OTTER TAIL POWER COMPANY

APPLICATION TO THE
MINNESOTA PUBLIC UTILITIES COMMISSION
FOR A SITE PERMIT FOR THE

66 MW SOLWAY SOLAR PROJECT IN BELTRAMI COUNTY, MN

MPUC DOCKET NO.
E017/GS-24-309

October 2024

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1. INTRODUCTION

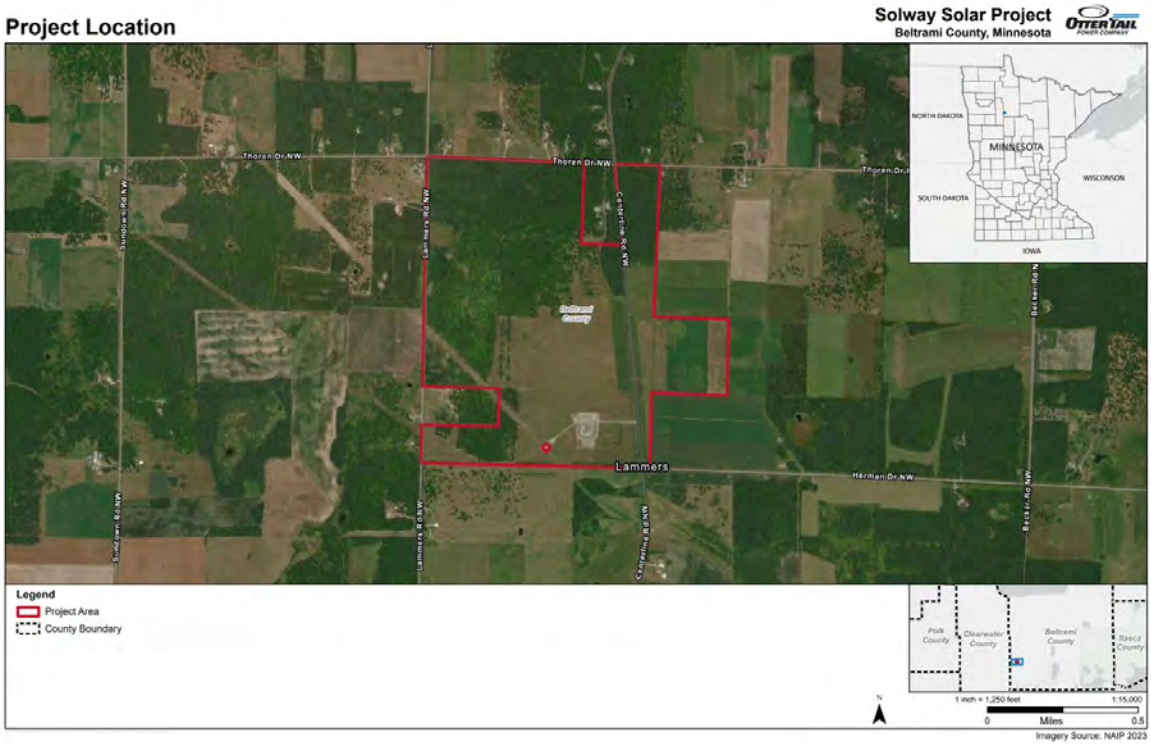
Otter Tail Power Company (Otter Tail, or the Applicant) is an investor-owned electric utility that provides electricity and energy services in Minnesota, North Dakota, and South Dakota. Otter Tail proposes to construct and operate the Solway Solar Project (Project), a solar energy conversion facility with an up to 66 megawatt (MW) alternating current (AC) nameplate capacity, in Lammers Township in Beltrami County, Minnesota. The Project is shown on **Figure A-1** in **Appendix A and below as Figure 1**.

The Project will be located at 7707 Centerline Road NW, Solway, MN 56678, just north of the City of Solway in Beltrami County, Minnesota. References to the "Project Area" within this Application refers to all land owned by Otter Tail for the Project (487 acres); whereas references to "Project Footprint" refers to the portions of the Project Area (267 acres) enclosed within the Project fence and includes the land needed for the Project components and for operation and maintenance of the Project, as shown on **Figure A-2** in **Appendix A**.

Otter Tail proposes to interconnect the Project using existing interconnection rights at the Solway Combustion Turbine Generating Station via the Midcontinent Independent System Operator (MISO) surplus interconnection process. Connecting the Project to the Point of Interconnection (POI) at this point will require an additional transformer and less than 500 feet of overhead transmission line. Otter Tail plans to construct the Project on a schedule that facilitates an in-service date by the end of 2026.

Construction of the Project requires a Site Permit from the Minnesota Public Utilities Commission (Commission or MPUC). On September 20, 2024, Otter Tail provided the Commission with notice that it is seeking approval for its Application under the alternative review process provided in Minnesota Statutes (Minn. Stat.) § 216E.04, subd. 2(8) and Minnesota Administrative Rules (Minn. R.) 7850.2800 to 7850.3900. Otter Tail respectfully submits this Application for a Site Permit pursuant to the Minnesota Power Plant Siting Act (Minn. Stat. ch. 216E) and Minn. R. ch. 7850. A Completeness Checklist for this Application is provided in **Appendix B**.

Figure 1. Project Location



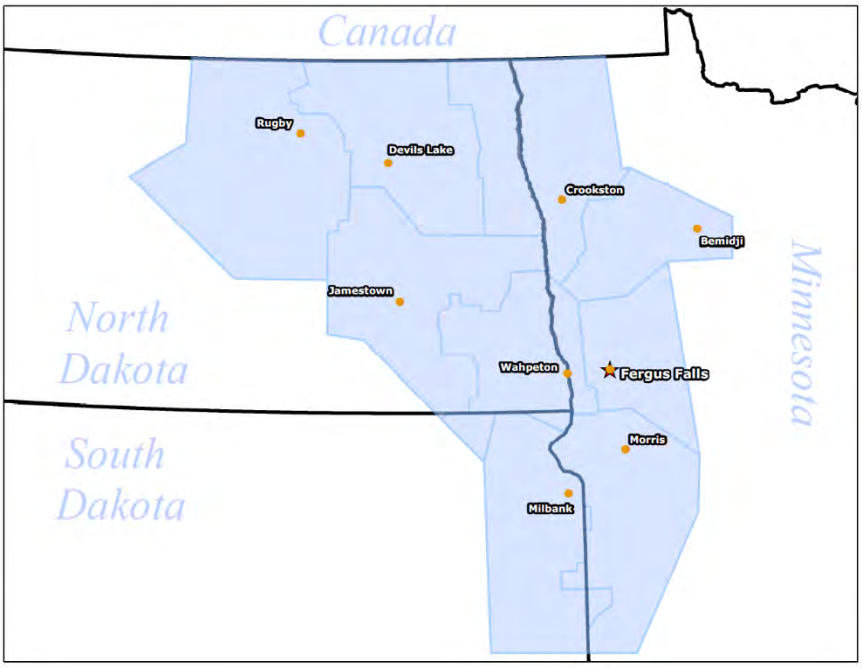
1.1. Applicant Information

Otter Tail generates, transmits, and distributes electricity to approximately 133,700 residential, commercial, and industrial customers in 422 communities across 70,000 square miles of Minnesota, North Dakota, and South Dakota. Otter Tail is named after the Otter Tail River, which provided the company's first source of electricity when it became an operating utility in 1909. A subsidiary of investor-owned Otter Tail Corporation, Otter Tail is headquartered in Fergus Falls, Minnesota. Otter Tail's mission is to produce and deliver electricity as reliably, economically, and environmentally responsibly as possible to the balanced benefit of customers, shareholders, and employees and to improve the quality of life in the areas in which we do business. To support this mission, Otter Tail adheres to the following six values: integrity, safety, customer focus, resourcefulness, community, and people. Otter Tail's service area is shown on **Figure 2**, with Customer Service Centers noted.

Otter Tail's generation mix includes coal, wind, natural gas, oil, solar, and hydroelectric plants. Otter Tail also purchases electricity from MISO. Otter Tail's generating facilities have the capacity to generate more than 1,160 MWs. In 2022, approximately 37 percent of Otter Tail's owned or contracted energy generation came from renewable resources (i.e., wind, solar, or hydroelectric power). Otter Tail owns over

6,352 miles of transmission line (34.5 kilovolts [kV] and higher) in Minnesota, North Dakota, and South Dakota.

Figure 2. Otter Tail's Service Area



1.1.1. Statement of Ownership

As of this permit filing, Otter Tail will construct, own, and operate the Project. Otter Tail plans to own, operate, and maintain the Project following the start of commercial operations.

1.1.2. Permittee and Contact Information

The permittee for this Application is:

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1.2. Capacity

Otter Tail will own the Project and utilize energy produced by the Project to meet the needs of its customers. As noted above, the Project will interconnect at the Solway Combustion Turbine Generating Station and utilize Otter Tail's existing interconnection rights, through a surplus interconnection.

The Project will consist of approximately 100,000 solar panels with total capacity of up to 66 MWac. The nameplate capacity of the Project will be up to 66 MWac and 74 megawatt direct current (DC). Otter Tail will be limited to 50 MWs of injection rights based on its existing MISO interconnection rights. However, Otter Tail plans to size the Project slightly larger, at up to 66 MWac, to minimize the overall effects of electrical losses and maximize the amount of production delivered to the POI during solar production hours. The as-built nameplate capacity of the Project will be determined during final engineering phases, based on the panels selected, to minimize the overall levelized cost of energy to customers. The Project's annual energy output is expected to be approximately 101,616 megawatt hours (MWh), at a projected net capacity factor of approximately 23.2 percent.

1.3. State Policy

The Project will provide up to 66 MWac of nameplate renewable power capacity and generate an average of approximately 101,616 MWh annually. Taking the anticipated annual generation and the average annual household electricity consumption in

Minnesota,[1] the Project will provide enough electricity to power approximately 9,000 homes annually. It will also avoid approximately 70,988 metric tons of carbon dioxide equivalent emissions annually, based on the United States Environmental Protection Agency (USEPA) Greenhouse Gas Equivalencies Calculator.[2]

The Project is consistent with and capable of supporting Minnesota's mandate and goals found in the Renewable Energy Objectives, Solar Energy Standards, and other applicable energy planning requirements.[3] The Project will support Minnesota's "100 percent by 2040" law that, generally, sets a standard for electric utilities to generate or acquire 100 percent of the energy for retail sales from carbon-free resources and expands the previous Renewable Energy Standard (RES) to require public utilities to generate or procure 55 percent of their energy used to serve Minnesota customers from renewables by 2035.[4] Further, the Project is directly aligned with the law's goal that ten percent of the retail electric sales in Minnesota be generated by solar energy by 2030.[5] The Project will partially replace energy production from Coyote Station, a coal-powered facility in North Dakota, a portion of which currently serves Otter Tail's Minnesota customers.[6] The Project is needed make progress toward the Minnesota Carbon Free Standard (CFS) and to fulfill the Commission's authorization, from Otter Tail's 2023–2037 Integrated Resource Plan, that Otter Tail acquire or build no less than 200 MW of solar resources with a commercial operation date of November 1, 2027, or as soon as practicable thereafter.[7]

1.4. Project Schedule

In order to meet the Project's commercial operation date by year-end 2026, the following schedule (**Table 1**) is anticipated moving forward for the various phases of

[1] U.S. Energy Information Administration "2020 Residential Energy Consumption Survey" https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=%E2%80%B9%20Consumption%20%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20(RECS)-b1.

[2] U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator, metric tonne/MWh.

[3] See Minn. Stat. §§ 216B.1691, subd. 2f, subd. 2g, 216C.05, and 216E.02, subd. 1.

[4] See Minn. Stat. §§ 216B.1691, subd. 2f, subd. 2g.

[5] See Minn. Stat. § 216B.1691 subd. 2f.

[6] *In the Matter of Otter Tail Power's 2023–2037 Integrated Resource Plan*, MPUC Docket No. E-017/RP-21-339, Order Modifying Otter Tail Power's 2023–2037 Integration Resource Plan at 13–14 (July 22, 2024).

[7] *In the Matter of Otter Tail Power's 2023-2037 Integrated Resource Plan*, MPUC Docket No. E-017/RP-21-339, Order Modifying Otter Tail Power's 2023–2037 Integration Resource Plan, Ordering Paragraph 11 at 20 (July 22, 2024).

development. This schedule is an estimate based on information known at the time of this Application.

Table 1. Project Schedule

Activity	Description	Timeline
Land Acquisition	Secure land rights necessary for development of the Project.	Complete
Interconnection Application	Approval from MISO to connect the Project to the grid and signed Interconnection Agreement.	Submitted July 8, 2024
Site Permit	Site Permit issuance for the Project.	October 2025
Other Permits	Obtain all federal, state, local, and tribal government permits and approvals necessary for construction and operation of the Project.	Prior to Construction
Equipment Procurement and Contractor Selection	Procurement of Project equipment. Final contractor selections will be made contingent on the Site Permit Application being approved by the Commission.	April through September, 2025
Construction	Construction of the Project.	October 2025 through September 2026
Testing and Commissioning	Testing and commissioning of project related equipment.	October 2026
Operation	Commercial operation of the Project following construction and testing/commissioning activities.	December 31, 2026
Decommissioning	The Site Permit is typically issued for 35 years.	

1.5. Required Project Permits

Project development will require several federal, state, and local permit approvals prior to construction. Potential permits, with respect to their prospective applicability and expected timing, are detailed below in **Table 2**.

Table 2. Summary of Possible Permits, Licenses, and Approvals

Agency	Permit	Applicability	Permit Status & Timing
Federal			
United States Army Corps of Engineers (USACE)	Section 404 Permit	Dredging or filling jurisdictional Waters of the United States (wetlands/waterways).	To be obtained prior to construction, as needed.
United States Environmental Protection Agency	Spill Prevention, Control, and Countermeasure (SPCC) Plan	Project facilities with oil storage of more than 1,320 gallons.	To be written prior to construction, as needed.
United States Fish and Wildlife Service (USFWS)	Section 7 Endangered Species Act (ESA) Consultation	Any Project with a federal nexus that may adversely affect a federally listed endangered, threatened, or candidate species as determined by the lead federal agency.	The Applicant is unaware of a federal nexus on the Project but will pursue if needed. The Project is not anticipated to have adverse impacts on federally listed species.
	Bald and Golden Eagle Protection Act, Eagle Take Permit	Projects involving potential take of Bald and Golden Eagles.	To be obtained prior to construction, as needed.
	Section 10 Endangered Species Incidental Take Permit and Habitat Conservation Plan	Potential impacts on federally endangered or threatened species.	To be obtained prior to construction, as needed.
State			
Minnesota Department of Agriculture	Agricultural Impact Mitigation Plan (AIMP)	Identify measures that Otter Tail will take to avoid and/or repair potential negative agricultural impacts that may result from the construction, operation, and eventual decommissioning of the Project.	Consultation prior to construction – see **Appendix R**.
Minnesota Department of Labor and Industry	Electrical inspection of installed equipment	Necessary to comply with state electrical codes.	Inspection to be conducted during construction and prior to operation.

Agency	Permit	Applicability	Permit Status & Timing
Minnesota Department of Natural Resources (MNDNR)	Water Appropriation/ Dewatering 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 construction, as needed.
	Consultation and Review of State Threatened and Endangered Species	Potential effects on State threatened and endangered species.	To be obtained prior to construction, as needed.
MNDNR, Division of Lands & Minerals	Utility Crossing License	Required to cross state land with utility infrastructure.	To be obtained prior to construction, as needed.
Minnesota Department of Health (MDH)	Well Construction Permit	Installation of a water supply well.	To be obtained prior to construction of a well (if needed for Operations and Maintenance (O&M) building).
Minnesota Department of Transportation (MnDOT)	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.
	Application for Utility Accommodation on Trunk Highway right-of-way (ROW)	Installing utilities along, across or within trunk highway ROW.	To be obtained prior to construction, as needed.
	Driveway Permit	Required for driveways off state highways.	To be obtained prior to construction, as needed.
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification	Required for Section 404 Individual and Nationwide Permits.	To be obtained prior to construction, as needed.
	National Pollutant Discharge Elimination System General Permit and Stormwater Pollution Prevention Plan (SWPPP)	Construction Stormwater General Permit MNR100001 for stormwater discharges associated with regulated construction activity that will result in land disturbance equal to or greater than one acre.	To be obtained prior to construction.
	Certificate of Need (CN)	A CN is required for certain large energy	CN exempt pursuant to Minn. Stat.

Agency	Permit	Applicability	Permit Status & Timing
Minnesota Public Utilities Commission		facilities, absent an exemption.	§§ 216B.2422, subd. 5 and 216B.243, subd. 9.
	Site Permit	Site Permit required for Large Electric Generating Facilities greater than 50 MW.	To be obtained prior to construction.
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 register properties or require Section 106 compliance.	Obtain Phase I inventory concurrence prior to construction.
County/Local			
Beltrami County	Noxious Weed Compliance	Requires control or eradication of noxious weeds.	Ongoing
	Building Permit Application	Required for the construction of any structure within a designated Shoreland Zone.	To be obtained prior to construction, as needed.
	ROW Permit	Required for any obstruction or excavation within a County ROW.	To be obtained prior to construction, as needed.
	Driveway Approaches	Required for any driveway approaches that connect to a County Highway.	To be obtained prior to construction, as needed.
	Oversize or Overweight Vehicle Permit	Required for transport of oversize or overweight vehicles within a roadway ROW under Beltrami County jurisdiction.	
	Access Driveway/Entrance Permit	Required for moving, widening or creation a new driveway access to County roads.	To be obtained prior to construction, as needed.
	Drainage and Ditching Work Within County Highway ROW	Required to work within public road rights-of-way.	To be obtained prior to construction, as needed.
	Grading and filling permit	Required for the movement of more than 10 cubic yards of material within shoreland.	To be obtained prior to construction, as needed.

Agency	Permit	Applicability	Permit Status & Timing
	Permit for Installation of Object/Structures Within County Highway ROW (Utility Permit)	Required for installation of a utility, tile inlet/outlet, or other object of any kind within the highway ROW.	To be obtained prior to construction, as needed.
	Subsurface Sewage Treatment System Ordinance Permit Application and Plan	Required for the construction, installation, modification, replacement, or operation of a subsurface sewage treatment system.	To be obtained prior to construction of septic system, as needed.
Beltrami County Environmental Services Department and Minnesota Board of Water and Soil Resources (BWSR)	Minnesota Wetland Conservation Act Approval	Activities affecting water resources.	To be obtained prior to construction, as needed.
Lammers Township	Driveway Approaches	If required for driveway access.	To be obtained prior to construction, as needed.
	Utility Permits on Township Road ROW	If required for collection and/or feeder lines in Township ROW	To be obtained prior to construction, as needed.

1.5.1. Local Approvals

Pursuant to Minn. Stat. § 216E.10, subd. 1, the Site Permit supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

Otter Tail has consulted with local officials from early in the development process and will strive to incorporate feedback and reasonable recommendations of local stakeholders into the final design of the Project. A summary of public and regulatory outreach is described in **Section 6.0** (Agency, Tribal, and Stakeholder Coordination).

1.5.2. Certificate of Need

A CN is required for a "large energy facilities," as defined in Minn. Stat. § 216B.2421, subd. 2(1), unless the facility falls within a statutory exemption from the CN requirements. The Project is exempt from CN requirements under two distinct statutory provisions: Minn. Stat. § 216B.2422, subd. 5 (Bidding Exemption), and Minn. Stat. § 216B.243, subd. 9 (RES/CFS Exemption). Otter Tail will submit a separate filing

to the Commission in early November providing additional detail regarding the application of these exemptions.

1.5.3. Site Permit

Pursuant to Minn. Stat. §§ 216E.03, subd. 1 and 216E.01, subd. 5, a Site Permit is required for a large electric generating plant, which includes solar energy generating systems designed for and capable of operation at a capacity of 50 MW or more. The Project falls within this definition and requires a Site Permit from the Commission prior to construction.

Pursuant to Minn. Stat. § 216E.04, subd. 2(8), Otter Tail seeks approval of its Application under the alternative review process provided for under Minn. Stat. § 216E.04 and Minn. R. 7850.2800 to 7850.3900. Otter Tail filed a Notice of Intent to File Under the Alternative Site Permit Process (**Appendix C**) to the Commission on September 20, 2024.

Additionally, on September 9, 2024, Otter Tail submitted a Solar Size Determination request to the Minnesota Department of Commerce, Energy Environmental Review and Analysis (EERA) in accordance with Minn. Stat. § 216E.021(a) (**Appendix D**).[8] This request is made to determine whether the Project meets the definition of a Large Electric Power Generating Plant (LEPGP) and, therefore, is subject to the Commission's siting authority.

EERA issued a size determination for the Project on September 13, 2024, which is provided in **Appendix D**.

