supporting vertical deadend steel structures on drilled pier foundations (70 to 75 feet tall), one steel H-frame deadend structure (**Image 4**) on drilled pier foundation (70 feet tall), conductor, and shield wire to accommodate the new 161 kV line terminations. One existing 65-foot-tall wood tangent H-frame structure would be removed. One self-supporting steel vertical deadend structure on a drilled pier foundation will be constructed for the Xcel Switchyard to connect (via the Gen-Tie Line) to the Project Substation. This structure will serve as the point of ownership change between Xcel Energy and Northern Crescent Solar. All construction will occur within the Project Area and Xcel Energy right-of-way property.

Image 4: Typical H-Frame Deadend Structure

Xcel Energy will apply for a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater (CSW) General Permit to discharge stormwater from its construction facilities and prepare a Stormwater Pollution Prevention Plan (SWPPP) prior to its construction activities that will identify specific Best Management Practices (BMPs) such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent erosion for the construction of Xcel Energy facilities.

4.1.4 Electrical Collection System

The electric collection system components include electrical cables and accessories, conduit, inverter pads, switchgears, step up transformers, SCADA system, and metering equipment. Electrical wiring will connect the solar modules to inverters which will convert solar energy generated power from DC to AC. Power inverters convert approximately 1,500 volts of DC power output from the solar modules to between 3,900 to 4,200 kilovolt-amperes of AC power based on the FS4200M inverter used in the preliminary design. A step-up transformer then converts the AC voltage to an intermediate voltage of 34.5 kV. Collection cables then carry the 34.5 kV power to the Project Substation (Section 4.1.4) (**Figure 4**).

Step-up transformers are located with each of the inverters. Similarly, the BESS Facility includes rows of pad-mount transformers and inverters. From each BESS container, medium voltage DC cables will connect an inverter, pad-mount transformer, and feeder cabling to a common bus that will then connect to the Project Substation. Auxiliary power will be routed from the Project Substation to the BESS Facility at 34.5 kV. The total length of the electrical collection system is approximately 96,000 linear feet.

The DC electrical collection cabling will be installed either below-ground, underhung beneath the solar modules and racking or suspended above ground via the CAB solar cable management system.[8] The CAB system is a cable management system that delivers a safe, strong, and durable support for utility-scale wiring for ground-mount solar power generation facilities. CAB systems are quick and easy to install and provide potential labor and material cost benefits on solar projects. If buried, the underground trench will be approximately 2 to 5 feet below ground and 1 to 2 feet wide (**Image 5**). Excavation and refilling the trench will be conducted in accordance with the Preliminary Agricultural Impact Mitigation Plan (AIMP; **Appendix E**).

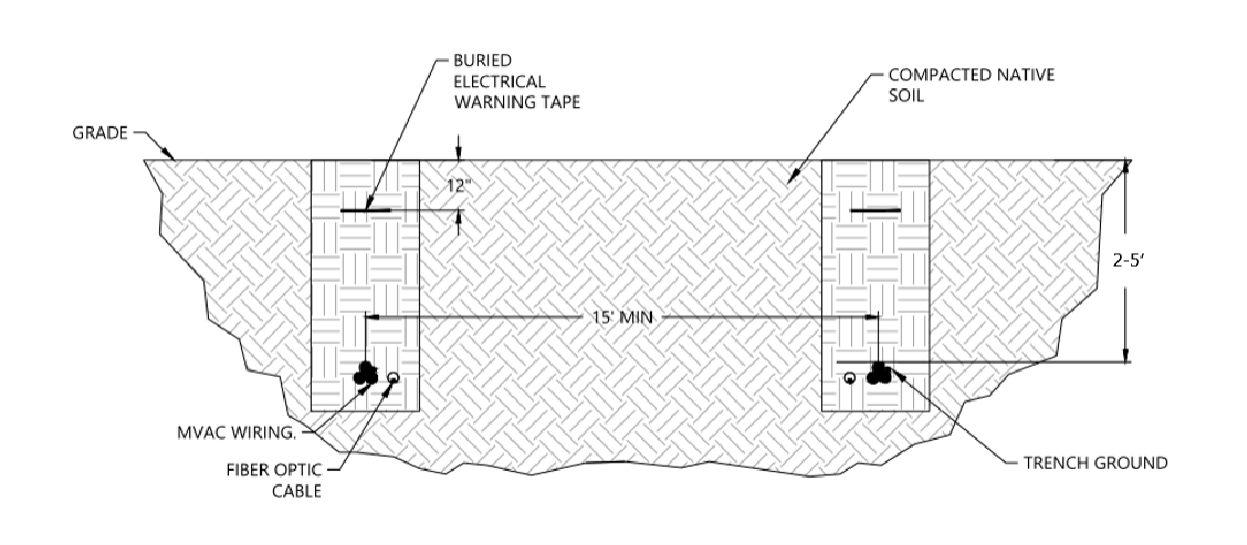

Image 5: Typical Solar Collection Trenches for Cables

Inverter skids will be installed at locations throughout the Preliminary Development Area. Each skid includes a DC to AC inverter and a step-up transformer to which the inverters will feed electricity. The Project's preliminary design proposes 43 inverters (**Figure 4; Appendix C**). The final number of solar inverters will depend on the inverter size, as well as inverter and panel availability.

Skids provide the steel foundation for the enclosed inverter, step-up transformer, and SCADA system. The height of a skid is approximately 8 to 12 feet above grade. The skids will be placed atop a poured reinforced concrete slab or pier foundations and will typically measure 10 feet wide by 25 feet long. Concrete foundations will be poured onsite using concrete delivered from an existing off-site concrete plant owned by a vendor or precast and assembled offsite. The inverter skids are located within the

[8] In this option some Project construction locations may install the CAB system on pile foundations (without racking on it) to connect the DC cables to the inverter/equipment pad.

interior fenced portion of the Project along access roads. The Project has been designed with Power Electronics FS4200M inverters; however, other inverters may be utilized when final equipment selections are made prior to construction.

Each inverter skid will also include one or more transformers to which the inverters will feed electricity (**Image 6** shows the DC cables buried option). Inverters convert the DC output of the modules to AC, which is required for delivery to the electrical grid. After the inverter has converted the electricity, it is stepped-up via a transformer from low voltage to medium or intermediate voltage (stepped up to 34.5 kV).

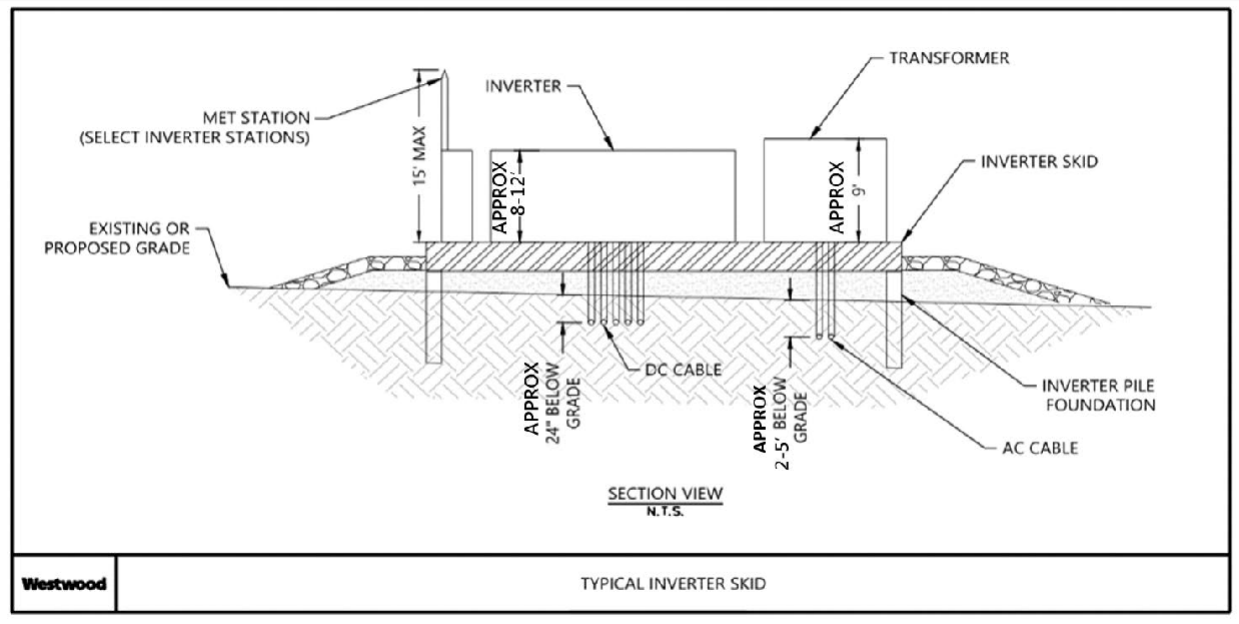

Image 6: Typical Solar Inverter Skid (AC and DC Cables Buried Option)

The AC electrical collection system from the inverters/step-up transformer to the Project Substation will be buried between 2 to 5 feet below ground. The final type of electrical system will be determined prior to construction based on technology, availability of materials, and costs. Below-ground AC electric conductor collection lines will transfer the converted 34.5 kV electricity from the inverter equipment (which is assembled on skids and delivered to the Project as a package) to the Project Substation. During trench excavations, the topsoil and subsoil will be removed and stockpiled separately in accordance with the AIMP (**Appendix E**). Once the electric conductor collection lines are laid in the trench, the trench will be backfilled with subsoil followed by segregated topsoil. Electrical collection installation methods and technology is changing and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Directional boring or vibratory plowing may also be used to install collection cables depending on the presence of surface or sub-surface features that may need to be avoided. For example, cables may be installed via directional boring at a depth deeper than trenches for installation under existing utilities or other features requiring avoidance. Final engineering and procurement recommendations will help determine the construction method for the electrical collection system.

4.1.5 Battery Energy Storage System Facility

The purpose of the proposed BESS Facility is to help balance the delivery of power generated by the Solar Facility by charging the batteries when demand is low and distributing electricity into the grid during outages or when demand is high. The BESS Facility is in part designed to reduce costs for interconnection customers and improve wholesale market competition, allowing Northern Crescent Solar to create additional energy and capacity value by maximizing the use of interconnection facilities and network upgrades necessary to accommodate the solar generation component of the Project.

The BESS is intended to maximize the usefulness of the network upgrades by dispatching stored power during times when less solar energy is being produced. For example, during off-peak times, when the Project is producing 100 MWac of solar generation, the BESS could dispatch up to an additional 50 MWac of power to fully utilize the 150 MWac of capacity allowed under the GIA. The BESS Facility will move energy from the BESS container and adjacent inverters via underground 34.5 kV line, to the Project Substation to be stepped up. A BESS is accredited capacity based generally on its ability to provide the energy equivalent of its claimed capacity for a minimum of at least four continuous hours each day.

Northern Crescent Solar anticipates a centralized, AC-coupled system for the BESS Facility (i.e., all batteries being in one location as opposed to being distributed throughout the Project). This type of system allows for more efficient access, monitoring, and maintenance; has more flexible energy and power capacity sizing; and has more flexible dispatch capabilities. The centralized design is also more technologically developed. The preliminary designs for the BESS Facility components incorporate a modular layout based on currently available technology, which provides a conservative analysis of the potential overall size of the BESS Facility.

The location of the BESS Facility is currently planned on 3.2 acres in the western portion of the Project Area, adjacent to and west of the Project Substation and Xcel Switchyard. The BESS will be configured of storage cells (batteries) arranged in modules for efficient operations. The batteries will be housed in racks within a series of steel shipping containers or similar enclosures (**Image 7**). Standalone enclosures are necessary, as opposed to a large warehouse or storage building, to ensure people cannot enter into the enclosures with the batteries for safety reasons as described in Section 4.1.5.1 below.

The BESS will include inverters and medium voltage transformers to transfer the energy to and from the batteries. From the BESS container, low voltage cables will connect to pad-mounted switchgear, step up transformer(s), and a power distribution system. Additionally, stabilized gravel access roads and perimeter fencing will be provided.

Image 7: Representative BESS Container

The BESS industry is currently deploying two main types of lithium-ion battery chemistries: nickel manganese cobalt oxide (NMC), and lithium iron phosphate (LFP). Northern Crescent Solar intends to use LFP due to its superior safety profile when compared to NMC. LFP batteries are more stable than NMC and have a lower risk for thermal runaway propagation or a deflagration event, which means in the unlikely event of a battery cell failure, the failure is less likely to spread.

Technology related to solar generation and battery storage is advancing at a rapid pace. Similar to other infrastructure components such as solar modules, the options available for the BESS when the Project begins procuring infrastructure could be significantly more advanced than those currently available. Therefore, Northern Crescent Solar will analyze current market offerings during final engineering to select the specific battery system model. Over the life of the Project, the batteries will lose capacity. The augmentation schedule will be determined during the design process, after equipment selection. The extra space required for these augmentation units has been considered in the proposed footprint.

Visually, the impact of the BESS would not be entirely out of character with the rest of the Project. The enclosures are grey, generally light in color, relatively short (9.5 feet), and around 20 feet long, similar in size to shipping containers.

4.1.5.1 BESS Safety

Safety will be Northern Crescent Solar's foremost principle at the facility during construction and operation. Safe design and operation of the BESS begins with safe equipment and compliance with safety codes, regulations, and industry recommendations.

BESS fires are extremely rare. Advances in technology, safety standards, and fire/building codes have and will continue to mitigate fire safety risks. Hazard mitigation systems include:

- Remote monitoring (down to the cell level);
- HVAC for temperature control;
- Heat and smoke detection;
- Automatic fire suppressant release;

- Automatic stop and response personnel alerts;
- Gas detection system;
- Deflagration venting (if applicable); and
- System-specific training for fire local departments and emergency response teams.

Northern Crescent Solar has proactively incorporated all reasonable safety precautions into the design of the proposed BESS. The lithium-ion batteries will be stored in weather-proof enclosures, similar in size to shipping containers. Each enclosure includes a fully integrated system of HVAC for temperature control, sensors, and controls for remote monitoring, and built-in fire detection and suppression. No off-gassing or air emissions are produced in day-to-day operations.

4.1.5.2 Testing and Certification

Northern Crescent Solar's equipment suppliers manufacture to stringent quality standards, and equipment must be tested and certified by third party professionals. Standards, certifications, and code requirements from multiple nationally recognized organizations will be required for the engineering, design, manufacture, and testing of the enclosures and equipment included in the BESS. The BESS equipment will be stringently tested to prominent safety standards, including International Electrotechnical Commission (IEC) 62619, IEC 6244-1, Underwriters Laboratories (UL) 1973, and UL 9540A. BESS design shall comply with International Fire Code (IFC) 2018, National Fire Protection Association 855 (NFPA 855), and National Electric Code (NFPA 70). For example, equipment suppliers will be required to perform the UL 9540A Large Scale Fire Test, which is a "Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems." The equipment procured must show that a thermal runaway event does not propagate from one battery rack to another. For this test, a third-party, Nationally Recognized Testing Laboratory will generate conditions, through external heating, over charging, or other, to initiate thermal runaway in a battery cell. The thermal runaway characteristics are observed and quantified, including gas generation/composition. These tests and reports allow stakeholders to understand the potential hazards posed by the specific batteries to ensure that the appropriate safety features are incorporated based upon the results, as required by NFPA 855 and the IFC.

Northern Crescent Solar will stay abreast of new codes and standards to ensure its equipment vendors and designs comply with industry standards and best practices.

4.1.5.3 BESS Facility Monitoring Systems

The BESS Facility will include a complex monitoring system that monitors many different aspects within the system. Each battery system is equipped with cell level, module level, rack level, and system level monitoring points. These points produce real-time data that feed into automatic control logic housed in the battery management system (BMS) and site controller. The BMS and site controller ensure the BESS Facility is operating within the original equipment manufacturer's operating parameters and warranty requirements. If any operating limit is exceeded or an alarm is triggered, either a fault signal is sent to the whole battery string to disconnect from the inverter, or the rack contacts will open to disconnect individual racks.

This real-time, automated system is designed to identify operational malfunctions or other safety hazards immediately and prevent incidents.

Automatic fire suppression systems will be installed on the BESS containers which includes both inverters and storage batteries. These systems use EPA-approved suppression agents tested for BESS systems and meet all relevant codes and regulations.

Northern Crescent Solar anticipates using a non-water-based fire suppression system, which can effectively suppress fires but will not cause electrical shorts if deployed. The automatic fire suppression system will be activated by smoke and/or heat detectors throughout the enclosure.

Northern Crescent Solar plans to house the BESS batteries in separate containers rather than one building. A containerized solution provides natural segmentation and spatial separation of the BESS components, greatly reducing the risk of fire propagation at the Project. Although this design requires a larger overall footprint than a single building, it is an appropriate consideration for safety because it allows the components to be farther apart to isolate and contain any unlikely conflagration incident. The containers will be non-walk-in with only external access, which excludes people from getting trapped inside a building if a fire occurs and will include auxiliary equipment for fully autonomous fire suppression as well as thermal management systems.

Northern Crescent Solar is committed to providing training resources for local responders, as well as the collaborative development of an emergency response program (ERP) specific to this Project. Northern Crescent Solar will work with local first responders to develop a site-specific ERP. The Project's ERP will require quarterly safety drills for the Project team and annual safety training with local first responders. The ERP for this Project would cover a wide breadth of possible incidents at the site and would include emergency procedures to be followed in case of fire, medical emergencies, and other potential situations. Northern Crescent Solar will initiate this process with a virtual meeting with local responders prior to the Project's operations date.

4.1.6 Operations and Maintenance Facility

The Project will include construction and use of an O&M facility that includes a building, gravel parking area, and perimeter security fence topped with one to two feet of barbed wire. The O&M facility will be located near the Project Substation and Xcel Switchyard with access from U.S. Highway 169. The building will be used to conduct maintenance and repair of Project equipment and solar module components, store parts and other equipment, and store other operation and maintenance supplies (e.g., materials for cleaning modules, etc.). The O&M building will be locked when not in use by Project staff and will also house the SCADA system that will remotely monitor Project facilities. A domestic water well and septic system will be constructed to provide water and sanitary service to the O&M building. Northern Crescent Solar will work with the applicable regulatory authorities and obtain all necessary permits to construct a new domestic water well and septic system. A parking area will be located adjacent to the O&M building for staff use. The location of the O&M facility is currently planned on 0.4 acre in the western portion of the Project Area, east of the Project Substation (**Figures 2, 3, & 4; Appendix C**).

During construction of the Project, nine temporary laydown yards/staging areas may be located near the planned O&M facility. Upon completion of Project construction, these temporary areas will be returned to their original condition if not used as part of Project facilities.

4.1.7 Fencing

Permanent security fencing will be installed along the perimeter of each grouping of the solar modules (**Figure 4; Appendix C**) to comply with applicable electrical codes. Fencing will consist of a lightweight agricultural woven wire (containing wire "knots" wrapped around each intersecting wire) secured to wooden posts which will be directly embedded in the soil or set in concrete foundations as required for structural integrity. The fencing will extend a maximum total height of approximately 10 feet above grade, inclusive of one to two feet of three to four strands of smooth wire. Additionally, "High Voltage Keep Out" signs and lockable gates will be placed along the fence line, warning the public of the potential hazards within the fenced areas. This fencing will be designed to prevent the public and to prevent larger wildlife from gaining access to electrical equipment which could cause harm or injury. Northern Crescent will coordinate with the DNR prior to finalizing the fence design.

Permanent 6-foot-tall chain-link security fencing, with one to two feet of barbed wire at the top, will be installed along the perimeter of the Project Substation, O&M facility, and BESS Facility to comply with applicable electrical codes. High voltage warning signs and lockable gates will also be installed on the fencing. The Xcel Switchyard fence will be designed by Xcel Energy and is likely to be similar to the Project Substation fence.

4.1.8 Access Roads/Transportation System

The Project will include approximately 12.1 miles of graveled access roads that lead to the inverters and other infrastructure for O&M activities (**Figure 4; Appendix C**). The final length of the access roads will depend on the equipment selected and final engineering. The internal roads will be 24 feet wide during construction and 20 to 24 feet wide during operations. The entry road from U.S. Highway 169 will be about 32 feet wide during construction and 24 feet wide for operations. Some of the roads will be wider along curves at internal road intersections (approximately 45 feet). See **Image 8** for typical access roads profiles.

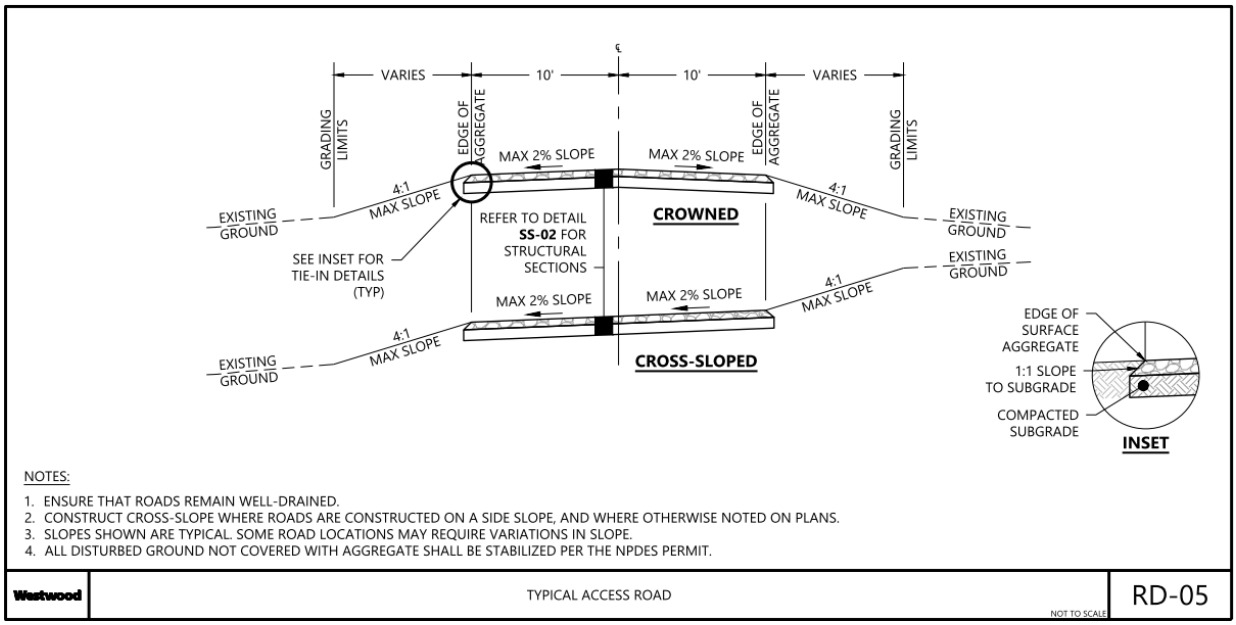

Image 8: Typical Solar Access Road Profile

Access roads may be temporarily wider during construction, and then narrowed for long-term site access upon completion of construction. The Project Substation, BESS Facility, Xcel Switchyard, and O&M facility will be accessed using a newly constructed 24-foot-wide gravel road extending north from U.S. Highway 169 to the Project facilities and the western portion of the Project Area. The northern portion of the Project will be accessed from 180th Street. The southern portion will be accessed from 170th Street. The eastern portion will be accessed from 380th Avenue. The proposed entrances will have locked gates.

Some upgrades or other modifications to the public roads may be required for construction or operation of the Project. Northern Crescent Solar will work with township and county staff to facilitate upgrades to meet required standards and with landowners for final design considerations as needed. Upgrades or changes could include, but are not limited to, road improvements, additional aggregate, and driveway changes. Driveway changes will require an access permit, which will be obtained prior to construction. Northern Crescent Solar will continue to coordinate with township and county road authorities as the Project develops.

Northern Crescent Solar will also coordinate with MnDOT for authorization to install the new gravel access road from U.S. Highway 169. Road improvements may also require a road use or development agreement with Faribault County.

Northern Crescent Solar will obtain relevant permits from road authorities relating to access to the Project through public roads, as well as installation of temporary facilities that may be proposed to occupy portions of public road rights-of-way during the construction process.

Northern Crescent Solar will also obtain relevant permits and/or authorizations from road authorities relating to electric cables and/or feeder lines that may be placed in or across a public road right-of-way.

4.1.9 Pipeline System

No pipeline system will be built, accessed, or needed to accomplish the Project. There are no existing pipelines in the Project Area. The nearest feature is a gas transmission pipeline located about 1.5 miles northwest of the Project Area.

4.2 Project Layout

The Project's final layout will optimize electrical generation, storage and efficiency while avoiding and minimizing human settlement, environmental, cultural resources, and infrastructure impacts. The Project's facilities will be sited to comply with the county's setback requirements, where feasible, and will also comply with other local, state, and federal regulatory standards. The preliminary site layout is shown on **Figure 4** and in **Appendix C**.

4.2.1 Setbacks

As described above, the Solar Facility is considered an LEF as defined in Minn. Stat. § 216.2421, subd. 2(1) and a Large Electric Generating Facility (LEGF) as defined in Minn R. 7849.0010, subp. 13. Because the Solar Facility is a large electric power generating facility that is powered by solar energy and the BESS Facility is an energy storage system, the Commission permits the Project under Minn. Stat. § 216E.04 and Minn. R. 7850.2800 to 7850.3900. In designing the Project layout, Northern Crescent Solar reviewed applicable setbacks and related requirements. While applicable rules and regulations for siting an LEF and LEGF do not require projects to meet local ordinances, Northern Crescent Solar has worked to comply with Faribault County setbacks and applicable ordinances in addition to meeting applicable State requirements.

Because it has a nameplate capacity of more than 40 kilowatts, the Solar Facility is considered a "Solar energy system, large" (large solar energy system) in Section 35 of the Renewable Energy Ordinance of Faribault County, Minnesota (Faribault County, 2020). The BESS Facility is not specifically contemplated by the Renewable Energy Ordinance of Faribault County. The Project Area mainly consists of cultivated land and is zoned as General Agriculture Zoning District (A-2) according to Faribault County zoning information. Large solar energy systems are conditionally permitted on lands zoned A-2 in Faribault County.

The setback regulations and distances for large solar energy systems in the county are included in **Table 4** and also shown on the Preliminary Site Design in **Figure 4** and see **Appendix C**. Where setbacks differed for the same feature, Northern Crescent Solar used the most stringent setback when possible. Northern Crescent Solar considered the County's setbacks for large solar energy systems for the entire Project, including the BESS Facility and the Solar Facility.

As indicated in **Table 4** below, the Project design setbacks meet or exceed the county's setback requirements as provided in the County's zoning ordinance (Section 7-E and Section 31-9 subd. 6). Northern Crescent Solar sited and designed the Project taking into account the county's setbacks, in addition to State requirements. As shown below, Northern Crescent Solar meets each county setback requirement. Northern Crescent Solar is committed to working with the county to meet setback

requirements where feasible. In addition, all MnDNR buffer requirements under Minn. Stat. § 103F.48 have been met.