[8] Minn. Stat. § 216E.021 repeal effective July 1, 2025 (2024 Minn. Sess. Law Serv. Ch. 126 (S.F. 4942) (WEST).

2. PROJECT INFORMATION

The following sections provide a description of the Project Area, Project Footprint, and proposed Project infrastructure including land control, Project design, interconnection, prohibited areas, alternatives, and costs.

2.1. Overall Project Description

The Project consists of an up to 66 MW solar energy conversion facility located in Beltrami County, Minnesota.

The Project will include:

- Solar modules and tracking racking systems.
- Inverters.
- An electrical collection system.
- A Project substation and interconnection facilities.
- Gravel access roads.
- Perimeter fencing and gates.
- An operations and maintenance building.
- Weather stations.
- Stormwater drainage basins.
- Temporary facilities such as laydown areas, temporary site offices, parking, and improvements for storage and staging of equipment prior to installation as needed.

The proposed equipment is preliminary and subject to change as the design advances. A Preliminary Project Layout is provided in **Appendix E**. The Applicant has not made a final selection of solar panels but anticipates using approximately 100,000 PV panels. The final Project Footprint will be dependent on the permitting process, final field surveys, engineering and geotechnical studies, and equipment selection. See **Section 4.1** below for additional information on Project design.

2.2. Facility Description

2.2.1. Location

The Project is in Lammers Township, in Beltrami County, Minnesota, located just north of the City of Solway. A map of the Project Location is shown on **Figure 1** and on **Figure A-1** in **Appendix A**. **Table 3** provides the Township, Range, and Section of areas included within the respective political boundary.

Table 3. Township, Range, and Section Areas Included Within the Project Boundary

Township Name	Township	Range	Sections
Lammers Township	147 N	35 W	04, 07–11, 14–23, and 27–29

Otter Tail owns 100 percent of the land on which the Project would be constructed.

A list of landowners within and adjacent to the Project Area is provided in **Appendix F**, and participating parcels are shown on the Landowner Map on **Figure A-12** in **Appendix A**.

Otter Tail believes the selected Project location in Beltrami County is advantageous for solar development based upon proximity to existing electric transmission infrastructure, sufficient solar resource, sufficient land control, consistency with local land uses, minimal impact to natural and cultural resources, and minimal impacts to prime farmland. Otter Tail's site selection considerations are discussed in more detail in **Section 3.0**.

2.3. Cost Analysis

The total installed capital costs and annual operating costs for the Project are expected to be between $70 and $100 million dollars. More detailed cost data is provided in NONPUBLIC **Appendix G**.

3. PROJECT SITE SELECTION AND CONSTRAINTS ANALYSIS

Site selection for the Project was the result of an iterative process that considered many factors, including but not limited to:

- Environmental analysis – A desktop environmental analysis and field surveys were performed to identify preliminary solar facility locations which would minimize impact to high value natural resources. High value natural resources include native plant communities (NPCs), wetlands, state-listed species, federally listed species, and public lands and waters. Desktop review for high value resources included review of MNDNR Natural Heritage Inventory System (NHIS) data, USFWS Information for Planning and Consultation (IPaC), and review of the Minnesota Conservation Explorer (MCE) for resources such as Minnesota Biological Survey (MBS) Sites of Biodiversity Significance and MNDNR NPCs.

- Setbacks – Setbacks from public ROWs, utilities, and other land uses were established and mapped.

- Unavailable or restricted land – Managed and public lands, conservancies, land under contracts such as Conservation Reserve Program (CRP), Sustainable Forest Incentive Act Forest Legacy easements, Minnesota Native Prairie Bank, and Farmland Preservation Agreements were reviewed and considered for restrictions.

- Constructability and collection – Construction restrictions due to factors such as slopes and soils were considered. Construction efficiency and costs were also evaluated. Construction equipment movement and the ability to network the collection system between solar panel array sites were additional considerations.

- Landowner preferences – Potential locations of panels, fences, and access roads were discussed with adjacent and community landowners, and their concerns and preferences were considered in the preliminary design.

The steps described above were repeated in an iterative process to arrive at a Project design that minimized impacts to the environment, considered the concerns of adjacent landowners and minimized the Project's costs all while maximizing the efficiency of the Project. Final revisions to the panel layout design may also require revisions in cable routes, access roads, and possibly slight shifts in other panel locations.

3.1. Prohibited and Exclusion Sites

Minnesota R. 7850.4400, subp. 1 prohibits siting large electric power generating plants in any of the following areas: 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; and state and national wilderness areas. According to the MNDNR Commercial Solar Siting Guidance, solar projects are also prohibited in the following areas: Reinvest in Minnesota (RIM) Reserve Program easements, Minnesota Native Prairie Bank Program easements, and Forest Legacy Program easements.[9] The Project facilities are not located within any prohibited areas.

Additionally, Minn. R. 7850.4400, subp. 3, requires that applicants avoid siting power generating plants in several 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. An analysis of Otter Tail's avoidance of exclusion areas and other sensitive environmental areas is provided below in **Section 5.5**.

Minn. R. 7850.4400, subp. 4, prohibits the developed portions of large energy power generating plants from being sited on more than 0.5 acre of prime farmland per MW of net generating capacity[10] unless there is no feasible and prudent alternative. The Project Area includes approximately 24.5 acres of prime farmland (see **Section 5.5.4**). Given the up to 66 MW net generating capacity of the Project, this rule would allow use

[9] MNDNR. 2023. Commercial Solar Siting Guidance. Online [URL]: https://files.dnr.state.mn.us/publications/ewr/commercial_solar_siting_guidance.pdf. Accessed September 5, 2024.

[10] "Net generating capacity" is not defined in Minn. R. ch. 7850. However, Minn. R. 7849.0010 defines the term as "the total number of kilowatts, less station use, that all the generating facilities of a system could supply at the time of its maximum system demand. The capability of the generating units that are temporarily out of service for maintenance or repair shall be included in the net generating capacity." "Station use" is not a term applicable to solar energy generating system. Generally, Minn. Stat. § 216E.021 evaluates the AC nameplate capacity of a solar energy generating system for the purposes of determining the Commission's siting authority. For distributed solar, Minn. Stat. § 216B.1691, subd. 2h, defines "capacity" as "the number of megawatts alternating current (AC) at the point of interconnection between a distributed generation facility and a utility's electric system." For the purpose of this prime farmland analysis, these distinctions do not change the analysis, as using the 66 MW nameplate capacity results in a prime farmland threshold of 33 acres, whereas the 50 MW capacity at the POI would result in a 25 acre threshold.

of up to 33 acres of prime farmland. While there are approximately 24.5 acres of prime farmland within the Project Area, there are only 6.7 acres of prime farmland located within the proposed Project Footprint. Accordingly, the Project siting is consistent with the prime farmland exclusion rule.

In May 2020, the Minnesota Department of Commerce issued Solar Energy Production and Prime Farmland: Guidance for Evaluating Prudent and Feasible Alternative (Prime Farmland Guidance).[11] The Prime Farmland Guidance recognizes that, "the State of Minnesota has dual mandates to advance solar energy production and protect prime farmland" and is "meant to assist developers in defining feasible and prudent in relation to siting alternatives."[12] While the Project is sited consistently with the prime farmland exclusion rule, current land use within the Project Area is predominately agricultural – specifically pasture and haying – and deciduous forest. The Project would result in the removal of these acreages from pasture and haying for the life of the Project. While likely not specifically required for this Project, Otter Tail nonetheless provides an analysis of factors identified in the Prime Farmland Guidance with respect to site selection and alternative sites is provided in the following sections below.

The Prime Farmland Guidance first directs an applicant to discuss why a project has been proposed in a particular region, including an assessment of: (1) the solar resource in the region; (2) available interconnection points; and (3) efforts to investigate developable sites (i.e., those with appropriate topography and willing participants). Otter Tail selected this site because it has a strong solar resource. Equally important, the site was selected due to the availability of existing transmission interconnection feasibility, specifically Otter Tail's planned use of existing interconnection rights at the Solway Combustion Generating Station. Finally, Otter Tail considered whether there were environmental constraints preventing development of solar facilities and whether landowners adjacent to the Solway Combustion Turbine Generating Station were willing to sell land to Otter Tail for siting solar facilities. The Project Area met each of these evaluation criteria.

3.2. Factors to Consider when Prime Farmland is Present

The Prime Farmland Guidance further identifies factors to assess when prime farmland is present within a proposed project site, including: (1) alternative sites in

[11] Minnesota Department of Commerce (DOC). 2020. Solar Energy Production and Prime Farmland. Online [URL]: https://mn.gov/eera/web/doc/13929/. Accessed September 5, 2024.

[12] DOC. 2020. Solar Energy Production and Prime Farmland. Online [URL]: https://mn.gov/eera/web/doc/13929/. Accessed September 5, 2024.

nonprime farmland in proximity to an interconnection site; (2) avoidance of other prohibited areas; and (3) alternative configurations or technologies.

As noted above, the Project Area contains approximately 24.5 acres of prime farmland. These soils are located primarily in the north and westerly portions of the Project Area, and much of this area remains forested (**Figure A-7** in **Appendix A**). Land within the Project Area currently in agricultural use for pasture and haying is not prime farmland. When designing the Project, Otter Tail located the Project Footprint (i.e., the developed portion of the site where solar equipment and associated facilities are located) to largely avoid the prime farmland within the parcels acquired for development. While Otter Tail also evaluated other nearby potential sites, alternative design configurations at the current location were utilized to minimize prime farmland impacts.

3.3. Mitigation and Offsetting Benefits

In addition to the minimization measures described above, Otter Tail also developed an AIMP and Vegetation Management Plan (VMP) as mitigation measures. Each of these is described further below.

3.3.1. Agricultural Impact Mitigation Plan

Otter Tail has voluntarily developed an AIMP detailing methods to minimize soil compaction, preserve topsoil, and establish and maintain appropriate vegetation that will help to ensure the Project is designed, constructed, operated and ultimately decommissioned and restored in a manner allowing the land to be returned to its original agricultural use in the future (**Appendix H**). Moreover, the Project may also have beneficial environmental impacts such as soil building, and habitat for wildlife (see **Section 5.5.3**, **Section 5.5.5**, and **Section 5.5.7**).

The AIMP has been designed to incorporate best management practices (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 AIMP for the Project is attached as **Appendix H**.

3.3.2. Vegetation Management Plan

Otter Tail has developed a VMP that provides a guide to site preparation, installation of prescribed seed mixes, management of invasive species and noxious weeds, and control of erosion/sedimentation (**Appendix I**). Shifting the land cover in the Project Area to native perennial grassland species for the life of the Project could prove

beneficial for nesting birds and pollinator species. Native plants also add organic matter to soil and encourage microorganisms to flourish due to their extensive root systems.

3.4. Alternative Solar Project Sites Considered but Rejected

Pursuant to Minn. Stat. § 216E.04, subd. 2(8), and as specified in Minn. R. 7850.2800 to 7850.3900, LEPGPs that are powered by solar energy qualify for the alternative review process, which eliminates the obligation for an applicant to propose alternative sites within the application. As such, no specific alternative sites for the Project were considered.

3.5. Future Expansion

The Applicant's interconnection request is for 66 MW, and there are currently no plans for future expansion of the Project.

4. ENGINEERING AND OPERATIONAL DESIGN

Solar electric panels create electricity directly from sunlight. When sunlight hits the panels, semiconductors inside the solar panels are activated to produce direct current (DC) electrical power. The panels are mounted on single-axis tracking systems which run north to south. Throughout the day the panels rotate from east to west to follow the sun. Blocks of panels are electrically connected in series and parallel and terminate at an inverter. Inverters convert the DC power from the panels to AC power. Electrical collection cables connect the inverters to the Project Substation, where the power is then stepped up at the Project Substation's main power transformer from 34.5 kV to 115 kV.

4.1. Design

The Project will utilize bifacial PV panels with tempered glass that are approximately four feet long by eight feet wide, and one to two inches thick. The panels will be installed on a tracking rack system that utilizes galvanized steel and aluminum for the foundations and frame with a motor that allows the racking to rotate from east to west throughout the day. Each tracking rack will contain multiple panels. Based on preliminary panel selection, panels on the tracking rack system could be up to 12 feet in height from the ground to the top of the panels when at a 60-degree angle, depending on manufacturer, topography, and vegetation constraints. The racks considered for this Project may go up to 75-degree tilt. Depending on the technology selected, the PV panels may have an aluminum frame, silicon, and weatherized plastic backing or a side-mount or under-mount aluminum frame, heat strengthened front glass, and laminate material encapsulation for weather protection.

To limit reflection, solar panels are constructed of dark, light-absorbing materials. Today's panels reflect as little as 2 percent of the incoming sunlight depending on the angle of the sun and assuming use of anti-reflective coatings.

The solar array will occupy approximately 55 percent of the Project Area for the solar facilities.

4.1.1. Linear Axis Tracking Rack System

A linear axis tracking rack system allows the PV panels to track the solar resource throughout the day. The panels and tracking rack system are generally aligned in rows north and south with the PV panels facing east toward the rising sun in the morning, parallel to the ground during mid-day, and then west toward the setting sun in the afternoon. The panels are rotated by a small motor connected to the tracking rack system to slowly track with the sun throughout the day. The tracking rack system allows the

Project to optimize the angle of the panels in relation to the sun throughout the day, thereby maximizing production of electricity and the capacity value of the Project.

The tracking rack system is mounted on top of steel piles that are typically driven into the ground, without a need for excavation or concrete to install the piles.

4.1.2. Electrical Collection System

Electrical wiring will connect the panels to inverters, which will convert the power from DC to AC. The AC will be stepped up through a transformer from the inverter output voltage to 34.5 kV and brought via the collection cables to the Project Substation. The DC cabling will be mounted underneath the panels in a hanging harness system (see **Image 1**). Use of this system minimizes soil disturbance and trenching along every row of panels. The AC collection system between the inverters and Project Substation will be located in a below-ground trench (approximately four feet deep and one to two feet wide). Below-ground AC collection systems from the inverter skids to the Project Substation will be installed in trenches at a depth of at least 36 inches below grade. During all trench excavations the topsoil and subsoil will be removed and stockpiled separately in accordance with the AIMP. Once the cables are laid in the trench, the area will be backfilled with subsoil followed by topsoil.

Image 1. Hanging Harness System for DC Cabling Between Panels and Inverters

Inverters and transformers are housed together on a "skid." This equipment converts approximately 1,500 volts of DC output of the PV panels to 34.5 kV of AC.

Inverter skids will be utilized at locations throughout the Project Footprint and include a transformer to which the inverters will feed electricity. The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project's preliminary design includes 15 central inverter skids (one inverter is required for every 3–4 MWac). These skids provide the foundation for the inverter, transformer, and Supervisory Control and Data Acquisition (SCADA) system. The skids will be placed atop pile foundations and typically measure 15 feet wide by 20 feet long, with a structure height of approximately 12 feet above grade.

The inverters are within the interior of the Project along access roads. A representative photo of an inverter is shown below in **Image 2**.

Image 2. Representative Photo of an Inverter

The Project will use a SCADA system, which allows remote control and monitoring of the status of the Project. The monitoring system provides status views of electrical and mechanical data, operation and fault status, meteorological data, and grid station data.

4.1.3. Project Substation

Otter Tail proposes to interconnect the Project using existing interconnection rights at the Solway Combustion Turbine Generating Station. An expansion adjacent to the existing interconnection switchyard/substation will be installed. A new main power transformer and associated interconnection equipment will be installed for the Project. The substation expansion is shown on the Preliminary Project Layout in **Appendix E**.

4.1.4. Transmission System

Otter Tail proposes to interconnect the Project using existing interconnection rights at the Solway Combustion Turbine Generating Station. Connecting the Project to the POI at this point will require an additional transformer and less than 500 feet of overhead generation tie-line (located within Project Area) to connect to existing interconnection facilities at the Solway Combustion Turbine Generating Station. The Project will export power using the existing 115 kV transmission line. The transmission system is shown on **Figure A-3** in **Appendix A**.

4.1.5. Security Fencing and Lighting

Permanent security fencing will be installed along the perimeter of the solar arrays and Project Footprint. Fencing will be secured to posts which will be directly embedded in the soil or set in concrete foundations as required for structural integrity. The fencing will consist of an agricultural woven wire fence and will extend approximately eight feet above grade. Barbed wire will not be used around the perimeter of the Project; instead, one foot of three to four strands of smooth wire will be used for a total fence height of eight feet. Fencing around the Project Substation will consist of a chain-link fence and will extend approximately six feet above grade. Fencing around the Project Substation will include one foot of barbed wire to comply with the National Electric Code. This fencing will be designed to prevent the public from gaining access to electrical equipment which could cause injury. Additionally, the fencing will prevent larger wildlife from entering the facility.

The Project may also have security cameras. Otter Tail will have security lighting at the entrances that will be down lit. The typical pole height will be ten feet and operated by switch as well as motion activated if an intrusion is detected. There will be lights at each inverter that will be down lit and switch controlled for repair purposes.

4.1.6. Weather Stations

The Project will include up to three weather stations up to eight feet in height. The weather stations will be within the Project Footprint; the final locations will be determined following final engineering.

4.1.7. Operations and Maintenance Building

An O&M building will be constructed in the Project Area and will provide access and storage for Project maintenance and operations. Such buildings are typically 1,500 to 2,500 square feet and house the equipment to operate and maintain the Project. The building will be used to conduct maintenance and repair of Project equipment and solar

module components, store parts, tools, and other equipment, and store other operation and maintenance supplies. The parking lot adjacent to the building is expected to be approximately 10,000 square feet. Otter Tail anticipates that a new well will provide water service for the O&M building, and that an on-site septic system will provide for sanitary needs. The O&M building is located adjacent to the Project Substation. Otter Tail conservatively includes a 0.5-acre area for the O&M building and parking area.

4.1.8. Access Roads/Transportation System

The Project will include approximately three miles of graveled access roads that lead to the inverters and PV arrays. The final length of the access roads will depend on the equipment selected and final engineering. The access point entrances will be constructed from public roads on temporary and permanent access roads throughout the Project Footprint. Temporary access roads may be used to access the seven planned temporary laydown yards. All other access points with access roads leading to areas within the fence (solar panels, Project Substation, and the O&M building) will be permanent for the life of the Project. Otter Tail anticipates installing a total of six permanent access points – none of which will allow access to the existing Solway Combustion Turbine Generating Station. All entrances will have locked gates.

Some upgrades or other changes to the public roads may be required for construction or operation of the Project. Otter Tail will work with Beltrami County, Lammers Township, and MnDOT to facilitate and pay for required upgrades that meet the required public road standards. Upgrades or changes may include road improvements, additional aggregate, and driveway changes. Road improvements may require a road use and repair agreement with Beltrami County and/or Lammers Township; Otter Tail will continue to coordinate with both agencies as the Project develops. Driveway changes will require a county entrance permit from Beltrami County or MnDOT, which will be obtained prior to construction.

4.1.9. Temporary Facilities

Otter Tail will utilize seven temporary laydown areas, totaling approximately ten acres. These areas will serve both as a parking area for construction personnel and staging areas for Project components during construction. Laydown areas will stage components for that block before transitioning to racking and panels. All laydown areas that are not developed for project facilities will be restored with a native seed mix.

4.1.10. Pipeline Systems

No pipelines will be accessed or built as part of the Project.

4.1.11. Stormwater Drainage Basins

Otter Tail has preliminarily designed five drainage basins throughout the Project Footprint that range in size from approximately 0.25 acre to 1.5 acres. These basins are located in or near existing low areas for which the preliminary design for solar facilities has avoided. Due to the existing topography and drainage patterns, Otter Tail has designed a higher quantity of smaller stormwater basins across the Project Footprint instead of fewer larger stormwater basins. Basins will be vegetated with a wet seed mix that will help stabilize soils after rain events. The size and location of stormwater drainage basins will be finalized concurrent with final engineering.

4.2. Project Layout

The Project's final layout will optimize electrical generation and efficiency of the proposed Project while avoiding and minimizing human settlement, environmental, cultural resources, and infrastructure impacts. The Project's facilities will be sited to comply with applicable local, state, and federal regulatory standards. The Preliminary Project Layout can be found in **Appendix E**.

4.2.1. Setbacks

While a site permit from the Commission preempts local ordinances, Otter Tail reviewed County ordinances to determine if the County had adopted standards applicable to solar facilities. Otter Tail also reviewed applicable state agency guidance.

Beltrami County's ordinances do not have setbacks specifically applicable to solar energy generation facilities. The Project generally follows the recommendations in the Beltrami County Buffer Ordinance;[13] there are no floodplains within the Project Area as shown in **Appendix J**. In the absence of applicable setback standards, Otter Tail voluntarily applied certain distances per industry best practices as reflected in **Table 4**.

[13] *See* Beltrami County Buffer Ordinance No. 48.

Table 4. General Distances Applied to the Project

Feature	Distance Applied (ft)
Interstate, State, and County Roads Centerline[1]	83 ft
Rail Lines	N/A
Transmission Lines	50 ft
Distribution Lines/Utilities	50 ft
Substations	200 ft
Dwellings[2]	200 ft
Unoccupied Structures[3]	100 ft
Water Wells	50 ft
Watercourses, ditches, and county tile mains	50 ft
Liquid Pipelines	N/A
Gas Pipeline ROW	50 ft
Natural Gas Distribution	N/A
Property Lines[4]	50 ft

[1] 33 ft Road ROW plus additional 50 ft setback
[2] No dwelling is within 200 ft of project fence
[3] No unoccupied structure is within 100 ft of project fence
[4] No setback applied to internal participating parcel boundaries

Additionally, Otter Tail considered the Commercial Solar Siting Guidance document published by the MNDNR[14] when designing the Project. Resources discussed in the guidance have been avoided and reasonable fencing setbacks from road ROW (based on traffic volume and speed) have been applied to provide space for animals to travel. The Project is not located within 300 feet of large block forest habitat (see **Section 5.5.9.2**). A greater diversity of wildlife habitat for migratory birds or other wildlife is present outside of the Project Area. Although agricultural land is the dominant wildlife habitat in the area surrounding the Project Area, the extensive forested areas and Clearwater River provide high quality wildlife habitat.

4.2.2. Estimated Project Facility Acreages

The 267-acre Project Footprint encompasses all areas within the Project fence that may be needed for solar development (i.e., all permanent and temporary Project components and operations and maintenance activities). The fence position may be adjusted during final design. The total Project Area is 487 acres. **Table 5** describes the Project's estimated acreages based on the preliminary design configurations.

[14] Commercial Solar Siting Guidance (state.mn.us).

Table 5. Estimated Project Components Acreages

Project Facilities	Acres
Solar Arrays/Trackers (excludes vegetated spacing between rows)	79.7
Access Roads	5.1
Electrical Collection Lines	2.6
Inverters	0.2
O&M Building	0.5
Project Substation (area for facility expansion)	0.6
Stormwater Basins	3.5
Laydown Yards (temporary)	7.3
Undeveloped Area (acreage within Project Footprint with no facilities, including vegetated spacing between rows and above facilities)	165.1
Total Project Fenced Area	**265.3**
Access Roads (outside fenced area)	1.0
Buried Electrical Collection Lines (outside fenced area)	0.4
Total Project Footprint	**266.7**
Overhead Transmission Line ROW (outside of fenced area)	2.7
Gas Transmission Line ROW (outside of fenced area)	4.7
Existing Otter Tail Power Peaking Plant (outside of fenced area)	5.0
Laydown Yards (temporary)	2.4
Undeveloped Area (outside the fenced area but within the Project Area)	205.5
Total Project Area	**487.0**

4.3. Project Construction

A variety of activities must be completed to carry the Project through construction. Below is a preliminary list of activities necessary to develop the Project. **Table 6** describes the Project's pre-construction, construction, and post-construction activities.

Table 6. Construction Activities for the Project

Construction Stage	Activity
Pre-Construction	Geotechnical analysis
	Design substation and electrical collection system
	Design solar array, access roads, and O&M building
	Design erosion and sedimentation and stormwater plans
	Underground utility discovery
	Procure all necessary facility components (solar panels, tracking system, transformers)
Construction	Install erosion control measures
	Site preparation, grubbing, and grading
	Construct laydown areas and set up temporary job site trailers
	Construct fencing
	Civil construction of access roads
	Install PV mounting posts
	Install below-ground collection system
	Install electrical enclosure/inverter
	Tracker installation
	PV panel installation
	Construct gen-tie line (if needed)
Post-Construction	Restore disturbed areas not intended for permanent above-ground facilities. Permanent above-ground facilities include the Project Substation, O&M building, inverter skids and electrical cabinets, and access roads
	Test facility
	Begin commercial production

4.3.1. Construction Activities

During construction, equipment and work vehicles will travel to and from the site. Daily construction duration is anticipated to be consistent throughout the construction season when the majority of the access road construction, electrical, and substation work is taking place. Typical construction equipment such as scrapers, dozers, dump trucks, watering trucks, motor graders, vibratory compactors and pile drivers, pickup trucks, and backhoes will be used during construction. Specialty construction equipment that may be used during construction will include:

- Bulldozer and excavator.
- Grader.

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

Upon completion of construction, heavy equipment will be removed from the site. An overview of construction activities follows.

4.3.1.1. Geotechnical

Geotechnical and pull testing studies will be performed to determine the topsoil and subsoil types, and the mechanical properties of the soils. Soil resistivity measurements will be taken on site as part of the Project's geotechnical analysis, and that data will be used to help design grounding systems. These variables will be used to engineer the solar array foundation system. Typically, the foundation is a steel pile, which is driven into the ground with a hydraulically powered high-frequency hammer mounted on a tracked carrier. The piles are installed at pre-defined locations throughout the array area to an embedment depth of 8 to 20 feet below grade, depending on soil properties and other factors.

4.3.1.2. Site Clearing & Vegetation Removal

After the necessary permits are received, construction will begin with the initial site preparation work, including utility locates within the Project Area. Tree clearing to allow for installation of the solar facilities will occur in accordance with required permits. Existing vegetation within the Project fence will be sprayed with a grass and broadleaf herbicide. Depending on construction timing, Otter Tail may dormant seed native species in Fall 2025 or wait until Spring 2026 to perform seeding efforts. Seeding, including cover crop, will be in alignment with the Project's VMP (**Appendix I**).

4.3.1.3. Earthwork

Areas of the site to be graded will have topsoil and organic matter stripped and segregated from the subsoil (depending on the depth of grading cut) in accordance with the Project's AIMP. Some grading will be required to provide a more level workspace and

maintain soil stability in areas with a slope greater than five percent. Topsoil shall have temporary and permanent erosion control and soil stabilization measures established in accordance with the Project's SWPPP. The earthwork activities will be completed using typical civil construction equipment – scrapers, bulldozers, front-end loaders, back-hoes, or skid-steers.

4.3.1.4. Access Road Construction

As a component of earthwork, permanent access roads and permanent turnouts will be developed. This work will start with the stripping and segregating of topsoil materials from the anticipated 20-foot-wide road width. The subgrade materials will be compacted 20-feet wide to the specified compaction requirements as laid out by the civil and geotechnical engineer. After compaction is reached and verified, the road will be installed as designed, typically done with or without geo-fabric depending on the soil type, and then, with a surface of four to 12 inches of gravel. The gravel will be placed level with the existing grade to facilitate drainage and minimize ponding.

After gravel is installed and compacted to engineers' requirements, the Project drainage ditches will be shaped as identified on the final grading plan. Finally, the previously stripped and windrowed topsoil material will be re-spread throughout the Project Area.

Topsoil removed from permanent access roads will be moved to suitable locations near the site of removal and spread across existing topsoil for storage. Storage locations will be identified (Global Positioning System [GPS] boundary and depth) and recorded on site maps to facilitate final reclamation after decommissioning.

4.3.1.5. Solar Array Construction

Once grading activities are complete, the racking system supports will be constructed using steel piles driven into the ground. The solar facilities will be constructed in blocks, and multiple blocks may be constructed simultaneously. Construction of the blocks will include pre-positioning and driving piles, mounting the tracking rack system to the piles, pre-positioning of panel pallets, mounting panels to the tracking rack system, the completion of electrical connections, terminations and grounding, and installation of cable management systems. In some situations where soils are low strength or consist of loose, non-cohesive sand, helical screw or auger-type foundation posts may be used. Foundations are typically galvanized steel and used where high load bearing capacities are required. The pile is driven using a hydraulic ram that moves along tracks and is operated by two workers. Soil disturbance would be restricted to the hydraulic ram/screw

machinery, about the size of a small tractor, temporarily disturbing soil at each pile insertion location and while driving between drilling locations.

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

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

4.3.1.6. Electrical Collection System

Electrical wiring will connect the panels to inverters, which will convert the power from DC to AC. The AC will be stepped up through a transformer from the inverter output voltage to 34.5 kV and brought via the AC collection cables to the Project Substation. The DC collection system will be installed underneath the panels in a hanging harness system; the AC collection system will be installed in a below-ground system.

Below-ground AC collection systems will be installed in trenches at a depth of at least 36 inches below grade. During trench excavation the topsoil and subsoil will be removed and stockpiled separately in accordance with the AIMP. Once the cables are laid in the trench, the area will be backfilled with subsoil followed by topsoil. Electrical collection technology is rapidly evolving and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement will help determine the construction method for the electrical collection system.

4.3.1.7. Project Substation Construction

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

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

In both scenarios, the limits of disturbance will be within the footprint of the substation for both the foundation equipment and the concrete delivery trucks. All topsoil from the Project Substation footprint will be removed to a pre-established suitable location for storage. The storage area would be near the site where the soil was removed, accurately located (GPS boundary, soil depth) and graded to facilitate revegetation. Subsoil would be removed, if necessary, to an acceptable preestablished and approved area for storage. After decommissioning, subsoil will be returned to the area from which it was excavated (as needed), topsoil will be replaced, and the area will be brought back to pre-construction contours.

4.3.2. Construction Management

Otter Tail will designate an on-site construction manager. The construction manager's responsibilities will include scheduling and coordinating the activities of engineering, procurement, and construction contractors. The construction manager will be supported by other members of Otter Tail's team who specialize in engineering, permitting, meteorology, environmental compliance, real estate, and Geographic Information Systems (GIS) mapping.

Throughout the construction phase, ongoing coordination occurs among the Project's development, design, and construction teams. The construction manager coordinates execution of the work. This coordination includes safety and quality control

programs, cost, and schedule forecasting, as well as site security and ongoing communication with local officials, citizen groups, and landowners.

4.3.3. Commissioning

During and upon completion of the construction phase, the Project will undergo inspections, testing, and commissioning. Inspection and testing will occur for each component of the solar array, as well as the associated communication, meteorological, collection, and SCADA systems.

4.3.4. Restoration

Following construction, areas that will not contain permanent facilities (laydown yards, access roads, inverter stations, etc.) will be stabilized and protected with sediment and erosion control best management practices such as silt fence, erosion control blanket, and biologs and re-vegetated according to the VMP (**Appendix I**). The site will be seeded with site-specific native seed mixes developed to comply with the Minnesota Habitat-Friendly Solar Standards in Minn. Stat. § 216B.1642. The VMP includes three seed mixes: (1) an array mix that includes low-growing species to accommodate 18-inch solar panel clearance; (2) a mixed height native pollinator mix to be used outside the panel areas; and (3) a wet mix for stormwater basins and areas susceptible to holding water. Additionally, a cover crop will be planted with the mixes to stabilize the soil, suppress weed growth, and prevent erosion during the time it takes for the native seed to establish. Vegetation outside the Project Footprint will remain in its current condition. Similarly, there are approximately 12 acres of existing public roads and between five and seven acres of Otter Tail facilities that will also not require restoration (**Appendix I**).

The VMP provides a guide to site preparation, installation of prescribed seed mixes, management of invasive species and noxious weeds, control of erosion/sedimentation, and maintenance strategies for the establishment and perpetual maintenance phases.

The native vegetation establishment phase is expected to continue for three years. The VMP outlines vegetation management tasks during the establishment and perpetual maintenance phases including monitoring for and treating any invasive species, mowing, and re-seeding as necessary.

The long-term vegetation maintenance strategies that may be implemented at the Project include: dormant mowing, haying, and/or grazing. Each of these management techniques can be used for the seed mixes proposed, though the management prescriptions may vary from mix to mix and location to location over time depending on

their condition and vegetation goals. For example, the array mix may have more frequent mowing to ensure no interference with the panels, whereas haying may be more appropriate for the non-array areas as vegetation is grown to a taller height before haying. Haying and grazing are management techniques that are especially beneficial to native plant species as they mimic natural disturbances. Grazing solar facilities with livestock (sheep) is an emerging management approach that Otter Tail may consider for this Project.

At no point will the site be maintenance free. Monitoring the vegetation during both the establishment phase and long-term management phase is critical in determining the best management practices most suitable for the site.

4.4. Project Operation and Maintenance

Following commissioning and commercial operation, the care, custody, and control of the facility 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 completed. The Project will be professionally maintained and operated by Otter Tail, an affiliate, or a contractor. Primary tasks include scheduled monthly and quarterly inspection(s) of electrical equipment, vegetation management, as well as snow removal on access drives.

The expected service life of the Project is at least 35 years, and Otter Tail estimates that the Project will result in up to two full-time permanent positions to operate and maintain the Project facilities. A maintenance plan will be created for the Project to ensure the performance of the solar 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 Otter Tail will plan for it and maintain the facility as needed. Once construction is complete, the solar facility will see one to two trucks on site daily, and at intervals associated with the maintenance schedule in **Section 4.4.5** during normal operations. The main scheduled activities are described in more detail below in **Sections 4.4.2 through 4.4.4**.

All maintenance activities will be performed by qualified personnel. Maintenance activities will be performed during the day to the extent that they do not disrupt energy

production. As an example, if a panel needs repair, that particular section of the array can be disconnected from the array by opening the combiner box circuit. The panel can then be replaced, and the combiner box circuit closed. Additionally, the power production circuits are separated from the tracking circuits. This allows the PV panels to operate during an unscheduled outage of the tracker system. Upon occasion, it may be desirable to perform maintenance when the sun is down. Activities that have the potential for substantial noise generation will be performed during the day to minimize impacts in areas where residents are present.

There will be an area for the storage of the spare parts and the tools as described in **Section 4.1.7** (O&M building). The solar generating facility will be operated through a real-time control system for most operations functions.

4.4.1. Supervisory Control and Data Acquisition System

The solar arrays will communicate directly with the SCADA system for remote performance monitoring, energy reporting and troubleshooting. The SCADA system provides data on solar generation and production, availability, meteorology, and communications. The SCADA system allows monitoring of, and communications with, the Project and relays alarms and communication errors. Otter Tail will manage all the monitored data on-site in addition to a qualified subcontractor that will remotely monitor the site 24 hours a day, seven days a week through the SCADA system.

4.4.2. Equipment Inspection

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

- PV panels – visual check of the panels, tracking system and surrounding grounds to verify the integrity of the panels and tracking structure, the presence of animals and nests, etc.
- Inverters, transformer, and electrical panels – visual check of the devices including the connection cabinet and the grounding network. Check for presence of water and dust.
- Electrical check – measurement of the insulation level and dispersion. Check of the main switches and safety devices (fuses).
- Noise – check of abnormal sounds.
- Cabling and wiring – visual check of the buried and aerial electrical line and connection box to verify their status.

4.4.3. Performance Monitoring

Performance monitoring of the Project facilities will consist of a daily, weekly or monthly download of the data acquired by the onsite meteorological stations (energy produced, alarms, faults, etc.).

4.4.4. Facility Maintenance

Housekeeping of the Project facilities will include road maintenance, vegetation maintenance (method is to be determined; either traditional mowing or sheep and/or lamb grazers will be utilized), fence and gate inspection, lighting system checks, and PV panel washing (if required; minimal to no washing is anticipated to be needed at Project facilities due to the naturally occurring and frequent precipitation).

4.4.5. Maintenance Schedule

Table 7 provides more information on the anticipated frequency of the O&M 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. Operations and Maintenance Tasks and Frequency

Plant Device	Task	Preliminary Frequency
PV Field	PV Panels visual check	Once Quarterly
	Wirings and junction boxes visual check	Once Yearly
	PV strings measurement of the insulation	Once Yearly
	PV strings and string boxes faults	Continuous
	PV panels washing	No regular washing planned (only as site-specific conditions warrant)
	Vegetation Management (if necessary at site)	Once per month during the summer or as Site Permit conditions dictate
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	Continuous
	Grounding check	Once Yearly
Inverter	Case visual inspection	Once Yearly
	Air intake and filters inspections	Twice Yearly
	Conversion stop for lack of voltage	Continuous
	AC voltage and current check	Continuous
	Conversion efficiency inspection	Continuous
	Datalogger memory download	Continuous
	Fuses check	Continuous
	Grounding check	Once yearly
	Torque check	Once yearly
Support Structures	Visual check	Quarterly
	PV panels torque check on random sample	Once yearly

4.5. Decommissioning and Repowering

At the end of the Project's useful life, Otter Tail 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. Decommissioning activities will include:

- Removing the solar arrays, inverters/transformers, electrical collection system, fencing, lighting, and Project Substation.
- Removal of below-ground electrical cables to a depth of three feet (cables buried below three feet will be left in place).

- Removal of buildings and ancillary equipment to a depth of three feet.
- Removal of surface road material and restoration of the roads to substantially the same physical condition that existed immediately before construction. If the Project is decommissioned and the land sold to a new owner, Otter Tail would retain any access roads the new landowner requested (in writing) be retained.
- Grading, adding or re-spreading topsoil, and reseeding according to the Natural Resources Conservation Service (NRCS) technical guide recommendations and other agency recommendations, areas disturbed by the construction of the facility or decommissioning activities, grading and soil disturbance activities will be kept to the minimum necessary to restore areas where topsoil was stripped in construction, topsoil in decommissioned roads and compaction only in areas that were compacted during decommissioning activities so that the benefits to the soil that were achieved over the life of the Project are not counteracted by decommissioning.
- Standard decommissioning practices would be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements, and restoration.

4.5.1. Timeline and Notice

Decommissioning is estimated to take up to 36 weeks to complete depending on seasonality, and the decommissioning crew will ensure that all equipment is recycled or disposed of properly.

Otter Tail will provide written notification of intent to decommission to adjacent landowners, the Commission, and local governments prior to commencing decommissioning activities.

4.5.2. Removal and Disposal of Project Components

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. All modules will be packed and shipped to the manufacturer or an offsite facility for recycling, disposal, or resale (if a resale market is available). During

operation and at end of life, non-functioning modules will be shipped to the manufacturer or a third party for recycling or disposal.

- 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 – Structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a recycling facility. The posts can be removed using back hoes or similar equipment. During decommissioning, the area around the foundation posts may be compacted by equipment and, if compacted, the area will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for vegetation.

- Hanging and Underground Cables and Lines – The hanging DC collection system will be removed with the modules and racking. All underground cables and conduits (AC collection system) will be removed to a depth of 36 inches. Facilities deeper than 36 inches 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. Topsoil will be segregated and stockpiled for later use prior to any excavation and the subsurface soils will be staged next to the excavation. The subgrade will be compacted per standards. Topsoil will be redistributed across the disturbed area.

- 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 Otter Tail's sole discretion, consistent with applicable regulations and industry standards.

- Equipment Foundation and Ancillary Foundations – Equipment foundations may include inverter foundation pads, substation foundation pads, and other electrical equipment foundations. Concrete foundations will be removed to at least 36 inches. As with the solar array steel foundation posts, any foundation piles will be completely removed. Duct banks will be excavated to a depth of at least 36 inches. All unexcavated areas compacted

by equipment used in decommissioning will be decompacted 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 Otter Tail's sole discretion, consistent with applicable regulations and industry standards.

- Fence – Fence parts and foundations will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Otter Tail's sole discretion, consistent with applicable regulations and industry standards. The surrounding areas will be restored to pre-solar farm 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(s), and one of the following options will be pursued:

    - After final clean-up, roads may be left intact through mutual agreement of the landowner and Otter Tail unless otherwise restricted by federal, state, or local regulations.

    - If a road is to be removed, aggregate will be removed and shipped from the site to be reused, sold, or disposed of appropriately, at Otter Tail'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. Internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. Any ditch crossing connecting access roads to public roads will be removed unless the landowner requests it remains. The subgrade will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming. Topsoil that was stockpiled during the original construction will be distributed across the open area. Finally, the access road corridors will be tilled to an agricultural condition.

- Project Substation – Decommissioning of the Project Substation will be performed with the rest of the Project. All steel, conductors, switches,

transformers, and other components of the substation will be disassembled and taken off site to be recycled or reused. Foundations and underground components will be removed to a depth of at least 36 inches. The rock base will be removed using bulldozers and backhoes or front loaders. The material will be hauled from the site using dump trucks to be recycled or disposed of at an off-site facility. Additionally, any permanent stormwater treatment facilities (e.g., infiltration ponds and engineered drainage swales) will be removed. Topsoil will be reapplied to match surrounding grade to preserve existing drainage patterns. Topsoil and subsoil will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming.

- O&M Building – The O&M building is a sturdy, general purpose steel building. If the building is not repurposed, decommissioning will include disconnection of the utilities and demolition of the building structure, foundation, rock base parking lot, and associated vegetated/stormwater handling facilities. All associated materials will be removed from the site using wheeled loaders or backhoes and bulldozers and hauled off site in dump trucks. All recyclable materials will be brought to appropriate facilities and sold; the remaining materials will be disposed of at an approved landfill facility. Subgrade soils will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming. Topsoil will be reapplied to match existing surrounding grade to preserve existing drainage patterns, and the site will be tilled to a farmable condition, depending upon location.