Table 4: Setback Requirements

Setback Type	County Setback Distance (feet)	Project Design Setback from Fence (feet)
Residential Dwellings	200	>200
US/State Highway Centerline	130	>130
County Road Centerline	100	>100
Existing Easements	65	>65
Existing Transmission Centerline	65	>65
Side yard (A-2)	30	>30
Rear yard (A-2)	50	>50
County drainage systems (tile measured from center line; ditch measures from top of bank)	100	>100
Wetland Ordinary High-Water Level	200	>200

In addition to the above county setbacks, additional standards, such as shoreland overlay districts, are applicable to large solar energy systems as provided in the County's zoning ordinance Section 35 (Renewable Energy Ordinance). While not specifically addressed in the County's zoning ordinance, the BESS Facility is setback in compliance with the county setback requirements for large solar energy systems, including setbacks of at least 170 feet from U.S. Highway 169 centerline, at least 136 feet from the northern parcel line, and about 950 feet from the nearest residential dwelling. Northern Crescent Solar will work with the county in designing and constructing the Project to meet these county standards when practicable. These standards refer to general design and impact mitigation standards, as well as to decommissioning standards.

Additionally, Northern Crescent Solar implemented its own internal setback BMPs into the Project design as detailed in **Table 5**. Setbacks are calculated as the distance from the nearest solar array (**Appendix C**).

Table 5: Project Initiated Setbacks

Setback Type	Project Design Setback from Fence (feet)
Main Access Road Width	24
Internal/Spur Access Road Width	20
Distance from Fence to Equipment	25
Property Boundary	>50

4.2.2 Project Development Area

Table 6 describes the Project facilities' estimated acreage within the approximately 929-acre Preliminary Development Area based on the preliminary layout (**Figure 4; Appendix C**).

Table 6: Estimated Project Facility Acreages in Preliminary Development Area

Preliminary Development Area (fenced area)[1]	**Acres**
Solar Array Area[2]	843.5
Access Roads (20-24 feet wide)[3]	32.9
O&M Facility[4]	0.4
Project Substation	1.3
Xcel Switchyard	1.5
BESS Facility	3.2
Stormwater Basins (15)	24.9
Temporary Laydown Areas (9)	21.7
Preliminary Development Area Subtotal	**929.3**
Area Outside Preliminary Development Area[5]	249.6
Total Project Area	**1,178.9**

1 The Preliminary Development Area includes the area within the perimeter fence that might host solar equipment. The Preliminary Development Area, based on the Project's preliminary design, includes access roads, buried electrical collection lines, inverter skids, an O&M facility, Project Substation, BESS, Xcel Switchyard, sedimentation basins, and temporary laydown yards.

2 The Solar Array Area represents the land hosting the solar modules, the areas in between the solar modules, electrical collection lines, and the solar inverter skids (.25 acre).

3 Access roads will be between 20 and 24 feet wide, with the main access from U.S. Highway 169 to the Project Substation, BESS, and O&M area being 24 feet wide.

4 The O&M facility (96 feet x 199 feet) includes the building, parking area, and other associated facilities that may be required such as a domestic drinking water well, aboveground water storage tanks, septic system, security gate, lighting, and signage.

5 The Area Outside Preliminary Development Area includes all areas outside the fenced areas and associated Project facilities but within the overall 1,179-acre Project Area and consists of vegetative areas, wetlands, waterways, buffers, 0.9 acre of access road entrance improvements, and 4.4 acres of electrical collection lines (a temporary buffer width of 5 feet on either side of the collection line was used to determine impacts).

Notes: Some addends may not sum due to rounding. Impervious surfaces determined by combining post-construction access roads, O&M facility, Project Substation, Xcel Switchyard, BESS Facility, and solar inverter skids for a total of 39.6 acres.

4.3 Project Construction

A variety of activities must be completed to carry the Project through construction and into operation. Below is a preliminary list of activities necessary to develop the Project. Pre-construction activities will be completed between submittal of this application and the start of construction.

Pre-construction, construction, and post-construction activities for the Solar Facility include:

- Pre-construction
  - Geotechnical investigation;
  - Underground utility identification and location;
  - Initiate soil/vegetation stabilization in areas with no disturbance;
  - Design Project Substation;
  - Design solar module layout, access roads, and electric collection system; and
  - Procure necessary facility components (solar modules, tracking system, inverters, and transformers).
- Construction
  - Site preparation, grubbing, and grading;
  - Maintain perennial vegetation established during preconstruction activities;
  - Establish temporary or permanent (seasonally dependent) vegetation in disturbed areas, as practical;
  - Construct laydown areas and set up temporary job site trailers;
  - Civil construction of access roads;
  - Construct fencing;
  - Install solar module pile foundation posts;
  - Tracker installation;
  - Solar module installation;
  - Install below-ground or above-ground collection system;
  - Install electrical enclosure/inverter; and
  - Construct transmission line;
  - Construct Project Substation; and
  - Construct O&M facility;
- Post-construction
  - Restore disturbed areas not intended for permanent above-ground facilities;
  - Maintain and restore established vegetation as per the VMP;
  - Replace temporary vegetation with perennial vegetation as applicable;
  - Permanent above-ground facilities include:
    - the Project Substation and inverters;
    - O&M facility;
    - Skids and electrical cabinets;
    - Access roads;
  - Test Solar Facility; and
  - Begin commercial operation.

Pre-construction, construction, and post-construction activities for the BESS Facility include:

- Pre-construction
    - Geotechnical investigation;
    - Underground utility identification and location;
    - Initiate soil/vegetation stabilization in areas with no disturbance;
    - Design BESS Facility; and
    - Procure necessary facility components (BESS inverters, storage devices/containers, emergency generators).
- Construction
    - Site preparation, grubbing, and grading;
    - Maintain perennial vegetation established during preconstruction activities;
    - Establish temporary or permanent (seasonally dependent) vegetation in disturbed areas, as practical;
    - Civil construction of access roads;
    - Construct fencing;
    - Install BESS Facility foundation; and
    - Install BESS Facility components and electrical connection to the Project Substation.
- Post-construction
    - Restore disturbed areas not intended for permanent above-ground facilities;
    - Maintain and restore established vegetation as per the VMP;
    - Replace temporary vegetation with perennial vegetation as applicable;
    - Permanent above-ground facilities include:
        - the BESS Facility;
        - Access roads;
    - Test BESS Facility; and
    - Begin commercial operation.

Construction will begin after the necessary permits are received and the electrical interconnection process is finalized with MISO. Project construction will begin with workforce mobilization and the initial site preparation work including grading, vegetation removal, and any necessary tree removal.

About 14% of the Preliminary Development Area will require grading. Preliminary engineering analysis indicates that approximately 128 acres of the Preliminary Development Area will require grading for the solar arrays, access roads, stormwater basins, Project facilities (Project Substation, Xcel Switchyard, and BESS Facility), and inverter pads. A preliminary total of approximately 69,700 cubic yards of cut and 66,000 cubic yards of fill are estimated for the Project based on the preliminary site design. The estimated grading quantities required for the Project are provided below:

- Solar Arrays – approximately 60 acres will be graded with 13,000 cubic yards of fill, and 14,7000 cubic yards of cut material.
- Access Roads – approximately 34 acres will be graded with 4,000 cubic yards of fill, and 5,000 cubic yards of cut material.
- Stormwater Basins – approximately 25 acres will be graded with 10,000 cubic yards of fill, and 50,000 cubic yards of cut material.

- BESS Facility – approximately 3.2 acres will be graded with 22,000 cubic yards of fill, and no removal of material.

The remaining 5.4 acres of grading will be for inverter pads (2.6 acres), Xcel Switchyard (1.5 acres), and Project Substation (1.3 acres), which are estimated to require approximately 17,000 cubic yards of fill with no cut material.

In the first phase of construction, general site improvements will be made such as access improvements and preparation of the staging/laydown areas. Temporary staging/laydown areas will be located in the northwestern portion of the Project Area near the proposed Project Substation, BESS Facility, Xcel Switchyard, and O&M facility. The staging/laydown areas will be used for storage of construction materials and shipped equipment containers, receiving construction deliveries, and temporary parking for Project-related vehicles. Temporary construction offices will also be located onsite during construction.

4.3.1 Solar Facility Construction

The solar array areas will a total grading area of approximately 60 acres. Mass grading of the site will not be employed. Instead, localized grading will generally occur to "flatten" various areas of the site to facilitate installation of modules, inverters, access roads, and the Project Substation as provided in the AIMP.

The solar energy system (solar modules and collection and distribution systems) will be installed next in conjunction with access roads within the modules. The Project will be constructed in blocks, and multiple blocks will be constructed simultaneously.

Construction of the Project Substation will take place simultaneously with the solar arrays. Grading for the Project Substation foundation and future access roads will have already been completed with the grading that will be completed for other areas of the Project. The grounding grid and underground conduit will be installed in conjunction with the foundations for the transformer, control housing, and high voltage structures. The Project Substation equipment will then be delivered to the site and installed on the prepared foundations. Secondary containment areas for the transformer will be constructed as necessary and finish grading will occur around the Project Substation. The last construction activities associated with the Project Substation include stringing the electrical wires, installing the perimeter fence, and placing course, clear, crushed rock throughout the interior of the fenced area and extending to three feet outside the fence.

The Xcel Switchyard will be constructed simultaneously with Project Substation construction. The Xcel Switchyard may require minimal amounts of grading, which will be completed by Xcel Energy, if needed. The structures used for the Xcel Switchyard will be determined by Xcel Energy but will likely be metal and will be around 70 feet tall. The overall length of the proposed Xcel Energy line tap connecting the Xcel Switchyard to the existing Huntley-Blue Earth 161 kV transmission lines will be less than 250 feet. The final activities for the Xcel Switchyard will be connecting the Project to the regional transmission grid, as discussed in Sections 4.1.2 and 4.1.3.

An O&M facility will be constructed as noted in Section 4.1.6. The 0.4-acre O&M facility will be located adjacent to the Project Substation and Xcel Switchyard.

4.3.2 BESS Facility Construction

Construction work for the proposed BESS will begin by scraping and segregating topsoil and placing it in a designated location. Construction of the BESS will require approximately a total grading area of 3.2 acres. BESS grading plans currently do not include any cut (i.e., removal of soil). Refer to the AIMP for notes on soil segregation. Additional site preparation will include installation of substructures and electrical equipment. Installation of concrete foundations and embedments for equipment will require the use of trenching machines, concrete trucks, pumpers and vibrators, forklifts, boom trucks, and cranes. Below-ground medium voltage cables from this equipment will run from the power conversion systems (PCSs) to the substation. The BESS will include individual BESS containers, inverters (or PCSs), switchboards, medium voltage (MV) cabling, MV switchgear, a junction box, and medium voltage transformers. Crushed rock will be placed between and among installed BESS equipment and adequate lighting will be installed around the BESS site for worker safety during construction and operation.

BESS foundations will typically be installed using one of the two methods as follows: Method 1 would be to use a small rubber tire backhoe to excavate major foundations prior to pouring the concrete slabs; and Method 2 would use an auger/drill type machine for minor foundations.

4.3.3 Construction Personnel and Equipment

Onsite construction personnel will consist of laborers, craftspeople, supervisory personnel, construction management personnel, civil and construction trades, as well as administrative and support staff. Northern Crescent Solar will issue a Request for Proposal (RFP) to Engineering, Procurement, and Construction (EPC) contractors to construct the Solar and BESS Facilities and associated facilities. Northern Crescent Solar will include preferences for contractor bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The selected EPC contractor will be required to work with labor unions, local subcontractors, and other vendors to implement a Project construction staffing model that maximizes local hiring and local economic benefits for the Project, while ensuring the Project is safely built on time and on budget.

Typical onsite construction staff levels will depend on the number of concurrent tasks being performed and the phasing of the Project. The Project will create approximately 200 jobs during the peak construction and installation phases, and three full-time jobs during the operations phase for the Solar and BESS Facilities and associated facilities.

Northern Crescent Solar estimates that there will be between 10 and 20 semi-trucks used daily for equipment delivery during construction. This volume of traffic will only occur for several weeks during tracker and module delivery; truck traffic will decrease once these components are delivered. Light duty trucks will also be used daily for transportation of construction workers to and from the site.

Typical construction equipment for the construction of Solar and BESS Facilities and associated facilities include, but are not limited to, scrapers, bulldozers, dump trucks, watering trucks, motor graders, vibratory compactors, and backhoes. Specialty construction equipment that may be used during construction will include:

- Skid steer loader;
- Pile driver;
- Medium duty crane;
- All-terrain forklift;
- Concrete truck and boom truck;
- High reach bucket truck; and
- Truck-mounted auger or drill rig.

Upon completion of construction, heavy equipment will be removed from the Project site.

4.3.4 Commissioning

Equipment inspections will be conducted prior to commercial operations of the proposed Project and in compliance with applicable Site Permit requirements. Inspection and testing will occur for each component of the solar array, as well as the associated communication, meteorological, collection, and SCADA system. Similarly, inspection and testing will occur for each component of the BESS Facility. Testing, inspections, and commissioning will occur at periods during construction and upon completion of the construction phase.

4.3.5 Restoration

As portions of the Project near completion, temporary staging and laydown areas and other temporary disturbance areas will be restored. The Project will be graded to natural contours, where possible, and soil will be de-compacted. Disturbed areas will be reseeded and re-vegetated with specific seed mixes in accordance with the VMP (**Appendix F**) and the SWPPP. These seed mixes are designed to be used in conjunction with the vegetation management practices of mowing, grazing, and selective herbicide application. All areas that will not contain permanent facilities (area under the arrays and the nine laydown yards) will be stabilized with erosion control measures such as silt fences, hydro-mulch, and sediment control logs until vegetation has 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.

Vegetation is expected to be fully established during the sixth growing season (Year 5) after native seed mix is planted. Northern Crescent Solar anticipates that the post-construction clean-up and site restoration activities will take approximately two to four months.

The VMP provides a guide to site preparation, installation of prescribed seed mixes, management of invasive species and noxious weeds, and control of erosion/sedimentation. The required restoration management is designed to continue for five years. The VMP outlines vegetation management tasks during the establishment and perpetual maintenance phases including monitoring for and treating invasive species, mowing, and re-seeding.

The Project will use an adaptive management approach for vegetation management as outlined in the VMP. Monitoring vegetation during the active growing season (May-November) is a key aspect of adaptive management and will be useful in identifying issues, tracking progress, and reevaluating management needs.

The VMP outlines several vegetation maintenance strategies that may be implemented at the Project including mowing, herbicide use, and grazing. Mowing may be used when vegetation reaches a height of approximately 12 to 18 inches initially to bring it back to a height of roughly 6 to 8 inches and will help control weed species until natives become established. From then on, mowing will occur as prescribed by the VMP. Herbicides will be employed where it is determined that mowing alone will not accomplish perennial weed control. Alternatively, if feasible, sheep may be used experimentally where grazing proves to be a more viable long-term management strategy.

4.3.6 Operations and Maintenance

Following commissioning and commercial operation, the care, custody, and control of the Project facilities transfers from the construction team to the operations staff. The construction manager works with the operations staff, the equipment suppliers, and other construction and maintenance personnel to ensure a smooth transition from the start of construction to the commercial operation date of the Project. The operations staff will have full responsibility for the facility to ensure operations and maintenance are conducted in compliance with approved permits, prudent industry practices, and the equipment manufacturer's recommendations.

The Project will be professionally maintained and operated by Northern Crescent Solar, an affiliate, or a qualified contractor. Primary tasks include scheduled monthly and quarterly inspection(s) of electrical equipment, vegetation management, solar panel and array cleaning, as well as snow removal on access roads, as needed. Operations and maintenance activities for the BESS Facility will be performed in coordination with the Solar Facility.

The expected service life of the Project is 30 years for the Solar and BESS Facilities and associated facilities. At the end of 30 years, the Project's operational life, Northern Crescent Solar reserves the right to extend operations of the Project. Should Northern Crescent Solar decide to continue operation, a decision would be made as to whether the Project would continue with the existing equipment or to upgrade the facilities with newer technologies.

Northern Crescent Solar estimates that the Project will result in up to three full-time positions to operate and maintain the Project, including the Solar and BESS Facilities and associated facilities. A maintenance plan will be created for the Project to ensure the performance of the facilities, 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's life cycle. Like all technology and physical components, a certain amount of this is unavoidable and Northern Crescent Solar will plan for it and maintain the facility as needed. The maintenance plan will clearly outline the scheduled checks and management approach for the Solar Facility, BESS Facility, and associated facilities. Once construction is complete, the Project is expected to see one truck onsite weekly with potentially more personnel onsite at intervals associated

with scheduled maintenance. The main scheduled activities are described in more detail in **Table 7** in Section 4.3.6.5 below.

Maintenance activities for the Solar Facility, BESS Facility, and associated facilities will be performed by qualified personnel and will be performed during the day to the extent that they do not disrupt energy production. Activities that have the potential for substantial noise generation will be performed during the day to minimize impacts in areas where residents are present. It may be desirable to perform certain maintenance functions after sunset to minimize loss of power production.

The operation of the Project is partitioned to a certain extent to minimize the effect of unscheduled maintenance on overall energy production. As an example, if a module needs repair, that particular section of the module can be disconnected by opening the combiner box circuit. The module can then be replaced, and the combiner box circuit closed. Because of the way the facility is designed, a temporary shutdown such as this would result in only a minimal loss of production capability during that time. Additionally, the power production circuits are separated from the tracking circuits. This allows the modules to operate during an unscheduled outage.

The facilities will be operated through a real-time control system for most operations functions, discussed further in Section 4.3.6.1.

4.3.6.1 Supervisory Control and Data Acquisition System

Performance monitoring of the Project will consist of a real-time and continuous assimilation of the 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 and BESS Facility 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.

4.3.6.2 Equipment Inspection

Inspection of the main equipment will occur at regular intervals, including:

- **Solar modules:** Visual check of the modules, tracking system, and surrounding grounds to verify the integrity of the modules and tracking structure, the presence of animals and nests, etc.;
- **Inverters, transformer, and electrical panels:** Visual check of the devices including connection equipment and the grounding network. Check for presence of water and dust;
- **BESS Facility:** Performance verification, check of air filters, HVAC system, and fire suppression systems;
- **Electrical check:** Check of the main switches and safety devices (fuses);
- **Noise:** Check of abnormal sounds;
- **Cabling and wiring:** Visual check of electrical lines (where visible) and connection box to verify its status;

- **Gen-Tie Line, structures, and components:** Routine visual inspection (maintenance of structures may be performed by other parties); and
- **Project Substation:** Scheduled visual inspections.

4.3.6.3 Performance Monitoring

Performance monitoring of the Solar Facility, BESS Facility, and associated facilities will consist of a weekly or monthly download of the data acquired by the SCADA system (energy produced, alarms, faults, etc.).

4.3.6.4 Facility Maintenance

Housekeeping of the Solar Facility, BESS Facility, and associated facilities will include access road maintenance, vegetation maintenance (method dependent on plant type, seasonality, and the VMP; likely traditional mowing and herbicides), fence and gate inspection, lighting system checks, and module washing at Northern Crescent Solar's direction (if required–- minimal to no solar module washing is anticipated to be needed for the Project).

4.3.6.5 Maintenance Frequency

Table 7 provides more information on the anticipated frequency of the operations and maintenance tasks associated with the Project. The table represents the anticipated preliminary frequency of these tasks; the frequency of inspection may be varied based on facility demands and experience with performance of certain components and Project features.

Table 7: Project Operations & Maintenance Tasks and Frequency

Plant Device	Task	Preliminary Frequency
Solar Modules	Solar modules visual check	Once Yearly
	Wiring and junction boxes visual check	Once Yearly
	Overview aerial thermal scan	Once Yearly
	Advanced diagnostics	At Owner's Direction
	Solar module strings and string boxes faults	Once Yearly
	PV strings measurement of the insulation	Once Yearly
	Solar module 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, and compatible with plant design and the VMP.
BESS	System Visual Inspection	Quarterly
	Filter Inspection	Quarterly
	Fire Safety System Inspection & 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
Inverter	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
	Data logger memory download	Once Yearly
	Fuses check	Once Yearly
	Grounding check	Once Yearly
	Torque check	Once Yearly
Support Structures	Visual check	Once Yearly
	Solar modules torque check on random sample	Once Yearly

4.4 Decommissioning and Repowering

The objective of decommissioning is to restore the site to a condition that will facilitate its pre-construction use at the end of operation. At the end of the Project's useful life, Northern Crescent Solar will either take necessary steps to continue operation of the Project (such as re-permitting and retrofitting) or will decommission the Project and remove facilities. A Project Decommissioning Plan is included in **Appendix G**.

4.4.1 Decommissioning

At the end of commercial operations, Northern Crescent Solar will be responsible for removing all solar modules and other associated facilities. At the end of each Site Permit terms, Northern Crescent Solar reserves the right to extend operations of the Project by applying for an extension of the Site Permits, if necessary, and continuing operation. Should Northern Crescent Solar decide to continue operation, a decision would be made as to whether the Project would continue with the existing equipment or to upgrade the facilities with newer technologies.

Decommissioning of the Project at the end of its operational life (30 years) would include removing the solar modules, tracker system, inverters, fencing, access roads, above-ground portions of the electrical collection system, lighting, Project Substation, Gen-Tie Line, BESS Facility, and the O&M facility. Standard decommissioning practices will be used, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy and battery improvements, and restoration. In accordance with Site Permit conditions, ninety days prior to the start of the decommission, notice will be sent in writing to landowners and local units of government. These parties will again be notified once decommissioning activities have been completed. A detailed decommissioning plan is provided in **Appendix G** and is generally summarized below.

4.4.1.1 Timeline

Decommissioning is estimated to take approximately 12 months to complete, and the decommissioning crew(s) will ensure that all equipment and materials are recycled or disposed of properly.

4.4.1.2 Financial Resource Plan

Northern Crescent Solar will be responsible for all costs to decommission the Project and associated facilities. A Financial Assurance in the form of an escrow account or surety bond equal to 100% of the net costs (i.e., total costs less salvage value of decommissioned components) to ensure proper decommissioning will be provided, with Faribault County listed as the beneficiary. Under DOC EERA recommendations, a Financial Assurance is not required during the first ten (10) years of operation; however, a financial surety will be provided no later than the 10th anniversary from the COD of the Project.

Northern Crescent Solar will submit a revised decommissioning plan every five years, or any time there is a change in ownership. Each revised plan will reflect advancements in construction techniques, reclamation equipment, and decommissioning standards. The amount of the Financial Assurance will be adjusted accordingly to offset any increases or decreases in decommissioning costs and salvage values determined during each plan reassessment. At that time, Northern Crescent Solar will revise the financial surety, as necessary, to account for the change in net decommissioning costs, if necessary. Northern Crescent Solar will abide by the applicable Site Permit condition(s) and ensure the Project is decommissioned in accordance with the Site Permits. In addition to Site Permit conditions, Northern Crescent Solar has included an obligation to decommission the Project components in applicable real estate agreements and has security obligations backing its obligations. Additional information on financial resource plans and assurances can be found in the decommissioning plan in **Appendix G**.

4.4.1.3 Removal and Disposal of Project Components

Typical construction equipment to be used during decommissioning will include, but is not limited to, truck-mounted cranes, loaders, bulldozers, dump trucks, and decompaction equipment. The removal and disposal details of the Project components are found below:

- **Modules:** Modules will be inspected for physical damage, tested for functionality, and disconnected and removed from racking. Functioning modules will be packed and shipped to an offsite facility for reuse or resale. Non-functioning modules will be packed, palletized and shipped to the manufacturer or a third party for recycling or disposal (Section 4.5.1).
- **Racking:** Racking and racking components will be disassembled and removed from the steel foundation posts, processed to appropriate size, and sent to a metal recycling facility.
- **Steel Foundation Posts:** All structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a metal recycling facility. The posts can be removed using backhoes or similar equipment. During decommissioning, the area around the foundation posts may be compacted by equipment and, if compacted, the area will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent to promote plant growth.
- **Overhead and Underground Cables and Lines:** All underground cables and conduits will be removed to a minimum depth of 48 inches as specified in the lease agreements. Facilities deeper than 48 inches or as specified in lease agreements may remain in place to limit vegetation and surface disturbance. The underground cables around equipment pads will be completely removed up to a length of 25 feet around the perimeter of pads. Prior to any excavation, topsoil will be segregated and stockpiled for later use, and the subsurface soils will be staged next to the excavation. The subgrade will be compacted to a density similar to the surrounding soils to promote plant growth and maintain drainage. Topsoil will be redistributed across the disturbed area. Overhead HVTL conductors will be disconnected and removed from the Project and taken to a recycling facility. The steel transmission poles will be felled within the transmission line right-of-way and any hardware, bracing, and attachments will be transported along with the poles to a recycling facility. Removed pole locations will be revegetated with a seed mix specified in the approved SWPPP and VMP.
- **BESS Facility**: The BESS containers will be disconnected from electric ports prior to removal. The lithium-ion batteries will be transported to a recycling facility. The containers can be resold, reused, or recycled. Gravel aggregate will be removed and shipped from the Project site to be reused, sold, or disposed of appropriately, at the Project Owner's sole discretion, consistent with applicable regulations and industry standards. Clean aggregate can often be used as "daily cover" at landfills for no disposal cost. All internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. All pile foundations will be pulled out completely. Underground cables and duct banks will be removed to a depth of four feet. Topsoil will be reapplied to the disturbed area. Soil and topsoil will be de-compacted, and the site will be restored to the pre-construction condition and re-vegetated.
- **Inverters, Transformers, and Ancillary Equipment:** All electrical equipment will be disconnected and disassembled. All parts will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Northern Crescent Solar's sole discretion, consistent with applicable regulations and industry standards.

- **Equipment Foundation and Ancillary Foundations:** The ancillary foundation for the Project are pile foundations for both equipment skids and meteorological stations. As described for the solar array steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be excavated to a depth of at least 48 inches. All duct banks, up to 50 feet, around the equipment pads will be removed. All unexcavated areas compacted by equipment used for decommissioning will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density similar to the surrounding soils. All materials will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Northern Crescent Solar's sole discretion, consistent with applicable regulations and industry standards.
- **Fence:** All fence parts and foundations will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Northern Crescent Solar's sole discretion, consistent with applicable regulations and industry standards. Fence posts can be pulled out using skid-steer loaders or other light equipment. The surrounding areas will be restored to pre-construction conditions to the extent feasible.
- **Access Roads:** Facility access roads will be used for decommissioning purposes, after which removal of roads will be discussed with the landowner, using the following process:
    - After final clean-up, roads may be left intact through mutual agreement of the landowner and Northern Crescent Solar unless otherwise restricted by federal, state, or local regulations; and
    - If a road is removed, aggregate will be excavated and loaded in dump trucks using front loaders, backhoes, or other suitable excavation equipment, and shipped from the site to be reused, sold, or disposed of appropriately at the Owner's sole discretion, consistent with applicable regulations and industry standards. Clean aggregate can often be used as "daily cover" at landfills for no disposal cost. Another disposal option is to provide the aggregate to local landowners as clean fill. All internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. Any ditch crossing connecting access road to public roads will be removed unless the landowner requests it remain. The subgrade will be de- compacted using a chisel plow or other appropriate subsoiling equipment. All large rocks will be removed. Topsoil that was stockpiled during the original construction will be distributed across the road corridor.