4.5.3. Restoration/Reclamation of Facility Site

Otter Tail will restore and reclaim the site to the pre-Project condition consistent with the AIMP. Otter Tail assumes that most of the Project site will be returned to farmland and/or pasture after decommissioning and will implement appropriate measures to facilitate such uses. Areas that consisted of non-agricultural vegetation prior to construction of the Project will be allowed to remain in native grasses. Tree encroachment into these non-agricultural areas may occur over time. If no specific use is identified, Otter Tail will plant unvegetated portions of the site with a seed mix specified in the approved SWPPP, as applicable. The goal of restoration will be to restore natural hydrology and plant communities to the greatest extent practicable, while minimizing new disturbance and removal of native vegetation or vegetation established during

operation of the facility. The decommissioning effort will implement construction stormwater BMPs to minimize erosion and to contain sediment on the Project to the extent practicable, including the following:

- Minimize new disturbance and removal of native vegetation to the greatest extent practicable.
- Remove solar equipment and all access roads up to a minimum depth of at least 36 inches backfill with subgrade material, and cover with suitable topsoil to allow adequate root penetration for plants, and so that subsurface structures do not substantially disrupt ground water movements.
- Any topsoil that is removed from the surface for decommissioning will be stockpiled to be reused when restoring plant communities or agricultural land. Once decommissioning activity is complete, topsoil will be re-spread to assist in establishing and maintaining plant communities.
- Stabilize soils and return them to agricultural 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 storm water management objectives and requirements.
- Remediate any petroleum product leaks and chemical releases from equipment operation and electrical transformers prior to completion of decommissioning.

Otter Tail reserves the right to continue to operate the Project, instead of decommissioning, by applying for an extension of required permits.

4.5.4. Financial Resource Plan

Under EERA guidance, financial assurance is not necessarily required during the first ten years of operation. According to the EERA guidance, a revised decommissioning estimate shall be submitted 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 decommissioning cost estimate will also be reassessed and revised to reflect any identified changes in the costs, including

current salvage values of materials and equipment. The amount of the Financial Assurance will be adjusted accordingly to offset any increases or decrease in decommissioning costs and salvage values determined during each plan reassessment. The total net decommissioning costs (decommissioning cost less salvage value) are estimated at $5.62 million (see **Section 5.0** of **Appendix K** – Decommissioning Plan). It is anticipated that the Project will be in operation for 35 years or until the Site Permit expires.

Otter Tail will utilize the net salvage rate methodology used for all its generation facilities. At the time of decommissioning, the costs of removal will be treated as a debit to Otter Tail's depreciation reserve and the reserve balance will be reduced. The preliminary decommissioning plan for the Project (**Appendix K**) reflects this methodology and, in a separate docket, Otter Tail will seek Commission approval of the net salvage rates used for the Project. The preliminary decommissioning plan (**Appendix K**) identifies anticipated net decommissioning cost to be a net cost of $5.62 million. This estimate is on par with current pricing for scrap metal, industry trends, and decommissioning practices, which may change over the life of the Project but will be accounted for as part of the regular review of the Decommissioning Plan.

5. ENVIRONMENTAL INFORMATION

For the discussion in the following sections, the following terminology, assumptions, and approach are used.

For the description of existing resource conditions, calculations are based on the Project Area (approximately 487 acres). This reflects the fact that final design may necessitate development within the overall Project Area. Additionally, for any discussions of resources that are located outside of the Project Area (such as parks within one mile), the Project Area is used in order to describe these features related to the acreage Otter Tail has acquired for the Project.

For approximating areas of temporary impact, the Project Footprint is used (approximately 267 acres); this reflects the possibility for resources to be temporarily impacted within the area that preliminary design indicates is needed for construction and operation of the facility. For some resources, such as land cover agricultural production, or other land uses, the Project Footprint is also referred to for "permanent impact" discussions (i.e., "permanent" for the life of the Project). It should be noted that the preliminary design does not identify locations of the posts for the solar arrays, so detailed calculations of impacts are not included. However, because the solar array posts are anticipated to be installed via a pile driver for the majority of the locations, the permanent impacts associated with these features are expected to be negligible. To illustrate, the I-beam shaped posts are anticipated to be approximately six inches by four inches, with a surface area of approximately eight square inches because the I-beam is approximately 0.25 inch thick within the six inch by four inch I-shaped configuration.

5.1. Environmental Setting

Typical land use and land cover within and adjacent to the Project Area consists of low-density residential property, forested land, and agriculture. The Project is located within the political boundaries of Lammers Township in Beltrami County. The nearest city to the Project is Solway, Minnesota which is located approximately 1.5 miles south of the Project and is not spanned by the Project Area.

The MNDNR and the U.S. Forest Service have developed an Ecological Classification System for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land (Province, Section, Subsection) with increasingly uniform ecological features.[15] Using this

[15] MNDNR. N.d. Ecological Classification System. Online [URL]: https://www.dnr.state.mn.us/ecs/index.html. Accessed on September 10, 2024.

classification system, the proposed Project is in the Laurentian Mixed Forest Province, Northern Minnesota Drift and Lake Plains Section, and Chippewa Plains Subsection. The Project Area is best described by features common to the Chippewa Plains Subsection.

The Chippewa Plains Subsection is characterized by landforms such as ground and stagnation moraines, a lake plain, and an outwash plain which are all associated with Des Moines or Wadena lobes from the middle to lake Wisconsin glaciation period.[16]. Thick glacial drift covers bedrock over most of the Subsection. Soils on moraines are typically loamy and well to moderately well drained, and soils on outwash plains are dominantly sandy and excessively well drained. Present-day vegetation is predominantly aspen interspersed with mixed stands of birch, maple, and oak species (*Betula spp, Acer spp., Quercus spp.*) white spruce *(Picea glauca),* jack pine (*Pinus banksiana*), and red pine (*Pinus resinosa*). Forestry, tourism, and recreation are the primary present-day land uses in this Subsection.

5.2. Human Settlement

Solar facilities have the potential to impact human settlements during construction and operation. Public health and safety issues during construction include injuries due to falls, equipment use, impaired air quality, and electrocution. Public health concerns related to the operation of the Project may include health impacts from electric and magnetic fields (EMF), stray voltage, induced voltage, and electrocution. Solar facilities also have the potential to displace homes or businesses, introduce new noise sources, affect the aesthetics and socioeconomics of the Project Area, impact local land use and zoning, and impact public services (i.e., transportation). These potential impacts are discussed in more detail below.

5.2.1. Aesthetics

This section describes aesthetics in terms of the current visual landscape in and adjacent to the proposed Project Area, which may be affected by Project construction or new Project features added to the landscape. A landscape's character is largely influenced by topography, vegetation, water resources, and existing development and infrastructure.

The topography of the Project Area is generally level to the south and southeast, with the central, north, and western portions characterized by rolling topography and multiple pockets of small wetland depressions that move northeast to central-southwest. Grassy areas surround impervious surfaces and an industrial facility (Otter Tail's Solway

[16] MNDNR.2024. Chippewa Plains Subsection. Online [URL]: https://www.dnr.state.mn.us/ecs/212Na/index.html. Accessed on September 10, 2024.

Combustion Turbine Generation Station) in the southeast. A primitive access road to the Solway Combustion Turbine Generation Station bisects the Project Area and moves from the central-southwest portion to the southeast. Centerline Road NW, a paved roadway, moves north to south through the Project Area. Additionally, the Project Area borders gravel roadways: Lammers Road NW on the west side, Thoren Drive NW on the north side, and a small portion of Herman Drive NW on the southwest corner.

The majority of the Project Area and Project Footprint is vegetated by forest or grassland species, as described in **Section 5.5.6**. The Project Area avoids densely populated areas, and displacement of residential areas is not anticipated for development of the Project (see **Section 5.2.3**). Low-density residential areas are concentrated to the north, northwest, and southwest of the Project Area. The current viewshed for surrounding residential areas is dominated by openly forested vegetation, pasture, and agricultural areas. The array area will make up the majority of the Project Footprint and impart the greatest visual change to the surrounding landscape. There are a total of nine residences within 0.25 miles of the Project Footprint; the closest residence is in a forested, low density residential area located 0.05 miles to the north and west of the Project Footprint. Fourteen residences are located within 0.26 to 0.5 miles of the Project Footprint. See Landowner Map on **Figure A-12** in **Appendix A**.

5.2.1.1. Impacts and Mitigation

The Project may alter the viewshed of areas surrounding the Project Footprint as trees or grassland species are cleared to support construction of the Project. In some areas, the viewshed of residential areas may change. The Project components including the array area, fence lines, and substation expansion will be visible to surrounding areas where the Project components are not obscured by existing tall vegetation such as trees or shrubs. The Applicant will mitigate aesthetic impacts to residences by retaining trees within 50–75 feet along the northern and western boundaries of the Project Area. As visual impacts will generally be obscured by existing vegetation, localized to the Project Footprint, and will likely diminish over time as residents become used to the visual landscape, no other mitigation is proposed.

5.2.2. Cultural Values

Cultural values are based on core principles and beliefs that form the foundation for community unity. The Project Area is in Beltrami County, which hosts historic and modern cultural values that drive present-day commerce, recreation, and tourism throughout the county.

Land in Beltrami County was historically settled by the Dakota and Ojibwe, who formed settlements and villages along lake shores such as Upper Red Lake, Lower Red Lake, and Cass Lake, which are located north and east of the Project Area.[17] The first European settlers were French fur traders. Several early trails and tote roads crossed through parts Beltrami County including the Red Lake-Leech Lake Trail, the Blackduck Trail, the Fosston Trail, the Freeman Tote Road, and the Park Rapids Trail, and eventually became the primary routes for business and commerce between early white settlers and Ojibwe.

Present-day cultural values in Beltrami County are focused heavily on forestry, tourism, and recreation. County forests are sustainably harvested and managed for habitat, fiber, recreation, water, air, and visual qualities.[18] There are multiple opportunities for recreation within the County including Movil Maze Park, Rognlien Park, Three Island Park, Wilton Hill Recreation Area, and multiple trails and campsites.[19] The city of Bemidji, which is located approximately 12.5 miles southeast of the Project Area, hosts a variety of attractions including city parks, a dog park, ice arenas, trails, and a golf course.[20] In vicinity of the Project, cultural values for surrounding residents are likely focused on land uses such as forestry and agriculture.

5.2.2.1. Impacts and Mitigation

Construction, operation, and maintenance of the Project is not expected to conflict with the cultural values within the general Project Area. As the County hosts a forestry-based economy, tree clearing is unlikely to permanently impact cultural values. The area surrounding the Project Area is generally forested to rural in nature, and historic pockets generally surround larger water bodies or cities beyond the boundaries of the Project Area. This character is anticipated to remain after construction. No aspects of the culture

[17] Beltrami County Historical Society. 2022. Beltrami County: From Earliest Settlements to Trading Posts, Trails, and Small Communities. Online [URL]: https://www.beltramihistory.org/post/beltrami-county-from-earliest-settlementsto-trading-posts-trails-and-small-communities. Accessed on September 10, 2024.

[18] Beltrami County. 2024a. Timber Sales. Online [URL]: https://www.co.beltrami.mn.us/business-development/timber-sales/. Accessed on September 10, 2024.

[19] Beltrami County. 2024b. Parks and Recreation. Online [URL]: https://www.co.beltrami.mn.us/living-here/parks-recreation/. Accessed on September 10, 2024.

[20] City of Bemidji. 2024. Departments: Parks and Recreation. Online [URL]: https://www.co.beltrami.mn.us/living-here/parks-recreation/. Accessed on September 10, 2024.

of the area are anticipated to be significantly impacted or changed as a result of the construction and operation of the Project.

5.2.3. Displacement

No displacement of residential homes, structures, or businesses will occur due to the Project. The closest residence is located 0.05 miles away from the eastern and northern boundary of the Project Footprint.

5.2.3.1. Impacts and Mitigation

No residences will be displaced by the proposed Project, and therefore no impacts are anticipated. Thus, no mitigation is proposed. Potential aesthetic impacts and mitigations to residences is discussed in **Section 5.2.1**.

5.2.4. Environmental Justice

Environmental Justice (EJ) refers to the fair treatment and meaningful involvement of communities of color, Indigenous communities, and low-income communities, to the enjoyment of a healthy environment and to fair treatment with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.[21] 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.

The MPCA maintains the Minnesota Areas of Environmental Justice Concern interactive map, which identifies areas of EJ concern within the State of Minnesota.[22] 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 percent of people reported income of less than 200 percent of the federal poverty level, 40 percent or more people of color, federally

[21] MPCA. N.d. Environmental Justice. Online [URL]: https://www.pca.state.mn.us/about-mpca/environmental-justice. Accessed on September 10, 2024.

[22] MPCA. 2021. Understanding environmental justice in Minnesota. Online [URL]: https://mpca.maps.arcgis.com/apps/MapSeries/index.html?appid=f5bf57c8dac24404b7f8ef1717f57d00#mapAccessed on September 10, 2024.

recognized Indian tribes, and at least 40 percent of people have limited English proficiency.[23]

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 2022, an individual in the U.S. was considered to be in poverty with an income of $14,880 or less, according to the 2022 Poverty Threshold Data Table[24], therefore, 200 percent of the poverty level would be calculated at $29,760 per person.

In addition to the screening criteria put forth by the MPCA, Otter Tail used the USEPA's Environmental Justice Screening and Mapping Tool (EJ Screen) to review the demographic socioeconomic and environmental information for the county and state. EJ Screen uses publicly available data from 2018–2022 to combine environmental and demographic indicators into EJ indexes including: 13 environmental indicators, 7 socioeconomic indicators, 13 EJ indexes, and 13 supplemental indexes. Results for the Census Block Group spanned by the Project Area (Census Tract 4501.02, Block Group 2) indicate that overall, 33 percent report low income, 14 percent are people of color, there are no federally recognized tribes, and 0 percent of households have limited English proficiency. Compared to the state, most environmental and socioeconomic indicators are similar with a few exceptions where the state values are considerably higher such as toxic releases to air and traffic proximity (**Appendix L**).

Based on the MPCA EJ criteria, the Project is not within any MPCA-identified EJ areas of concern for as shown in **Table 8**.

[23] Minn. Stat. § 216B.1691, subd. 1(e) defines an "environmental justice area" as an area in Minnesota that, based on the most recent data published by the U.S. Census Bureau meets one or more of the following criteria: (1) 40 percent or more of the area's total population is nonwhite; (2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level; (3) 40 percent or more of residents over the age of 5 have limited English proficiency; or (4) the area is located within Indian country, as defined in United States Code, title 18, section 1151.

[24] U.S. Census Bureau. 2022. Poverty Thresholds for 2022 by Size of Family and Number of Related Children Under 18 Years. Online [URL]: https://www.census.gov/data/tables/2023/demo/income-poverty/p60-280.html. Accessed on September 10, 2024.

Table 8. Environmental Justice Areas of Concern Within the Project Area

MPCA EJ Criteria	Project Area Values for 2022[1]	MPCA Environmental Justice Area (Yes/No)[2]
At least 35 percent of people reported income less than 200 percent of the federal poverty level	31.7% ± 0.07%	No
40 percent or more people of color	14.2% ± 0.07%	No
Federally recognized Indian Tribes	N/A	No
At least 40 percent of people have limited English proficiency	0% ±1.1%	No

[1] The most recent U.S. Census Data was published in 2022
[2] The margin of error is accounted for in determining environmental justice areas of concern. For example, if a census tract has an estimated population of 36 percent people of color with a 5 percent margin of error, then the MPCA would count that census tract as an environmental justice area of concern.
Sources: U.S. Census Bureau. 2022. American Community Survey Table C17002, B03002, S1602. Online [URL]: https://data.census.gov/

Combined, the environmental justice screening criteria put forth by the MPCA and the data embedded in the EJ Screen report in **Appendix L** indicate there are no environmental justice communities within or adjacent to the Project Area.

Section 5.2.11 (Socioeconomics) summarizes population, race, housing, income, and poverty for the township, county, and state levels.

5.2.4.1. Impacts and Mitigation

No measures to mitigate environmental justice impacts are needed because the Project is not within an EJ area of concern and there is no indication that any minority or low-income population is concentrated within or adjacent to the Project Area. Therefore, disproportionate impacts on EJ areas of concern are not anticipated.

In an effort to prioritize environmental justice, Otter Tail has reached out to the site's neighbors and the local community to ensure community impacts are considered. Additionally, this Project furthers the transition from fossil fuels to renewable energy sources with far less pollution and impact to the environment.

5.2.5. Public Health and Safety

Public health and safety issues during construction and operations include unauthorized entry to the Project, risks from existing potential sources of contamination, risks associated with the use and disposal of hazardous materials, and worker injuries due to falls, equipment use, and electrocution.

As mentioned in **Section 4.1.8** (Access Roads/Transportation System), the access points to the Project from existing county roads/new access roads will have locked gates to prevent unauthorized entry.

A Phase I Environmental Site Assessment (Phase I ESA) was conducted within the Project Area for indications of current and historical recognized environmental conditions. The Phase I ESA identified a "suspected landing strip and associated aircraft hangar, and an electric utility peaking plant." Otter Tail subsequently determined the airstrip is outside the Project Area. The Phase I ESA also states that there is no "evidence of controlled recognized environmental conditions or historical recognized environmental conditions" with the Project Area. The Phase I ESA recommends factoring into the design of the Project the natural gas pipeline that runs through the Project Area. Otter Tail considered the presence of the natural gas pipeline in the Project design. Otter Tail also plans to complete a subsurface investigation as recommended in the Phase I ESA.

5.2.5.1. Impacts and Mitigation

Construction and operation of the Project will have minimal impacts on the health and safety of the general public. As described in **Section 4.1.5** (Security Fencing and Lighting), perimeter fencing will be installed around the solar arrays, Project Substation, and O&M building; and each access road will have lockable gates to prevent unauthorized access to the Project facilities. Only authorized personnel will be allowed entry. Signs will be posted to warn unauthorized persons not to enter fenced areas. Additionally, signage at the Project Substation will warn of high voltage equipment. These precautions should prevent accidental electrocution from happening to someone who may have otherwise unintentionally wandered onto the site. All equipment, tools, and substances that will be used for the Project will be properly stored, maintained, and monitored.

Grounding of electrical equipment, lines, and other applicable infrastructure will be completed to federal and state standards. Inspection of grounding will be done prior to operation. Any changes or failures in grounding electrical infrastructure will be identified through the Project's active monitoring system.

Health and safety concerns that may occur during construction can include injuries due to falls, equipment malfunction and/or misuse, and electrocution. To prevent health and safety incidents, Otter Tail 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). Workers

will have, or be provided, proper training to successfully complete required construction activities while reducing risks associated with it.

During operations, the Project 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. To avoid potential impacts to water and soil resources, all hazardous materials stored outdoors will be stored within secondary containment. Secondary containment will prevent impacts and will contain leaks in the event that they occur.

An SPCC Plan will be required for the main power transformers located in the Project Substation, as well as for oil-filled operational equipment (inverter/transformer) or oil storage at the O&M building. The SPCC Plan will detail the appropriate storage, cleanup, and disposal of oil products associated with the Project. The transformers will be properly contained per USEPA requirements. Any monitoring, transportation, or handling of materials will be conducted by trained and qualified personnel utilizing established procedures and proper equipment and in accordance with applicable laws. The SPCC will be kept on-site during construction and will meet all USEPA requirements. The SPCC, because of its specificity, will be completed prior to construction. An additional SPCC Plan will also likely be needed for the operational phase of the Project.

Otter Tail will coordinate with all emergency and non-emergency response teams for the Project, as needed. Emergency services for responding to public health and safety emergencies are further described in **Section 5.2.8.2** (Emergency Services).

5.2.6. EMF

EMF are present around any electrical device. Electric fields arise from the voltage or electrical charges while 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. The general consensus is that electric fields pose little to no health risk to humans. [25]

The sources of EMF related to the Project include electrical collection lines and the transformers installed at each inverter. EMF from electrical collection lines and

[25] NIEHS, 2002. Electric and Magnetic Fields Associated with the Use of Electric Power. Online [URL]: https://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf. Accessed September 10, 2024.

transformers dissipates rapidly with distance from the source.[26] Generally speaking, higher voltage electrical lines produce higher levels of EMF at the source before dissipating with distance. There are presently no Minnesota regulations pertaining to magnetic field exposure. The internationally accepted guideline for the general public exposed magnetic fields is 833 milliGauss (mG).[27] There also is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV per meter (kV/m) measured at one meter (3.28 feet) above the ground.[28] The standard was designed to prevent serious hazards from shocks when touching large objects parked under AC transmission lines of 500 kV or greater.

The National Institute of Environmental Health Sciences (NIEHS) provides typical EMF levels for varying voltage transmission lines as measured at 1 meter above ground. For a 115 kV overhead transmission line, typical electrical fields were reported at 1.0 kV/m directly below the line before dissipating to 0.1 kV/m at 100 feet. In addition, the average magnetic fields directly below a 115 kV transmission line were calculated at 29.7 mG before dissipating to 1.7 mG at 100 feet.[29] Based on the NIEHS study, measurements of typical electrical fields were found to be well below the Commission's maximum electric field limit of 8 kV/m measured at 1 meter above the ground.

5.2.6.1. Impacts and Mitigation

The solar project is not expected to cause electrical interference from electrical and magnetic fields on nearby residences. The nearest residence to inverter equipment is about 900 feet and nearest residence to medium voltage (34.5 kV) electrical collection

[26] NIEHS. 2022. Electric and Magnetic Fields. Online [URL]: https://www.niehs.nih.gov/health/topics/agents/emf/index.cfm. Accessed September 10, 2022.

[27] NIEHS, 2002. Electric and Magnetic Fields Associated with the Use of Electric Power. Online [URL]: https://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf. Accessed September 10, 2024.

[28] In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (adopting Administrative Law Judge Findings of Fact, Conclusions and Recommendation at Finding 194 [April 22, 2010 and amended April 30, 2010]) (September 14, 2010).

[29] NIEHS, 2002. Electric and Magnetic Fields Associated with the Use of Electric Power. Online [URL]: https://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf. Accessed September 10, 2024.

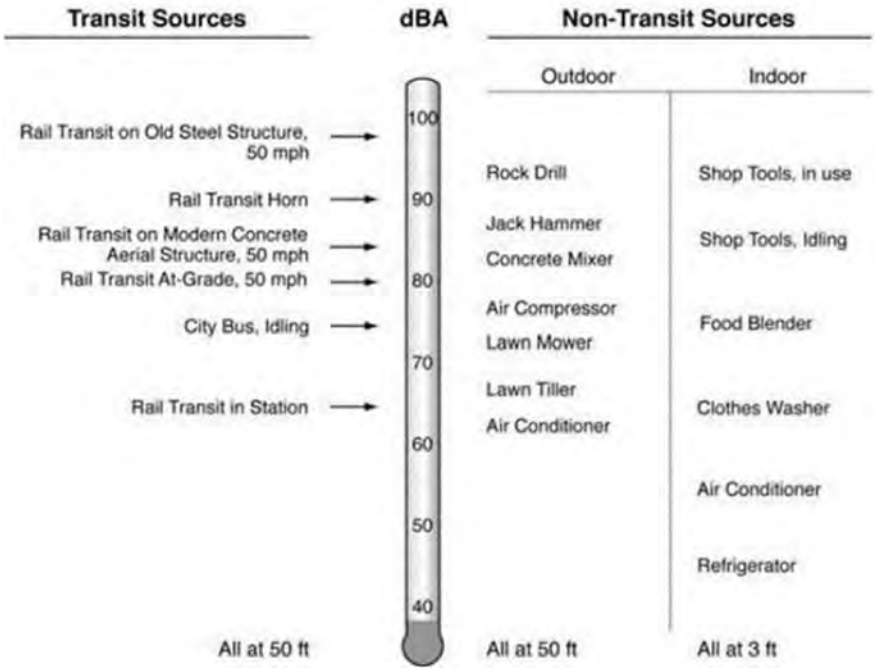
line is also about 900 feet. At this distance EMF will have dissipated to the background and no impacts from EMF on nearby residences are expected.

5.2.7. Noise

Noise is defined as sound that is considered unwanted or undesirable. Sound travels through the air as waves of tiny air pressure fluctuations that are caused by vibration. The intensity, or loudness, of a sound is determined by how much that sound pressure fluctuates, with greater fluctuations resulting in greater sound intensities. Sound pressure is described in terms of "levels" which are expressed in decibels (dB).

Most sounds consist of a broad range of sound frequencies, from low to high frequencies; however, the average human ear does not perceive all frequencies equally. Therefore, the A-weighting scale (dBA) was developed to approximate the way the human ear responds to sound levels. Mathematically, it applies less "weight" to frequencies that human beings do not hear well and applies more "weight" to frequencies that human beings do hear well. All noise levels presented herein are relative to 20 micro-pascals (10^{-6} pascals) and use the A-weighting scale. Typical A-weighted noise levels for various types of sound sources are summarized in **Figure 3**.

Figure 3. Common Sources of Noise and the Noise Levels Produced



Exposure to sound levels can have an impact on human hearing, with greater impact caused by exposure to greater levels, longer exposure, or both. The amount of time exposed to sound levels is of particular concern; however, noise is always changing and never stagnant. Because of this, it is challenging to estimate the exact amount of noise that is experienced during exposure. The equivalent average sound level (Leq) is a characteristic of noise that is often used to describe sound levels that vary over a chosen period of time, typically a one-hour period. The Leq is often described as a constant sound level, which when exposed to, has an equivalent effect to the exposure of an actual time-varying sound level over the specified period (one hour).

The MPCA has the authority to adopt noise standards pursuant to Minn. Stat. § 116.07, subd. 2. The adopted standards are set forth in Minn. R. ch. 7030. The MPCA standards require A weighted noise measurements. Different standards are specified for daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) hours. The noise standards specify the maximum allowable noise volumes that may not be exceeded for more than 10 percent of any hour (L_{10}) and 50 percent of any hour (L_{50}). Household units, including farmhouses, are included in Noise Area Classification 1. **Table 9** shows the MPCA state noise standards.

Table 9. State Noise Standards - Hourly A-Weighted Decibels

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

The noise sensitive locations surrounding the Project Area consist primarily of residential homes, which fall under the first Noise Area Classification (NAC 1) per Minn. R. 7030.0050, subp. 2 [1]. NAC 1 has the lowest noise limits of the three NACs, as this NAC represents land uses for when people are most sensitive to loud noises. These noise limits are expressed in the L_{50} and L_{10} metrics, which represent the sound level that is exceeded 50 percent, and 10 percent, of the duration of the measurement period, respectively. Otter Tail identified 33 noise sensitive receptors/areas (NSAs; residences) within 3,200 feet of the Project Area. The NSAs were initially identified using aerial imagery then field-verified to determine their occupancy status. The NSAs are categorized by distance from the Project Area as shown in **Table 10**. There are two residences located within 100 feet of the Project Area, and more than 30 residencies located within 3,200

feet. Noise receptors within 3,200 feet of the Project Area are shown on **Figure A-8** in **Appendix A**.

Table 10. NSA Distance Distribution

Distance from Project Area (feet)	# of NSAs
<50	0
50–100	2
100–200	2
200–400	8
400–800	3
800–1600	9
1600–3200	8

5.2.7.1. Impacts and Mitigation

A "noise impact" is defined as an occurrence where a noise receptor (in this case, a residency) experiences a noise level greater than what is allowed per the standards defined above via Minn. R. ch. 7030.

During construction, noise will be emitted by the construction vehicles and equipment. The amount of noise will vary based on what type of construction is occurring at the Project on a given day. Construction associated noise will likely be perceptible at adjacent residences (see **Section 5.2.7** and **Figure A-8** in **Appendix A** for locations). Grading equipment, skid steers, and other construction equipment are anticipated to emit noise between 76–85 dBA at 50 feet.[30] Noise associated with these types of equipment will primarily occur during the initial site set up – grading and access road construction which is expected to last approximately four weeks. Otter Tail anticipates pile driving of the rack supports to create the most noise measured at 101 dBA at 50 feet.[31] The driving of each pile normally takes only a few minutes to complete, and Otter Tail Power expects that this pile driving activity will take two to three months to complete in its entirety. Noise associated with pile driving will not be concentrated in the same location, but rather vary throughout the Project Area during that time, as each phase of construction is completed. This means that pile driving noise levels at the receptors are expected to

[30] U.S. Department of Transportation Federal Highway Administration (FHWA). 2017. Construction Noise Handbook. Online [URL]: https://www.fhwa.dot.gov/Environment/noise/construction_noise/handbook/handbook09.cfm. Accessed September 10, 2024.

[31] U.S. Department of Transportation Federal Highway Administration (FHWA). 2017. Construction Noise Handbook. Online [URL]: https://www.fhwa.dot.gov/Environment/noise/construction_noise/handbook/handbook09.cfm. Accessed September 10, 2024.

fluctuate throughout the construction of the Project, depending on where the pile driving activities are located.

Finally, installation of the solar panels on the tracking would emit noise levels similar to general construction equipment described above. Typically, a forklift is used to place individual panels on the tracking rack system. The noise from any of these construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. Note that construction activities will be sequenced; site preparation may occur at a portion of the site while pile driving occurs at a different location. As stated above, these noise impacts will be temporary and limited to daytime hours.

For solar power generation facilities, operations related noise is typically generated by three main noise sources: the tracking motors, the inverters, and the substation transformer.

Since this Project is in initial phases, design equipment is yet to be selected. On this basis, representative equipment from past projects is being included in this discussion, in lieu of project specific equipment. The representative inverters selected for this analysis are the SunGrow SG4400UD inverter. Reference substation transformer noise levels were estimated values for a typical 130 megavolt-amperes (MVA) transformer, referenced from previous project analyses. Tracking motors are small and move in discrete increments, meaning that they do not make continuous noise, and that the noise they do produce as they move is low in comparison to noise produced by other equipment. References from past projects show that typical tracking motors (NEXTracker, or similar) produce 70 dBA at one foot.

The main source of noise from the Project during operation will be the substation transformer, the inverters, and to a lesser extent the rotation of the tracking system. **Appendix M** summarizes the anticipated distance for project related noise to attenuate to the most stringent MPCA noise standard of 50 dBA L_{50} from the representative inverters, tracking motors, and a typical substation transformer to represent potential project related noise. Note that the 50 dBA MPCA limit is set forth in terms of the statistical L_{50}, which represents the sound pressure level exceeded for 50 percent of the time within a measurement period. In steady state operation, the L_{50} is equivalent to the sound power level (SPL). For the purposes of this discussion, it is assumed that project machinery will be functioning at steady state, and thus the SPL at 50 feet for each piece of equipment is assumed to be equivalent to the equipment specific L_{50}. **Appendix M**

also provides the source specific noise levels at 50 feet so noise levels can be calculated at greater distances.

The closest residence to any of the inverters is approximately 900 feet. **Appendix M** shows that the distance taken for inverter noise to attenuate to MPCA limit value of 50 dBA is less than the 900-foot distance of the nearest residence. As a result, the project related noise is not anticipated to cause adverse impacts at receivers in the vicinity.

The noise produced from construction and operation activities will attenuate with distance and the project noise levels at each residence will vary depending on the location of the equipment and receptor.

The measures below can be taken to mitigate potential noise impacts:

Construction Noise Mitigation

- Consider alternative construction methods that allows for the use of quieter equipment.
- Use quieter versions of equipment. Newer equipment is generally quieter than older equipment for a variety of reasons, including more advanced technology, and the lack of worn or damaged components.
- The type of engines and power transfer methods considerably influence how much noise a piece of equipment produces.
- Electric powered equipment is typically quieter than diesel, and hydraulic-powered equipment is quieter than pneumatic-power equipment.
- Use mufflers when possible. Most construction noise originates from internal combustion engines due to their air intake and exhaust cycles. Specifying the use of adequate muffler systems can help control engine noise.

Operational Noise Mitigation

- Locating inverters and the substation transformer further away from noise sensitive areas.
- Considering a quieter (lower noise emission) inverter/project equipment.

5.2.8. Public Service and Infrastructure

Public services are those typically provided by a government entity to its citizens and those services are used to benefit public health and safety. Public services include existing roadways, emergency services, local and regional utilities, public and emergency communications, and regional landfills, as shown on **Figure A-3** in **Appendix A** and discussed in the sections below.

5.2.8.1. Transportation

The Project Area will span two existing roadways, Centerline Rd NW for approximately 0.73 miles and Herman Dr NW for 0.04 miles. Additionally, the Project will border and share rights-of-way with Thoren Dr NW and Lammers Road NW. A review of the Beltrami County Transportation Improvement Plan did not indicate any roadway improvement projects are planned in the Project Area.[32]

As aircraft maneuver near airports, tall structures can pose hazards to aircraft if the structures encroach into airspace. Federal Aviation Regulation Part 77 and Minn. Stat. § 8800.1200 establish criteria defining heights for any structures that could endanger aircraft, which includes structures exceeding 200 feet above ground level within 3.78 miles of a public use or military airport that has at least one airstrip more than 3,200 feet long. The closest airport, Bemidji Regional Airport, is approximately 12.3 miles southeast of the Project Area. This airport has two runways and is located at an elevation of 1384 feet.[33] There is one private airstrip along the north side of the Project Area – approximately 300 feet outside the boundary – which is also mentioned in the Phase I ESA. Based on the low overall height of the solar panels and that the Project will not impart any solar glint or glare impacts to surrounding aircraft, there are no impacts expected from the solar farm to this private airstrip.

Aerial crop dusting, which involves the application of pesticides, herbicides or fertilizers by use of specialized aircraft, is an important part of agricultural operations in Minnesota. Aerial crop dusting may occur along fields surrounding the Project Area. Aircraft used in aerial crop dusting may utilize airstrips surrounding the Project Area.

[32] Beltrami County. 2024. Beltrami County, Transportation Improvement Plan. Online [URL]: https://www.co.beltrami.mn.us/media/mogpfexc/transportation-improvement-plan-2023.pdf. Accessed September 10, 2024.

[33] Bemidji Regional Airport. 2020. Airport Diagram. Online [URL]: https://www.bemidjiairport.org/generalaviation. Accessed September 10, 2024.

5.2.8.2. Emergency Services

Emergency services in the area of the Project are provided by local emergency service personnel and law enforcement located in nearby communities. Fire departments respond to fires, emergency medical services supply emergency patient transport and medical care, and county and local police and sheriff departments administer law enforcement. Most law enforcement surrounding the Project Area is centered around urban settings such as Bemidji, Minnesota where higher human populations and crime are typically concentrated.

If emergency personnel were needed at the Project, multiple agencies would likely respond, depending on the situation. These include the Beltrami County Sheriff's Office and city and community fire departments. The cities of Solway and Shevlin, have volunteer fire departments located 1.55 miles south and 5.56 miles west of the Project Area. The Bemidji fire department is located 12.3 miles southeast of the Project Area. [34]

General ambulance services in the area of the Project are provided by Bemidji Ambulance Service Incorporated in Bemidji.[35] Combined fire and ambulance services are provided by the Solway Fire Department, Shevlin Fire Department, and the Bemidji Fire Department. The North Memorial Air Care Station provides emergency helicopter transport for patients in areas surrounding the Bemidji Regional Airport. Emergency medical response is also available from the Sanford Bemidji Medical Center in Bemidji.[36]

5.2.8.3. Local Utilities

Local utilities include utilities that would service or directly span the area of the Project. Electric utilities in the Project Area are provided by Beltrami Electric Coop, Inc.[37] There is one utility gas pipeline owned by the Great Lakes Gas Transmission Company that spans the Project Area northwest to southeast.

[34] County Office. 2024. Fire Departments in Beltrami County, Minnesota. Online [URL]: https://www.countyoffice.org/mn-beltrami-county-fire-departments/. Accessed September 10, 2024.

[35] USGS. 2024. Fire and Emergency Medical Service (EMS) Stations. Online [URL]: https://hub.arcgis.com/datasets/geoplatform::fire-and-emergency-medical-service-ems-stations/about. Accessed September 10, 2024.

[36] MDH. 2020. Hospitals Serving Minnesota, 2020. Online [URL]: https://hub.arcgis.com/datasets/geoplatform::fire-and-emergency-medical-service-ems-stations/about. Accessed September 10, 2024.

[37] MPUC. 2014. Electric Service Area Map. Online [URL]: https://mn.gov/puc/activities/maps/. Accessed September 10, 2024.

5.2.8.4. Regional Utilities

Regional utilities include utilities that service or span Beltrami County. Electric utilities that service Beltrami County include Otter Tail Power Company, Clearwater Polk Electric Coop, Beltrami Electric Coop, Inc., North Itasca Electric Coop, North Star Electric Coop, Roseau Electric Coop, and Red Lake Electric Coop.[38]

5.2.8.5. Public Communications

The are no cellular phone towers located within the Project Area. There are 18 registered cellular phone towers in the general vicinity of the Project (ten miles of the Project Area).

GPS technology uses satellites to provide precise location information across the surface of the earth, functioning independently of internet or telephone operation. GPS applications are used by a range of industries and public sectors including agriculture, aviation, defense, education, GIS services, and public recreation. GPS technology is likely used throughout areas surrounding the Project.

5.2.8.6. Emergency Communications

Allied Radio Matrix for Emergency Response (ARMER) towers are a network of radio towers and radio transmission equipment used for emergency response services throughout the state of Minnesota.[39] The city of Bemidji has two active ARMER towers (Bemidji West, Bemidji Fire Tower) within 15 miles of the Project Area.

5.2.8.7. Regional Landfill

The Applicant reviewed the MPCA What's in My Neighborhood dataset and queried 13 active solid waste facilities and closed landfill sites within Beltrami County, as shown in **Table 11**.

[38] MPUC. 2014. Electric Service Area Map. Online [URL]: https://mn.gov/puc/activities/maps/. Accessed September 10, 2024.

[39] MDH. 2022. ARMER Radio System. Online [URL]: https://www.health.state.mn.us/communities/ep/taccomm/armerradio.html. Accessed September 10, 2024.

Table 11. Solid Waste and Closed Landfill Sites Within Beltrami County

Facility Type	Site Name	City
Permitted Solid Waste Facility	Beltrami County - Blackduck Transfer Station	Blackduck
Permitted Solid Waste Facility	Beltrami County Demolition Landfill	Bemidji
Permitted Solid Waste Facility	Beltrami County Transfer Station	Bemidji
Permitted Solid Waste Facility	Bemidji Transfer Station	Bemidji
Permitted Solid Waste Facility	Bemidji city of	Bemidji
Permitted Solid Waste Facility	Magnuson Trucking Transfer Facility	Bemidji
Permit by Rule	TC Lighting Supplies & Recycling Inc	Bemidji
Utilization Projects	Bemidji city of	Bemidji
Utilization Projects	West Fraser US EWP - Bemidji	Solway
Closed Landfill Privately Managed	Beltrami County Transfer Station	Bemidji
Closed Landfill Privately Managed	Bemidji Demolition Landfill	Bemidji
Closed Landfill Privately Managed	Magnuson Trucking Transfer Facility	Bemidji

5.2.8.8. Impacts and Mitigation

The Applicant will coordinate with local emergency services to ensure that emergency access to areas near construction activities is maintained and will contact utility providers, businesses, or residents near the construction area to notify of potential impacts and prevent damage to public utilities. A list of emergency contact information will be made available to all construction contractors and posted in an easily accessible location during construction and operation.

Solar facilities will not be placed within surrounding roadways but impacts or upgrades may occur to support final design and construction as driveways are placed on public roads, roadways are improved, electric facilities are placed within roadway rights-of-way, or equipment is moved along public roads throughout construction. The Applicant will obtain necessary permits from road authorities relating to road access, placement of electric facilities within roadway rights-of-way, and transportation of equipment along roadways. If new driveways are placed along public roads, an access permit will be obtained from Beltrami County prior to construction.

Increased traffic may be perceptible to area residents during construction, 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. However, these delays should be minimal for the relatively short construction delivery period.

As there are no FAA-registered airports or airstrips within 20,000 feet (3.78 miles) of the proposed Project, the Project will not impart any solar glint or glare impacts to surrounding aircraft. Therefore, no mitigation concerning airports is proposed.

Damage to utility pipelines or water lines are not expected to occur during ground disturbing activities, as solar facilities will be designed to avoid the existing ROW of underground utilities. The Applicant will notify Gopher State One-Call of all proposed excavations to ensure that underground utilities will not be impacted throughout construction. If a pipeline or water line must be spanned during construction of the Project, the Applicant will use soil preserving BMPs such as construction matting over underground utilities when using heavy equipment.

The Applicant will regularly remove waste throughout construction of the proposed Project. Paper, plastic, petroleum, and other waste products will be gathered and disposed of appropriately at surrounding waste disposal facilities.

5.2.9. Land use and Zoning

The Applicant evaluated zoning information, including the most recent comprehensive plans and zoning maps, to assess: current zoning; allowable land uses for current zoning; determination of use by right, Conditional Use, or Special Use criteria and processes; zoning constraints and necessity of conversion; and compatibility for future use with adjacent properties for the Project Area.

5.2.9.1. Land Use

The 2021 National Land Cover Database maintained by the United States Geological Survey (USGS) was reviewed to identify existing land cover and uses within the Project Area.[40] A total of 14 land cover types were mapped in the Project Area, as shown on **Figure A-6** in **Appendix A**.