4.4.1.4 Restoration/Reclamation of Facility

Northern Crescent Solar will restore and reclaim the Solar Facility, BESS Facility, and associated equipment and facilities to approximately the pre-construction condition consistent with the requirements of the Project lease agreements, AIMP, and VMP, as applicable. Northern Crescent Solar assumes that most of the site will be returned to farmland and/or pasture after decommissioning and will implement appropriate measures to facilitate such uses. If no specific use is identified, Northern Crescent Solar will plant unvegetated portions of the site with a seed mix specified in the approved SWPPP, AIMP, and VMP, as applicable. The goal of restoration in that instance will be to maintain natural hydrology and the plant communities growing on the site during operation of the Project to the greatest extent practicable while minimizing new disturbance and removal of native vegetation.

The decommissioning effort will implement BMPs to minimize erosion and to contain sediment on the Project to the extent practicable. The BMPs will include work to:

- Minimize new disturbance and removal of native vegetation to the greatest extent practicable.
- Remove of solar and BESS equipment and all access roads up to a minimum depth of 48 inches, backfill with subgrade material, and cover exposed subgrade material with suitable topsoil as necessary to allow adequate root penetration for plants, and so that subsurface structures do not substantially disrupt ground water movements.
- Stockpile any topsoil that is removed from the surface for decommissioning to be reused when restoring plant communities or when restoring agricultural uses. Once decommissioning activity is complete, topsoil will be respread to assist in establishing and maintaining perennial or annual plant communities, depending on the ongoing planned uses of the property.
- Stabilize soils and return them to agricultural use or other beneficial use according to the landowner direction.
- During and after decommissioning activities, install erosion and sediment control measures, such as silt fences, bio-rolls, and ditch checks in all disturbance areas where potential for erosion and sediment transport exists, consistent with stormwater management objectives and requirements.
- Remediate any petroleum product leaks and chemical releases from equipment operation and electrical transformers prior to completion of decommissioning.

Decommissioning and restoration activities will be completed within 12 months after the end of commercial operations.

4.4.1.5 Post-Restoration Monitoring

Decommissioning of the Project site will comply with the NPDES/SDS CSW Permit, Spill Containment and Countermeasure (SPCC) Plan, and SWPPP, if grading activities are necessary and exceed applicable permit thresholds. Decommissioning may include post-restoration monitoring as required by the NPDES/SDS CSW Permit and SWPPP and other applicable requirements. In addition, Northern Crescent Solar's Field Representative assigned to decommissioning monitoring will stay in contact with the landowner, including onsite check-ins until the NPDES/SDS CSW permit is closed.

4.5 Facility Recycling

4.5.1 Solar Facility

Solar modules typically consist of glass, aluminum, copper, silver, and semiconductor materials that can be successfully recovered and reused. By weight, more than 80% of a typical solar module is glass and aluminum, which are common and easy to recycle materials. Other module components that can be successfully recovered are copper, silver and semiconductor materials. More than 90% of semiconductor material and glass can be reused in new modules and products. While the solar modules and equipment used for the Project are expected to last for at least 30 years, at some point, they will need to be safely managed as waste products. Numerous research and development organizations, producers, academia, reuse service providers, and recycling and waste management companies work to develop end-of-life solutions for solar modules and equipment. One organization, the Solar Energy Industries Association (SEIA) has been actively seeking and developing solar module and associated equipment recycling

partners across the U.S. since 2016. Under the National Recycling Program, SEIA's recycling partners have processed more than four million pounds of solar modules and related equipment since the program was initiated (SEIA, 2020).

While a majority of the solar module is comprised of glass and aluminum, which are not hazardous, different varieties of solar modules have different metals present in the semiconductor and solder. If these metals are present in high enough quantities in the solar modules, solar module waste could be a hazardous waste under the Resource Conservation and Recovery Act (RCRA). The most common reason that solar modules would be determined to be hazardous waste would be by meeting the characteristic of toxicity.

Many manufacturers of modules are taking proactive actions to determine the potential for the metals contained in modules to leach from the panels during operation of the module or if it is broken into pieces. Each of the manufacturers being considered by Northern Crescent Solar to provide modules completes testing for hazardous substances; the manufacturers have confirmed that no hazardous substances are leached from the tested products resulting in leachate concentrations that exceed regulatory standards. In light of the modules being fully encapsulated, unlikely to shatter, and not expected to leach hazardous materials into the environment, the risk to the environment from the contents of the modules will be minimal. If a module is broken at the Project, the broken pieces and the remainder of the module will be recycled or disposed of and replaced, thereby further reducing the risk for hazardous materials contained in the modules to leach into the environment.

According to SEIA (2020), recycling of solar equipment is increasingly possible as more recyclers accept modules. And based on recent conversation with national solar module recyclers, Northern Crescent Solar anticipates that, by the end of the useful life of the modules used for the Project, module recycling will be sufficiently established in Minnesota or surrounding states to recycle the solar modules and associated equipment used for the Project.

4.5.2 BESS Facility

Lithium-ion batteries are rechargeable batteries that consist of cells containing an anode layer, a cathode layer, and a separator, all in contact with an electrolyte. These batteries come in various chemistries, such as lithium cobalt oxide, lithium nickel cobalt aluminum oxide, and lithium iron phosphate, each with different characteristics in terms of energy capacity, stability, recharge speed, and longevity. Common materials used in these batteries include lithium, nickel, cobalt, manganese, graphite, iron, copper, and aluminum foils (EPA, 2023b).

When lithium-ion batteries reach the end of their life cycle, they are often considered hazardous waste due to the potential for fire or explosion if not handled properly. Improper handling of lithium-ion batteries is thought to be one of the leading causes of increased fires in waste management facilities (Fogelman, 2020). Properly recycling these batteries is crucial for safety and to conserve critical minerals and valuable materials used in their production. The recycling process typically involves collecting, sorting, and shredding the batteries to recover materials like black mass, copper, aluminum foils, separators, and electrolytes. These recovered materials can then be processed through heat-based smelting or liquid-based leaching to extract metals like cobalt, nickel, and lithium for reuse in new batteries. The EPA is planning to propose new rules for recycling lithium batteries with hopes to improve the

management of materials (EPA, 2023b). These new rules for improving the recycling process of lithium-ion batteries are expected to be in place by the end of the useful life of the BESS facility.

In addition to recycling, there is a growing focus on battery reuse and repurposing as environmentally friendly alternatives to recycling or disposal. Used lithium-ion batteries can still provide useful energy storage for other applications even after their performance degrades. Reuse and repurposing options are being developed to give batteries a "second life," extending their usefulness before they are eventually recycled. These practices not only benefit the environment by reducing resource demands for new batteries but also contribute to a more sustainable approach to managing lithium-ion battery waste. Northern Crescent anticipates that, by the end of the useful life of the BESS Facility, there may be more opportunities for lithium battery reuse and repurposing options.

4.6 Repowering

As the solar and battery markets continue to produce less expensive and more efficient solar modules and batteries, repowering the Project may be a viable option as the Project ages. Potential triggers for initiating a repower may be aging or faulty equipment, maintenance costs, extending the useful life of the Project, or increasing the generation output of the Project. Northern Crescent Solar will continually evaluate the Project's generation output, maintenance costs, and other contributing factors in conjunction with available technology upgrades to determine if repowering the Project is a worthwhile investment. Any proposed repowering of the Project will abide by all local, state, and federal regulations. A new Application may be necessary and will be sought out if required.

5.0 ENVIRONMENTAL INFORMATION

For existing conditions within the portions of land under Northern Crescent Solar's control, area calculations are based on the Project Area. This reflects the fact that final design may necessitate development in areas within the overall Project Area and not simply the Preliminary Development Area as previously defined. Additionally, for any discussions of resources that are located outside of the facility (such as parks, trails, and other natural resources), the Project Area boundary is used to discuss the proximity of these features to the Project.

5.1 Environmental Setting

The Project is located in a sparsely populated rural area, approximately one mile southeast of Winnebago. Residences are scattered throughout the rural area, where land use is dominated by agricultural fields (predominately corn and soybeans planted in row crops). The Project Area is located on predominantly agricultural land, immediately adjacent to the Xcel Energy's existing Huntley-Blue Earth 161 kV HVTL (**Figures 4 & 10**). The Project is located on relatively level fields conducive to solar energy generation development.

There are no other solar facilities within the immediate Project vicinity. The nearest solar facility is the 6 MW Aurora-Eastwood Solar Project located near Mankato, 30.5 miles northeast of the Project Area. The nearest wind facility includes two 250-foot-tall wind turbines located along 190th Street, approximately 1.1 miles north of the Project Area. The Big Blue Wind Farm is the nearest utility-scale wind facility and

is located west of Blue Earth, 8.4 miles southwest of the Project Area and includes 18, 295.3-foot-tall turbines with a rated capacity of 2 MW each.

Except for U.S. Highway 169, roads that surround the Project Area are county or township roads. The Project Area is bordered by 380th Avenue on the East and 180th Street to the North. It is intersected by 170th Street that runs through the middle of the Project going east-west. Xcel Energy's existing Huntley-Blue Earth 161 kV HVTL goes directly through the northern portion of the Project Area, allowing for a short connection (less than 300 feet) from the Xcel Switchyard (**Figures 3 & 4**).

According to the Natural Resources Conservation Service (NRCS) Land Resource Region and Major Land Resource Area (MLRA), the Project site is located within the northern part of the Central Feed Grains and Livestock Region and the Central Iowa and Minnesota Till Prairies. This MLRA is in the southern part of the till prairies and is characterized by Calcareous Upland Prairies, Sandy Upland Prairies, Loamy Upland Prairies, and Clayey Upland Prairies (U.S. Department of Agriculture [USDA] NRCS, 2022). The area is generally level, agricultural land with few wooded areas. The nearest section of the Blue Earth River is located approximately 0.25-mile away from the western boundary of the Project.

The MnDNR and the U.S. Forest Service have developed an Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. Through the ECS, the State of Minnesota is split into Ecological Provinces, Sections, and Subsections. The Project site is located within the Prairie Parkland Province (251), North Central Glaciated Plains Section (251B), and the Minnesota River Prairie Subsection (251Ba) (MnDNR, 2023).

The Minnesota River Prairie Subsection is part of a prairie over bedrock or till in southwestern and central Minnesota and in northern Iowa that is drained by the Minnesota River. Elevation ranges from 300 to 400 meters. With a near level to gently sloping till plain, the land is primarily used for agriculture. This subsection is covered by 100 to 400 feet of glacial drift, and soils are made up of predominantly well-drained loamy soils formed in gray calcareous till. Annual precipitation ranges from 25 inches in the west to 30 inches in the east, with 11 to 13 inches of growing-season precipitation. The growing season lasts approximately 147 to 152 days. Fire was the most common natural disturbance before settlement, but fire suppression has allowed woodlands to develop. Other causes of disturbances include tornadoes and floods. Pre-settlement vegetation was primarily tallgrass prairie, with many islands of wet prairie and forests on floodplains along the Minnesota River and other streams. These forests include silver maple, elm, cottonwood, and willow. Currently, the predominant land use in this subsection is agriculture; there are few remnants of pre-settlement vegetation remaining (MnDNR, 2023).

5.2 Human Settlement

5.2.1 Aesthetics

The Project Area is located in a sparsely populated rural area dominated by agricultural fields. The topography of the Project Area is generally level with elevations ranging from 1,080 to 1,110 feet above sea level. Existing topographic contour lines are shown on the Overall Site Plan map in **Appendix C**.

The Project Area and surrounding land are typical of agriculturally dominated landscapes. Viewsheds in this area are generally broad and uninterrupted, with only small, scattered areas where they are interrupted by trees or topography.

Few remaining surface water features exist as the area has numerous drain tiles and ditches to remove water from agricultural fields. As discussed in Section 5.2.11, land use within the Project Area is predominantly agricultural. Corn and soybeans are the most common agricultural crops grown. Cattle and hogs are also raised in the area.

The area is also shaped by a built environment. The settlements in the vicinity are residences and farm buildings scattered along rural county roads. Horizontal elements, such as U.S. Highway 169 and county roads, are consistent with the long and open viewsheds in the area. Vertical elements such as the two wind turbines located along 190th Street are visible from considerable distances and are the tallest and the most dominant visual feature on the landscape (**Figure 5**). Additionally, numerous electrical transmission and distribution lines parallel county and township roads that contribute to the existing visual elements.

Areas surrounding the Project Area offer recreational opportunities and scenic views within county parks, waterfowl productions areas, wildlife management areas and trails. There are no designated scenic byways or drives in Faribault County (MnDOT, n.d.-a).

Observation Points (OPs) include residential homes and open spaces where a viewer may be able to see Project infrastructure. Rows of trees and shrubs can sometimes visually block views of the Project. Notes on vegetative screening are provided below and typically include trees and shrubs along fence rows around residences.

There are a total of 26 OPs within a one mile of the Project Area, including two farmsteads and one single-family residence within the Project Area, and three OPs associated with the Conservation Reserve Enhancement Program (CREP) easement area (**Figures 2 & 5**). **Table 8** provides distances to the nearest OPs to the Project, including approximate distance to the Preliminary Development Area and approximate distance to the edge of solar arrays based upon the current preliminary design.

Table 8: Proximity of OPs to the Project

OPs	General Location	Distance to Preliminary Development Area (feet)	Distance to Solar Arrays (feet) [1]
R1	Located north of the Project Area, east of 360th Avenue. This residence has existing buildings and vegetative screening around four sides of the residence.	2470	2525
R2	Located north of the Project Area, west of 375th Avenue. This residence has existing buildings and vegetative screening around four sides of the residence.	2494	2700
R3	Located just north of the Project Area, north of 180th Street. This residence has existing buildings and vegetative screen along the north and west sides.	340	558

OPs	General Location	Distance to Preliminary Development Area (feet)	Distance to Solar Arrays (feet) [1]
R4	Located north of the Project Area, south of 180th Street. This residence has existing buildings and vegetative screening around four sides of the residence.	1027	1059
R5	Located north of the Project Area, south of 180th Street. This residence has existing buildings and vegetative screening around four sides of the residence.	377	430
R6	Located north of the Project Area, south of 180th Street. This residence has existing buildings and vegetative screening around four sides of the residence.	413	479
R7	Located west of the Project Area, west of U.S. Highway 169 and north of 345th Avenue. This residence has existing buildings and vegetative screening around four sides of the residence.	3151	3243
R8	Located west of the Project Area, west of U.S. Highway 169 near 345th Avenue and the river. This residence has existing buildings and vegetative screening around four sides of the residence.	2724	2822
R9	Located west of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence.	332	369
R10	Located west of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence.	1514	1557
R11	Located west of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence.	344	376
R12	Located centrally within the Project Area, north of 170th Street. This residence has existing buildings and vegetative screening around four sides of the residence.	274	409
R13	Located west of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence	296	405
R14	Located west of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence.	306	338
R15	Located west of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence.	530	622
R16	Located east of the Project Area. west of 380th Avenue. This residence has existing buildings and vegetative screening around three sides of the residence, including the west side adjacent to the Project Area.	0	47

OPs	General Location	Distance to Preliminary Development Area (feet)	Distance to Solar Arrays (feet) [1]
R17	Located east of the Project Area east of 380th Avenue. This residence has existing buildings and vegetative screening around three sides of the residence, including the west side adjacent to the Project Area.	539	564
R18	Located to the east of the Project Area, west of 380th Avenue. This residence has existing buildings and vegetative screening around three sides of the residence, including the west and south sides adjacent to the Project Area.	306	346
R19	Located to the southwest of the Project Area, about 0.2 mile west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence.	1698	1793
R20	Located to the southwest of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence, including the north and west sides adjacent to the Project.	2236	2426
R21	Located to the southwest of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence.	2952	3033
R22	Located to the southwest of the Project Area, west of U.S. Highway 169. This residence has existing buildings and vegetative screening around four sides of the residence,.	3494	3587
R23	Located to the north of the Project Area, east of 360th Avenue. This residence has existing buildings and vegetative screening around four sides of the residence.	2290	2345
E1	CREP easement located within the eastern portion of, but excluded from, the Project Area. There is no screening around the area.	371	391
E2	CREP easement located within the eastern portion of, but excluded from, the Project Area. There is no screening around the area.	303	336
E3	CREP easement located within the eastern portion of, but excluded from, the Project Area. There is no screening around the area.	383	438
[1] Based on Project preliminary design.			

5.2.1.1 Impacts and Mitigation

The Project will convert predominately agricultural land to Solar and BESS facilities and will alter the current viewshed. Rows of solar modules separated by perennial vegetation will be constructed over most of the Preliminary Development Area. Solar modules use dark anti-reflective glass modules that are

designed to absorb sunlight to produce electricity. The images in Section 4.0 provide a reference for how the Project will appear during operation. Solar modules commonly used for this type of project absorb up to 98% of the incoming sunlight depending on the angle of the sun, glass texture, and use of anti-reflective coatings. Therefore, during operation of the facility there will be little glare from the modules used for the Project.

Solar Facilities will occupy most of the disturbed area of the Project. The BESS Facility, Project Substation, Xcel Switchyard, O&M facility, access roads, and electrical transformers and inverters will utilize the rest of the disturbed area. Most of the Project, including the Solar Facilities, will be low-profile, typically less than 15 feet tall, while the BESS containers will be about 9.5 feet tall. While the Project will create additional infrastructure compared to current predominately agricultural land use, the Project facilities (Solar Facility, BESS Facility, Project Substation, O&M facility, Xcel Switchyard, new overhead electric lines, etc.) will be situated near U.S. Highway 169 and existing overhead transmission facilities associated with utilities serving the area. Since the Project Area and vicinity are generally level, and due to existing trees along agricultural fields and vegetative cover along wind rows, the visual impact of the Project is expected to be limited to surrounding land (e.g., U.S. Highway 169 located west of the Project) and higher elevation points. The feedback that Northern Crescent Solar has gathered from public outreach efforts completed for the Project to date has not indicated aesthetic or visual concerns associated with the Project from the surrounding landowners or community. As stated above and in Section 6.0, the Project has garnered strong positive landowner involvement and support, as well as overall wide community support.

The Project Substation and Xcel Switchyard will contain transmission pole H-frame deadend structures (see **Image 4**) that will support above ground conductors. The deadend structures will be between 70 and 75 feet tall. These transmission facilities will be grouped together and connect to the existing Xcel Energy 161 kV HVTL that crosses through the northern portion of the Project Area, just north of the planned Xcel Switchyard site. They will be visible from the local roadways and about 1,200 feet from the nearest residence (**Figures 4 & 5**). From outside the facility these structures would be most visible from U.S. Highway 169.

Other existing power poles with heights up to 100 feet are located in the vicinity of the Project and adjacent to roadways and the rail line. The addition of Project transmission facilities is not expected to significantly alter the viewshed or increase visual impacts.

The Project solar modules (surrounded by security fence) will be visible from adjacent roadways and parcels up to approximately 0.5-mile given their relative low profile and color. Project fencing will look similar to existing agricultural field fencing. While relatively few trees exist within the Project Area, Northern Crescent Solar has designed the Project to avoid tree clearing which will somewhat break up the view of the modules in some areas.

Exterior security lighting will be installed at the O&M facility and Project Substation. No security lighting will be installed at the BESS Facility. As needed by maintenance personnel, lights will be used if work or maintenance is required after dark. A motion sensing, down casting security light will be installed at the locked entrance of the Project. Switch activated lights will be placed at each inverter for repair

purposes. Impacts to light-sensitive land uses are not anticipated given the rural Project location coupled with minimal required lighting for operation of the Project.

5.2.2 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area, which provide a framework for community. According to the U.S. Census Bureau (2020), the majority of the population in Faribault County identifies as White with an ethnic background of European origin. The population is comprised of 89.1% White, followed by 7.3% Hispanic or Latino, and less than 1% each Black or African American, American Indian, Asian, and other origins. The region surrounding the Project has cultural values tied to the area's Norwegian, German, and Native American heritage, and the agricultural economy. Cultural representation in community events appears to be tied to geographic features (such as nearby lakes), seasonal events, national holidays, and municipal events, as well as ethnic heritage.

Cultural representation in community events appears to be closely tied to art, food, seasonal events, national holidays, and municipal events than to those based on ethnic heritage. Examples of regional cultural events include summertime festivals such as the Faribault County Fair (Faribault County Fair.com, n.d.). There are several "organizations dedicated to preserving the history and heritage of the county," including county and local area historical societies, libraries, and museums (Faribault County, 2015, p. 54).

Construction of the proposed Project is not expected to conflict with the cultural values and heritage of the area.

5.2.2.1 Impacts and Mitigation

Construction and operation of the Project would not impact public participation in the regional community cultural events noted above, as the Project Area is located outside of municipal areas. Therefore, no impacts to cultural values are anticipated and no mitigation measures are proposed.

5.2.3 Displacement

As previously indicated, the Project is located in an agricultural area with relatively few residences and widely dispersed farmsteads among row crop farm fields. Two farmsteads and a single-family residence are located within the Project Area. One farmstead is located within the south-central portion of the Project Area, north of 170th Street, and one farmstead and the single- family residence are located in the eastern portion of the Project Area along 380th Avenue (**Figure 5**). The occupants are participating landowners in the Project. The farmsteads include a home, a barn and several outbuildings, silos, and several grain storage bins. The farmsteads are surrounded by trees and vegetation with sparse trees located in close proximity to the residences. The Project will not displace or require removal of any part of this farmstead.

Several other farmsteads are located in close proximity to, but outside of the Project Area. Section 4.2.1 describes the Project design's adherence to local setback requirements. Minimum setbacks of 200 feet from the adjacent farmsteads will avoid any potential for displacement of non-participating, adjacent landowners.

5.2.3.1 Impacts and Mitigation

Because the Project will not displace or require removal of any part of the existing farmstead or grain storage/handling area located within the Project Area, no mitigation is proposed. To mitigate potential impacts to these areas and land uses, Northern Crescent Solar is and will continue working with the participating landowners and coordinating the Project design and construction to ensure the Project will not interfere with existing facilities.

5.2.4 Environmental Justice

Environmental Justice (EJ) refers to 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 (MPCA, 2015). In general, EJ is intended to ensure all people benefit from equal levels of environmental protection and have the same opportunities to participate in decisions that may affect their environment or health (EPA, 2021). Minority and/or low-income communities are often concentrated in small geographical areas within the larger geographically and/or economically defined population. Minority communities and low-income communities may constitute a very small percentage of the total population and/or geographical area.

Northern Crescent Solar evaluated the environmental justice interactive map created by the MPCA (MPCA, 2021). The MPCA uses U.S. Census Bureau's 2023 Cartographic Boundary File, the five-year (2017-2021) American Community Survey data, and MnDOT's Tribal Government data in preparing the map. A census tract is considered an area of concern if it has higher concentrations of low-income residents, people of color, or limited English proficiency. The four criteria include: at least 35% of people reported income of less than 200% of the federal poverty level, 40% or more people of color, federally recognized Indian tribes, and at least 40% of people have limited English proficiency.

The MPCA refers to the U.S. Census Bureau and U.S. Department of Health and Human Services to define poverty, a threshold which is calculated using a family's household size and composition. In 2021, an individual was considered to be in poverty with an income of $13,788 or less, according to the 2021 Poverty Threshold Data Table (U.S. Census Bureau, 2021), therefore, 200% of the poverty level would be calculated to $27,576 per person.

Based on the MPCA EJ criteria, the Project Area is identified as an area where at least 35% of people within the Project Area reported income less than 200% of the federal poverty level. **Table 9** summarizes the EJ criteria within the Project Area.

Table 9: Environmental Justice Areas of Concern within the Project Area

MPCA EJ Criteria	Project Area (census tract 27043460200)
At least 35% of people reported income less than 200% of the federal poverty level	31.98% (+/- 9.01% margin of error) reported income less than the 200% federal poverty level
40% or more people of color	16.27% (+/- 5.62% margin of error) are people of color
At least 40% of people have limited English proficiency	2.9% (+/- 2.24% margin of error) are reported as residents with limited English proficiency
Federally recognized Indian Tribes	No

[1] Margin of error is accounted for in determining EJ areas of concern. For example, census tract 27043460200 indicates 31.98% of people reported income less than 200% of the federal poverty level with a 9.01% margin of error. The MPCA counts this as 40.99%, which exceeds the 35% threshold.

In addition to the screening criteria put forth by the MPCA, Northern Crescent Solar used the EPA's Environmental Justice Screening and Mapping Tool (EJScreen) to review the socioeconomic and environmental information for the Project Area. EJScreen uses publicly available data to map and report environmental and socioeconomic indicators and EJ/supplemental indexes. The EJ and supplemental indexes summarize how an environmental indicator and socioeconomic factors come together in the same location. Results for the Project Area, indicate that overall, 22% report low income, 5% are people of color, 0% of households have limited English proficiency, and no Federally recognized Indian Tribes. Based on the information embedded in the EJScreen report, there are no environmental justice communities within the Project Area.

Section 5.2.13 (Socioeconomics) summarizes population, race, housing, income, and poverty for the township, county, and state levels.

5.2.4.1 Impacts and Mitigation

The Project is not expected to cause disproportionate or adverse impacts to low income or minority populations. In an effort to prioritize environmental justice, Northern Crescent Solar has reached out to the site's neighbors and the local community to ensure they can work together to build a solar farm that benefits everyone.

5.2.5 Public Health and Safety

The Project is in Prescott and Verona Townships, a sparsely populated rural area with farmsteads located along roads, and away from population centers. According to the 2020 U.S. Census, Faribault County has a population density of 19.5 persons per square mile of land area (U.S. Census Bureau, 2020). Prescott Township has a total area of 36.8 square miles and a population of 185 persons. Verona Township has a total area of 35.3 square miles and a population of 323 persons.

If emergency personnel were needed at the Project, multiple agencies would likely respond, depending on the situation. These include the Faribault County Sheriff, Winnebago Fire and Police Departments, and

ambulances from United Hospital District, all of which are within approximately 1.6 to 4.9 miles of the Project Area.

Two radio towers are part of the Allied Radio Matrix for Emergency Response (ARMER) in Faribault County (MnDOT, 2018). These ARMER towers are a part of Minnesota's Statewide Communication Interoperability Plan which aims to improve communication for emergency responders. The ARMER radio system operates by line of sight, talking to other ARMER towers. For the system to operate effectively, multiple towers need to produce a solid blanket of coverage. The system can be interrupted if tall objects are proposed within the line-of-sight— typically at or near the top of a tower, over 150 feet tall. There are no ARMER towers within one mile of the Project Area; the nearest ARMER tower is approximately five miles south of the Project in Blue Earth Township.

Northern Crescent Solar completed a Critical Issues Analysis (CIA), which included review of environmental records (i.e., an environmental records data request (EDR)) of the Project Area and performed a Phase I Environmental Site Assessment (ESA). The ESA revealed no American Society for Testing and Materials (ASTM) Recognized Environmental Conditions, no Controlled Recognized Environmental Conditions, and no Historical Recognized Environmental Conditions (Westwood Professional Services, Inc. [Westwood], 2023). The EDR report provided a review of federal, state, regional, and local records to assess whether the Project Area or facilities within the study area have experienced significant unauthorized releases of hazardous substances or other events with potentially adverse environmental effects.[9] A review of facilities listed within the EDR (EDR Area/Corridor) report was conducted and identified the following:

- The Project Area was not listed in any databases; and
- Nearby facilities within the study area were included in the following database:
    - Four locations in the MPCA "What's in My Neighborhood" database, which provides information about air quality, hazardous waste, remediation, solid waste, tanks and leaks, and water quality around Minnesota—
        - Three feedlots and a minimal quantity hazardous waste generating facility are located within a 0.25 mile of the Project; and
        - Two of these locations are just outside the Project Area along U.S. Highway 169.