The dominant land cover within the Project Area is deciduous forest making up 38.6 percent of the Project Area and 18 percent of the Project Footprint. Pasture is the dominant land cover in the Project Footprint, making up 36.3 percent of the Project Area and 53.3 percent of the Project Footprint. Agricultural land (cultivated crops) makes up

[40] United States Geological Survey. 2021. National Land Cover Database. Earth Resources Observation and Science Center. Online [URL]: https://www.usgs.gov/centers/eros/science/national-land-cover-database. Accessed September 10, 2024.

11.9 percent of the Project Area and 25 percent of the Project Footprint. Typical crops grown in the region of the Project (Beltrami County) include soybeans, hay, alfalfa, and corn. Other land cover types greater than 1 percent in the Project Area or Project Footprint include developed (low intensity, open space), shrub/scrub, and grassland/herbaceous. See **Tables 12 and 13** for a complete breakdown of land cover acreages within the general Project Area and Project Footprint.

Table 12. Land Cover Types in the Project Area

Land Cover Type	Acres in Project Area	Percent of Project Area
Developed, Open Space	15.74	3.23
Developed, Low Intensity	6.2	1.27
Developed, Medium Intensity	1.17	0.24
Developed High Intensity	0.35	0.07
Barren Land (Rock/Sand/Clay)	4.78	0.98
Deciduous Forest	188.5	38.63
Mixed Forest	1.77	0.36
Shrub/Scrub	23.92	4.90
Grassland/Herbaceous	6.63	1.36
Pasture/Hay	176.97	36.27
Cultivated Crops	57.88	11.86
Woody Wetland	1.76	0.36
Emergent Herbaceous Wetlands	2.31	0.47

Table 13. Land Cover Types in the Project Footprint

Land Cover Type	Project Component	Land Area (Acres)	Percent of Project Footprint
Permanent Impacts			
Barren Land (Rock/Sand/Clay)	Substation, Gas Line	0.46	0.17
Cultivated Crops	Array, Fenceline	46.93	17.60
Deciduous Forest	Array, Fenceline	80.18	30.06
Developed, Low Intensity	Fenceline	0.09	0.03
Developed, Open Space	Array, Fenceline, Substation	1.32	0.49
Grassland/Herbaceous	Array, Fenceline, Substation	4.92	1.84
Mixed Forest	Array, Fenceline	0.73	0.27
Pasture/Hay	Array, Fenceline, Substation, Gas Line	122.52	45.94
Shrub/Scrub	Array, Fenceline	9.56	3.58
TOTAL PERMANENT IMPACTS		266.70	100.00
Temporary Impacts*			
Pasture/Hay	Laydown yard	2.35	N/A
TOTAL TEMPORARY IMPACTS		2.35	N/A

*Temporary impacts outside of Project Footprint.

5.2.9.2. Zoning

According to the Beltrami County Parcel Map[41], the Project Area is zoned 2A/1B/4BB Agricultural, 2B/1B Rural Vacant Land, and 3A U/P Land and Building. The Project Area does not contain any areas zoned for special protection (i.e., shoreland). A summary of parcels and zoning information is provided below in **Table 14**.

[41] Beltrami County. 2024. Geographic Information Systems (GIS): Property Mapping. Online [URL]: https://www.co.beltrami.mn.us/departments/gis/. Accessed September 10, 2024.

Table 14. Project Zoning and Parcel Information

Owner	FIPS Pin	Zoning ID	Parcel Acres
OTTER TAIL POWER COMPANY	27007-230017100	2A/1B/4BB AGRICULTURAL	6.46
OTTER TAIL POWER COMPANY	27007-230017101	3A U/P LAND AND BUILDING	33.47
OTTER TAIL POWER COMPANY	27007-230016800	3A U/P LAND AND BUILDING	60.52
OTTER TAIL POWER COMPANY	27007-230016900	2A/1B/4BB AGRICULTURAL	39.76
OTTER TAIL POWER COMPANY	27007-230017000	2A/1B/4BB AGRICULTURAL	39.63
OTTER TAIL POWER COMPANY	27007-230016600	2A/1B/4BB AGRICULTURAL	40.76
OTTER TAIL POWER COMPANY	27007-230016700	2B/1B RURAL VACANT LAND	41.06
OTTER TAIL POWER COMPANY	27007-230016200	2A/1B/4BB AGRICULTURAL, 2B/1B RURAL VACANT LAND	59.63
OTTER TAIL POWER COMPANY	27007-230016500	2A/1B/4BB AGRICULTURAL	82.72
OTTER TAIL POWER COMPANY	27007-230016400	2A/1B/4BB AGRICULTURAL	83.25

5.2.9.3. Comprehensive Plans

Beltrami County has one comprehensive plan, the Beltrami County Forest Management Plan, that concerns land use and land improvements in the County.[42] A review of the 2018 Beltrami County Forest Management plan shows that Beltrami County is not currently planning improvements or managing forest in the area of the Project or within two miles of the Project Area. Forestry within Beltrami County is detailed in **Section 5.3.2**. The Project is not anticipated to negatively impact forestry management within Beltrami County, and therefore there should be no land use conflicts in the Project Area.

5.2.9.4. Local Ordinances

The Beltrami County Ordinances do not presently outline standards for large solar farms or solar facilities, but conditional use permits are required for other renewable energy facilities such as small Wind Energy Conversion Systems.[43]

[42] Beltrami County. 2018. Beltrami County Forest Management Plan. Online [URL]: https://www.co.beltrami.mn.us/media/1pcenblj/forest-management-plan.pdf. Accessed September 10, 2024.

[43] Beltrami County. 2024. Ordinances. Online [URL]: https://www.co.beltrami.mn.us/business-development/ordinances/. Accessed September 10, 2024.

5.2.9.5. Impacts and Mitigation

All acres within the Project Area could be impacted by the proposed Project, either on a temporary or permanent basis. The Project will not impact any areas zoned for special protection. The Applicant will coordinate with Beltrami County officials to obtain all permits necessary for approval of the proposed Project, if any.

5.2.10. Public Lands and Recreation

Beltrami County has various recreational opportunities that support activities such as hiking, hunting, fishing, boating, snowmobiling, birdwatching, golfing, and archery. Beltrami County also provides opportunities to explore parks, nature centers, and museums. There are multiple recreational lakes present within Beltrami County which include, but are not limited to, Lake Bemidji, Upper Red Lake, and Lower Red Lake.

Information from the MNDNR and Beltrami County website was reviewed to identify recreational resources and public lands within and near the Project Area.[44] [45] Public lands in Beltrami County that may be used for recreational activities include WMAs, Aquatic Management Areas (AMAs), Scientific and Natural Areas (SNAs), state forests, municipal or state parks and trails, and national forests.

The nearest recreational resource to the Project Area is Red Trail, a horse trail associated with Grant Creek Horse Camp that spans land between the cities of Scribner and Pinewood and is approximately 1.1 miles northeast of the Project Area.[46] The nearest parcel of public land that may be used for recreational activities is the Mississippi Headwaters State Forest, located 2.1 miles to the northeast of the Project Area (**Figure A-9** in **Appendix A**).

5.2.10.1. Impacts and Mitigation

The Project Area is located over 1 mile from the nearest public land or recreational resource; therefore, no impacts are anticipated, and no mitigation is proposed.

5.2.11. Socioeconomics

The area of study for the socioeconomic analysis includes the State of Minnesota, the county of Beltrami, and the cities of Bemidji and Solway. U.S. Census data was

[44] MNDNR. 2024. Minnesota Conservation Explorer. Online [URL]: https://mce.dnr.state.mn.us/content/explore. Accessed September 10, 2024.

[45] Beltrami County. 2024. Parks & Recreation. Online [URL]: https://www.co.beltrami.mn.us/living-here/parks-recreation/. Accessed September 10, 2024.

[46] Beltrami County. 2024. Grant Creek Horse Camp. Online [URL]: https://www.co.beltrami.mn.us/living-here/parks-recreation/grant-creek-horse-camp/. Accessed September 10, 2024.

obtained from the 2010 and 2020 census at the state, county, and city levels to characterize the Project area.[47] These datasets were compared to county and state data, as demonstrated in **Table 15**.

Table 15. Socioeconomic Data for the Area of the Project

Location	2010 Population	2020 Population	Population Change (%)	2020 Median Household Income	2020 Unemployment Rate	2020 Largest Employment Industry
State of Minnesota	5,241,914	5,707,390	6.83	$73,382	3.80%	Manufacturing, Health Care, Retail
Beltrami County	44,442	46,228	4.01	$50,525	6.10%	Health Care and Social Assistance
Bemidji City	13,431	14,574	8.5	$36,250	4.90%	Educational Services, Health Care, and Social Assistance.
Solway City	96	73	-23.9	$65,625	0%	Manufacturing

Beltrami County is a relatively rural county with a lower positive growth rate than the State of Minnesota. The largest population center in Beltrami County is Bemidji, which is growing at a higher rate than the county. The Project Area is 12.5 miles northwest of Bemidji and 1.6 miles north of the City of Solway. Solway is a sparsely populated rural town. Unemployment in Beltrami County is generally higher than that of the State of Minnesota. Healthcare, Social Assistance, and Educational Services are the largest employers in the region (**Table 15**).

5.2.11.1. Impacts and Mitigation

The construction and operation of the Project is expected to have minimal long-term impacts on local (county and municipal) economies due to the relatively short-term time frame of construction. Construction of the Project will last approximately 12 to 14 months and will employ 70 to 80 construction workers at peak. The Applicant will pay prevailing wages for applicable construction jobs in the Project area. The Project will support multiple employment sectors (i.e., utilities, construction, manufacturing) and provide employment opportunities during the duration of construction and operation. During construction, local businesses may experience increases in revenue due to increased purchase of goods and services. Local construction crew expenditures will result in temporary, positive impacts on local economies.

Long-term benefits of the Project include ensuring continued, reliable electric service for communities serviced by the Project and economic benefits through

[47] U.S. Census Bureau. 2010, 2020. Online [URL]: https://www.census.gov/. Accessed September 10, 2024.

incremental increases in revenues from utility property taxes. Additionally, the Project will support increases in renewable energy production and enhance the capacity for the energy industry (including the Applicant) to accommodate growing communities, which will benefit local economies.

5.3. Land-Based Economies

This section describes land-based economies at a county level and summarizes the potential impacts the Project would have on land-based economies. Construction and operation of the Project has the potential to affect Beltrami County and associated municipalities through physical, long-term presence, which could prevent or otherwise limit use of the land for other purposes. The following subsections present an overview of agricultural, forestry, tourism, and mining operations in the vicinity of the Project Area and discusses how the Project may affect these economies and what measures the Applicant will implement to mitigate Project effects.

5.3.1. Agriculture

The United States Department of Agriculture assesses agricultural economy statistics at a county wide level. In 2017, the average farm size in Beltrami County was 289 acres which is smaller than the 371-acre statewide average.[48] Crop sales account for about 56 percent of agricultural sales compared to 44 percent of Livestock sales in the county. See **Table 16** below.

Table 16. Agricultural Statistics for the Area of the Project

Location	Number of Farms	Average Farm Size (Acres)	Total Land in Farm Operation (Acres)	Crop Sales	Livestock Sales
Minnesota	68,822	371	25.5 million	$10 billion (55%)	$8 billion (45%)
Beltrami	583	289	168,667	13 million (56%)	10.5 million (44%)

5.3.1.1. Impacts and Mitigation

The Project Area includes 221.8 acres of farmland of statewide importance and prime farmland if drained, which may be temporarily or permanently impacted by construction of the proposed Project. The Project Area also includes approximately 225 acres of active farmland. Temporary construction impacts on farmland of statewide importance, prime farmland if drained, and agricultural land could include soil compaction and rutting, accelerated soil erosion, crop disturbance, disruption to normal

[48] United States Department of Agriculture. 2017. Census of Agriculture: Beltrami County. Online [URL]: https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Minnesota/cp27007.pdf. Accessed September 10, 2024.

farming activities, and introduction of noxious weeds. Prime farmland and farmland of statewide importance within the Project Area is shown on **Figure A-7** in **Appendix A**.

The Applicant will implement measures to reduce compaction, soil erosion, and sedimentation and will compensate producers for crop or livestock loss or damage. Post-construction restoration efforts will include restoration of any temporary access modifications and deep plowing to remove compaction. Both crop and livestock activities will be able to continue around Project structures and facilities after construction.

The Applicant will implement an AIMP, which will discuss impacts and mitigation for construction activities on agricultural land. The Applicant will also implement a VMP to reduce impacts agriculture, as appropriate. (See **Appendix I**). As a result of mitigation as described in the referenced plans, impacts are not likely to be significant.

5.3.2. Forestry

Forestry is an important part of the Beltrami County economy. Timber sales are tracked by the county; as of April 2024, 11,961 cords of wood had been sold for a total of $466,118 in Beltrami County. [49]

The Project is located in Beltrami County Forest District 1, which includes the townships of Buzzle, Lammers, and Jones. A review of the 2018 Beltrami County Forest Management Plan shows that the County of Beltrami is not managing forest in the area of the Project or within two miles of the Project Area.[50] The Project is not located within any active timber sale tracts.[51]

5.3.2.1. Impacts and Mitigation

Since there are no known commercial forestry operations in the vicinity of the Project, there are no anticipated impacts to commercial forestry operations from the construction and operation of the Project. Impacts on forested areas within the Project Area would be reduced by minimizing the tree clearing to the extent feasible; however, tall-growing vegetation within the Project Area must be cleared to support placement of solar facilities. All timber cleared during construction would be moved outside of the

[49] Beltrami County. 2024. Timber Auction Results - April 2 and 4, 2024. Online [URL]: https://www.co.beltrami.mn.us/media/lb2a2poq/april-auction-results.pdf. Accessed September 10, 2024.

[50] Beltrami County. 2018. Beltrami County Forest Management Plan. Online [URL]: https://www.co.beltrami.mn.us/media/1pcenblj/forest-management-plan.pdf. Accessed September 10, 2024.

[51] Beltrami County. 2024. Timber Sales. Online [URL]: https://www.co.beltrami.mn.us/business-development/timber-sales/. Accessed September 10, 2024.

Project Area and disposed of appropriately prior to final operation of the proposed Project.

5.3.3. Mining

Mining is not a prevalent industry in Beltrami County.[52] A review of Mine Safety and Health Administration (MSHA) Mine Data Retrieval System found that all mines in Beltrami County are surface mines for construction sand and gravel (aggregate source). According to MSHA there are 37 aggregate sources in Beltrami County, 19 of these mines are intermittent and 18 are abandoned.[53] None of these mines are within two miles of the Project Area.

5.3.3.1. Impacts and Mitigation

Since there are no known mining operations in the vicinity of the Project, there are no anticipated impacts to mining from the construction and operation of the Project; therefore, no mitigation is proposed.

5.3.4. Tourism

Tourism in Beltrami County is centered around outdoor recreational activities as described in **Section 5.2.10**, local community festivals such as the Beltrami County Fair in Bemidji[54], and leisure and hospitality industries such as local restaurants and resorts. The 2020 Minnesota Department of Revenue's (MDR) Tourism Economic Impact Fact Sheet listed Beltrami County as having gross tourism sales of $124,161,005, state tourism sales of $6,402,368, and 1900 individuals employed in the tourism industry.[55] The Project is located over one mile from surrounding recreational resources (see **Section 5.2.9**).

5.3.4.1. Impacts and Mitigation

The Project is located on private land and is over one mile from known recreational resources; therefore, significant impacts to tourism and recreational resources are not anticipated, and no mitigation is proposed.

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[52] United States Census Bureau. 2024. Beltrami County. Online. [URL]: https://data.census.gov/. Accessed August 19, 2024.

[53] Mine Safety and Health Administration. 2024. Mine Data Retrieval System. Online [URL]: https://www.msha.gov/data-and-reports/mine-data-retrieval-system. Accessed August 19, 2024.

[54] Beltrami County. 2023. Beltrami County Fair. Online [URL]: https://beltramicountyfair.org/. Accessed September 10, 2024.

[55] MDR. 2020. Tourism's Economic Impact of Minnesota: 2020 Tourism Facts by County. Online [URL]: https://mn.gov/tourism-industry/assets/22_FactSheet_tcm1135-518462.pdf. Accessed September 10, 2024.

5.4. Archeological and Historical Resources

In July of 2024, HDR staff conducted a Phase Ia Cultural Resources Literature Review and Assessment using the Minnesota Statewide Historic Inventory Portal records maintained by the SHPO and the Minnesota Office of the State Archeologist (OSA) online portal to identify known Precontact and Post-Contact archaeological sites, as well as architectural properties that have been previously inventoried within the Study Area, as presented in **Appendix N**. The National Park Service's online National Register of Historic Places (NRHP) information was reviewed to confirm if NRHP Listed Historic Properties or National Historic Landmarks are present within the Study Area. All work was conducted in accordance with the SHPO Manual for Archaeological Projects in Minnesota[56], Historic and Architectural Survey Manual[57], the State Archaeologist's Manual for Archaeological Projects in Minnesota[58], and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation [48 Federal Register 44716–44740].[59]

5.4.1. Phase Ia Literature Review and Archaeological Assessment

No previously recorded archaeological sites, previously inventoried historical cemeteries or architectural properties, or National Historic Landmarks, or Locally Designated historic properties were identified within the Study Area. A Phase I Archaeological Survey is planned for the Project Area in October of 2024.

Based on elevation and prehistoric hydrology data reviewed during the archaeological assessment, there is reasonable potential to encounter yet unrecorded Pre-Contact Archaeological Sites. A Phase I Archaeological Survey is planned to be completed in October of 2024 for the areas identified as possessing high archaeological potential.

5.4.2. Impacts and Mitigation

Considering no previously recorded archaeological resources are located within one mile of the Project Area, no impacts to previously recorded cultural resources are currently anticipated. If cultural resources are identified during the Phase I

[56] SHPO. 2005 SHPO Manual for Archeological Projects in Minnesota. Minnesota State Historic Preservation Office, St. Paul, Minnesota.

[57] SHPO. 2017. Historic and Architectural Survey Manual. Minnesota State Historic Preservation Office, St. Paul, Minnesota.

[58] OSA. 2011. State Archaeologist's Manual for Archaeological Projects in Minnesota. Office of the State Archaeologist, St. Paul, MN.

[59] NPS. 1983. Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. Federal Register 48(190):44716–44740.

Archaeological Survey planned for October of 2024, potential impacts to newly identified cultural resources and mitigative measures will be explored.

5.5. Natural Resources

The Project has the potential to impact natural resources through temporary construction-related impacts and long-term impacts to air quality, geology and groundwater, soils, water resources, flora, and fauna.

5.5.1. Air Quality

Section 109(b) of the Clean Air Act (CAA) requires that the USEPA establish National Ambient Air Quality Standards (NAAQS) "requisite to protect" public health and welfare (42 United States Code [USC] 7401 et seq.; 40 Code of Federal Regulations [CFR] Part 50). The CAA identifies two classes of NAAQS: primary standards, which are limits set to protect the public health of the most sensitive populations, such as asthmatics, children and the elderly; and secondary standards which are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife and structures. The USEPA has promulgated NAAQS for six criteria pollutants: ozone, particulate matter ($PM_{10}/PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide, carbon monoxide (CO), and lead. Individual states implement the CAA through State Implementation Plans.

The USEPA and state agencies operate a system of air quality monitoring stations throughout the country. Readings from these stations are compared to the NAAQS as a way to classify the air quality of the area surrounding the monitoring stations. Areas of the country that do not meet the NAAQS are classified as "non-attainment" areas. Regions that were classified as non-attainment and have improved their air quality to meet the NAAQS are considered to be in "maintenance." Areas of the country that are not represented by a monitoring station are considered "unclassifiable." Unclassifiable areas are considered to be in attainment with the NAAQS.

Compliance with the national and state air quality standards in the State of Minnesota is assessed at the county level. The USEPA designates Beltrami County, MN as in attainment for all NAAQS.[60]

Within Minnesota, the Project is located in the Red Lake Nation Air Quality Index (AQI) Region. The AQI for the years 2018–2022 are provided in **Table 17**. Bad air days

[60] EPA. 2024. Minnesota Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Green Book. Retrieved from https://www3.epa.gov/airquality/greenbook/anayo_mn.html. Accessed August 20, 2024.

are generally considered to be all days in the unhealthy for sensitive groups, unhealthy, and very unhealthy groups. The AQI is a uniform, health-based index to understand daily air quality conditions that is calculated by converting PM2.5 and ozone measurements by nearby air quality monitoring stations.[61]

Table 17. Air Quality Index for 2018-2022

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2018	327	24	1	0	0
2019	332	18	1	1	0
2020	348	11	0	0	0
2021	298	33	5	3	1
2022	342	4	0	0	0

5.5.1.1. Impacts and Mitigation

The impacts are divided between construction and operations, as presented in the sections below.

5.5.1.1.1. Construction Emissions

Construction of the Project will result in intermittent and temporary emissions of criteria pollutants. Construction would begin in October 2025 and last for approximately one year. Emissions generally include dust generated from soil disturbing activities, such as earthmoving and wind erosion associated with grading and construction, combustion emissions from construction machinery engines, and indirect emissions attributable to construction workers commuting to and from work sites during construction. These emissions would be dependent upon weather conditions, the amount of equipment at any specific location, and the period of operation required for construction at that location. Air pollutants from the construction equipment will be limited to the immediate vicinity of the construction area and will be temporary. Therefore, it is not anticipated that construction activities will independently cause or significantly contribute to an emission level that alters the attainment status for any of the NAAQS.

The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and road surface characteristics. Emissions would be greater during dry periods and in areas where fine-textured soils are subject to surface activity. If construction activities generate

[61] EPA. 2024. Technical Assistance Document for the Reporting of Daily Air Quality - the Air Quality Index. Online [URL]: https://document.airnow.gov/technical-assistance-document-for-the-reporting-of-daily-air-quailty.pdf. Accessed September 10, 2024.

problematic dust levels, the Applicant may employ construction-related practices to control fugitive dust such as application of water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic, reducing the speed of vehicular traffic on unpaved roads, and covering open-bodied haul trucks. BMPs from the approved SWPPP, AIMP, and VMP would additionally reduce dust emissions through minimizing new disturbance, stabilizing soils, treating stockpiles, and erosion and sediment control measures.

Table 18 summarizes the estimated potential emissions of criteria pollutants from construction activities for the Project. Construction emissions are calculated based on typical counts of diesel-fueled construction equipment, expected hours of operation, and estimated vehicle miles traveled. Supporting emission calculations are provided in **Appendix O**.

Table 18. Construction Emissions of Criteria Air Pollutants (tons/year)

Construction Components	NO_x[a]	CO	VOC[a]	SO_2	PM_{10}	$PM_{2.5}$
Year 2025						
Off-Road Engine Emissions	4.90	8.92	0.36	0.01	0.18	0.18
Fugitive Dust Emissions	-	-	-	-	241.16	24.5
On Road Emissions	0.15	3.67	0.04	<0.01	0.16	0.04
Year 2025 Total	5.05	12.59	0.40	0.01	241.51	24.73
Year 2026						
Off-Road Engine Emissions	12.90	19.77	0.88	0.01	0.50	0.50
Fugitive Dust Emissions	-	-	-	-	242.11	24.60
On Road Emissions	1.38	7.95	0.12	0.01	0.50	0.14
Year 2026 Total	14.28	27.72	0.99	0.02	243.11	25.24

[a]NOx = oxides of nitrogen; VOCs = volatile organic compounds

Air emissions from the construction equipment will be limited to the immediate vicinity of the construction area and will be temporary. Therefore, it is not anticipated that construction activities will independently cause or significantly contribute to an emission level that results a violation of NAAQS. At the completion of construction activities, all construction-related air impacts would cease.

5.5.1.1.2. Operational Emissions

During operation of the proposed solar facility, air emissions would be minimal. Emissions will be generated during routine inspection and maintenance activities throughout the 35-year lifetime of the permit. As described in **Section 4.4.4 and 4.4.5**, vehicles will be used for vegetation maintenance, road maintenance, fence and gate inspection, lighting system checks, and limited panel washing. Maintenance tasks may occur up to once a month for vegetation maintenance or yearly for electrical board checks. Routine maintenance activities will not have a significant impact on ambient air quality.

Operation of the proposed solar facility would reduce use of fossil fuel power plants that emit criteria pollutants and replace it with clean energy. Furthermore, as the proposed solar facility would take the place of some pasture and agricultural land, any grazing or crop related emissions from farming would cease during the Project's lifetime. This would be a beneficial effect to air quality from operation of the project.

5.5.2. Climate Change

5.5.2.1. GHG Emissions

Climate change is the alteration of average or "typical" weather, which includes variables like temperature, precipitation, and drought, in a certain location. Some of the most abundant gases in the atmosphere are known as greenhouse gases (GHGs). Anthropogenic climate change is caused by the production of GHGs, gases that exacerbate climate change through increased infrared radiation absorption in the atmosphere. The concentration of GHGs in the atmosphere has a direct relationship to global warming or climate change. GHGs are known to trap heat in Earth's atmosphere by absorbing light energy and emitting a portion of released energy back towards Earth. Trapped heat in the atmosphere creates a warming effect known as the GHG effect, in which the temperatures of Earth's atmosphere rise as more GHGs are added to the atmosphere. This drives further changes to the climate affecting precipitation, flooding, and storms.[62]

The most common and significant contributors to the GHG effect include carbon dioxide (CO_2), followed by methane (CH_4), nitrous oxide (N_2O), and fluorinated gases including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The amount of energy absorbed by one ton of a GHG over a given period is known as the Global Warming Potential (GWP). The order of common GHGs by GWP from lowest to highest is CO_2, CH_4,

[62] EPA. 2024. Minnesota Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Green Book. Retrieved from https://www3.epa.gov/airquality/greenbook/anayo_mn.html . Accessed on August 20, 2024.

N_2O, and fluorinated gases.[63] For ease of comparison, GWPs are calculated relative to the energy absorption of 1 ton of CO_2. Emission of a given GHG is normalized using the GWP; the resultant value is referred to as carbon dioxide equivalent (CO_2e). In Minnesota, CO_2 makes up 70 percent of GHG emissions.[64] CO_2 is most frequently produced through the combustion of hydrocarbon fuels to operate vehicles and equipment.

5.5.2.2. Existing and Projected Future Climate Conditions

Based on the available data for Beltrami County, there have been increases in average temperatures, maximum temperatures, and precipitation depths, all which can be explained or supported by the idea of climate change.[65] With increased GHG emissions from anthropogenic actions such as the burning of fossil fuels for transportation and power generation, the greenhouse gas effect's positive feedback loop continues to be fueled. Implications of this feedback loop include rising temperatures and increased precipitation and are a very reasonable explanation for the trends observed in the four analyzed climate variables. The following trends were identified:

- Annual average temperatures have displayed an average increase of 0.27F/decade.
- Maximum temperatures (averaged monthly) have displayed an average increase of 0.02F/decade annually.
- Annual precipitation has shown an increasing trend of 0.05 inch/decade.
- Annual Palmer Drought Severity Index (PDSI) has displayed an average increase of 0.17/decade.[66]

[63] MPCA. 2024. Count of Annual AQI Days by Category. https://public.tableau.com/app/profile/mpca.data.services/viz/MinnesotaAirQualityIndex_0/AQIExternal . Last updated February 22, 2024.

[64] EPA 2024. Climate Change Indicators: Weather and Climate. Retrieved from: https://www.epa.gov/climate-indicators/weather-climate. Accessed August 21, 2024.

[65] EPA. 2024. Understanding Global Warming Potential. Retrieved from: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials. Accessed August 21, 2024.

[66] Minnesota Department of Commerce. 2021. Greenhouse Gas Emissions Inventory 2005-2018. Available at https://mn.gov/puc-stat/documents/pdf_files/MPCA-DOC%20Greenhouse%20Gas%20Inventory%20Report%20-%202021-1-14.pdf Accessed August 21, 2024.

5.5.2.3. Impacts of Climate Change on the Project

The Project will be sited and engineered to be resilient under changing climatic factors including increased average temperatures and changes in precipitation intensities and quantities.

Final structure placement will consider the Project slope to avoid areas with associated risks of erosion from changes in precipitation. Upon construction completion, disturbed areas will be restored and revegetated. Increases in heavy precipitation events, could change site drainage patterns requiring stormwater runoff basins and associated management.

Although the annual precipitation trends indicate increases, there may be periods of dry weather and concerns of wildfires, which is supported by the increasing trend in the PDSI (i.e., wet winters and dry springs and summers). However, the Project would be maintained to address vegetation management, including the increase of fire or the spread of noxious weeds that could occur from changed conditions. Although the climate trends in the county show slight increases in precipitation, it also shows an increase in drought severity (PDSI). Drought during the growing season could affect maintenance and vegetation management cycles.

5.5.2.4. Impact of the Project on Climate Change

Otter Tail will use construction vehicles and equipment and maintenance vehicles throughout the Project to support transport, construction, equipment operation, maintenance, and repair activities. The Project will produce GHG emissions during earth-moving activities, construction, and restoration activities through the use of bulldozers, bucket loaders, personal employee vehicles, and other heavy equipment associated with Project construction and maintenance.

During construction of the Project, small amounts of GHGs will be generated. GHG emissions from the construction of this Project will be largely from the combustion of fossil fuels such as gasoline and diesel. GHGs associated with fuel combustion are CO_2, CH_4, and N_2O. The largest source of GHG emissions from the Project will be from the temporary combustion of fossil fuels in construction equipment and heavy machinery. Project construction is estimated to take place over one year.

Construction efforts will involve the use of various mobile combustion sources. Construction emissions will be localized to the construction area and are not anticipated to result in long-term impacts. Operational impacts are expected to be minimal and limited to periodic maintenance activities.

To estimate the potential amount of GHG emissions, Otter Tail identified the types and numbers of construction equipment that could be used to construct the Project. Supporting emission calculations are provided as **Appendix O**. This assessment is preliminary and based on the best information available as of the date of this Application. Based on this assessment, potential GHG emissions from construction activities and restoration are indicated in **Table 19**. This table provides preliminary estimates of CO_2, CH_4, N_2O and CO_2e emissions. CO_2 and CH_4 emissions were calculated using factors for diesel combustion from the South Coast Air Quality Management District (SCAQMD).[67] N_2O emissions estimated based on the ratio of grams of N_2O per CO_2 in a gallon of gasoline obtained from Table 2.7 of the 2023 Climate Registry Default Emission Factors.[68]

Table 19. Preliminary Greenhouse Gas Emissions from Project Construction

Year	Activity	CO_2 (metric tons/year)	CH_4 (metric tons/year)	N_2O (metric tons/year)	CO_2e[1] (metric tons/year)
2025	Equipment	987.83	0.29	0.11	1026.06
	Onroad	414.74	0.01	<0.01	415.69
2026	Equipment	2315.75	0.59	0.26	2400.71
	Onroad	1314.52	0.03	0.07	1333.05
Total		5032.83	0.92	0.44	5175.52

[1] CO2e calculated by equation A-1 of 40 CFR, Part 98.2, which states the total CO2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions. The GWP for CO2 is 1, CH4 is 85, and N2O is 265.

All estimates are quantified as CO_2 equivalents and based on a one year construction period occurring in October 2025 to end of September 2026. Based on this initial assessment the total GHG emissions from construction of the Project would be 5,176 metric tons CO_2e. Over the Project's lifetime, GHG emissions from construction would be insignificant compared to overall regional GHG emissions and, in turn, climate change impacts.

The generation of construction-related GHG emissions would be short term and temporary. Emissions resulting from routine operation and maintenance of the Project

[67] SCAQMD. 2023. South Coast Air Quality Management District. Off-Road - Model Mobile Source Emission Factors. Air Quality Analysis Handbook. [Online] Off-road Mobile Source Emission Factors (Scenario 2007-2025.xls [2023 SCAB Fleet Average Emission Factors (Diesel). Online [URL]: https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors. Accessed February 6, 2024.

[68] The Climate Registry. 2023. Default Emission Factors. Online [URL]: https://theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final.pdf.

will largely be from the combustion of gasoline or diesel in maintenance equipment and vehicle use. Operational GHG emissions would be minimal.

The Project is expected to generate approximately 101,616 MWh of carbon-free power on average annually. This would avoid the production of roughly 70,988 metric tons of CO2 equivalent (MTCO2e) generated by carbon-based power generation.[69] Approximately 115 acres of forested area will be removed and developed within the Project Footprint, which is further discussed in **Section 5.5.6.1**. The net carbon flux (i.e., the amount of carbon exchanged in the carbon pool) from all carbon pools associated with forest land converted to grassland in Minnesota would result in a one-time, net carbon flux of approximately 39.5 MTCO2e per acre, or 4,540 MTCO2e for the 115 acres of forested land removed by the Project. GHG emissions from this land use change would be more than offset by the avoidance of GHG emissions through the generation of clean energy by the Project.[70]

5.5.3. Geology and Groundwater Resources

The Project Area lies within the Wawa Subprovince of the Superior Province. The underlying bedrock is an Archean age granitic intrusion known as the Bemidji Batholith. The associated granite is described as massive to weakly foliated.[71] The bedrock is overlain by Quaternary glacial deposits from the Marcoux Formation of the Crow Wing River Group. These sediments are a light gray to grayish brown, pebbly loam that is sandy, unbedded and unsorted, with inclusions of sand and gravel and abundant cobbles and boulders.[72] Within the Project Area, the deposits are cut by a Palimpsest channel (collapsed meltwater channel), that is oriented northeast-southwest across the site. Younger deposits (Holocene) of moderately to poorly sorted sand and gravel, as well as

[69] This is based upon the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator and 101,616,000 kilowatt hours (101,616 MWhs) annual production (https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results).

[70] Greenhouse gas emissions and removals from forest land, woodlands, urban trees, and harvested wood products in the United States, 1990-2021. https://research.fs.usda.gov/treesearch/66035.

[71] Minnesota Geological Survey. S-21 Geologic Map of Minnesota- Bedrock Geology https://cse.umn.edu/mgs/precambrian-geology. Accessed September 10, 2024.

[72] Harris, K.L. 2007. M-177 Quaternary geology of the Fosston 30' x 60' quadrangle, northwest Minnesota. Online [URL]: https://conservancy.umn.edu/items/8b3b4573-77bb-414c-8214-4fe07e2d497d. Accessed September 10, 2024.

organic debris (clay and silt) are found within the channel. Based on well logs from the Project Area and surrounding area, surficial deposits are in excess of 200 feet thick.[73]

Groundwater in the Project Area is mainly derived from thick sand and gravel layers found within the Quaternary deposits. Wells completed nearby to the north in the unconfined Quaternary aquifer report depths to water between 46 to 60 feet below ground surface (bgs). The groundwater flow direction in the unconfined aquifer is estimated to the east towards Grant Creek and other nearby water bodies.

Two industrial wells were mapped within the Project Area near the facility buildings onsite. **Table 20** summarizes the attributes of these wells.

Table 20. Well Information

Well Name	Well ID	Well Depth	Static Water Level* (ft bgs)	Year Drilled	Aquifer
Otter Tail Power Co. #1	650734	123	18.6	2002	Quat. Buried Artesian Aquifer
Otter Tail Power Co. #2	672118	125	18	2001	

*water levels above the water table due to pressure from the artesian aquifer

Geology, topography, and groundwater resources within and surrounding the Project Area are shown on **Figure A-4** in **Appendix A**.

5.5.3.1. Impacts and Mitigation

No geologic hazards such as shallow bedrock, karst features, or mapped faults were found in the Project Area. Groundwater onsite is derived from a buried Quaternary aquifer. Nearby data suggest that the unconfined aquifer (water table) is greater than 45 feet bgs. Impacts to geologic and groundwater resources from the Project are not anticipated.

5.5.4.Soils and Prime Farmland

Information on soils, including prime farmland, on the Project site was obtained from the NRCS Soil Service Geographic Database (SSURGO) (NRCS 2024).[74] The following summarizes soil types within and adjacent to the Project Area. Prime farmland soils are discussed in detail in **Appendix P**.

Based on the SSURGO data, there are eight mapped soil types present within the Project Area. The most widespread soil types are Sol cobbly sandy loam (1–6 percent

[73] MDH. 2024. Minnesota Well Index. Online [URL]: https://mnwellindex.web.health.state.mn.us/index.faces. Accessed September 10, 2024.

[74] NRCS. 2024. Soil Survey Geographic Database (SSURGO). Online [URL]: https://www.nrcs.usda.gov/resources/data-and-reports/soil-survey-geographic-database-ssurgo. Accessed September 10, 2024.

slopes) and Nary cobbly fine sandy loam. These two soil units comprise 221.8 acres (45.5 percent) and 165.9 acres (34 percent), respectively, for a total of 387.7 acres (80 percent) of the 487-acre Project Area. The four other soil types present comprise an additional 88.1 acres (18 percent), with the remaining two soil units covering less than 3 percent of the Project Area. The SSURGO soil types and related classification data are shown in **Table M-1** in **Appendix P** and SUURGO soil types in the Project Area and Project Footprint are shown on **Figure A-5** and **Figure A-5a** in **Appendix A**.

Soils in the Project Area are derived predominantly from till, with minor amounts of glaciolacustrine deposits, outwash and organic matter over glaciolacustrine deposits. The two most prevalent soil types have sand as their primary constituent (49–63 percent), with silt and clay also present, but as minor constituents (19–32 percent silt and 17–19 percent clay). Percent coarse fragments are generally under 14 percent except in two main types (23–33 percent). The predominant soil types are relatively rocky, with up to 18 percent volume of 3"–9" stones and cobbles in their upper horizons.

Soils within the Project Area are rated by NRCS/SSURGO as "prime farmland," "prime if drained," "farmland of statewide importance," and "not prime farmland." Prime farmland and prime if drained are considered prime farmland; farmland of statewide importance and not prime farmland are not considered prime farmland.

Within the 267-acre Project Footprint, soils are rated by NRCS/SSURGO as three types: "prime if drained," "farmland of statewide importance," and "not prime farmland." These include Sol cobbly sandy loam (140.5 acres), Nary cobbly fine sandy loam (119.5 acres), and Stunz loam (6.7 acres). Of these soils, the Stunz loam is considered "prime if drained." Impacts and mitigation are discussed below.

5.5.4.1. Impacts and Mitigation

Construction of the Project would disturb all soil within the Project Footprint (e.g., clearing and grading, access roads, solar generating facilities, power delivery systems, inverters, etc.) as shown in **Figure M-1** in **Appendix P**. Soil impacts will be mitigated by minimizing soil compaction, preserving topsoil, and establishing and maintaining appropriate vegetation in accordance with BMP's found in the requirements of the SWPPP and outlined in the Applicant's AIMP (**Appendix H**) and VMP (**Appendix I**).

Minnesota's prime farmland rule permits no more than 0.5 acres of prime farmland to be developed per MW of net generating capacity (unless no alternative land exists). A detailed assessment of the prime farmland rule applicable to the Project is included in **Appendix P**. Under the prime farmland rule, the Project would be allowed to develop up to 33 acres of prime farmland.

Only 24.5 acres (5 percent of the overall Project Area) is in a soil unit, Lengby sandy loam, designated by NTCS/SSURGO as "prime farmland" (**Table M-1** in **Appendix P**). Two other soil units present, Stuntz loam (8.7 acres) and Willosipi loam (3.5 acres), are designated as "prime if drained." Together these three soil types total 36.7 acres, or 7.5 percent of the overall Project Area. However, only 6.7 acres of Stuntz loam (i.e., prime if drained) will be developed in the Project Footprint (267 acres).

Proposed development of the Project within the Project Footprint would impact 6.7 acres of "prime if drained" or prime farmland, thus below the 33-acre limit. The Applicant has designed the Project Footprint to minimize development of the prime farmland, and the Applicant will implement an AIMP for the Project (see **Appendix H**). Therefore, no additional mitigation concerning prime farmland is required.

5.5.5. Surface Waters (Including Stormwater, Floodplains, and Wetlands)

5.5.5.1. Rivers, Streams, and Lakes

The initial desktop review identified several streams present in the Project Area (see **Figure A-10** in **Appendix A**). However, the field review demonstrated there are no rivers, streams or lakes present within the Project Area (*compare* **Appendix J, Figures 2 and 3**).

5.5.5.2. Public Waters

There are no MNDNR designated public waters within or adjacent to the Project Area. No waters on the Beltrami County Public Waters Inventory occur within or adjacent to the Project Area.

5.5.5.3. Wetlands and Calcareous Fens

There are no MNDNR designated calcareous fens within or adjacent to the Project Area. Wetlands are discussed below.

5.5.5.4. Delineated Wetlands

In August 2024, HDR conducted field investigations of the Project Area. Preliminary results of the field investigation identified approximately 13.8 acres of wetlands within the Project Area. The majority of delineated wetlands were associated with saturated meadows and primarily include small, ephemeral palustrine forested wetlands and up to two small wetland complexes comprising palustrine emergent, forested and scrub-shrub types. Complete information on wetlands within the Project Area including applicable maps of the National Wetlands Inventory and delineated

wetlands within and adjacent to the Project Area can be found in the Wetland Delineation Report as presented in **Appendix J** as well as **Figure A-10** in **Appendix A**.

5.5.5.5. Drainage Ditches

No drainage ditches were identified within the Project Area; therefore, impacts are not anticipated.