As part of the CIA, the National Pipeline Mapping System (NPMS) was searched to assess whether pipelines are present in the Project Area and study area (NPMS, 2019). The NPMS Public Viewer enables the user to view NPMS pipeline, liquefied natural gas plant, and breakout tank data by county, including attributes and pipeline operator contact information. The user can also view gas transmission and hazardous liquid pipeline accidents and incidents going back to 2002 for the entire United States. NPMS pipeline data consists of gas transmission pipelines and hazardous liquid pipelines jurisdictional to the Pipeline and Hazardous Materials Safety Administration. No pipelines are located in or within one mile of the Project Area. The nearest feature is a gas transmission pipeline located about 1.5 miles northwest of the Project Area.

[9] EDR performed a database search of the Project Area in accordance with the ASTM E 1527-13.

In addition to the EDR report, information from the MPCA "What's in My Neighborhood" database was reviewed. This online database offers a way to access a wide variety of environmental information about a given site and location. The website provided data on:

- **Potentially contaminated sites**: A searchable inventory dating back to the 1980s of contaminated properties, sites that have already been cleaned up, and those currently being investigated or cleaned up; and
- **Environmental permits and registrations**: A searchable inventory of businesses that have applied for and received different types of environmental permits and registrations from the MPCA.

Review of the MPCA "What's in My Neighborhood" database indicated there are 12 records within one mile of the Project Area. There are no records within the Project Area. The sites are listed in **Table 10** and shown in **Figure 6**.

Table 10: MPCA Sites within One Mile of Project Area

MPCA Site ID	Site Name	Site Status	Program Name
52457	Doug Jenkins	Active	Feedlots
63103	Jody Blackburn	Active	Feedlots
66365	Thomas Golly 18-011-2220	Active	Feedlots
66376	Dwayne Mortenson Farm	Inactive	Feedlots
67148	Robert Thorson Farm	Inactive	Feedlots
67528	Glenn Huber	Active	Feedlots
67530	Scott Cyphers 18-013-2313	Active	Feedlots
69612	Bruce Hartman Farm–- Sec 11	Active	Feedlots
120643	ITC Midwest–- Winnebago Junction	Active	Hazardous Waste
147084	ITC Midwest Faribault County Laydown Area	Active	Stormwater
148923	Faribault County Garage/Winnebago	Inactive	Underground Tanks
233764	Cody and Jessica Theobald	Active	Subsurface sewage treatment system

None of these sites are expected to have an adverse effect on the Project.

5.2.5.1 Impacts and Mitigation

Construction and operation of the Project will have minimal impacts on the security and safety of the local populace, and the level of use/service potentially needed by the Project is expected to be low. The Project is being engineered and designed, and will be constructed, to meet applicable National Safety Council, MISO, Xcel, state, and local electrical standards and therefore will pose minimal safety and security risks to the public. As discussed in Section 4.1.7, the Project arrays will be fenced and secured. Access will be allowed only for authorized personnel via lockable gates. The Project Substation, BESS Facility, and O&M facility will also be fenced with controlled/locking access gates and topped with one to two feet of barbed wire.

Signs will be posted to warn unauthorized persons not to enter fenced areas and of the presence of electrical equipment associated with Project facilities. These precautions should prevent accidental electrocution from happening to someone who may have otherwise unintentionally wandered onto the site.

While it is possible that portions of the Project facility (e.g., arrays, etc.) could be damaged or affected by extreme weather events, the Project will be designed and constructed such that Project materials are not expected to leave the Project site. Northern Crescent Solar will regularly inspect the Project for damage and, if found, will repair and/or replace impacted materials and dispose of generated waste in accordance with applicable requirements.

Health and safety concerns that may occur during construction can include injuries due to falls, equipment malfunction and/or misuse, and electrocution. To prevent negative health and safety incidents, Northern Crescent Solar requires all parties involved with the Project to implement well-developed, comprehensive health and safety plans and protocols. While difficult to quantify, during construction an emergency incident or accident may occur and would be addressed as needed by Project personnel and local responders (as required).

Northern Crescent Solar will coordinate with all emergency and non-emergency response teams for the Project, as needed, including law enforcement agencies, such as Faribault County Sheriff, Winnebago Police Station, Winnebago Fire Chief, Delavan Fire Department, United Hospital District in Blue Earth, ambulance services from Winnebago Area Ambulance Service, and 911 services. The type and number of responding agencies will depend on the incident requiring emergency services.

To ensure safety during construction and operation of the Project, Northern Crescent Solar will develop a site-specific ERP to this Project in coordination with local first responders as mentioned in Section 4.1.5. Additionally, construction contractors will be required to comply with local, state, and federal regulations regarding installation of the Project facilities and use standard construction-related health and safety practices. Established industry safety procedures will be followed during and after construction of the Project; these include clear signage during all construction activities and fencing of all Project facilities to prevent public access.

The nearest ARMER tower is in Blue Earth, located about five miles south of the Project Area, and the Project will not impact this communication system as Project facilities are proposed well 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). Northern Crescent Solar anticipates the tallest Project facility to be the poles and associated conductors for the Xcel Energy line tap that will connect the Xcel Switchyard to the existing Huntley-Blue Earth 161 kV HVTL. The Xcel Switchyard will include four poles that will be from 70 to 75 feet in height, depending on final Project design. The Project solar modules will be no more than 15 feet in height and not impact the ARMER system. As such, no mitigation concerning the ARMER system is proposed.

Review of environmental records in the EDR report and MPCA database indicated no sites located within the Project Area. A number of sites are located in the vicinity of the Project Area, though none are expected to impact the Project. Prior to construction, Northern Crescent Solar will update the Phase I ESA

of the Project Area to confirm these findings and refresh review of potential environmental site impacts to the Project.

5.2.6 Electromagnetic Field

The term electromagnetic field (EMF) refers to electric and magnetic fields that are present around any electrical device. Electric fields arise from the voltage or electrical charges and magnetic fields arise from the flow of electricity or current that travels along transmission lines, power collection lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (wire). EMF can occur indoors and outdoors.

With the proposed Project, the sources of EMF will be from electrical collection lines, either buried below-ground or hung above-ground, the gen-tie transmission line, and from the transformers installed at each inverter. EMF from electrical collection lines, regardless of whether they are below-ground or above-ground, transmission lines, and transformers dissipates rapidly with distance from the source (National Institute of Environmental Health Sciences [NIEHS], 2002). Generally speaking, higher voltage electrical lines produce higher levels of EMF at the source before dissipating with distance. The internationally accepted guideline for the general public exposed to electric fields is 4.2 kV per meter (kV/m) and 833 milliGauss (mG) for magnetic fields (NIEHS, 2002). While there are no federal standards for transmission line electric fields, the Commission has imposed a maximum electric field limit of 8 kV/m measured at one meter (3.28 feet) above the ground (MPUC, 2010). This standard is meant to prevent serious hazards from shocks when touching large objects that are located underneath 500 kV or greater AC transmission lines. There are presently no Minnesota regulations pertaining to magnetic field exposure.

Characterization of EMF in a 2015 study revealed that the levels of EMF near solar energy facilities are lower than the average exposure levels for most Americans (Tell et al., 2015). An additional study by Guldbert (2012) showed that EMF levels were zero at night when solar panels were not operating and that EMF levels 50 feet from the solar arrays were less than 0.005 kV/m and 0.02 mG. This frequency is similar to or less than EMF frequencies generated by typical electrical appliances and wiring that are used in many homes and buildings.

The 34.5 kV underground power cable to be used in the proposed Project collection system is shielded, meaning the energized conductor is located at the center of the cable and is surrounded by a grounded metallic shield. This construction confines the electric field to the interior of the cable. Thus, no detectable electric field is produced by the cable or by any other components of the solar project collection system.

The 2002 NIEHS report lists typical EMF levels for 115 kV, 230 kV, and 500 kV transmission lines. **Table 11** summarizes the electric fields and mean magnetic fields reported at the transmission lines.

Table 11: Typical EMF Levels for Power Transmission Lines

Transmission Line Voltage	Distance from Transmission Line Centerline (meter/feet)				
	0 m/0 ft	15 m/50 ft	30 m/100 ft	61 m/200 ft	91 m/300 ft
Electric Field (kV/m)					
115 kV	1.0	0.5	0.07	0.01	0.003
230 kV	2.0	1.5	0.3	0.05	0.01
500 kV	7.0	3.0	1.0	0.3	0.1
Magnetic Field (mG)[1]					
115 kV	29.7	6.5	1.7	0.4	0.2
230 kV	57.5	19.5	7.1	1.8	0.8
500 kV	86.7	29.4	12.6	3.2	1.4

[1] The magnetic fields are means calculated for 321 power lines based on 1990 annual mean loads.

5.2.6.1 Impacts and Mitigation

EMFs associated with the Project are not expected to have an impact on public health and safety. As shown in **Table 11**, EMF levels decrease with distance from the transmission line. The 161 kV gen-tie transmission line will be setback over 1,200 feet and the 161 kV line taps will be setback over 1,300 feet from the nearest residence. At these distances, the EMF would be well-below the internationally accepted guideline of 4.2 kV/m for electric fields and 833 mG for magnetic fields, and below the Commission limit of 8 kV/m at one meter (3.28 feet) above the ground for electric fields.

In relation to the nearest residences, underground collection lines are anticipated to be setback approximately 300 feet, inverters will be setback over 350 feet, and solar arrays will be setback approximately 50 feet from the residence closest to each source of EMF. At these distances, any EMF generated from these sources is anticipated to be minimal and dissipate to background levels. Accordingly, any public health impacts will be negligible, and no mitigation measures are proposed.

5.2.7 Noise

Noise is defined as unwanted sound. It may be made up of a variety of sounds of different intensities, across the entire frequency spectrum. Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more “weight.” The A-weighted decibel scale (dBA) is used to reflect the selective sensitivity of human hearing. This scale puts more weight on the range of frequencies that the average human ear perceives, and less weight on those that we do not hear as well, such as very high and very low frequencies.

Audible traffic sounds are present in the Project Area. U.S. Highway 169 is immediately west of the Project Area and county roads adjacent to and near the Project Area, with average daily traffic as described in Section 5.2.9 (Roadways). Other sound sources in the Project vicinity include agricultural activities on neighboring properties, vegetation, birds, and insects.

The MPCA has the authority to adopt noise standards pursuant to Minn. Stat. § 116.07, subd. 2. The adopted noise standards are set forth in Minn. R. Chapter 7030, which sets noise limits for different land uses (**Table 12**).

Table 12: Minnesota Noise Standards

NAC Area	Daytime Limit (dBA)		Nighttime Limit (dBA)	
	L_{10}	L_{50}	L_{10}	L_{50}
NAC -1 Residential	65	60	55	50
NAC -2 Commercial	70	65	70	65
NAC -3 Industrial	80	75	80	75

Noise sensitive areas in the Project Area consist of residential homes. Noise sensitive receptors are also within the CREP easement area, which is excluded from the Project Area (see **Figure 2**). While conservation areas are not classified, they were included and held to NAC 1 limits.

Noise sensitive receptors/areas (NSAs) were identified within 3,200 feet of the Project boundary and were categorized by distance from the Project Area, shown in **Table 13** below.

Table 13: NSA Distance Distribution

Distance from Project Area	# of NSAs
<50'	6
50' - 100'	0
100' - 200'	0
200' - 400'	8
400' - 800'	1
800' - 1600'	5
1600' - 3200'	8

Noise modeling is most accurate predicting Leq levels, which is the overall logarithmic average of a measurement period. L_{10} levels are on average 3 dBA above Leq, while L_{50} values are lower than Leq. Thus, modeled Leq can be compared to the L_{50} limits to ensure full compliance and conservatism. The visual relationship between the Leq, L_{10}, and L_{50} metrics is shown on **Image 9** (Federal Highway Administration [FHWA], 2017).

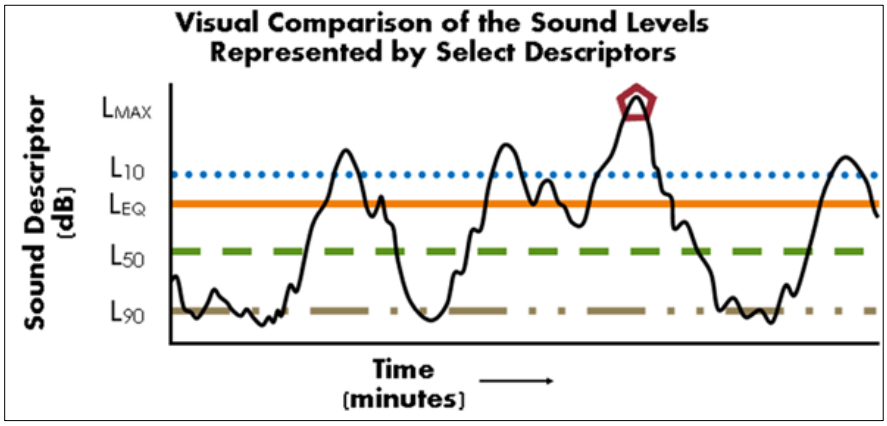

Image 9: Comparison of Sound Level Metrics

Project noise levels were predicted using CADNA-A, a noise modeling software in conformance with International Organization for Standardization 9613-2, Attenuation of Sound During Propagation Outdoors – Part 2: General method of calculation. As Minn. R. 7030 refers to total noise (ambient plus Project generated noise), an ambient level of 45 dBA was assumed and added to Project noise within the model.

Two scenarios were modeled: a daytime operation scenario with all equipment running, and a nighttime operation scenario with all equipment except the solar inverters running. Predicted daytime total noise levels (assuming an ambient level of 45 dBA) fall below the 60 dBA daytime total noise level limit set forth in MN Rules Chapter 7030. Predicted nighttime noise levels indicate an exceedance of the 50 dBA limit set forth in MN Rules Chapter 7030 at one receptor, primarily due to the BESS Facility's proximity to the receptor.

5.2.7.1 Impacts and Mitigation

Based on current equipment used for the preliminary site design, and without any mitigation, predicted nighttime noise levels exceed the limits set within MN Rules Chapter 7030 at one receptor. NSA 10 (R9), located approximately 0.18 mile from the southern edge of the BESS Facility, exceeds the nighttime noise limit of 50 dBA. As shown in **Table 14**, the modeled nighttime noise level is 54.4, which exceeds the nighttime limit of 50 dBA. Also as shown in **Table 14**, proposed mitigation will reduce the nighttime noise level to 48.8, below the 50 dBA limit.

Table 14: Modeled Daytime, Nighttime, and Total Nighttime Noise Levels

Receptor ID	Total Unmitigated Daytime Noise (L_{eq} dBA)	Total Unmitigated Nighttime Noise (L_{eq} dBA)	Total Mitigated Daytime Noise (L_{eq} dBA)	Total Mitigated Nighttime Noise (L_{eq} dBA)
R1	46.5	45.3	45.4	45.1
R2	46.2	45.0	45.3	45.0
R3	50.2	45.8	46.7	45.4
R4	47.8	45.1	45.7	45.0
R5	49.7	45.0	46.4	45.0
R6	49.6	45.0	46.3	45.0
R7	49.9	49.6	47.5	47.4
R8	47.8	47.5	46.2	46.2
R9	55.2	54.4	49.4	48.8
R10	50.4	49.5	47.2	46.9
R11	51.8	49.5	47.5	46.5
R12	53.0	45.7	48.1	45.3
R13	50.1	47.4	46.6	45.6
R14	49.9	46.7	46.5	45.5
R15	49.2	46.3	46.2	45.3
R16	50.9	45.0	46.9	45.0
R17	48.7	45.0	46.0	45.0
R18	52.9	45.0	48.1	45.0
R19	46.8	45.7	45.5	45.2
R20	47.0	45.5	45.5	45.2
R21	46.7	45.4	45.4	45.1
R22	45.6	45.1	45.1	45.0
R23	46.7	45.4	45.5	45.2
R24	46.9	46.6	45.8	45.7
R25	46.0	45.0	45.2	45.0
E3	50.6	45.1	46.7	45.0
E2	51.8	45.0	47.3	45.0
E1	51.4	45.0	47.1	45.0

Using modeling, Northern Crescent Solar explored using different equipment and/or mitigation to reduce noise levels to comply with noise limits. Based on this modeling, mitigation measures will likely include attenuation/silencer kits on each battery inverter and construction of a noise barrier wall at the south end of the BESS Facility. As shown in **Table 14**, with these mitigation measures, daytime and nighttime noise levels fall below the noise limits of 60 dBA and 50 dBA, respectively (**Figure 7a** and **Figure 7b**). Once

Project design is completed, modeling will be updated accordingly, mitigation measures, if needed, will be documented, and a comprehensive noise study showing full compliance will be issued.

The Project will also create intermittent noise during construction, and the resulting noise impacts will be temporary. Additionally, Project construction noise will likely be similar to noise emitted from existing farm operations in the area and vary from day to day. Northern Crescent Solar will mitigate noise impacts by limiting construction to daytime hours and ensuring that equipment/vehicles are operated with properly functioning mufflers and noise-control devices.

5.2.8 Public Services

Public services are those typically provided by a government entity to its citizens and those services are used to benefit public health and safety. These services can include emergency services, potable water, sanitary systems, and utilities. Faribault County and Winnebago Police provide Police services to the area where the Project is proposed; the Winnebago and Delavan Fire Departments respond to fire, search, rescue, and hazardous material emergencies in a 118- square-mile area that includes the Project Area (Winnebago, 2023b). The nearest hospital offering emergency care is the United Hospital District, located in Blue Earth. Nearby clinics affiliated with the hospital include the Blue Earth Clinic, Fairmont Clinic, and Wells Clinic (United Hospital District, 2021).

The Project is located in an area where private wells and septic systems are used at rural and farmstead residences. Review of the MDH County Well Index (CWI) identified one active domestic well (696386) within the Project Area (Section 5.4.4). Several other domestic wells were identified at the residences located adjacent to the Project Area (**Figure 9**).

There are numerous telephone services and broadband providers in Faribault County (Minnesota Department of Employment & Economic Development [DEED], 2022).

Five transmission lines cross the Project Area, ranging from 69 kV to 161 kV, and are owned by ITC Midwest LLC or Xcel Energy, with the exception of the Winnebago Junction to Freeborn 161 kV line which is owned by an undetermined company. ITC Midwest transmission lines identified in the Project Area include the Winnebago Junction to Blue Earth Interconnect Sub / BLU Tap 161 kV line, Winnebago Local to Winnebago Junction 69 kV line, Winnebago Tap to Winnebago 69 kV line, and the Winnebago Junction to Blue Earth (IPL) 69 kV line. Approximate locations of these transmission lines are displayed on **Figures 4 & 5**.

According to the NPMS, no gas transmission or hazardous liquid pipelines were identified in the Project Area. A Northern Natural Gas active natural gas pipeline was identified 1.4 miles northwest of the Project Area, southwest of Winnebago as shown on **Figure 5** (NPMS, 2019).

5.2.8.1 Impacts and Mitigation

Northern Crescent Solar will coordinate with Gopher State One Call before and during construction to fully understand infrastructure, utility locations and safety concerns and to avoid possible structural conflicts. Northern Crescent Solar will also conduct an American Land Title Association survey to identify the locations of underground utilities. Final design will minimize and avoid impacts to

underground utilities; if conflicts are unavoidable Northern Crescent Solar will coordinate with the utility to develop an approach to reroute or otherwise protect the utility. Underground utilities will be marked prior to construction start.

The Project will interconnect into the existing Huntley-Blue Earth 161 kV HVTL that runs through the northern portion of the Project Area. During interconnection construction work associated with the Xcel Switchyard, customers may experience short outages when the Huntley-Blue Earth 161 kV HVTL is shut down and temporary service is being established. The timing and duration of any service interruptions would be determined and communicated by the interconnecting utility (Xcel Energy). Limited, temporary impacts to service are anticipated to be of short duration and closely coordinated with utilities and landowners.

The one known domestic well (696386) associated with the farmstead in the south-central portion of the Project Area will be avoided by Project facilities; therefore, no impacts or subsequent mitigation activities are proposed. Any unidentified wells within the Preliminary Development Area will be capped and abandoned in place according to MDH requirements.

5.2.9 Roadways

Access to the Project will be via existing state, county and township roads. The major roadway in the area is U.S. Highway 169, located immediately west of the proposed Project. U.S. Highway 169 is part of the state Trunk Highway System. Other roads that surround the Project Area are county or township roads.

Annual Average Daily Traffic (AADT) counts based on MnDOT's Traffic Mapping Application (MnDOT, 2022) are provided in **Table 15** and displayed on **Figure 5**.

Table 15: Annual Average Daily Traffic in the Project Vicinity

Roadway	Year	AADT Traffic Volume Total
U.S. Highway 169 (west of Project Area from Winnebago to County Road 10)	2022	3,073
U.S. Highway 169 (west of Project Area from County Road 10 to Interstate 90)	2022	2,414
State Highway 109 (north of Project Area)	2022	858
375th Avenue/County Road 107 (north of Project Area)[1]	2011	65
390th Avenue/County Road 103 (east of Project Area)[2]	2019	55
[1] MnDOT 2023 estimates show traffic counts for County Road 107 could increase to 100. [2] MnDOT 2023 estimates show traffic counts for County Road 103 could decrease to 32.		

There will be several access points to the Project. The BESS Facility, Project Substation, Xcel Switchyard, and O&M facility will be accessed using a newly constructed gravel road from U.S. Highway 169 to the Project facilities. This access road will also connect with newly constructed access roads within the adjacent solar modules. The northern portion of the Project will be accessed from three newly

constructed access roads from 180th Street. The southern portion will be accessed from five newly constructed access roads from 170th Street (**Figure 4; Appendix C**).

5.2.9.1 Impacts and Mitigation

Access to the Project will be via existing township, county, and state roads. With the limited possible exception of minor field access or driveway changes depending on final design, no changes to existing roadways will occur. Driveway permits will be acquired prior to initiating construction activities. The roads used for access to the Project are shown on **Figure 4** and **Appendix C**. Northern Crescent Solar will work with the appropriate governmental units to obtain road use agreements to address road use and related concerns. These agreements will be completed prior to start of construction.

During the construction phase, temporary impacts are anticipated on some public roads within the vicinity of Project facilities, primarily through additional construction worker traffic, equipment and material deliveries and potentially slow-moving construction vehicles. Northern Crescent Solar will secure necessary local permits for road access and other ancillary aspects of the Project.

Overall construction traffic will use the existing public roadway system to access the Project site and facilities to deliver construction materials and personnel. Traffic during construction is estimated to average 130 to 200 pickup trucks, cars, and/or other types of employee vehicles onsite for the majority of construction.

Approximately 10 to 20 semi-trucks per day will be used for delivery of facility components. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment. For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day (AADT). Since the area roadways have AADTs that are below 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 also cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest seasons. However, these delays should be minimal and only for the relatively short construction delivery period. Overweight or oversized loads may be required during construction and equipment delivery for the Project. If they are required, Northern Crescent Solar will obtain the appropriate State and/or county approvals prior to construction.

After construction is complete, traffic impacts during the operational phase of the Project are expected to 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; traffic function in the Project Area will not be impacted as a result.

5.2.10 Railroads and Airports

No active railways were identified in the Project Area according to publicly available sources. An abandoned Union Pacific railroad corridor runs through the Project Area.

According to the Federal Aviation Administration (FAA, 2024), there are two FAA-registered airports located within 10 nautical miles of the Project Area. The United Hospital District helicopter pad is located

6.3 miles south of the Project in Blue Earth, and the Blue Earth Municipal airport is located about 8.7 miles to the south of the Project in Blue Earth City Township.

5.2.10.1 Impacts and Mitigation

No active railways are located in the Project Area; therefore, no crossing or encroachments agreements will be required prior to construction. No other impacts are anticipated, and no other mitigation measures have been considered with respect to railways.

There are no FAA-registered airports that will be affected by the Project; therefore, no mitigation is needed or planned concerning airports.

5.2.11 Land Use and Zoning

The Project is located in a sparsely populated rural area of Faribault County. Land use in the vicinity of the Project is predominantly agricultural as summarized in **Table 26** in Section 5.4.6 (Vegetation). Farmsteads are sparsely scattered outside of the Project Area and generally situated near public roads. Based on review of available aerial photography, there are 10 residences located on parcels adjacent to the Project Area as highlighted on **Figure 5**. There are two farmsteads and one single-family residence within the Project Area.

Based on Faribault County zoning information, the Project Area is zoned agricultural. Review of the Official Zoning Maps for Prescott and Verona townships indicates Project land parcels are classified as General Agricultural (**Figure 10**). Land use on parcels is shown as agricultural (corn and soybean) on the 2013 Land Use Map. The county's Renewable Energy Ordinance outlines standards for "solar energy system, large" (Faribault County, 2020).

As noted in the Faribault County Renewable Energy Ordinance, Section 7, Subdivision 2, development of large solar energy systems within the general agricultural district (or agricultural shoreland district) is a conditionally permitted use (Faribault County, 2020). The County zoning ordinance applies to solar energy systems that are not otherwise subject to siting and oversight by the State of Minnesota under the Minnesota Power Plant Siting Act (Minn. Stat. Chapter 216E). Minn. Stat. § 216E.10, subd. 1, states that the Site Permit is the only site approval required for construction of the proposed Project. A Site Permit supersedes and preempts all zoning or land use rules, regulations, or ordinances put in place by regional, county, local, and special purpose governments. Regardless, Northern Crescent Solar has applied county standards to the Project where feasible. The proposed Project will consider the setback requirements noted in the Renewable Energy Ordinance where practicable and as discussed in Section 4.2.1.

In addition to the zoning ordinances set by Faribault County, the *2015-2035 Comprehensive Land Use Plan* of Faribault County highlights the visions and plans for zoning and land use (Faribault County, 2015). The county's objective is to continue to grow and develop zoning practices to reflect the needs of its residents while maintaining environmental and economic health.

Northern Crescent Solar reviewed Faribault County's *2015-2035 Comprehensive Land Use Plan* (Faribault County, 2015) during preparation of the Project design. As feasible, the Project has been designed in compliance with the goals and policies of the *Comprehensive Land Use Plan*. The

Comprehensive Land Use Plan acts as a basis for the Faribault County zoning ordinance and as a guideline to be used to make adjustments to the land use system of the county. Policies of the General Agricultural District are to retain suitable agricultural lands, reduce scattered non- farm developments, and secure economy in governmental expenditures for public services, utilities, and schools.

Northern Crescent Solar reviewed the *2018 – 2027 Faribault County Local Water Management Plan* (Faribault County, 2018) during preparation of the Project design. As feasible, the Project has been designed in compliance with the goals and policies of the *Local Water Management Plan*. The *Local Water Management Plan* sets a 10-year course for water resource management activities in the county, with the aim to protect and enhance resources related to surface water quantity and quality and ground water. The priority concerns are to protect, restore, and manage the quantity and quality of surface water, drinking water supplies, and groundwater in the Blue Earth River and Le Sueur Watersheds, as well as create and enforce regulatory controls for all priority concerns throughout the county.

Northern Crescent Solar has demonstrated a need for a solar energy facility in this location throughout this Application. Northern Crescent Solar has demonstrated the lack of other suitable locations (Section 3.2). Since Project land will be temporarily leased from participating landowners and land will be returned to agricultural land uses upon decommissioning of the Project, the Project will further the county's goals of providing long-term agricultural opportunities.

5.2.11.1 Impacts and Mitigation

The Project will temporarily change the land use from agricultural to a solar energy generation use within the Preliminary Development Area (**Figures 2 & 4**). The conversion of agricultural land to the solar facility will be visually different than the surrounding rural character of the area. As discussed further in Section 5.3.1 (Agriculture), Faribault County has approximately 383,231 acres of cropland. As shown in **Table 27**, impacts to cropland (922.9 acres – Solar Facility, and 3.2 acres – BESS Facility) would reduce the amount of agricultural land in the county by less than 1%.

Although Northern Crescent Solar proposes impacting a relatively small percentage of available farmland in Faribault County with the Project, Northern Crescent Solar has coordinated with DOC EERA, Minnesota Department of Agriculture (MDA), and other applicable stakeholders concerning the Project AIMP (**Appendix E**) and VMP (**Appendix F**), as discussed below. The AIMP has been designed to incorporate BMPs into siting procedures; pre- construction, construction, and post construction methods; operational procedures; and decommissioning and restoration procedures to avoid and minimize impacts to soil and site productivity such that pre-construction agricultural productivity (anticipated use, appropriate management) is rapidly returned to the site following decommissioning. The VMP was developed to address revegetation and maintenance of the Project site in accordance with DOC EERA draft guidelines and other applicable agency concerns. Northern Crescent Solar met with MDA staff on September 20, 2021 to discuss the AIMP and VMP contents and site-specific characteristics.

Normal agricultural activities can continue within some portions of the Project Area not converted to solar modules, BESS Facility, Project Substation, O&M facility, Xcel Switchyard, access roads, transmission facilities, and fencing. After the useful life of the Project, the current agricultural land use would be restored by removing the Solar Facility and BESS Facility. Northern Crescent Solar

prepared a Decommissioning Plan which will be implemented upon completion of the Project (Section 4.4; **Appendix G**).

The Project is not anticipated to preclude current or planned land use on adjacent parcels. Upon decommissioning and removal of the Project, the affected parcels may be returned to the existing agricultural use or transitioned to other planned land uses.

The Project has been designed in compliance with the *Faribault County Comprehensive Land Use Plan* (Faribault County, 2015). Agricultural activities will be resumed upon decommissioning of the Project, as determined with landowners. Components of the Project may be located in areas where there is a planned extension of water, sewer, or other services.

Construction of the Project would not preclude the future orderly extension of these services across property under Northern Crescent Solar's control as these extensions would likely be accomplished by utilizing existing public rights-of-way which will not be impacted by the Project.

The Project has also been designed in compliance with the *2018 – 2027 Faribault County Local Water Management Plan* (Faribault County, 2018), and will protect and enhance resources related to surface water quantity and quality and ground water by installing BMPs during construction, replacing tilled agricultural land with perennial plant species, and following the practices outlined in the AIMP, VMP, and SWPP. Implementing these practices will help protect, restore, and manage the quantity and quality of surface and ground water in the Blue Earth River and Le Sueur Watersheds. Northern Crescent Solar will continue to coordinate with the townships and Faribault County on other potential permits for the Project (e.g., road use agreement, driveway permits, etc.).

Because no permanent land use or zoning impacts are anticipated, no additional mitigation measures are proposed beyond those described above. Northern Crescent Solar is coordinating with county and township officials regarding the Project (Section 6.0).

5.2.12 Recreation

Recreational opportunities in Faribault County primarily include snowmobiling, swimming, boating, hiking, camping, bicycling, nature walking, picnicking, golfing, gun clubs, hunting and fishing, and opportunities to explore wildlife management areas, parks, and other natural recreation areas (**Figure 8**).

Information from the MnDNR, Faribault County, and other federal Geographic Information System (GIS) databases were reviewed to identify recreational resources within and near the Project. There are no designated public (federal, state, or local) recreational lands within the Project Area boundaries (**Figure 8**).

As mentioned in Section 5.2.1, two CREP easements are located within, but excluded from, the Project Area. These easements were established in 2002 and are managed for conservation benefits. While not considered public lands open for recreation, the easements will remain in private ownership and can be used by the landowner for passive recreation activities such as bird watching. Project fencing has been designed to be setback from the easements (**Appendix C**).

According to the MnDNR Recreational Compass, there are no state forests, national forests, or national wildlife refuges in close proximity to the Project. Additionally, there are no state-owned Off-Highway Vehicle trails and no MnDNR SNAs identified within a mile of the Project Area. Also, no lakes with public access are located in the Project Area or in close proximity to the Project.

Primary recreational resources identified within approximately five miles of the Project Area are shown in **Table 16** and **Figure 8**.

Table 16: Recreational Resources

Resource	Approximate Distance to Project Area Boundary
Prescott Waterfowl Production Area	0.2 mile
Faribault County Trails (Snowmobile Trail 127)	1.0 mile
Riverside Town and Country Golf Club (public)	1.0 mile
Blue Earth River (150th St. Public Water Access Site)	1.3 miles
Rice Lake WMA (South Public Water Access Site)	1.3 miles
Charlotte Hynes WMA	1.5 miles
Whiting Park (Winnebago, MN)	1.6 miles
West City Park (Winnebago, MN)	1.8 miles
Blue Earth River Aquatic Management Area	3.1 miles
Lane WMA	4.0 miles
Delevan Park/Water Tower	5.0 miles

The nearest public recreational resource to the Project is the Prescott Waterfowl Production Area (WPA), located approximately 0.2 mile east of the Project Area. The Faribault County Snowmobile Trail 127 is approximately one mile east of the Project Area and runs along 390th Avenue. The Riverside Town and Country Golf Club is a public golf course and event center located about one mile south of the Project Area, on the west side of U.S. Highway 169.

Public water access sites are located along the Blue Earth River, about 1.3 miles from the Project Area, and in the southern portion of the Rice Lake WMA, about 1.3 miles from the Project Area. The Charlotte Hynes WMA is located about 1.5 miles northeast of the Project Area and is mainly comprised of a restored prairie wetland complex with an upland forest component.

Whiting Park and West City Park are located in Winnebago about 1.6 and 1.8 miles northwest of the Project Area, respectively. Delevan Park/Water Tower is located about 5 miles northeast of the Project Area in the city of Delevan.

The nearest MnDNR Aquatic Management Area (AMA) is the Blue Earth River AMA, located about 3.1 miles northwest of the Project Area.

Lane WMA is located about 4.1 miles southwest of the Project Area and is mainly comprised of restored prairie wetland complex.

5.2.12.1 Impacts and Mitigation

The Project will avoid the Prescott WPA and all other identified recreational resources in the surrounding area. No significant impacts to recreational opportunities are anticipated, therefore, no mitigation measures are proposed.

5.2.13 Socioeconomics

The Project is in a sparsely populated rural area within Faribault County and is within both Prescott and Verona Townships. Winnebago is approximately three miles from the Project Area. Data is provided at the township, county, and state levels for the purpose of comparing the demographics in the Project Area to a larger area. There is no indication that any minority or low-income population is concentrated within the Project Area or that the solar modules will be placed in an area occupied by a minority group.

This discussion does not address every socioeconomic measure, but instead addresses the most applicable statistics related to the Project. The socioeconomic statistics that best characterize the demographic and economic context of the Project Area and represent the socioeconomic characteristics that potentially could be affected by construction and operation of the Project, include population, race, housing, income, and poverty.

5.2.13.1 Population Characteristics

Population characteristics for Prescott and Verona townships, Faribault County, and Minnesota are detailed in **Table 17**. The population of Faribault County according to the 2020 Census was 13,921 with a median age of about 45 years. Prescott Township had a population of 185 and a median age of about 46 years. Verona Township had a population of 323 and a median age of about 44 years. Verona Township includes the southern portion of Winnebago.

The predominant population group in Prescott and Verona Townships and Faribault County is White. Less than 11% of the population is categorized as a minority population in the county. The largest minority population of one race in the county is comprised of residents who identify as American Indian or Alaska Native, followed by Black or African American, and Asian.

Based on these statistics, there is no indication that minority populations are concentrated within the Project Area, or that the Project is located in an area occupied by a minority population.

Table 17: Population Characteristics in Minnesota

Category	Prescott Township	Verona Township	Faribault County	Minnesota
Total Population[1]	185	323	13,921	5,706,494
Hispanic or Latino	10	11	1,013	345,640
Not Hispanic or Latino	175	312	12,908	5,360,854
Population of One Race:	170	307	12,599	5,124,820
White	170	304	12,402	4,353,880
Black or African American	0	1	55	392,850
American Indian or Alaska Native	0	1	58	57,046
Asian	0	0	45	297,460
Native Hawaiian/Pacific Islander	0	0	0	2,621
Some Other Race	0	1	39	20,963
Population of Two or More Races	5	5	309	236,034
Median Age[2]	46.3	43.9	44.6	39
Population Density (per square mile)	5.13	9.12	19.5	71.7

[1] Data retrieved from Table P9: Hispanic or Latino, and Not Hispanic or Latino (U.S. Census Bureau, 2020).

[2] Data retrieved from Table DP05: 2021 ACS Demographic and Housing Estimates (U.S. Census Bureau, 2021).

5.2.13.2 Housing

Faribault County had 6,916 total housing units in 2022 with 830 vacant housing units. While Prescott Township had 86 total housing units and 12 vacant and Verona Township had 171 total housing units and 39 vacant. The data suggests there are more persons per household in the townships, and Verona Township has a higher vacancy rate than Prescott Township and the county. The housing characteristics are detailed in **Table 18**.

Table 18: Housing Characteristics

Category	Prescott Township	Verona Township	Faribault County	Minnesota
Total Households[1]	73	129	6,035	2,299,740
Average Household Size[1]	2.48	2.43	2.24	2.46
Total Housing Units[2]	86	171	6,916	2,485,558
Occupied	74	132	6,086	2,253,990
Vacant	12	39	830	231,568

[1] Data retrieved from Minnesota State Demographic Center, 2023a, 2023b and 2023c.

[2] Data retrieved from Table H1: Occupancy Status (U.S. Census Bureau, 2020).

In the nearest city, Winnebago, Minnesota, there are approximately 78 vacant housing units (U.S. Census Bureau, 2020). In addition, according to Winnebago's website, numerous hotels, guest houses, and campgrounds are available in the greater Winnebago area, as well as in the nearby Blue Earth area

(Winnebago, 2023a). These residences and temporary housing statistics suggest the local area would support an influx of construction workers if needed.

5.2.13.3 Income and Poverty

Median household income, unemployment rates, and the number of persons living below the poverty rate are provided in **Table 19**. Overall, Prescott Township has the highest median household income and lowest unemployment rate. The unemployment rate in Verona Township and Faribault County is slightly higher than the state for populations over 16 years old.

Table 19: Income and Poverty

Category [1]	Prescott Township	Verona Township	Faribault County	Minnesota
Median Household Income	$88,750	$63,750	$55,186	$82,338
Unemployment Rate (population over 16 years) (%)	0.0	3.4	2.9	2.2
Persons Living Below Poverty Level	8	9	1,560	516,621

[1] Data retrieved from the 2021: ACS 5-Year Estimates, Table DP03: Selected Economic Characteristics and Table B17101: Poverty Status in the Past 12 Months of People in Housing Units (U.S. Census Bureau, 2021).

The primary industries in Faribault County are classified as Educational Services and Health Care and Social Assistance (20.7%), Manufacturing (16%), and Retail Trade (11.3%).

5.2.13.4 Impacts and Mitigation

In general, the socioeconomic impacts associated with the Project will be positive; therefore, no mitigative measures are proposed. The Project is designed to be socioeconomically beneficial to the landowners and those who reside near the Project Area, local governments, and communities. Landowner compensation is established by voluntary leases or purchase agreements between the landowners and Northern Crescent Solar for lease or purchase of the land for the Project. The development of solar energy in this part of Minnesota has been important in diversifying, supporting, and strengthening the personal income tax base of southeastern Minnesota. This Project would diversify and support the personal income tax base of the area with no negative impact to minority groups or other groups/areas of concern.

Owners of land where the Project will be constructed have entered into lease or purchase contracts with the Applicant and are compensated for the use of the land based upon these agreements. Of the five participating landowners involved with the Project, five currently farm (four farm their own land and one of the participating landowner's farms on another participating landowner's land); as such, no tenant farmers outside of the participating landowner group actively work the Project Area land.

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for lodging, food services, fuel, transportation, and general supplies. The Project will also create new local job opportunities for various trade professionals that live and work in the area, and it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. Additional personal income will also be generated by

circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes.

General skilled labor is expected to be available in Faribault County and nearby larger cities 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. 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 must be comprised of Minnesota licensed electricians. Much of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code.

Northern Crescent Solar will issue an RFP to find contractors to construct the Project. Northern Crescent Solar will include preferences for contractor bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The contractor selected will be required to work with labor unions, local subcontractors, and other vendors to implement a project construction staffing model that maximizes local hiring and local economic benefits for the Project, while ensuring the Project is safely built on time and on budget.

Effects on temporary or permanent housing are anticipated to be negligible. During construction, out-of-town laborers will likely use lodging facilities nearby. The operations and maintenance of the facility will require three long-term personnel. Northern Crescent Solar anticipates that sufficient temporary lodging and permanent housing will be available within larger cities such as Winnebago, Blue Earth, and Fairmont, to accommodate construction laborers and long-term personnel.

Wages will be paid, and expenditures will be made to local businesses and landowners during the Project's construction and operation. Lease options and purchase payments paid to the landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. The Project is expected to generate annual property tax revenue of $420,000 for Faribault County and approximately $49,000 for Prescott Township and $46,000 for Verona Township. Because property taxes are determined by the county assessor when the Project is built, the county assessor will determine the final tax revenue.

Temporary construction jobs will generate indirect economic benefits as employees spend their income on local goods and services and pay local sales tax. During peak construction, an estimated 200 jobs will be created, with an average of 130 jobs created during construction. As an operating facility, the Project will annually generate $2.5 million in economic output by distributing nearly $1.5 million in direct earnings and supporting three operational jobs.

Effects on temporary or permanent housing are anticipated to be negligible. During construction, out-of-town laborers will likely use lodging facilities nearby. The operations and maintenance of the facility will require three long-term personnel. Northern Crescent Solar anticipates that sufficient temporary lodging and permanent housing will be available within larger cities such as Winnebago, Blue Earth, and Fairmont, to accommodate construction laborers and long-term personnel.

5.2.14 Radio and Television Interference

No Amplitude Modulation (AM), Frequency Modulation (FM), microwave, television, or other radio towers were identified in the Project Area or within one mile. There are 39 AM and FM radio broadcasting stations operating near Winnebago, Minnesota with the nearest being KGAC (92.3 FM), KBEW (98.1 FM), KJLY (104.5 FM), and KBEW (1560 AM). These stations, and others, operate or can be heard within the vicinity of the Project (Radio-Locator, n.d.).

There are 25 television transmitters and 10 towers within 70 miles within of Winnebago, Minnesota with the nearest tower being K27FI-D in Frost, Minnesota about 22 miles southwest of the Project Area (Antennas Direct, 2024). Television providers include DISH TV, Direct TV, and Mediacom Cable (CableTV.com, 2024). There are several broadband providers in the Winnebago area offering a range of available technologies including mobile, fiber, satellite, and cable broadband service (DEED, 2023).

According to publicly available Federal Communications Commission (FCC) sources, there is one licensed antenna structure within one mile of the Project Area. The Interstate Power and Light antenna is located west of U.S. Highway 169, west of the Project Area. There are no cell towers within a mile of the Project Area. The nearest tower is an AT&T mobile tower in Winnebago, MN (FCC, 2024).

5.2.14.1 Impacts and Mitigation

Due to the low-profile nature of a solar facility (i.e., less than 20 feet), which is well below the line of sight of some communication system signals, interference with communication systems is not anticipated. If radio or television interference occurs due to the Project, the Northern Crescent Solar will work with the affected landowner/business to restore reception to pre-Project quality.

5.3 Land-Based Economies

5.3.1 Agriculture

As shown in **Table 26**, the majority of land use in the Project Area is cultivated crop land (approximately 1,137.6 acres or 96.5%), as shown on **Figure 10**, and discussed in Section 5.2.11.1 Faribault County encompasses about 462,000 acres (Faribault County, 2015). According to the USDA's 2022 Census of Agriculture, approximately 383,231 acres are farmland including 366,048 acres used for cropland. A total of 773 individual farms are in Faribault County with the average farm size of 496 acres. The top crops (in acres) include corn, soybeans, vegetables, and sweet corn. Hogs and pigs top the list of livestock inventory, with a significantly smaller number of cattle, chickens, and sheep making up most of the remaining livestock (USDA, 2022).

The 2022 market value of agricultural production in Faribault County was approximately $588 million. Livestock, poultry, and their products accounted for approximately 35% of the total value of agricultural production, while crop sales accounted for the remaining 65% (USDA, 2022).

5.3.2 Drain Tile

Northern Crescent Solar will avoid County drain tiles and judicial ditches through design and during construction (**Figure 9**). Where county drain tiles and judicial ditches need to be crossed by Project facilities (e.g., collection lines), directional boring will be used to install the facilities which will avoid impacts to these tiles and ditches. Northern Crescent Solar is aware of the presence of drain tiles within the farm fields making up the Project Area, which appear to be adequately draining the Project Area and discharging off site primarily into the surrounding private and county managed drain tiles and judicial drainage ditches.

To minimize unforeseen repairs or damages to existing drain tile lines and/or drain tile systems, Northern Crescent Solar is committed to preserve soil drainage conditions as they currently exist. Existing drain tile lines and surrounding drainage systems will be maintained, repaired, relocated, or replaced (if damaged during construction or operation of the Project) by Northern Crescent Solar as needed.

5.3.2.1 Impacts and Mitigation

As indicated in **Table 27**, the Project will temporarily impact 922.9 acres of agricultural land for the Solar Facility and 3.2 acres of agricultural land for the BESS Facility within the Preliminary Development Area (**Figure 4**; **Appendix C**) and will not result in a significant impact to land-based economies in the Project vicinity as this acreage constitutes less than 1% of the agricultural land in Faribault County (462,000 acres). Agricultural production would continue in the surrounding areas during construction and operation of the Project. The Project will not impact livestock operations.

Areas disturbed during construction will be repaired and restored to pre-construction contours and characteristics as much as practicable. This restoration will allow the Project's land surfaces to drain properly, blend with the natural terrain, re-vegetate, and avoid erosion. Northern Crescent Solar would allow agricultural production to continue in areas outside of the Preliminary Development Area, but not within the Project Area during construction of the Project.

Measures to mitigate topsoil removal include limiting removal to areas designated for spot grading and construction of roads and structures. Impacts to soils will be further mitigated by incorporating erosion control measures during and following construction. Installation activities will implement erosion and sediment control BMPs outlined in the SWPPP, which will be specifically prepared for the Project, and as provided below. BMPs during construction and operation for general agricultural impact mitigation is outlined in the Project AIMP included in **Appendix E**. Vegetation management during construction and post-construction Project operations will be implemented in accordance with the Project VMP included in **Appendix F**.

The SWPPP will also include a discussion on topsoil and compaction management. During the operating life of the Project, erosion control will be further accomplished by establishment of a perennial, primarily native vegetative cover under the solar arrays and installation of gravel roads with culverts (as necessary) to redirect concentrated surface water and maintain existing drainage within the Project Area. These actions will preserve the soils in place and will likely result in less soil erosion than is typical with row crop agricultural activities.

Northern Crescent Solar will contract with a third-party environmental monitor to periodically observe earthmoving activities during Project construction to ensure appropriate measures are taken to properly segregate and handle the topsoil. As discussed in the AIMP (**Appendix E**) and VMP (**Appendix F**), the following is an overview of best practices and mitigation planned during construction:

- Topsoil will be separated from the other subgrade/subsoil materials when earthmoving activities, excavation, or trenching are taking place;
- Use of native grass species to the extent practicable within the Preliminary Development Area;
- Avoid and minimize disturbance to environmentally sensitive areas such as existing wetlands, drainages, and existing high quality natural vegetation;
- Use of temporary cover crop seed mixes until perennial vegetation can be planted;
- Replacement of temporary seed cover with perennial vegetation during the next available growing season;
- Construction activities will be halted if weather conditions pose a risk to worker safety and/or would cause significant soil compaction or rutting;
- The construction plan will remain flexible and implement new practices/procedures as needed under the directive of adaptive management;
- Stripped topsoil will be stored on site and any topsoil that is respread will be loosely compacted;

  While performing foundation work, stripped topsoil will be stored for later use and once the construction is complete, topsoil piles will be distributed in a thin layer adjacent to the Project Substation and Xcel Switchyard areas and the topsoil revegetated with an appropriate seed mix;
- Trenching activities will require excavation of topsoil and subgrade materials (which will be segregated) and ultimately backfilled with unscreened native backfill and covered with topsoil;
- Silt fencing on the downside of all slopes, near waterways, and near drain tile inlets will all be used to minimize erosion;
- Soil drainage conditions as they currently exist will be preserved, and if damage occurs, Northern Crescent Solar will fix it as soon as practicable; and

  Construction-related debris and unused material will be removed by Northern Crescent Solar.

As provided in the lease option agreements, payments will be made by Northern Crescent Solar to the owners of the land used for the Project. These payments will replace the revenue that would have been generated if the landowners continued agricultural production.

5.3.3 Prime Farmland

Soil characteristics within the Preliminary Development Area were assessed using the Soil Survey Geographic database (SSURGO; Soil Survey Staff, 2019). The SSURGO database is a digital version of the original county soil surveys developed by NRCS for use with GIS. It provides the most detailed level

of soils information for natural resource planning and management. **Table 20** lists the USDA NRCS farmland classification of soil types located within the Preliminary Development Area (**Figure 11**).

Table 20: Prime Farmland Classifications within Preliminary Development Area

Facility	Farmland Classification	Acres	Percent of Preliminary Development Area
Solar Facility	Prime Farmland if Drained	485.4	52.2
	Prime Farmland	439.6	47.3
	Statewide Importance	0.9	0.1
	Not Prime Farmland	0.2	<0.1
BESS Facility	Prime Farmland	3.2	0.3
	TOTAL	**929.3**	**100.0**

Nearly all of the Solar Facility is located on prime farmland/prime farmland if drained and a small percentage is located on farmland of statewide importance (discussed below) as shown on **Figures 4 & 11**. The entire BESS Facility is located on prime farmland. 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). It contains soils that are considered to be nationally significant. 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, 2021).

In the Preliminary Development Area, approximately 440 acres of prime farmland and 485 acres of prime farmland if drained are located within the Solar Facility and approximately three acres of prime farmland are located within the BESS Facility (**Figures 3 & 11**). These acreages of prime farmland would be temporarily taken out of production for the life of the Project but would not be permanently removed. Northern Crescent Solar identified and assessed one other potential site for the Solar Facility in an attempt to find a site that would otherwise be compliant with the 'prime farmland exclusion rule' found in Minn. R. 7850.4400, subp. 4 (Rule).[10] Northern Crescent Solar ruled out the potential site and does not have any leases or purchase options that would allow it to use the optional site for the Project. Moreover, Northern Crescent Solar does not have condemnation rights and therefore is unable to force any landowner to grant Northern Crescent Solar any lease, easement, or purchase option.

Northern Crescent Solar conducted a prime farmland assessment to review the feasibility and prudency of potential sites as well as the prime farmland impacts. The detailed assessment identified no other feasible or prudent site in comparison to the Project Area concerning prime farmland impacts and concluded that the otherwise Rule compliant site was not feasible or prudent for siting the Project for reasons outlined in

[10] 2023 Legislation specifically exempts the BESS Facility from the Rule (2023 Session Laws – Ch. 60, Art. 12, Sec. 67)

the Prime Farmland Assessment (**Appendix D**). Accordingly, there are no feasible or prudent alternatives to the proposed Project Area for the Project. The detailed Rule assessment, which was prepared following guidance issued by the DOC in May 2020 as it relates to the Rule is included in **Appendix B** (DOC, 2020).

In addition to prime farmland, approximately 0.1% of the Solar Facility Preliminary Development Area is on farmland of statewide importance. These areas are classified as soils that, although they do not have national significance and are not considered prime farmland, are of statewide importance for agriculture. In addition to that distinction, farmland of statewide importance does not carry the same protections as Prime Farmland.

Additionally, the Project Area was chosen due to the capacity of and proximity to the Huntley-Blue Earth 161 kV transmission line, (thus minimizing the need for extensive new transmission facilities), willing landowners and community interest in the Project, the lack of farmsteads and rural residences and human settlement impacts, the lack of other environmental constraints, adequate roads for access, level terrain, and overall need for renewable energy generation.

5.3.3.1 Impacts and Mitigation

Grading activities with the greatest potential to affect topsoil conditions are likely to be associated with construction of the Solar Facility, access roads, stormwater basins, and the BESS Facility. As mentioned in Section 4.3, preliminary engineering analysis indicates that approximately 128 acres of the Preliminary Development Area will require grading and a total of approximately 69,700 cubic yards of cut and 66,000 cubic yards of fill is estimated for the Project based on the preliminary site design. Section 4.3 provides a breakdown of the estimated grading volumes.

Areas to be graded are shown in **Appendix E** as part of the AIMP. The majority of soil disturbances will occur during the first phase of Project construction when grading takes place. Soils may need to be moved in some areas to "flatten" parts of the Project site to lessen further disruption and avoid erosion. The earthwork activities will be completed using typical earthmoving construction equipment such as scrapers, bulldozers, front-end loaders, excavators, and skid-steers. Topsoil will be separated from subsoil/subgrade to maintain the integrity of the productive topsoil. Once topsoil is respread, appropriate seed mixes will be spread to maintain the soil, avoid erosion, and enhance nutrient cycling.

Topsoil handling will first include stripping topsoil that sits higher than other areas that need to be leveled. Topsoil will be pushed outside of the cut/fill areas and collected into designated spots for later use. This topsoil will be separated from subsoil/subgrade materials. Once topsoil is removed from the cut/fill areas, the subgrade materials will be removed as required from onsite slopes and relocated to onsite low spots. In the limited instances where subsoil and topsoil will both be excavated and held in the same area, a thin straw mulch layer will be used to facilitate effective separation. Prior to relocating subgrade materials to the low spots, topsoil in the low areas will be stripped and set aside before the fill is added, then respread over the new fill. The subgrade materials would be compacted in place. When compaction is complete, the topsoil spoil piles will be respread over the reconditioned subgrade areas. While in piles, topsoil will be windrowed or piled and loosely compacted and/or tracked with stormwater and wind erosion BMPs in place.

Because the Project will result in a temporary land use without significant grading, minimal loss of soils or opportunity for future agricultural production is expected when the Project is decommissioned. In addition to topsoil being separated from subsoil/subgrade, once respread, seed mixes will be spread over the topsoil to avoid erosion, maintain the integrity of the soil, improve nutrient cycling, suppress weeds, and break pest cycles. BMPs are further discussed in the accompanying Project AIMP and VMP (**Appendices E and F**, respectively).

Impacts to soils will occur during the construction and decommissioning stages of the Project. Because the Project location is on relatively level existing agricultural fields, construction will require minimal grading to provide a level surface, only 14% (127.6 acres) of the Preliminary Development Area. Impacts to soils would be temporary and minor and would be mitigated through the proper use and installation of BMPs such as stockpiling topsoil for later spreading and seeding and minimizing soil compaction to work areas to the degree practicable. Northern Crescent Solar will also develop a SWPPP that complies with applicable MPCA rules and guidelines. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.

As indicated above, Northern Crescent Solar has prepared an AIMP and VMP outlining how soils and vegetative cover will be managed during and after construction for preservation of soils and creation of beneficial habitat (**Appendices E and F**, respectively).

5.3.4 Forestry

Economically important forestry resources are not found in this region of Minnesota. The Preliminary Development Area is located solely on agricultural land (**Figures 2 & 10**). Similarly, there are no resources within the Project Area considered to be forestry resources for commercial use. The primary tree cover within the Project Area is associated with farmsteads.

5.3.4.1 Impacts and Mitigation

No impacts to economically important forestry resources will occur from construction or operation of the Project; therefore, no mitigation measures are proposed.

5.3.5 Tourism

This region draws tourists to participate in recreational activities such as festivals, fairs, markets, celebrations, and outdoor recreation like camping, fishing, bicycling, and hiking. Primary tourism activities in the vicinity of Project facilities are associated with the recreational resources discussed in Section 5.2.12 (Recreation), and local community festivals and other events. An example of local tourism includes the Winnebago Area Museum (2022), whose mission is to share artifacts and historical items with the public for study, education, and enjoyment.

No recreational resources are located within the Project Area. The nearest public recreational resource to the Project is the Prescott WPA, located approximately 0.2 mile east of the Project Area, and the Faribault County Trail 127, a snowmobile trail, located about one mile east of the Project Area along 390th Avenue (**Figure 8**). These resources will not be impacted during construction or operations.

5.3.5.1 Impacts and Mitigation

Because all Project facilities will be located on private land, there will be no direct impacts to existing recreational facilities and tourism activities that typically generate revenue for the local community.

Prescott WPA is used by birdwatchers throughout the warmer months. The Prescott WPA is about 0.2 mile east of the Project Area and will not be impacted. Faribault County Trail 127 is used by snowmobilers during the winter and will not be impacted by the construction or operation of the Project.

Northern Crescent Solar will construct the Project facilities within the limits of the Project Area and no road closures are anticipated during active construction. Northern Crescent Solar will closely coordinate construction activities with the townships, county, and Winnebago staff if any closures are determined necessary. The annual events hosted by the county do not occur within the Project Area; most of these events are held within city limits or in areas outside of the Project Area. No impacts to public access to these events is anticipated during construction or operation of the Project.

5.3.6 Mining

According to the MnDOT Aggregate Source Information System (ASIS) Map, there are no quarries or active gravel pits located within the Project Area. The ASIS Map shows an active gravel pit (22040) about 3.5 miles southeast of the Project Area (MnDOT, 2023). Based on aerial photography, this pit no longer appears to be active.

5.3.6.1 Impacts and Mitigation

No impacts to mining operations are anticipated; therefore, no mitigation measures are proposed.

5.3.7 Archaeological and Historical Resources

Northern Crescent Solar has considered potential Project effects on archaeological and historical resources. Investigations to date include desktop review, file searches, and field surveys. Field studies of the Project Area were completed in December 2021 and June 2022. Additionally, Northern Crescent Solar engaged cultural resource regulatory and tribal stakeholders to introduce the Project, request comments, and gain feedback as detailed in Section 6.0 below (**Appendices B and I**). As requested by the DOC and in general accordance with Governor Walz Executive Order 19-24 (dated April 4, 2019) which orders state agencies to conduct meaningful and timely consultation with Minnesota Tribal Nations, Northern Crescent Solar sent a Project introduction letter and map to the Minnesota Tribal Nations requesting feedback on the Project. See Section 6.0 for details and responses.

Northern Crescent Solar performed a review of records for cultural resources in July 2021 and this review is provided in the Cultural Resources Literature Review dated September 2, 2021 (**Appendix I-1**). This review included a request for data from the SHPO and a review of the online Portal maintained by the Office of the State Archaeologist (OSA). The records review study area included the Project Area and a one- mile buffer.

A review of archaeological data indicated that no previously recorded archaeological sites had been identified in the Project Area, but 13 archaeological sites were recorded in the one-mile buffer. Most of

the archaeological sites in the buffer had been recommended or determined not eligible for listing in the National Register of Historic Places (NRHP) with two sites being unevaluated for NRHP eligibility. No historic/architectural resources were previously recorded in the Project Area. Four architectural resources have been previously inventoried in the one- mile buffer; each are located less than 0.25 mile from the Project. None of the architectural resources have been evaluated for listing in the NRHP.

Northern Crescent Solar's review determined that the Project Area is located in Minnesota Archaeological Region 2s – Prairie Lake (South). Sites of earlier prehistoric periods in this region are generally located on islands and peninsulas of lakes, with some villages near major rivers. Winter villages would be located in the wooded areas of large river valleys. Temporary campsites could be found on rivers and around lakes. Late prehistoric large village sites may be found on the terraces of the Minnesota and Blue Earth rivers, with some campsites on islands and peninsulas of lakes (Gibbon et al. 2002).

Archaeological field surveys for the planned development area were conducted in December 2021 and June 2022 and are detailed in the July 22, 2022 *A Report for Phase I Archaeological Survey* (**Appendix I-2**). No new or previously recorded archaeological, architectural, or historic sites were identified/reviewed during the surveys. The Phase I Archaeological Survey report was submitted to the SHPO for review. In a letter dated August 23, 2022, the SHPO concluded that there are no known properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological resources in the area will be affected by the Project (**Appendix I-3**). The MPUC/DOC will be updated as coordination with SHPO continues.

5.3.7.1 Impacts and Mitigation

No previously recorded archaeological, architectural, or historic sites will be directly impacted by the proposed Project, and there are no known properties listed in the National or State Registers of Historic Places. Before construction of the Project begins, the Applicant will prepare an Unanticipated Discoveries Plan that will outline the steps to be taken if previously unrecorded cultural resources or human remains are encountered during construction. Should previously unknown archaeological resources be inadvertently encountered during Project construction and/or operation, 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 OSA will be notified.

Should human remains be inadvertently discovered, Minn. Stat. § 307.08 will be followed, all work will cease, law enforcement will be immediately contacted, and the OSA will be notified.

5.4 Natural Environment

5.4.1 Air Quality

Minnesota has a good record of complying with federal air quality standards, and the state's air quality has been improving for most pollutants. Currently all areas of Minnesota are attainment areas except for an area in Dakota County (EPA, 2023c). Much of this decline in pollution is attributed to lowered emissions from major facility or "point sources" from enforcement of the Clean Air Act (CAA) and subsequent amendments. The CAA requires that the EPA establish National Ambient Air Quality Standards for various pollutants, including carbon monoxide (CO), lead, nitrogen dioxide (NO_2), ozone

(O_3), particulate matter (PM), and sulfur dioxide (SO_2). The Project Area presently meets federal air quality standards.

In recent years, because of an increased understanding of the health effects of certain pollutants, air quality standards have become stricter and acceptable thresholds for some pollutants have been lowered including the daily fine particle standard, the ozone standard, and lead standards. According to the MPCA *Air Quality in Minnesota: 2023 Report to the Legislature*, a majority of sources that contribute the most to air pollution are transportation (e.g., traffic, airplanes, trains, and boats), permitted facilities (e.g., feedlots, solid waste, and hazardous waste facilities), and burning wood for home heating (MPCA, 2023a).

In Minnesota, air quality is tracked using air quality monitoring stations across the state. The MPCA uses data from these monitors to calculate the Air Quality Index (AQI), on an hourly basis, for O_3, $PM_{2.5}$, SO_2, NO_2, and CO. The pollutant with the highest AQI value for a particular hour sets the overall AQI for that hour. The AQI is used to categorize the air quality of a region as one of five levels of quality: good, moderate, unhealthy for sensitive groups and unhealthy, or very unhealthy (MPCA, 2023b).

The nearest air quality monitoring station is in Rochester, Minnesota, approximately 138 miles northeast of the Project. This station monitors for O_3 and $PM_{2.5}$. The five most recent annual AQI Days in each category at the Rochester monitoring station are provided in **Table 21** (MPCA, 2023c).

Table 21: Days in Each Air Quality Index Category (Rochester, Minnesota)

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2021	301	58	2	0	0
2020	325	40	1	0	0
2019	313	51	0	0	0
2018	292	69	0	0	0
2017	312	53	0	0	0

Air quality has been considered good for the majority of the past five reported years in Rochester. Since 2017, the largest number of days classified as moderate occurred in 2018, with a day or two in 2020 and 2021 where air quality was considered Unhealthy for Sensitive Groups. No days have been classified as unhealthy or very unhealthy in the past five years (2017-2021) of monitoring at the Rochester station.

In addition, clean energy from renewable sources such as solar, produce almost no harmful emissions, known as greenhouse gasses (GHG), such as CO_2. Clean energy generally results in less air pollution compared to combustible fuels, such as coal, because it does not produce CO_2 emissions (U.S. Department of Energy [USDOE], n.d.).

5.4.1.1 Impacts and Mitigation

Impacts on air quality from construction and operation of the Project would be low and primarily limited to the period of construction. Minor temporary effects on air quality are anticipated during construction of

the proposed Project as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust from wind erosion of agricultural land that becomes airborne during dry periods of construction activity.

The magnitude of air emissions during construction is influenced by weather conditions and the type of construction activity. Exhaust emissions, primarily from diesel and other carbon-based fueled equipment, will vary with the phase of construction. Emissions from construction vehicles will be minimized by using modern equipment with lower emissions ratings and properly functioning exhaust systems. Adverse effects on the surrounding environment are expected to be negligible because of the short and intermittent nature of the emission and dust-producing construction phases. These effects will most likely be less than the historic emissions from farm machinery and fugitive dust produced during normal farming operation that would otherwise typically occur within and near the Project site.

Post-development emissions will be less than current and historic emissions due to the cessation of farming and the installation and maintenance of perennial native plantings and other vegetation planned at the Project site under solar modules and other areas disturbed by construction. While some dust may be produced from the use of planned gravel access roads from O&M vehicles, this emission is expected to be minimal, temporary, and infrequent throughout the year. Emissions generated during operational activities will further be limited in duration and frequency from use of relatively few trucks, cars, and other related O&M vehicles as part of O&M activities associated with the Project.

Applicable BMPs will be used during construction and operation of the Project to minimize dust emissions. Additional BMPs will be implemented as part of the SWPPP, VMP and AIMP (Section 5.3.1; **Appendices E and F**), which will also address emissions (e.g., reducing vehicle and equipment speed, maintaining equipment and exhaust/mufflers, etc.). Additional practices may include watering or treating haul and access roads and other exposed dust producing areas, containment of excavated material, protection of exposed soil, soil stabilization, and treating stockpiles to control fugitive dust. The Applicant will obtain an NPDES/SDS CSW permit and prepare the required SWPPP, which will be developed prior to construction and implemented during construction that will include BMPs to minimize to potential for fugitive dust.

The Project is expected to have an overall effect of improving air quality by replacing electrical generation produced from the burning of fossil fuels (**Appendix H**). This is expected to reduce harmful GHG and other pollutant emissions detrimental to air quality. Additionally, since agricultural operations at the Project site will no longer occur during construction and operation of the facility, reduced particulate emissions, dust and farm equipment exhaust would occur and further improve air quality at and in the vicinity of the Project Area. Following construction, the facility will not generate pollutant emissions.

5.4.2 Soils and Prime Farmland

The Soil Survey of Faribault County indicates that the soils of Faribault County are primarily deep dark colored soils formed in silty and clayey glacial lacustrine sediments, loamy glacial till, and loamy and sandy glacial outwash (Soil Survey Staff, 2019).

The soils within the Project Area are typically silty clay soils or silt loam soils suited for the existing agricultural production when drained. As indicated in **Table 22**, soils within the Project Area mainly consist of silty clay loam, clay loam, and silt loam soils with most of the land used and classified as farmland. Most of the Project Area is on level to nearly-level topography, which is consistent with the current row-crop agricultural production. Large areas of hydric soils are present across the Project Area where historic wetlands were present prior to drainage (e.g., installation of drain tiles and county ditches as shown on **Figure 12**) or where wetlands are presently located (**Figure 14**).

Table 22: Project Area Soils

Map Unit Symbol	Map unit name	Farmland Classification	Hydric Rating[1]	Acres
84	Brownton silty clay loam, 0 to 2% slopes	Prime farmland if drained	Hydric	6.8
86	Canisteo clay loam, 0 to 2% slopes	Prime farmland if drained	Hydric	15.1
110	Marna silty clay loam, 0 to 2% slopes	Prime farmland if drained	Predominantly Hydric	31.6
134	Okoboji silty clay loam, 0 to 1% slopes	Prime farmland if drained	Hydric	16.3
136	Madelia silty clay loam, 0 to 2% slopes	Prime farmland if drained	Predominantly Hydric	315.6
140	Spicer silty clay loam, 0 to 2% slopes	Prime farmland if drained	Predominantly Hydric	90.9
197	Kingston silty clay loam, 1 to 3% slopes	All areas are prime farmland	Predominantly Nonhydric	193.7
229	Waldorf silty clay loam, 0 to 2% percent slopes	Prime farmland if drained	Predominantly Hydric	26.5
281	Darfur loam	Prime farmland if drained	Predominantly Hydric	4.5
336	Delft clay loam, 0 to 2% slopes	Prime farmland if drained	Predominantly Hydric	1.4
539	Klossner muck, lake plain, depressional, 0 to 1% slopes	Farmland of statewide importance	Hydric	5.0
1877	Fostoria loam	All areas are prime farmland	Predominantly Nonhydric	85.0
1907	Lakefield silt loam	All areas are prime farmland	Predominantly Nonhydric	58.5
101B	Truman silt loam, 2 to 6% slopes	All areas are prime farmland	Predominantly Nonhydric	76.7
102B	Clarion loam, 2 to 6% slopes	All areas are prime farmland	Predominantly Nonhydric	42.5
128B	Grogan silt loam, 1 to 6% slopes	All areas are prime farmland	Predominantly Nonhydric	11.7

Map Unit Symbol	Map unit name	Farmland Classification	Hydric Rating[1]	Acres
230A	Guckeen silty clay loam, 1 to 3% slopes	All areas are prime farmland	Predominantly Nonhydric	6.7
275B	Ocheyedan loam, 2 to 6% slopes	All areas are prime farmland	Predominantly Nonhydric	55.8
286A	Shorewood silty clay loam, 1 to 3% slopes	All areas are prime farmland	Predominantly Nonhydric	1.5
286B	Shorewood silty clay loam, 3 to 6% slopes	All areas are prime farmland	Predominantly Nonhydric	6.4
909D2	Bold-Truman complex, 12 to 18% slopes, eroded	Not prime farmland	Predominantly Nonhydric	0.7
96A	Collinwood silty clay loam, 1 to 3% slopes	All areas are prime farmland	Predominantly Nonhydric	3.8
L83A	Webster clay loam, 0 to 2% slopes	Prime farmland if drained	Predominantly Hydric	103.1
L85A	Nicollet clay loam, 1 to 3% slopes	All areas are prime farmland	Predominantly Nonhydric	18.9
			TOTAL	**1,178.8**

[1] The Hydric Rating is based on the composition of hydric components of a soil unit. The five classes are Hydric (100% hydric components), Predominantly Hydric (66-99% hydric components), Partially Hydric (33-65% hydric components), Predominantly Nonhydric (1-32% hydric components), and Nonhydric (less than 1% hydric components).

Most of the soils are classified as hydric and predominantly hydric (616.9 acres). The remaining soils are classified as predominantly nonhydric (562 acres).

According to the USDA NRCS SSURGO data, approximately 47.6% of the Project Area is considered prime farmland, and 52.2% is considered prime farmland if drained. An additional 0.1% of the Project Area is farmland of statewide importance and a small portion (<0.1%) of the Project Area is classified as not prime farmland (Soil Survey Staff, 2019).

5.4.2.1 Impacts and Mitigation

Impacts to soils will occur during both the construction and, to a much lesser degree, operational stages of the Project. Grading impacts will primarily be with the construction of foundations for the Project Substation, BESS, O&M facility, access roads, and spot grading for the solar arrays, foundations, and inverter skid locations. Use of direct-embedded pier foundations for the inverters will further minimize impacts to soil.

Because the Project is located on relatively level existing agricultural fields, a relatively small amount of grading will be necessary for the Project overall given its size. In addition, some soil compaction may result from the installation of the direct-embedded piers for the solar arrays and inverter skids. Soil compaction will be mitigated by use of low-impact equipment and methods, regrading, and tilling these areas following construction.

During operation of the Project, ongoing soil compaction could occur from the use of access roads. This impact is expected to be negligible, confined to the roadbed and mainly from relatively light duty maintenance vehicles. Overall, the Project is expected to reduce the potential for erosion by establishing permanent vegetation, in contrast to the current amount of exposed soils common to row cropping in the existing agriculture fields. Erosion control will be further accomplished by establishment of a perennial, primarily native vegetative cover under the solar arrays and installation of gravel roads with culverts (as necessary) to redirect concentrated surface water runoff and maintain existing drainage within the Project Area.

Because the Project will disturb more than 50 acres and is within one mile of an impaired water (Blue Earth River), Northern Crescent Solar will submit the SWPPP to MPCA for review and approval at least 30 days prior to construction. The SWPPP will include BMPs such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent erosion. BMPs will be used during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion from 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.

Implementing the Project VMP and AIMP will also further minimize and mitigate soil impacts. Finally, the Project design includes installation of stormwater ponds in accordance with MPCA regulations to collect and treat runoff from the Project during its operation (**Figure 4; Appendix C**).

5.4.3 Geology

According to the Geologic Atlas of Faribault County Minnesota (Mankato State University 1991), Faribault County's present land surface is the result of the actions of glacial ice and its flowing meltwaters. Surface materials are primarily glacial drift deposits. These deposits are composed mostly of glacial till, characterized by a matrix of sand, silt and clay with scattered pebbles, cobble, and few boulders. These deposits lay over bedrock surfaces and range in depth from less than 50 to over 250 feet deep. The bedrock underlying this glacial drift is late Cambrian to middle Ordovician sedimentary rock consisting of sandstones, shales, and carbonates. This bedrock was deposited in shallow marine waters that flooded the area around 500 million years ago.

The Minnesota Geological Survey (MGS) Depth to Bedrock mapping indicates bedrock depths are 150 to 250 feet below ground level in the Project Area (Minnesota Geological Survey, 2020). **Figure 13** is a map of the MGS depth to bedrock in the Project Area.

Karst features are formed primarily of limestone, make the topography "porous", and make the area's water resources more challenging to protect (MPCA, 2021). Contaminants can quickly find routes from the surface into groundwater. Petroleum and other chemicals leaking from underground storage tanks can quickly move into groundwater. Spilled manure can cause fish kills many miles from the release point. Chemicals used on the landscape can reappear at unexpected times and in unexpected locations.

According to the University of Minnesota, Department of Geology and Geophysics and the MnDNR Ecological and Water Resources Division's Karst Mapping, susceptible geologic features, including sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions are not present

in the vicinity of the Project Area. The mapping indicates the nearest karst feature is located approximately 15 miles northeast of the Project Area, near the town of Minnesota Lake (**Figure 13**).

5.4.3.1 Impacts and Mitigation

Due to the thickness of surficial materials of approximately 150 to 250 feet at the Project site, excavation or blasting of bedrock is unlikely for the Project. Karst features have not been identified at the Project site and should not be a concern for the Project. Geotechnical soil borings will be completed by Northern Crescent Solar as Project design and engineering advances; this information will be assessed for potential impacts to geologic resources. If any, impacts of the proposed Project to available geologic resources are likely to be limited; therefore, no mitigation measures are proposed.

5.4.4 Groundwater

Minnesota is divided into six groundwater provinces based on bedrock and glacial geology. The aquifers within these provinces occur in two general geologic settings: (1) bedrock; and (2) unconsolidated sediments deposited by glaciers, streams, and lakes. The Project is located within the South-Central Province, which is characterized by thick clayey glacial drift with limited extent sand aquifers overlying Paleozoic sandstone, limestone, and dolostone aquifers. In this province, groundwater is typically derived from sedimentary bedrock aquifers (MnDNR, 2021). Based on information from the USGS Ground Water Atlas, the Project Area is underlain by the Cambrian-Ordovician aquifer system. This aquifer system consists primarily of sandstone in the lower part and sandstone and shale interbedded with limestone or dolomite in the upper part (U.S. Geological Survey [USGS], 1992). The dominate use of the water is for the public drinking supply and agriculture. The aquifer is recharged through downward movement of water from the overlying surficial aquifer system (Mankato State University, 1991).

According to the Geologic Atlas of Faribault County Minnesota (Mankato State University, 1991), Faribault County's groundwater is found in unconsolidated glacial deposits and in the underlying sedimentary bedrock. The four main aquifers in Faribault County are the Cedar Valley-Maquoketa-Galena aquifer, the St Peter-Prairie Du Chien-Jordan aquifer, the Franconia- Ironton-Galesville aquifer, and the Mt. Simon-Hinckley aquifer. Most wells in Faribault County draw from the uppermost bedrock aquifer, usually the Cedar Valley-Maquoketa-Galena aquifer. The Minnesota Well Index Data (MDH, n.d.-a) indicates that the wells in the vicinity of the Project Area draw water from the Quaternary Buried Artesian Aquifer.

Under the federal Safe Drinking Water Act (SDWA), 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. The SDWA was updated in 1986 with an amendment requiring the development of a broader-based Source Water Assessment Program, which includes the assessment of potential contamination to both groundwater and surface water through a watershed approach. A 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. A search for WHPAs in the MDH Source Water Protection Web Map Viewer (MDH, n.d.-b) indicated there are no WHPAs or Drinking Water Supply Management Areas (DWSMAs) in the Project Area. The 346-acre Winnebago WHPA and 483-acre Winnebago DWSMA are located approximately one mile northwest of the Project Area (**Figure 9**).

The MDH uses a vulnerability rating method in which points are assigned for conditions that represent a perceived risk to a well (MDH, 2018). The evaluation includes each of the criteria noted below, where such information is available. Vulnerability assessments consider the following: geologic sensitivity; well construction; maintenance; and use. Higher point totals suggest relatively greater well vulnerability and vice versa. A numeric cutoff is used to categorize "vulnerable" from "nonvulnerable" wells. The Winnebago DWSMA is classified as low vulnerability by the MDH.

The MDH Well Index (**Figure 9**) identified 26 domestic wells in the database within one mile of Project Area with average depth to bedrock of 167 feet below ground surface. One MDH- identified well (696386) is located within the Project Area (MDH, n.d.-a). **Table 23** summarizes all the wells within, and within one mile of, the Project Area.

Table 23: MDH Well Index within One Mile of Project Area

Unique Well ID	Well Name	Well Elevation (feet/msl)	Drilled Depth (feet)	Depth to Bedrock (feet)	Well Installation Date	Well Use/Status
102314	Gilreath Estate D.C.	1075	125	Unidentified	3/9/1977	Domestic/Active
142857	Mertinsen, Duane	1070	180	122	6/10/1978	Domestic/Active
158177	Jenkins, Larry	1095	210	178	10/14/1980	Domestic/Active
171103	Spence, Gary	1080	195	135	11/1/1981	Domestic/Active
171132	Leach, Mrs. Bill	1074	100	Unidentified	6/25/1985	Domestic/Active
217056	Whiteford, Wayne	1103	175	175	11/27/1962	Domestic/Active
226984	Terhue, George	1082	90	Unidentified	6/4/1956	Domestic/Active
501629	Nagel, Ted	1105	123	Unidentified	10/25/1988	Domestic/Active
502216	Huber, Carrol	1069	160	Unidentified	2/9/1990	Domestic/Active
502218	Thorsen, Clayton	1088	230	205	4/20/1990	Domestic/Active
532136	Hassing, Patrick	1086	242	190	5/15/1995	Domestic/Active
561928	Owen, Gary	1077	137	Unidentified	3/20/1995	Domestic/ Unidentified
685002	Stix, Kim	1080	125	Unidentified	9/16/2002	Domestic/Active
695777	Meidinger, Gerald	1103	109	Unidentified	10/16/2003	Domestic/Active
696386	Marsh, Barry	1102	106	Unidentified	6/4/2004	Domestic/Active
703050	Goily, Todd & Mindy	1082	110	Unidentified	9/18/2003	Domestic/Active
768165	Cartwright, Joe	1088	205	180	10/21/2009	Domestic/Active
781817	Rockers, Mark	1087	98	Unidentified	7/29/2011	Domestic/Active
791847	Jenkins, Mitch	1072	170	Unidentified	8/30/2012	Domestic/Active
791850	Engelby, Jason	1111	165	Unidentified	6/7/2012	Domestic/Active
804609	Soronen, Ed & Rosie	1085	202	160	12/24/2015	Domestic/Active
810216	Mensing, Mike	1089	134	Unidentified	5/19/2017	Domestic/Active
826561	Kral, Jacob	1099	97	Unidentified	8/30/2019	Domestic/Active

5.4.4.1 Impacts and Mitigation

Due to the relatively shallow nature of construction work to be performed for the Project, impacts to groundwater resources both at the site and surrounding areas are not anticipated. Northern Crescent Solar will be completing additional geotechnical studies closer to the construction date to further inform the Project's design, engineering, and construction techniques. As previously mentioned, there are no designated sole source aquifers or WHPAs within the Project Area.

Project facilities are not likely to affect the use of existing water wells. Project facilities within the Preliminary Development Area are located at about 475 feet from the nearest identified drinking well. No impacts to this well are expected. If an unknown well is discovered that was not mapped on available mapping resources, Northern Crescent Solar will assess whether the well is open, coordinate with the

underlying landowner and cap it, if necessary and approved by the underlying landowner, in accordance with MDH requirements.

A water supply well will be installed at the O&M facility as part of the Project. This well will be installed following MDH guidelines and will be for potable water in the building.

Construction of Project facilities is not likely to require subsurface blasting; therefore, disturbances to groundwater flow from newly fractured bedrock are not anticipated. Any dewatering required during construction will be managed in accordance with the SWPPP and discharged to the surrounding surface, thereby allowing it to infiltrate back into the ground to minimize potential impacts. If dewatering is necessary, Northern Crescent Solar will obtain a Water Appropriation Permit from MnDNR if the applicable permit thresholds are expected to be exceeded during construction.

Impacts to groundwater resources (including aquifers) are not anticipated during facility operation of the Project as water supply needs will be quite limited. The O&M facility will require potable water for facility personnel and O&M uses and will be satisfied with a single domestic-sized water well. A domestic water well license will be acquired by an approved well drilling contractor prior to installation, construction, and use of the O&M facility water well.

A total of 39.6 acres of impervious surface will be created by construction of the Project.[11] Based on the small amount of increased impervious surface (3.5%), the Project will likely have minimal impacts on regional groundwater recharge. The foundations of the tracking rack system will likely be a driven steel pier and will not require concrete in most circumstances, although some concrete foundations may be required dependent on soil conditions. The depth that the foundations will be installed at an estimated range of 10 to 14 feet below ground surface (depending on soil conditions) and would, therefore, not impact aquifer resources.

Project operation will not require the use or storage of large quantities of hazardous materials that might otherwise have the potential to spill or leak into area groundwater. No chemicals are planned to be used for solar module washing activities and ionized water is typically used if needed (minimal to no solar module washing is anticipated to be needed for the Project).

Herbicides may be used for vegetation management which will follow applicable regulatory use and management requirements or as required by applicable permit(s). Pesticides may be used around inverters and other electrical cabinets to control insects and any use would also follow applicable requirements.

A SPCC Plan will be required for the Project Substation transformer. The transformer will be properly designed, constructed, and operated per the SPCC and in accordance with EPA and MPCA requirements; it will be equipped with required secondary containment to contain a potential spill or leak and to prevent impacting the ground from transformer oil.

[11] Impervious surface for Solar Facility is 36.4 acres and BESS Facility is 3.2 acres for a total of 39.6 acres. Also see Table 6 in Section 4.2.2.

5.4.5 Surface Waters

The Project Area is split between the Le Sueur River Watershed (LSRW) and the Blue Earth River Watershed (BERW; **Figure 9**). The LSRW encompasses 1,112 square miles or 711,838 acres and is located in parts of 6 counties in Minnesota. The BERW encompasses 1,550 square miles or 992,034 acres and is located in parts of eight counties in Minnesota and four in Iowa. Both watersheds are located in the Western Corn Belt Plains ecoregion. Most of the land in the watershed areas is cropland.

The Project is located in the Blue Earth River and Rice Lake minor watersheds which are sub-watersheds of the BERW and LSRW, respectively (**Figure 9**). The western portion of the Project Area drains to the Blue Earth River which is a minor watershed district encompassing approximately 7.3 square miles and the eastern portion of the Project Area drains towards Rice Lake which encompasses 23.9 square miles.

Surface water features in the Project Area and surrounding area are shown on **Figure 9**. No rivers, streams, lakes or MnDNR Public Waters are within the Project Area. The nearest MnDNR Public Waters are two unnamed public water wetlands (22006500 and 22006900) located about 0.2 mile east of the Project Area, and the Blue Earth River (M-055-076) located approximately 0.2 mile west of the Project Area (**Figure 9**).

According to the Faribault County Drainage Viewer, the eastern portion of the Project Area contains underground tile systems that are part of the JD17F Main Trunk drainage system. The Main Trunk drainage system consists of 8- to 10-inch drain tile that flows northwest into other tile systems. Several branches of drain tile connect with the JD17F Main Trunk system within the Project Area, including JD17F Branch 185, an 8-inch tile, and JD17F Main Diversion, a 26- inch tile that drains southeast towards an unnamed tributary associated with the Prescott WPA. JD17F Branch 116 is partially within the western portion of the Project Area and consists of an 8-inch drain tile and flows to the northwest.

5.4.5.1 Floodplains

The Federal Emergency Management Agency (FEMA) floodplain mapping for the Project Area indicates that the Project Area is located outside of the 100-year floodplain (Panel Number 2706690160B, dated May 17, 1982) and is mapped as Zone C, an area of minimal flooding. The nearest Flood zone is associated with the Blue Earth River approximately 0.2 mile west of the Project Area.

No other surface water resources other than those above are located within a mile of the Project Area.

5.4.5.2 Wetlands

A desktop review of the National Hydrography Dataset (NHD) indicates there are no NHD mapped waterbodies within the Project Area. There are portions of three unnamed NHD watercourses within the Project Area. The National Wetlands Inventory (NWI) depicts five wetlands scattered throughout the Project Area as shown in **Figure 9**. NWI wetlands within the Project Area are classified as freshwater emergent, freshwater forested/shrub, or freshwater pond.

Wetlands were delineated in the Project Area by Westwood by a field review on July 15, 2021 (**Appendix J**). The wetlands and watercourses delineated by Westwood are shown on **Figure 14**. The five NWI polygons and three NHD water resources mapped within the Project Area were investigated during the

field delineation. The Project Area consists of approximately 52% of soils rated at predominantly hydric or all hydric. An offsite hydrology review to identify potential wetlands in cropped portions of the Project Area was conducted using the July 1, 2016 Minnesota Board of Water and Soil Resources (BWSR)/UUSACE-accepted protocol for conducting offsite wetland determinations, *Guidance for Offsite Hydrology/Wetland Determinations* (BWSR & USACE, 2016). A total of 25 suspect areas were identified and verified in the field.

The delineation was completed using a level two routine determination method set forth in the USACE 87 Manual and the Midwest Regional Supplement (USACE, 2010). A total of 10 wetlands were identified during the field survey for the Project using the boundary at that time. Of the 10 delineated wetlands, six are now outside of the Project Area, and four are within the proposed Project Area. These wetlands were delineated as wet meadows, floodplain forest, and a shallow open water/wet meadow wetland complex as indicated in **Table 24** below (**Figure 14**). The four wetlands within the Project Area are located primarily along the Project Area boundary and existing gravel roads, outside of the perimeter fence. There are no wetlands within the Solar Facility or BESS Facility.

Table 24: Delineated Wetland Summary Table

Wetland ID[1]	Wetland Classification		Area (acres)
	Circular 39	Eggers and Reed	
Outside Current Project Area			
WB-A-01	Type 2/5	Shallow Open Water/Wet Meadow	0.63
WB-A-02	Type 1	Floodplain Forest	0.06
WB-B-01	Type 2	Wet Meadow	0.57
WB-B-02	Type 2	Wet Meadow	0.26
WB-B-03	Type 2	Wet Meadow	0.33
WB-B-04	Type 2	Wet Meadow	0.12
		Subtotal	**1.97**
Within Current Project Area			
WB-A-03	Type 2	Wet Meadow	0.03
WB-A-04	Type 2	Wet Meadow	0.001
WB-B-05	Type 2	Wet Meadow	0.27
WB-B-06	Type 2	Wet Meadow	0.05
		Subtotal	**0.351**
		Total Delineated Wetland Acreage	**2.321**

1 When delineated in 2021, wetlands WB-A-01 and WB-A-02 were within the Project Area. Wetlands WB-B-01, 02, 03, 04, and 05 are within the excluded CREP parcels.

One ephemeral watercourse (WC-A-01) was delineated outside the Project Area. This watercourse is associated with WB-A-01 (**Figure 14**). The delineated watercourse is summarized in **Table 25** below.

Table 25: Delineated Watercourse Summary Table

Stream ID	Flow Regime	Cowardin Class	Watercourse Name	Average Width (ft)	Surveyed Length (ft)	Surveyed Area (acres)
WC-A-01	Ephemeral	R6	Unnamed	4	446	0.07
Note: When delineated in 2021, watercourse WC-A-01 was within the Project Area, however, it is no longer in the Project Area.						

An application for a Boundary and Type Confirmation as well as an Approved Jurisdictional Determination was submitted to the Faribault County Soil and Water Conservation District (SWCD) as well as the St. Paul District of the USACE on June 13, 2022. A Notice of Decision confirming the delineated wetland boundaries was provided by the Faribault County SWCD on July 7, 2022. An Approved Jurisdictional Determination for a portion of the Project Site was also obtained from the USACE on August 8, 2022. The Approved Jurisdictional Determination for the review area specified in the Approved Jurisdictional Determination classifies wetland WB-B- 06 as not a water of the United States. Delineated wetlands comprise 2.3 acres (**Table 24)**, approximately 0.2% of the Project Area overall. **Figure 14** depicts the location and extent of delineated wetland boundaries.

Impacts and Mitigation

The Project is being designed in a manner to avoid all impacts to wetlands and water resources as shown in the Preliminary Site Design (**Figure 4**) and Detailed Preliminary Site Plan (**Appendix C**). Wetlands and ditches within the Project are potentially regulated under:

- The Minnesota Wetland Conservation Act (WCA) of 1991, as amended, administered in this area by the Faribault County SWCD;
- Section 404 and 401 of the Federal Clean Water Act (CWA) administered by the USACE and the MPCA; and
- Minn. Stat. § 103G.245, administered by the MnDNR.

As currently designed, the Project avoids all impacts to wetlands and other waters. Pending final design, potential impacts to wetlands on the Project may include temporary impacts associated with the installation of electrical collection lines and temporary access roads during construction of the Project. No access road or Project facilities (Solar Facility, Project Substation, O&M facility, Xcel Switchyard, transmission line/poles, BESS Facility) are located in a wetland or watercourse. Permanent impacts may result if direct-embedded piers require concrete foundations to address problematic soil conditions and from the establishment of access roads for operation of the Project.

The driven piers used to support the solar arrays and inverter skids are not anticipated to result in a loss of wetland under the WCA as they would not alter the wetland's cross-section or hydrological characteristics, obstruct flow patterns, change the wetland boundary, or convert the wetland to non-wetland (Minn. R. 8420.0111, subps. 26 and 32). Further, the driven piers are not expected to constitute

wetland fill under Section 404 of the CWA as they likely to fall under a structural discharge activity of the USACE Minnesota Regional General Permit (RGP)-003.

If required by final design, temporary construction impacts will be minimized by using BMPs that include temporary construction mats for work in wetlands, directional bores under wetlands, as necessary, for the installation of electrical collection lines, and other erosion control measures identified in the MPCA Storm Water Best Management Practices Manual, such as using silt fencing to control sediment runoff to adjacent water resources. Disturbed surface soils will be stabilized at the completion of the construction process to minimize the potential for subsequent effects on surface water quality. Construction operations will be designed and controlled to minimize and prevent material discharge to nearby wetlands.

Depending on the final Project design, potential temporary or permanent impacts may be required to construct the Project. If impacts are proposed, a Joint Application Form for Activities Affecting Water Resources in Minnesota will be submitted for the Project; the Joint Application Form for Activities Affecting Water Resources is the accepted means for initiating review of proposals that may affect a water resource (wetland, tributary, lake, etc.) in the State of Minnesota under state and federal regulatory programs. The need for this approval will be evaluated with final Project design information.

Minnesota Wetland Conservation Act

Depending on the final wetland impacts associated with the Project and final Project design, construction activities may qualify for a No Loss exemption, or require a permit under the WCA. If a permit is required, any proposed wetland impact would require full sequencing under the WCA and address wetland avoidance, impact minimization, rectification, and replacement (if applicable). The need for this will be determined as final Project design is completed.

Section 404 of the Federal Clean Water Act

Under Section 404 of the federal CWA, the USACE regulates the discharge of dredged and fill material into waters of the U.S. As the Project is currently designed to avoid all wetlands and waters, coverage under Section of 404 of the CWA is unlikely to be required. If impacts are proposed at a later date, authorization from the USACE would likely fall under one of the categories of activities of the Minnesota RGP-003.

Section 401 Water Quality Certification

Projects required to obtain an Individual Section 404 Permit are also required to obtain an MPCA Section 401 Water Quality Certification (WQC) to ensure they comply with the State water quality standards in Minn. R. Chapter 7050, as amended. If the Project secures approval under Minnesota RGP-003, Section 401 WQC is automatic, provided the Project follows the specific pre-determined certification requirements. Because the Project is unlikely to require an Individual Section 404 Permit from the USACE, a project specific MPCA Section 401 WQC is unlikely to be required as part of the wetland permitting process.

Minnesota Public Waters Act and MnDNR Public Waters Permits

The MnDNR requires a Public Waters Work Permit for any alteration of the course, current, or cross section below the Ordinary High Water level of MnDNR public waters, wetlands, and watercourses, as well as any crossing of a public water, including aerial transmission line crossings. Because no MnDNR

public watercourses or waterbodies are mapped or have been identified within the Project Area, no impacts to the MnDNR public watercourses are expected from the Project. Therefore, a Public Waters Work Permit will not be required for the Project.

Should the Project result in permanent, unavoidable impacts to wetlands or water resources, impacts will be replaced in accordance with the WCA and Section 404 of the federal CWA. Additionally, there are no public ditches that require 50-foot buffers within the Project Area. The nearest feature that requires a buffer is associated with the WPA to the east (MnDNR, n.d.-a.). The Project will comply with MnDNR/BWSR buffer rules around public ditches.

5.4.5.3 Impacts and Mitigation

The Project is being designed and engineered to avoid and minimize impacts to wetlands and water resources to the greatest extent practicable. During construction, appropriate BMPs will be implemented and maintained to additionally mitigate potential impacts in accordance with an MPCA construction stormwater permit and SWPPP that will be in place for the Project. Existing private and county drain tile will be protected during construction. In the event drain tile is damaged, the Applicant will repair, relocate, or replace the tile in coordination with the owner. Fifteen stormwater basins will be used to collect and treat/discharge runoff following MPCA regulations.

Potential impacts to water resources and applicable mitigation measures are discussed in more detail in Section 5.4.5. No impacts to MnDNR Public Waters or FEMA flood zones are anticipated; therefore, no other mitigation measures are proposed.

5.4.6 Vegetation

As noted in Section 5.1 (Environmental Setting), the Project Area is located in the Minnesota River Prairie Subsection. Pre-settlement vegetation in this subsection was primarily tallgrass prairie, with many islands of wet prairie and forests on floodplains along the Minnesota River and other streams. The forests include silver maple, elm, cottonwood, and willow. Currently, the predominant land use in this subsection is agriculture; there are few remnants of pre-settlement vegetation remaining.

The Minnesota Biological Survey (MBS) includes areas of the State with varying levels of native biodiversity and may contain high quality native plant communities, rare plants, animals, and/or animal aggregations. According to the MBS Sites of Biodiversity Significance, there are no sites within the Project Area; however, there is one site assigned a moderate rank for biodiversity significance, associated with the Prescott WPA. The Prescott WPA is located outside the Project Area, on the east side of 380th Street (**Figure 8**). The MBS site also corresponds with a mapped Native Plant Community (NPC). There are no NPC sites within the Project Area.

The U.S. Geological Survey (USGS) 2021 National Land Cover Database (NLCD) was reviewed to identify land cover categories present within the Project Area (Dewitz and USGS, 2021). As shown in **Table 26** and on **Figure 10**, the predominant land cover in the Project Area is agricultural, with cultivated crops comprising about 96.5%, followed by developed land (3.3%), and mixed forest (0.1%). The

remainder of the Project Area consists of less than 0.1% each of hay/pasture, high intensity development, emergent herbaceous wetlands, and grassland/herbaceous land cover.

Table 26: Land Cover Within the Project Area

Land Cover Category	Acres in Project Area	Percent of Total Acreage
Agricultural Land		
Cultivated Crops	1,137.6	96.5
Hay/Pasture	0.1	<0.1
Developed Areas		
Open Space	32.6	2.8
Low Intensity	3.6	0.3
Medium Intensity	2.5	0.2
High Intensity	0.9	<0.1
Wetlands/Open Water		
Emergent Herbaceous Wetlands	0.1	<0.1
Forest		
Mixed Forest	1.3	0.1
Herbaceous		
Grassland/Herbaceous	<0.1	<0.1
Total	**1,178.8**	**100.0**
Note: Addends may not sum due to rounding.		

Most of the agricultural land in the Project Area is cultivated crops, such as corn and soybeans. Developed land within the Project Area generally consists of farmsteads, and public roads, namely 170th Street, 180th Street, U.S. Highway 169, and 380th Avenue. The small area of hay/pasture (0.1 acre) and emergent herbaceous wetlands (0.1 acre) are associated with the CREP area in the eastern portion of the Project Area. The minor amount of mixed forest is associated with trees surrounding the residence (OP R16; Section 5.2.1) along the western border of the Project Area boundary.

5.4.6.1 Impacts and Mitigation

Little impact to vegetation will occur as a result of construction and operation of the Project. Project fencing and infrastructure will not impact two CREP parcels. One underground collection line crossing is proposed to be across the northern parcel. The bore entry and exits will be located outside the CREP parcel. The Project is not expected to impact vegetated areas outside the Project Area associated with the Prescott WPA, east of 380th Avenue. See Section 5.2.12 (Recreation) for more information on the Prescott WPA and Section 6.2 (State Agencies) for comments from MnDNR regarding impacts to the Prescott WPA.

A majority of the Project infrastructure and facilities are located within areas currently in row-crop agriculture. Approximately 1.3 acres of forest are mapped within the Project Area. Based on the preliminary layout, approximately 0.9 acre of forest would be removed during construction for access road and solar module installation. No trees would be removed for construction of the BESS Facility. Overall, the Project will result in a net improvement to vegetative cover in the Project Area because of revegetation efforts in former agricultural areas and the significant decrease in the use of herbicides and pesticides typical of agricultural practices through implementation of the Project AIMP and VMP plans (discussed above), as well as the SWPPP.

Northern Crescent Solar will avoid and minimize impacts to vegetation to the extent practicable within the context of the Project and apply applicable buffers and setbacks. Northern Crescent Solar has designed the Project utilizing a PV system of single-axis trackers which minimize the amount of ground shading on the Project site. The PV system is installed on driven pier foundations which minimizes the amount of ground disturbance associated with installation.

Land disturbance is limited to what is necessary to establish fences, access roads, rack installations, array grading, BESS grading, O&M facility, Project Substation, Xcel Switchyard, and temporary laydown/staging areas used during construction. Expected land cover impacts within the Preliminary Development Area are provided in **Table 27**.

Table 27: Expected Land Cover Impacts – Preliminary Development Area

Facility	Land Use Type	Acres in Preliminary Development Area	Percent of Total Acreage
Solar Facility	Agricultural/Cultivated Crops	922.9	99.3
	Developed	2.3	0.2
	Forest	0.9	0.1
BESS Facility	Agricultural/Cultivated Crops	3.2	0.3
	Total	**929.3**	**100.0**
Note: Addends may not sum due to rounding.			

During construction, Northern Crescent Solar will implement the SWPPP developed for the Project site and BMPs to control erosion, prevent sedimentation, and promote soil stabilization in disturbed areas, as well as implement the AIMP and VMP plans.

To mitigate potential impacts to vegetation, Northern Crescent Solar anticipates site restoration, seeding, establishing, maintaining, and monitoring disturbed areas and areas below the solar modules in accordance with the AIMP and VMP plans. Control of invasive and noxious weeds will be ongoing during the construction and operation of the Project by mowing and applying herbicides when applicable.

5.4.7 Wildlife

Overall, the Project Area is dominated by agriculture land primarily used for row crop production, primarily corn and soybeans. Land use in the Project Area consists of predominantly of cultivated crops

(96.5% of Project Area) and developed open space (2.8%) as described in Section 5.4.6 and shown in **Table 26**. These are annual temporary cover types that will be utilized by a small number of common wildlife species on a limited seasonal basis. Species that will utilize these areas include the common raccoon (*Procyon lotor*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), white tailed deer (*Odocoileus virginianus*), and woodchuck (*Marmota monax*).

Bird species that will utilize these agricultural areas include killdeer (*Chardrius vociferus*), red- winged blackbird (*Agelaius phoeniceus*), ring-necked pheasant (*Phasianus colchicus*), various small perching birds and common raptors such as red-tail hawks (*Buteo jamaicensis)*. After harvest, the fields may offer short-term foraging areas for common waterfowl including Canada geese (*Brantacanadensis*) and mallards (*Anas platyrhynchos*). The conversion of row crop production to the recommended grassland mix will improve habitat and foraging opportunities for a variety of grassland and ground nesting birds.

Reptiles and amphibians accustomed to agriculture habitats and annual disturbances by heavy equipment, such as the American toad (*Anaxyrus americanus*), common garter snake (*Thamnophis sirtalis*), and northern leopard frog (*Lithobates pipiens*), may also have nearby populations. However, due to the relative lack of diverse vegetation cover and habitat structure, and the temporary seasonal nature of the cover, even these common species' use of the cropped field habitat is likely limited to occasional foraging in the fields. These areas will provide more suitable habitat once seeded with native grassland plants that will remain throughout the Project duration.

5.4.7.1 Impacts and Mitigation

The Project layout has been designed to avoid those portions of the Project Area with the highest concentration of high-quality habitat and water resources. Based on the preliminary layout, only 0.9 acre of potential forest land habitat is estimated to be removed during construction for access road and solar module installation. The establishment of native grassland plants, discussed above in Section 5.4.7, will provide new beneficial habitat for many insect species and ground nesting bird species.

Movement of large mammals, such as white-tailed deer, will not be impeded through the Project Area. As discussed in Section 4.1.7 above, lightweight agricultural woven wire fencing extending approximately 8 feet above grade will be used around the solar modules for safety and security purposes to prevent larger wildlife and the public from access to Project electrical equipment. This fencing will be topped by 3 to 4 strands of smooth wire (not barbed wire). There will be wide corridors between fenced areas throughout the Project Area (**Figure 4; Appendix C**). The arrangement of the fenced areas of the Project array relative to existing roads and utilities provide various pathways through the Project Area which would allow wildlife to cross. These corridors will allow larger wildlife various options to cross unimpeded through the Project Area.

5.4.8 Rare and Unique Natural Resources

Westwood submitted a formal MnDNR Natural Heritage Information System (NHIS) data request for the Project Area on September 13, 2023 (**Appendix K**). In a letter dated October 4, 2023, the Natural Heritage Review Team identified a Site of Moderate Biodiversity Significance in T103N, R27W, Section 8, and the mudpuppy (*Necturus maculosus*), a state-listed species that has been documented in the Blue

Earth River. A previous MnDNR NHIS letter dated July 18, 2022, identifies the same impacts, and is provided for reference in **Appendix K**.

U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) portal was most recently reviewed on September 13, 2023 (**Appendix K**) for federally endangered and threatened species, candidate species, and designated critical habitat that may occur in the Project vicinity. The IPaC results identified one federally endangered species (the northern long-eared bat [NLEB] [*Myotis septentrionalis]*); and one federally proposed endangered species (the tricolored bat [TCBA] [*Perimyotis subflavus]*) within or near the Project Area. Suitable NLEB and TCBA habitat consists of a variety of forested habitat near water sources (MnDNR, 2022). According to MnDNR and USFWS (2020), there are no known NLEB or TCBA maternity roost trees or hibernaculum in Faribault County; however, the species may still occur within or near the Project Area. The IPaC report also identified the candidate species for listing, monarch butterfly (*Danaus plexippus*), which is not afforded any protections at this time. Previous IPaC reports dated June 15, 2020, July 29, 2021, and February 28, 2022, are provided for reference in **Appendix K**.

Although these reviews do not represent a comprehensive biological inventory of the State, they provide information on the potential presence of protected species and habitat.

The USFWS (2007) adapted National Bald Eagle Management Guidelines to help protect eagle nests and avoid "disturbance" of eagles as required by the Eagle Act. Guidance has also been developed to help determine if a project needs an incidental take permit for bald eagles if disturbance cannot be avoided. Land uses in the Project Area are primarily agricultural (96.6%), with small areas of developed land (3.3%), mixed forest (0.1%), and less than 0.1% of wetland and grassland/herbaceous land. The forested land that is present is generally limited to windbreaks around residences. As a result, suitable nesting habitat is limited within the Project Area. At this time, there are no anticipated impacts to Bald Eagles, their nests, or waterbodies where they could hunt.

5.4.8.1 Impacts and Mitigation

No impacts to any Minnesota State endangered, threatened, or special concern species are anticipated throughout construction or operation of the Project. The Project Area is highly disturbed from agricultural activities (96.5% cultivated crops), therefore impacts to high-quality habitat and forested areas will be avoided. The MnDNR formal response to the NHIS request for the Project was received on October 4, 2023 (**Appendix K; Figure 15**). The formal review identified the mudpuppy (*Necturus maculosus*) as a state-listed species of special concern in Blue Earth River in the vicinity of the Project. The Blue Earth River is about 0.3 mile west of the Project Area.

The Project is being designed and engineered to avoid and minimize impacts to wetlands and waterways to the greatest extent practicable. In addition to the VMP and AIMP, a SWPPP will be developed for the Project prior to construction that will include temporary and permanent BMPs such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent sediment from entering into wetlands and waterways. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction. These measures are anticipated to minimize the potential for surface water runoff and erosion to enter the Blue Earth River and negatively affect mudpuppies.

BMPs outlined in Sections 5.4.5 and 5.4.6 concerning wetlands, erosion control, and vegetation will serve to protect, prevent, and mitigate negative impacts to rare and unique natural features surrounding the Project Area. The SWPPP, AIMP and VMP will also be implemented during construction, post-construction, and operational phases of the Project, when applicable. Northern Crescent Solar will also provide training to onsite personnel to educate and avoid negative impacts to potential rare features in surrounding areas.

5.5 Climate Change

5.5.1 Impact of Project on Climate Change

Minnesota has been taking more action against climate change. Executive Order 19-37 (Climate Change Executive Order), signed in December 2019, created the Governor's Advisory Council and the Climate Change Subcabinet to coordinate climate change mitigation and resilience strategies in the State of Minnesota. The subcabinet's 2020 Annual Report to the Governor describes climate change as an existential threat that impacts all Minnesotans and our ability to thrive. It also encourages State leaders and policy makers to consider equity in our State's response to climate change (MPCA, 2020).

The Next Generation Energy Act set statutory goals to reduce GHG emissions in the State by 80% between 2005 and 2050, while supporting clean energy, energy efficiency, and supplementing other renewable energy standards in Minnesota. Interim goals were also set: a 15% reduction by 2015, and a 30% reduction by 2025. Minnesota's GHG emissions declined 23% between 2005 and 2020. If current trends continue, the State is on track to meet the goal of reducing emissions 30% by 2025. Since 2005, emissions from the electricity generation sector have declined by 54%, mainly because of producing energy from renewable sources like wind and solar (DOC and MPCA, 2023).

In 2022, the Governor and Lt. Governor introduced Minnesota's Climate Action Framework that updates Minnesota's climate goals to reduce emissions 50% by 2030 and achieve net-zero emissions by 2050. As mentioned in Section 1.1, the Project will help meet Minnesota's 100% carbon-free energy standard by 2040 and will contribute to meeting the Minnesota Renewable Energy Objectives and other clean energy requirements in Minnesota, neighboring states, and the country at large, including the renewable energy and carbon reduction goals of Xcel Energy. It will serve consumers' growing demand for renewable energy under various utility-sponsored programs and for utilities, independent power purchasers and corporations seeking to use renewable energy for business growth.

The Project will further Minnesota's clean energy goals by providing a renewable source of energy that will offset other GHG emissions, primarily from coal and natural gas. The Project will beneficially impact climate change because it will reduce the need for carbon-based electric generation processes, reduce the need for and minimize the proliferation of additional transmission infrastructure, and temporarily reduce emissions from agricultural activities (e.g., use of tractors and other farm implementation, decreased use of agricultural chemicals, etc.) during operation of the Project. In addition, about 752 acres of perennial seed mix are proposed to be established within the solar array development area, and about 178 acres of perennial seed mix is proposed in the open space between the solar arrays and the fence line. The establishment of over 900 acres of vegetation throughout the Project Area is expected to increase the carbon storage capacity of the land and is likely to result in additional carbon being sequestered over the life of the Project compared to the current agricultural land use (Walston et al., 2021).

The Applicant prepared an emissions estimate for the Project during construction and operations (**Appendix H**). This estimate is based on the number and type of equipment, the days and duration, and the estimated fuel consumption to determine the total amount of gas and diesel fuel used during construction and operation of the Project. The calculations also include the annual emissions of the Project during operations, including the emergency generators, onsite vehicle traffic, and Project staff commuter traffic to and from the Project Area.

Based on these calculations, the Project is estimated to generate approximately 7,940 short tons of CO_2 during the Project construction phase, and 19 short tons of CO_2 annually during the operational life of the Project.[12] As described above, the Project is expected to offset approximately 262,228 metric tons (289,057 short tons) of CO_2 equivalent annually and increase the carbon sequestration potential of the soils within the Preliminary Development Area. The Project is expected to produce several beneficial climate change effects; therefore, beyond Project design as discussed below, additional mitigation measures are not proposed.

5.5.2 Impact of Climate Change on Project

Data on historic temperature and precipitation trends were obtained from the MnDNR Climate Trends tool (MnDNR, n.d.-b.) based on the geographic unit of the Faribault County. Climate variables reviewed included average annual temperature and annual precipitation data from 1895-2023.

The mean temperature in the county between 1895-2023 was approximately 44.76°F, with the lowest average temperature in 1917 (40.27°F) and the highest average temperature in 1931 (50.33°F). The model estimated the average annual temperature increased by 0.14°F per decade.

The mean precipitation over this same 129-year period was 29.83 inches annually, with the lowest precipitation in 1910 (15.76 inches) and the highest precipitation in 1993 (46.59 inches). On average, precipitation has increased by 0.41 inch per decade.

If the trends continue, temperature and precipitation will increase over the life of the Project.

5.5.2.1 Impacts and Mitigation

The Project has been designed with resiliency in mind as climate continues to change in Minnesota. Project equipment has been carefully engineered and selected to withstand the potential for an increase in the frequency of severe weather events. As an example, the solar modules being considered for the Project have an operating temperature of -40°F to about +185°F. The operating ambient temperature for the BESS containers being considered for the Project ranges from -13°F to about +131°F.

The Project is not expected to have any negative effects or increase flood depths in the surrounding areas. The 15 stormwater management basins onsite will be sized appropriately and will meet state and county requirements for reducing runoff rates and providing the required treatment. This will be achieved by

[12] This is an initial estimate based on the current energy mix in the U.S. Moving forward, with new regulations, increased renewables and use of electric vehicles, this estimate can reasonably be expected to decrease drastically and trend towards zero over the operational life of the Project.

installing a combination of wet sedimentation basins, detention ponds, and infiltration basins. Minimal grading and the use of swales and diversion berms may also be used to prevent flooding of infrastructure and route water to the proposed basins. The existing drainage patterns will be maintained and the increase in perennial vegetation onsite under the modules is expected to increase the uptake of water onsite and slow and reduce runoff when compared to the current, cropped nature of the Preliminary Development Area.

The design of the Project, including solar modules, BESS, and related facilities, will be designed to withstand potential weather events that would reasonably be expected to occur in or near the Project Area. Northern Crescent Solar has reviewed the climate history for the Project location and intends to purchase equipment designed to ensure the highest level of operability reliability across the range of anticipated environmental conditions for the lifetime of the Project such as temperature, precipitation, wind, mechanical loading, etc.

The structural, civil, and electrical works will comply with all applicable local and State building codes in addition to codes and standards set by technical society and standards-developing organizations. The design safety factor used on snow and wind loads (to de-risk extreme weather events) will be based on recommendations from these standards. Similarly, the final tracking system components and pile sizes and depths will be designed to meet building codes for wind and snow loads. Potential tracking technologies will be assessed in the context of other Project attributes, such as resource forecast and expected operating profile.

Standard safety features in modern solar tracking systems include protective settings or modes known as "stowing" that are enabled during various extreme weather events, such as high wind or snow events. During extreme weather events, the trackers can enable these settings and rotate the modules to an angle that best protects the equipment from damage from environmental factors; rotating to reduce the degree of load experienced on the modules and underlying structures. In this way, the tracking system works in tandem with the modules to mitigate risks to equipment from extreme weather events. Northern Crescent Solar intends to utilize trackers capable of rotating as described. The solar modules selected will meet international standards for hail ratings and operating temperature ranges. Northern Crescent Solar is taking into account the potential for increased precipitation, as identified using the MnDNR model as discussed above, in designing and sizing applicable stormwater management basins for operation of the Project. In addition, the establishment of perennial vegetation under the solar modules is expected to increase the residence time of water onsite by slowing the runoff rate and increasing the uptake of water onsite when compared to the current, cropped conditions. This will also lower the amount of nutrients leaving the site compared to row crop agriculture from both the reduction in fertilizer and pesticide application, and the slowing of runoff brought about by the perennial vegetation. This slowing of runoff and reduction in the amount of nutrients leaving the site is expected to have a direct, positive effect on the water quality of any surface waters receiving runoff from the site, and also expected to positively benefit onsite wildlife and plant communities.

In extreme precipitation events, there is a risk of septic tank systems being flooded and impacting nearby water resources. As mentioned in Section 4.1.6, the O&M facility will include a well and septic system. Based on the preliminary site plan, the O&M facility will be located about 0.5 mile from the Blue Earth River, and 0.1 mile from the nearest delineated wetland.

Based on the distances, the septic system is not expected to adversely impact nearby water resources.

5.6 Potential Cumulative Impacts

Cumulative impacts are combined, incremental effects of human activity. While an individual activity may be insignificant by itself, minor impacts in combination with other actions may cause a larger issue in a region or to an important resource. A review of the Faribault County website (Faribault County, 2023), and known MnDOT District 7 projects (MnDOT, n.d.-b), did not reveal any projects proposed with similar timing and within close proximity to the Project Area that would be expected to interact negatively, or create significant cumulative impacts with the proposed Project.

Other planned projects in the Project vicinity have not been identified by Northern Crescent Solar that would contribute to potential cumulative impacts with the Project; therefore, no mitigation measures are proposed.

5.7 Irreversible, Irretrievable, and Unavoidable Impacts

Irreversible, irretrievable, and unavoidable, impacts or commitment of resources refers to impacts on or losses to resources that cannot be avoided, recovered, or reversed. Examples include the permanent conversion of wetlands and loss of cultural resources, soils, wildlife, or agricultural production.

Irreversible is a term that describes the loss of future options. It applies primarily to the impacts of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, which are renewable only over long periods of time.

Irretrievable is a term that applies to the loss of production, harvest, or use of natural resources. For example, if farmland is used for a non-agricultural development, some or all of the agricultural production from an area of farmland is lost irretrievably while the area is temporarily used for another purpose. The production lost is irretrievable, but the action is not irreversible.

Land required for the Project would be committed to hosting solar modules, the BESS Facility, and associated facilities for the life of the Project, which is expected to be 30 years. Although the entire 1,179-acre Project Area would not be developed, the 929 acres of land within the PDA would be developed for Project infrastructure. This land would be unavailable for other uses. However, after the Project reaches the end of its operational life and the decision is made to decommission it and restore the site, the land would again be available for other uses.

The Project has been thoughtfully sited and designed to avoid natural environment effects to the degree possible and practicable. However, with all construction projects, impacts to the natural environment are not entirely avoidable; temporary minor impacts will occur in some circumstances. Northern Crescent Solar has taken steps to minimize the long-term effects of these impacts by implementing mitigation measures where warranted.

Environmental effects related to the Project and efforts to minimize and mitigate these effects are discussed in detail within this Application. Environmental impacts that are not entirely avoidable, but will be minimized and mitigated, are summarized below. The majority of these unavoidable impacts will be temporary in nature, will occur during Project construction, and will be rectified through the SWPPP, VMP, AIMP, BMPs, and site restoration activities.

The primary unavoidable impacts that will resolve following construction include the following:

- Construction-related noise;
- Dust related to construction traffic;
- Construction-related traffic;
- Wildlife displacement; and
- Exposed soils from grading activities and potential for soil erosion and sedimentation.

While temporary, the primary unavoidable impacts that are anticipated to remain for the life of the Project include the following:

- Aesthetic changes to the landscape (agricultural landscape to solar);
- Land use change from row-crow agriculture to solar modules, BESS, and perennial vegetation; and
- Infrequent vehicle trips from maintenance vehicles traveling to and from the site.

Beyond the above-described mitigation measures that will be implemented for the Project, no other mitigation is proposed. There are no increased costs from these mitigation measures because mitigation of environmental effects was incorporated in Project design.

6.0 AGENCY AND PUBLIC OUTREACH

As part of pre-Application efforts, Northern Crescent Solar completed extensive and comprehensive engagement with local, state, and federal regulatory stakeholders to introduce the Project, request comments and gain feedback. Additionally, Northern Crescent Solar contacted the eleven recognized Minnesota Tribal Nations for comments. Northern Crescent Solar will continue to engage with interested stakeholders throughout the Site Permit application process.

On November 15, 2021, Northern Crescent Solar sent a Project introduction letter and map to federal, state, and local agencies, and other stakeholders with jurisdiction or interest in the Project Area. Northern Crescent Solar requested comments and input on permits or approvals that may be required. The agency list and representative letter are included in **Appendix B**.

In a letter dated November 15, 2021, Northern Crescent Solar provided Project information and a map to Tribal Representatives in Minnesota (e.g., Tribal Historic Preservation Officers) that may have an interest in the Project Area and requested input on the proposed Project. In a letter dated May 25, 2022, Northern

Crescent Solar provided a Project update and requested comments from Tribal Representatives. The Tribal list and representative letters are included in **Appendix B**.

A summary of all Agency and Tribal coordination and correspondence is summarized in **Table 28** along with dates of correspondence. Responses received to-date are included in **Appendices B, J, K, and L**.

Table 28: Summary of Agency and Tribal Coordination

Agency	Response Date and Summary
Federal	
U.S. Army Corps of Engineers, St. Paul District	December 4, 2021 – The USACE responded to the Project introduction letter indicating that a full review cannot be provided until a detailed plan is received. June 15, 2022 – The USACE responded to the submission of the wetland delineation report with an acknowledgement letter and provided the name of the Project Manager assigned to the Project. August 8, 2022 – The USACE provided an Approved Jurisdictional Determination for Wetland WB-B-06, classifying it as not a water of the United States.
U.S. Fish and Wildlife Service, Minnesota Wisconsin Field Office	September 28, 2021 – Westwood and Applicant held a joint meeting with USFWS and MnDNR. USFWS requested Project shapefiles and copy of IPaC report. November 11, 2021 – Westwood sent USFWS Project shapefiles and copy of the July 29, 2021 IPaC report (**Appendix K**). November 29, 2021 – USFWS responded to the Project introduction letter and provided information and comments for listed species that could occur in the proposed Project area.
Federal Aviation Administration	No written response to date.

State	
Minnesota Historical Society (SHPO)	December 15, 2021 – The SHPO responded to the Project introduction letter and recommended background literature review for architectural and archaeological resources and a Phase I Archaeological assessment be completed for the Project. July 25, 2022 – Westwood sent the July 22, 2022 Phase 1 Archaeological Survey to SHPO. August 23, 2022 – The SHPO reviewed the cultural resources survey report: *A Report for Phase I Archaeological Survey, Winnebago Solar and Storage Project, Faribault County, Minnesota* (July 22, 2022) as prepared by Westwood. Based on the results of the survey, the SHPO concluded that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological resources located in the area that will be affected by this Project (**Appendix I**).
Board of Water and Soil Resources (BWSR)	June 13, 2022 – The Local Governmental Unit (LGU; Faribault County SWCD) provided a Minnesota Wetland Conservation Act Notice of Application indicating comments on the wetland boundary/type must be received by July 7, 2022. July 7, 2022 – The LGU provided a Minnesota Wetland Conservation Act Notice of Decision approving the wetland boundaries/types. The decision is valid for 5 years from date of decision.

Minnesota Department of Natural Resources (MnDNR)	September 28, 2021 – Westwood and Applicant held a joint meeting with MnDNR and USFWS. November 11, 2021 – Westwood sent MnDNR Project shapefiles and copy of the July 29, 2021 IPaC report. December 29, 2021 – MnDNR requested shapefiles or site plan and project description. Inquired about plans for RIM easement, fencing, flow paths, native pollinator plantings. December 29, 2021 – Westwood responded and stated a GIS file can be provided once project layout is completed, and that plans are to avoid the RIM easement area, and more details will be forthcoming on flow paths, pollinator plantings, and related questions. January 11, 2022 – MnDNR provided early coordination comments and recommendations and provided the Standard Erosion Control and Invasive Species Prevention Best Practices document.
Minnesota Pollution Control Agency (MPCA)	No response to date.
Minnesota Department of Agriculture (MDA)	No response to date.
Minnesota Department of Transportation, (MnDOT)	December 13, 2021 – MnDOT responded to the Project introduction letter and offered comments for consideration and recommended early coordination with Steve Schoeb, MnDOT District 7 Engineering Specialist.
Minnesota Department of Employment & Economic Development (DEED)	No response to date.
Minnesota Department of Health (MDH)	No response to date.
Tribal Nations	
Lower Sioux Indian Community	No response to date.
Upper Sioux Community	No response to date.
Prairie Island Indian Community	No response to date.
Shakopee Mdewakanton Sioux Community (SMSC)	November 18, 2021 – SMSC responded to the Project introduction letter requesting to be informed of progress on the Project and for archaeological reports to be shared. May 26, 2022 – SMSC responded to the updated Project introduction letter requesting proof that a records search

	through SHPO or OSA had been completed. Also requested that an Inadvertent Discovery Plan be in place. June 7, 2022 – Westwood provided confirmation that a database search from the OSA and SHPO was completed on July 28, 2021, and that an Unanticipated Discovery Plan has been prepared for the Project. June 7, 2022 – The SMSC requested a copy of the archaeology report. June 7, 2022 – Westwood offered to provide the final (archaeological) report to SMSC concurrent with the SHPO submittal. The report titled *A Report for Phase I Archaeological Survey* is in **Appendix I**.
Bois Forte Band of Chippewa	No response to date.
Fond du Lac Band of Lake Superior Chippewa Indians	No response to date.
Grand Portage Band of Lake Superior Chippewa Indians	No response to date.
Leech Lake Band of Ojibwe	No response to date.
Mille Lacs Band of Ojibwe Indians	May 26, 2022 – Mille Lacs Band of Ojibwe Indians responded to the updated Project introduction letter requesting information about any archeology surveys and if artifacts were found. May 26, 2022 – Westwood responded and provided a copy of the interim memo summarizing the cultural investigations completed to date and noted that no archaeological resources were identified during the survey.
Red Lake Nation	No response to date.
White Earth Nation	December 6, 2021 – White Earth Nation responded to the updated Project introduction letter and stated there are no known historic sites located near the project area. Expressed concern about preservation and protection of waterways and wild rice watersheds as they consider them to be cultural sites. Requested notice if these waterways are located within or near the area of potential effect (APE). Also inquired about the Project having potential to increase sediment levels in the Blue Earth River and impact surrounding wetlands. December 6, 2021 – Westwood responded and stated additional study will be done to determine if waterways and wild rice watersheds are located within or near the project

	APE. See additional response information below.
Minnesota Indian Affairs Council Cultural Resources	No response to date.
Local	
Faribault County	June 29, 2023 – Applicant attended an in person meeting to introduce county staff to Primergy and provide a high-level overview of the Project. September 5, 2023 – Primergy hand delivered drain tile map for county review and input. September 8, 2023 – Primergy submitted Meteorological Station Conditional Use Permit (CUP) and discussed the process and expectations for the meetings in October. October 10, 2023 – Primergy attended an in person public hearing for Meteorological Station CUP. October 17, 2023 – Primergy attended an in person and remote Planning Commission meeting on Meteorological Station CUP. Commission voted unanimously to approve CUP.
Faribault County Attorney – Cameron Davis, County Attorney	No response to date.
Faribault County Economic Development Authority – Annie Leibel, Director	No response to date.
Faribault County Geographic Information Systems (GIS) – Brandee Douglas, GIS Coordinator	No response to date.
Faribault County Parks – Bryce Werner, Park Manager	No response to date.
Faribault County Public Works – Mark Daly, Director/Engineer	No response to date.
Faribault County SWCD – Nate Carr, Conservation Technician	No response to date.
Prescott Township – Brian Millmann, Chair	No response to date.
Verona Township – Neal Mensing, Chair	No response to date.
City of Winnebago – Scott Robinson, Mayor	No response to date.

Blue Earth Schools – Mandy Fletcher, Superintendent	No response to date.
Union Pacific Railroad Company	September 21, 2023 – Primergy and Union Pacific had call to discuss work being done to release railroad easement on the property.
Landowners	April 18, 2023 – Primergy attended an in person meeting to introduce county staff to Primergy and provide a high-level overview of the Project. September 5, 2023 – Applicant attended an in person meeting to review Meteorological Station site and sign off on lease agreement.

6.1 Federal Agencies

On November 15, 2021, Northern Crescent Solar sent a Project introduction letter and map to the USACE, USFWS, and the FAA. Federal written correspondence includes responses from the USACE and USFWS as detailed in **Table 28**. See Section 5.4.8 for additional USFWS coordination including information on the most recent IPaC report. USACE was contacted and responded with details and approval for the Approved Jurisdictional Determination for wetland WB-B-06. No response or correspondence has been received from the FAA.

6.2 State Agencies

On November 15, 2021, Northern Crescent Solar sent a Project introduction letter and map to seven State of Minnesota agencies. Responses have been limited to responses from the SHPO, MnDNR, and MnDOT as detailed in **Table 28**. See Section 5.4.8 for additional MnDNR coordination information including results from the most recent Natural Heritage Review.

In response to the MnDNR general recommendations on January 11, 2022, Northern Crescent Solar referenced the MnDNR's Commercial Solar Siting Guidance throughout the application process and has included several GIS data layers in figures throughout this Application. These layers were also referenced, and native prairie remnants avoided when designing the Project. As seen in the VMP, native, pollinator friendly seeds will be planted, and invasive species prevention BMPs will be used (**Appendix F**). Northern Crescent Solar is committed to stringent erosion control. This will be reflected in the SWPPP that will be prepared for the Project.

Additionally, minimizing impacts to wetland or mucky soils is outlined in the AIMP (**Appendix E**).

In their January 11, 2022, response, the MnDNR also provided the following project-specific recommendations. The Applicant's intentions regarding these comments follow in italics.

- Ensure that the project contacts BWSR regarding any limitations or requirements regarding the onsite [Reinvest in Minnesota Reserve (RIM)] easement. A large portion of the RIM easement is also an NWI wetland. Ensure any WCA requirements are met. *Northern Crescent Solar will coordinate with BWSR as necessary to determine any limitations or requirements regarding the*

two CREP parcels and the potential underground collection line crossing of the northern CREP parcel.

- The area of the RIM easement and nearby locations were historically a wetland. We'd recommend not siting infrastructure in this area. *As noted in Section 5.2.1 and **Table 16**, two CREP parcels are located within an excluded area, near the eastern portion of the Project Area, and the Prescott WPA is located east of 380th Avenue, outside the Project Area. Project fencing and infrastructure will not impact the wetlands associated with the two CREP parcels. Based on the preliminary design, one underground collection line crossing is proposed to be bored across the northern parcel. The bore entry and exits will be located outside the CREP parcel. No Project infrastructure will be installed outside the Project Area boundary, therefore, no direct impacts to the Prescott WPA (a RIM easement) east of 380th Street are anticipated. In addition to the VMP and AIMP, a SWPPP will be developed for the Project prior to construction that will include temporary and permanent BMPs such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent sediment from entering into wetlands. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.*

- The project area contains a mix of soil types, roughly half of which are poorly drained. We have seen subsurface drainage networks fail over time with a change of land use, contributing to construction and operational issues. We urge you to plan carefully to avoid complications due to soil types and drainage issues. *A preliminary geotechnical investigation was performed for the Project and included subsurface exploration, field and laboratory testing, pile load testing, and an engineering analysis to help guide Project design. Results of the preliminary geotechnical investigation will be taken into consideration during the Project design process. A final geotechnical investigation will be performed for final design recommendations.*

- Seed mixes should be matched to the soil conditions. Although there is a mosaic of soils throughout the Project Area, the soil characteristics can generally be described as relatively poorly drained. *As outlined in the VMP, for vegetation establishment and maintenance purposes, perennial plant species associated with a wet-mesic plant community were selected because they can tolerate extended periods of increased soil moisture. Where soil conditions are potentially less wet, either a mesic species-based or dry species-based seed mix will be used. Prior to initiating seeding activities, existing soil conditions and types will be field verified to confirm the appropriateness of the proposed seed mix. Adjustments to the species composition of the seed mixes will be made, as necessary. The VMP is in **Appendix F**.*

- The site is "nestled" between the Blue Earth River corridor on the West and a wetland complex on the East. Due to these habitat features, this area may be used by wildlife. As mentioned above, we can look at the fencing more once specific infrastructure is identified. *Based on preliminary design, the fence consists of lightweight agricultural woven wire (containing wire "knots" wrapped around each intersecting wire) secured to wooden posts which will be directly embedded in the soil or set in concrete foundations as required for structural integrity. This fencing will be topped by 3 to 4 strands of smooth wire (not barbed wire) to reach a maximum total height of approximately 10 feet above grade.*

- Some flow paths (identified as unnamed streams in the map below) occur on the West edge of the project area. We recommend avoiding these areas and careful erosion protection within these areas. *Delineated wetlands comprise 0.351 acre (**Table 24**) of the Project Area. The Project is being designed to avoid all impacts to wetlands and water resources as shown on the preliminary layout (**Figures 4 & 14**) and Preliminary Site Plan (**Appendix C**).*

- Provide more safety information on the storage aspect of the project and identify if there are any additional regulatory requirements regarding this storage. *Information on the BESS and safety measures is provided in Section 4.1.5.*

6.3 Tribal Nations

In a letter dated November 15, 2021, Northern Crescent Solar provided Project information to 11 Tribal Nations in Minnesota and the Minnesota Indian Affairs Council. In a letter dated May 25, 2022, Northern Crescent Solar provided updated Project information to the same 11 Tribal Nations and the Minnesota Indian Affairs Council.

Responses from Tribal Nations have been limited to responses from the Shakopee Mdewakanton Sioux Community, White Earth Nation, and the Mille Lacs Band of Ojibwe as detailed in **Table 28**. Northern Crescent Solar is committed to maintaining coordination with all Tribal Nations in Minnesota as the Project progresses.

In its December 6, 2021, response, the White Earth Nation expressed concern about the preservation and protection of waterways and wild rice watersheds as they are considered cultural sites. The White Earth Nation specifically noted the following concerns. The Applicant's intentions regarding these comments follow in italics.

- Should any waterways or wild rice watersheds be located within or near the APE, the Applicant should contact the [Tribal Historic Preservation Office (THPO)]. Special precautions should be taken to ensure the quality, quantity, and safety of the wild rice and connecting watersheds. *As mentioned in Section 5.4.5, a wetland delineation was conducted on July 15, 2021 and a total of 10 wetlands were identified, of which four are located within the Project Area, and six are located outside the Project Area. No waterways were identified within the Project Area, the nearest waterway was identified as WC-A-01 located about 0.2 mile south of the Project Area. There are no wild rice waters within the Project Area. The nearest identified wild rice water is Rice Lake, located about 1.5 miles north of the Project Area. The Project is being designed and engineered to avoid and minimize impacts to wetlands and water resources to the greatest extent practicable. In addition to the VMP and AIMP, a SWPPP will be developed for the Project prior to construction that will include temporary and permanent BMPs such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent sediment from entering into wetlands. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.*
- Inquired about potential for increased sediment levels along the Blue Earth River, and if there any other impacts to the Blue Earth River or surrounding wetlands. *The Project is not expected to increase sediment levels along the Blue Earth River or surrounding wetlands. The NPDES/SDS CSW requires the use of BMPs during construction and includes sediment control and erosion prevention practices that will be implemented to prevent the movement of sediment off-site. The Project-specific SWPPP will address the sediment control and erosion prevention BMPs that may be used during construction.*
- If any cultural materials are uncovered during construction, the White Earth Nation requests that all work cease and the THPO be contacted. *As mentioned in Section 5.3.7.1, before construction of the Project begins, the Applicant will prepare an Unanticipated Discoveries Plan that will*

outline the steps to be taken if previously unrecorded cultural resources or human remains are encountered during construction. Should previously unknown archaeological resources be inadvertently encountered during Project construction and/or operation, 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 OSA will be notified. Should human remains be inadvertently discovered, Minn. Stat. § 307.08 will be followed, all work will cease, law enforcement will be immediately contacted, and the OSA will be notified.

6.4 Local Agencies and Other Stakeholders

Regarding other local agencies and organizations, no written responses have been received.

6.5 Meetings

In addition to the above outreach and responses, Northern Crescent Solar held various meetings with State and Federal representatives to introduce the Project, provide information, receive feedback, and design a Project that respects concerns and has the support of the community. As applicable, Northern Crescent Solar has made a point of completing outstanding action items soon after these meetings were held. The general feedback has been positive, and Northern Crescent Solar has provided fact sheets, articles, and other resources, specifically to state and local agencies, to maximize the understanding of the Project. A summary of the completed meeting notes is included in **Table 29** below. Meeting notes are included in **Appendix B**.

Table 29: Summary of Agency Meetings

Date	Agency	Meeting Summary
September 20, 2021	MDA	Online meeting to introduce the Project. Attendees: Stephen Roos, MDA Michelle Matthews, GlidePath Jeremy Duehr, Fredrikson & Byron Joe Sedarski, Westwood Annabel Sammons, Westwood
September 22, 2021	MPUC and DOC	Online meeting to introduce the Project. Attendees: Cezar Panait, MPUC Charlie Bruce, MPUC Bret Eknes, MPUC Louise Miltich, DOC David Berkholz, DOC Andrew Levi, DOC Michelle Matthews, GlidePath Jeremy Duehr, Fredrikson & Byron Joe Sedarski, Westwood Annabel Sammons, Westwood
September 29, 2021	MnDNR and USFWS	Online meeting to introduce the Project. Attendees: Dawn Marsh, USFWS Joanne Boettcher, MnDNR Cynthia Warzecha, MnDNR Michelle Matthews, GlidePath Jeremy Duehr, Fredrikson & Byron Joe Sedarski, Westwood Annabel Sammons, Westwood
August 22, 2023	DOC EERA	Online meeting to introduce Primergy and the Project. Attendees: Raymond Kirsch, DOC EERA Richard Davis, DOC EERA Toby Tuttle, Primergy Linn Zukor, Primergy Jemuel Selorio, Primergy Jeremy Duehr, Fredrikson & Byron David Weetman, Westwood

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