5.5.5.6. Impaired Waters

No impaired waters were identified within the Project Area; therefore, impacts are not anticipated.

5.5.5.7. Floodplains

The Project Area is not within a Federal Emergency Management Agency-mapped floodplain; therefore, impacts are not anticipated.

5.5.5.8. Impacts and Mitigation

The Project Area includes approximately 13.8 acres of wetlands. To avoid impacts to the wetlands, the Project Footprint will avoid developing within 50 feet of the wetland areas and BMPs, such as temporary sediment basins, stormwater drainage basins, and erosion control measures, will be incorporated into the design. A complete discussion of the wetland delineation and the location of the wetlands is provided in **Appendix J**.

5.5.6. Vegetation

The Project crosses the Chippewa Plains subsection in Cass, Hubbard, Clearwater, Itasca, and Beltrami counties. Prior to European contact and into the early Post-Contact Period, vegetation was a mixture of deciduous and coniferous forests dominated by white pine, red pine, and hardwoods on moraines, and jack pine on lake and outwash plains. Wetland areas were dominated by sedge meadow communities. Present-day vegetation in this subsection is approximately 57 percent forest, 18 percent wetland/open land, and 14 percent row crop.[75] The remainder of land cover is composed of developed areas and water.

The Project Area is primarily forested in the northern, western, and southwestern portions, and vegetated with grassland species in the southern, central, and eastern portions. Forested areas are interspersed with grassland areas where trees were cleared prior to purchase of the Project Area by the Applicant. Suitable habitat for Species in

[75] Minnesota Department of Natural Resources, 2006. Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife, Comprehensive Wildlife Conservation Strategy. Division of Ecological Services, Minnesota Department of Natural Resources.

Greatest Conservation Need, including special concern, threatened, and endangered plant and animal species, may be present in natural areas surrounding forested areas and within rangeland.

5.5.6.1. Impacts and Mitigation

The acreage of land cover in the Project Area is provided in **Section 5.2.9.1**. Impacts to flora in the Project will primarily be associated with vegetation clearing within rangeland and forested areas. Permanent impacts to vegetation within the Project Area will occur where clearing of trees and tall vegetation is required for construction, maintenance, and safe operation of solar facilities. Approximately 115 acres of trees will be cleared to support construction and operation of the proposed Project. Other potential impacts to flora may include vegetation disturbance in the Project Area such as cutting, mowing, and removal of vegetation, crushing of vegetation with construction equipment, and grading soils. Impacts to pre-existing low growing vegetation will be permanent in active construction areas as vegetation is cleared to support placement of solar facilities, but construction areas will be reseeded with native vegetation as described in the VMP (**Appendix I**).

Construction and maintenance activities have the potential to introduce or spread noxious weeds. Noxious weeds are regulated under Minn. Stat. ch. 18 and can be introduced to new areas through roots or seeds transported by contaminated construction equipment. Noxious weed species generally establish more quickly on disturbed soil surfaces than existing native vegetation does and have the potential to displace existing vegetation, without proper controls in place. The Applicant will work with the state of Minnesota and Beltrami County to identify locations where noxious weeds may be present and will develop appropriate BMPs to minimize impacts during construction.

5.5.7. Wildlife and Their Habitats

Wildlife common to the Project Area include those typically found in rangeland, deciduous forest patches, shallow wetlands, and habitat transition zones frequently associated with agricultural and rural areas. Homesteads, farmsteads, pastures, and forested areas may provide ideal habitat for a variety of wildlife species well-adapted to broken forest patches and areas dominated by agriculture. Common species in the Project Area are shown in **Table 21**.

Table 21. Common Wildlife Species in the Area of the Project

Common Name	Scientific Name	Habitat
Mammals		
Deer mouse	*Peromuscus maniculatus*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
White-tailed deer	*Odocoileus virginianus*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
Gray squirrel	*Sciurus carolinensis*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
Coyote	*Canis latrans*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
Red Fox	*Vulpes*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
Eastern cottontail	*Sylvilagus floridanus*	Forest fringes, open areas, grasslands, suburban and rural communities
Striped skink	*Mephitis*	Forest fringes, open areas, grasslands, suburban and rural communities
Northern raccoon	*Procyon lotor*	Forested areas with abundant water sources including ponds, lakes, streams, and rivers
American Black Bear	*Ursus americanus*	Open forest and forest fringes with thick understory vegetation
Birds		
Wild turkey	*Meleagris gallopavo*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
American robin	*Turdus migratorius*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
Blue jay	*Cyanocitta cristata*	Open forest, forest fringes, grasslands, farms, suburban and rural communities
Brown-headed cowbird	*Molothrus ater*	Forest fringes, grassland, farms and pastures, suburban and rural communities
Ring-necked pheasant	*Phasianus colchicus*	Forest fringes, grassland, farms and pastures, suburban and rural communities
Common crow	*Corvus brachyrhynchos*	Forest fringes, grassland, farms and pastures, suburban and rural communities
Common yellowthroat	*Geothlypis trichas*	Wetland edges, wet meadows, marshes, wet areas with dense vegetation, brushy fields
Red-winged blackbird	*Agelaius phoeniceus*	Wetland edges, wet meadows, marshes, wet areas with dense vegetation, brushy fields
Common raven	*Corvus corax*	Forested areas bordering open land
Reptiles and Amphibians		
American toad	*Anaxyrus americanus*	Forested areas, grasslands, farms, suburban and rural communities, and freshwater ponds and lakes (early development)
Tiger salamander	*Ambystoma tigrinum*	Forested areas, grasslands, farms, suburban and rural communities, and freshwater ponds and lakes (early development)

Common Name	Scientific Name	Habitat
Northern leopard frog	*Lithobates pipiens*	Wetlands, wet meadows, ponds, lakes, and streams with abundant vegetation
Common garter snake	*Thamnophis sirtalis*	Forested areas, grasslands, farms, suburban and rural communities near water sources

5.5.7.1. Avian Species

The Migratory Bird Treaty Act (MBTA) of 1918 prohibits the "take" of migratory birds. The regulatory definition of "take" as defined by 50 CFR § 10.12, "means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue hunt, shoot, wound, kill, trap, capture, or collect." The following prohibitions apply to migratory bird nests: "possession, sale, purchase, barter, transport, import and export, take, and collect." The MBTA is administered and enforced by the USFWS.

The Bald and Golden Eagle Act (BGEPA) of 1940 (16 USC §§ 668–668d) prohibits anyone without a permit from "taking" bald and golden eagles. "Take" is defined to include a number of actions including disturb. The regulations define disturb as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR § 22). The rules and regulations for this Act were updated in 2024 to provide new guidelines concerning the consequences of take (50 CFR §§ 13 and 22).

Through the USFWS IPaC Trust Resource Report (**Appendix Q**), five migratory birds of conservation concern and one bird protected under the BGEPA are expected to occur within the Project Area (**Table 22**).

Table 22. USFWS Birds of Conservation Concern in the Project Area

Common Name	Scientific Name	Breeding Season
Bald eagle*	*Haliaeetus leucocephalus*	Breeds Dec 1 to Aug 31
Bobolink	*Dolichonyx oryzivorus*	Breeds May 20 to Jul 31
Chimney swift	*Chaetura pelagica*	Breeds Mar 15 to Aug 25
Evening grosbeak	*Coccothraustes vespertinus*	Breeds May 15 to Aug 10
Veery	*Catharus fuscescens fuscescens*	Breeds May 15 to Jul 15
Wood thrush	*Hylocichla mustelina*	Breeds May 10 to Aug 31

*This is not a Bird of Conservation Concern in the Project Area but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Ruffed Grouse Management Areas (GMAs) include areas that have high potential for the production of ruffed grouse (*Bonasa umbellus*) and American woodcock (*Scolopax minor*) and are managed to promote suitable habitat conditions for these species.[76] There are no GMAs within two miles of the Project Area.

5.5.7.2. Waterfowl Feeding and Resting Areas

Waterfowl Production Areas (WPAs) are federally owned wetland and grassland units which are used to provide breeding and nesting habitat for the production of waterfowl and other migratory birds. WPAs are generally subject to the same rules and regulations as national wildlife refuges and are typically off-limits to activities which disturb wildlife or habitat. There are no WPAs within the Project Area or within two miles of the Project Area.

5.5.7.3. Important Bird Areas

The Audubon Society maintains a list of Important Bird Areas (IBAs), which identify essential habitat for breeding, wintering, and/or migrating bird species.[77] There are no IBAs within the Project Area or within two miles of the Project Area.

5.5.7.4. Impacts and Mitigation

Wildlife species may be temporarily and permanently displaced during construction of the proposed product due to loss of habitat or disturbance due to noise and use of equipment. Impacts to wildlife will be determined by a number of variables, including the size of the animal, its range and mobility, and its behavioral traits, including tolerance to disturbance, denning/nesting habits and periods of activity. The area of the disturbance and vicinity to the species' activity will also influence the Project's impact on individual species. Larger or more mobile animals such as deer, foxes, and bears will be able to vacate the immediate area of construction. During final operation of the proposed Project, the solar facility will be fenced which will impede larger animals from accessing portions of the Project Area. Small species such as reptiles, amphibians, and small mammals could be more affected by construction because of their inability to vacate a construction area. Nocturnal animals not resting in the construction area will unlikely be impacted as construction would stop at night. Aquatic species should not be permanently impacted as the Project will avoid wetlands, waterbodies, and watercourses, and any

[76] MNDNR. 2024a. Ruffed Grouse Management Areas. Online [URL]: https://www.dnr.state.mn.us/rgma/index.html. Accessed September 10, 2024.

[77] Audubon. 2024. Minnesota Important Bird Areas. Online [URL]: https://umr.audubon.org/conservation/minnesota-important-bird-areas. Accessed September 10, 2024.

potential temporary impacts to wetlands will be returned to preconstruction conditions. The arrangement of the fenced areas of the Project array relative to existing roads and utilities provides various pathways through the Project Area and around fence lines which would allow wildlife to cross. The construction, operation, and maintenance of the Project would be designed to minimize potential adverse impacts to wildlife resources.

The Project is not located near a WPA, IBA, GMA, or any areas that would support substantial populations of waterfowl, and will not introduce substantial transmission line infrastructure, so the Project is unlikely to pose a risk of injury or death to bird species. Birds will be able to vacate the immediate area of construction and return to the Project Area upon final operation of the proposed facility.

It is not anticipated that construction and operation of the Project will result in take of migratory birds. As the proposed Project will lack a federal nexus, pre-clearing nest surveys are unlikely to be required. The Applicant will commit to avoiding take of nesting migratory bird species where active nests are observed during construction.

5.5.8. Rare and Unique Natural Resources

Rare and Unique Resources include plant and animal species listed at the federal or state level as endangered or threatened. Federally listed endangered or threatened species are protected under the Endangered Species Act of 1973, administered by the USFWS. State-listed endangered and threatened species are protected under Minn. Stat. § 84.0895, administered by the MNDNR. Additionally, rare and unique resources include plant and animal species listed as proposed or candidate listings at the federal level, and as special concern at the state level. These species are not legally protected by federal or state laws; however, USFWS and/or MNDNR are typically notified of potential impacts to these species.

No SNAs, WMAs, AMAs, or RIM Wetlands Reserve Program sites identified by the BWSR are located within the Project Area.

A summary of federal and state listed species concerns in the Project Area is presented below.

5.5.8.1. Federal Listed Species

The Applicant requested consultation with USFWS and reviewed data on federally listed species potentially present within one mile of the Project Area. On August 19, 2024, the USFWS IPaC website was used to review federally threatened and endangered species listed under the Endangered Species Act (ESA; 16 USC 1531 et seq.), candidate species, experimental populations, and designated critical habitat that may be impacted by

implementation of the Project.[78] This review does not represent a comprehensive survey but provides an overview of federally listed species that may occur in the vicinity of the Project.

The USFWS IPaC review determined that two species with federal status are potentially present within one mile of the Project Area. These species are shown in **Table 23**. Only species with federal endangered or threatened status are protected by USFWS under the ESA. According to the effect determination, the Project is not likely to adversely affect the gray wolf and will have no effect on the monarch butterfly. Species with candidate or proposed status are under consideration for listing and protection under the ESA but have not yet been designated by USFWS as endangered or threatened. The USFWS IPaC review and associated effects determination letter is provided in **Appendix Q**.

Table 23. Federally Listed Species Potentially Present in the Project Area

Species	Federal Status	Likelihood of Presence in Project Area
Mammals		
Gray Wolf (*Canis lupus*)	Threatened	Unlikely. The Project Area is outside of final critical habitat for this species. The effect determination for the gray wolf found that the Project is not likely to adversely affect this species.
Insects		
Monarch Butterfly (*Danaus plexippus*)	Candidate	Potentially present within Project Area. May occur within disturbed grassland habitat. However, the species presently has no federally protected status. The effect determination for the monarch butterfly found that the Project will have no effect on this species.

5.5.8.2. State Listed Species

The MNDNR lists state-listed species on the Natural Heritage Review of the NHIS MCE database, which assists in determining if a proposed action is in the vicinity of a protected natural resource.[79] Any review of NHIS data is preliminary until the MNDNR can conduct a formal consultation and review of state-listed species data, which follows submission of a Natural Heritage Review request on the MNDNR Minnesota

[78] United States Fish and Wildlife Service. 2023. IPaC: Information for Planning and Consultation. Online [URL]: https://ipac.ecosphere.fws.gov/. Accessed August 31, 2024.

[79] MNDNR. 2024b. Minnesota Conservation Explorer Website. Online [URL]: https://mce.dnr.state.mn.us/. Accessed July 31, 2024.

Conservation Explorer website. A Natural Heritage Review request was submitted to the MNDNR by HDR on July 15, 2024 and an official letter of automated results was received on July 15, 2024, which is provided in **Appendix Q**.

According to the official automated Natural Heritage Review and subsequent manual MNDNR review of automated results, the Project will not negatively impact any known occurrences of rare features. The Natural Heritage Review indicated the federally endangered northern long-eared bat may occur in forested areas throughout Minnesota, which includes habitat observed in the Project Area; however, according to the official IPaC queried on August 30, 2024, impacts to this species should not occur within one mile of the Project Area.

5.5.8.3. Impacts and Mitigation

Based on NHIS MCE, the Project may impact habitat for one federally endangered species (northern long-eared bat). However, the northern long-eared bat is not included in the official IPaC review, so impacts are unlikely to occur. The Project is unlikely to adversely affect other threatened or endangered species such as the gray wolf and will not impact the candidate monarch butterfly. If a federal nexus is established through permitting or grant funding or listed species are observed during construction, consultation with the USFWS and MNDNR regarding threatened and endangered species will be required. To mitigate impacts to potential habitat for the northern long-eared bat in the Project Area, the Applicant will commit to avoiding tree removal from March 15 to August 15 per recommendations from USFWS and MNDNR

5.5.9. MNDNR Commercial Solar Siting Guidance

The MNDNR issued guidance for commercial solar sites entitled Commercial Solar Siting Guidance that recommends identification of high value natural resources during Project development. High value natural resources include state listed species; NPCs and native prairie; MBS sites of biodiversity significance (SOBS); shoreland and floodplains; public waters; wetlands; calcareous fens; public lands; and large block and other important habitats.

High value natural resources are discussed throughout this Application. Federal and state listed species are discussed in **Section 5.5.8**. Native plant communities and native prairie are discussed in **Section 5.5.6**. Public waters, wetlands, calcareous fens, and floodplains are discussed in **Section 5.5.5**. Public lands are discussed in **Section 5.2.10**. MBS SOBS and large block and other important habitats are discussed below.

5.5.9.1. MBS Sites of Biodiversity Significance

MNDNR's MBS SOBS assesses Minnesota landscapes for NPCs, rare animals, rare plants, and animal communities through desktop review and follow-up field survey. Based on this assessment, MBS designates and assigns rankings to SOBS, based on landscape context, NPC, and occurrence of rare species populations. The MBS groups and ranks SOBS for each Minnesota's system subsections for the purpose of designating and cataloguing the state's most notable examples of NPCs and rare species. There are four ranks for SOBS: outstanding, high, moderate, and below.[80] Based on a review of the MNDNR's data, there are no SOBS within the Project Area (see **Figure A-11** in **Appendix A**).

5.5.9.2. Large Block and Other Important Resources

Large block habitat is composed of large (40 acres of more) contiguous natural habitat unfragmented by human disturbance including roads, agriculture, or development. There are no large blocks of forest habitat within 300 feet of the Project Area. There are over 40 acres of contiguous grassland located in the central portion of the Project Area and within the Project Footprint; however, this area has been historically grazed and was predominantly vegetated with common or non-native grass species including timothy (*Phleum pratense*), Kentucky bluegrass (*Poa pratensis*), and smooth brome (*Bromus inermis*) during a site visit conducted in August 2024. A greater diversity of wildlife habitat for migratory birds or other wildlife is present outside of the Project Area. Although agricultural land is the dominant wildlife habitat in the area surrounding the Project Area the extensive forested areas and Clearwater River provide high quality wildlife habitat.

5.5.10. Native Prairie

Native prairie, as defined by Minn. Stat. § 84.02, subp. 5, means "land that has never been plowed where native prairie vegetation originating from the site currently predominates or, if disturbed, is predominantly covered with native prairie vegetation that originated from the site. Unbroken pastureland used for livestock grazing can be considered native prairie if it has predominantly native vegetation originating from the site and conservation practices have maintained biological diversity." The Applicant reviewed SOBS, aerial photography data, CRP agreements, and examined vegetated areas

[80] MNDNR. 2024. Online [URL]: https://www.dnr.state.mn.us/eco/mbs/biodiversity_guidelines.html. Accessed August 26, 2024.

during an onsite wetland delineation in August 2024 (**Appendix J**). Based on this analysis, there are no native prairie areas in the Project Area.

5.6. Unavoidable Impacts

Otter Tail designed the Project to avoid impacts to environmental resources whenever possible. In some cases, impacts to environmental resources could not be entirely avoided, but will be minimized by implementation of mitigation measures. A detailed discussion of the environmental impacts of the proposed Project, as well as the mitigation measures that would be used to minimize impacts is presented in **Sections 5.1 through 5.5** of the Application. Environmental impacts that will be minimized by the use of mitigation measures, but not entirely avoided, are provided below. Most of these unavoidable impacts will occur during construction of the Project and will resolve with the completion of construction.

Unavoidable impacts related to the Project that will last only as long as the construction period include:

- Noise emitted from vehicles and equipment during construction that will be audible to neighboring landowners.
- Increased traffic on roads that bisect the Project Area.
- Minor air quality impacts due to fugitive dust.
- Potential for soil erosion.
- Potential disturbance to and displacement of some species of wildlife.

Unavoidable impacts related to the Project that will last as long as the life of the Project will include:

- Aesthetic changes to the landscape (forest and agricultural fields to solar facility), which will be visible from local roadways and parcels.
- Changes in land cover and vegetation from current land use, which is predominately agricultural – specifically pasture and haying – and deciduous forest to a solar facility with perennial vegetation underneath the solar modules and around the Project Footprint. As discussed in **Section 5.5.7.4**, this is likely to be a positive impact for wildlife and the environment.

Unavoidable impacts will be mitigated through the SWPPP, VMP, AIMP, and decommissioning plan, and compliance with applicable federal, state, and local permits. No other mitigation measures are proposed.

5.7. Irretrievable and Irreversible 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, that 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 and associated facilities for the life of the Project, which is expected to be 35 years. Although the entire 487-acre Project Area would not be developed, the 267 acres of land within the Project Footprint 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.

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

No wetland or other sensitive land conversion or alteration is anticipated during construction of the Project. The proper steps will be taken to address any sensitive land situations in the event Otter Tail becomes aware of such conditions.

5.8. Cumulative Potential Effects

Cumulative potential effects result when impacts associated with the proposed Project are combined with impacts associated with past, present, or reasonably foreseeable future actions within the area affected by the proposed Project. The Applicant reviewed the Beltrami County website (Beltrami County, 2024a),[81] MnDOT Region 2 website (MnDOT, 2024f),[82] Minnesota Environmental Quality Board Projects Interactive Map (EQB, 2024),[83] and the Minnesota Public Utilities Commission's electronic docket system. The Applicant did not identify any proposed projects within close proximity to the Project Area that would be expected to interact negatively or create significant cumulative impacts with the proposed Project. Further, no information regarding plans for other solar or infrastructure projects near the Project Area were identified during the Applicant's coordination or outreach activities. With no significant known projects in the area during the construction timeline, it is expected that the project construction will contribute minimal short term cumulative potential effects.

Otter Tail's Solway Power Plant is adjacent to the Project Area. Although no significant cumulative impacts are anticipated, the Project will add new energy infrastructure in the area which could lead to increased long term cumulative effects to the viewshed.

[81] Beltrami County. 2024. Beltrami County Highway Department, Road Construction. Online [URL]: https://www.co.beltrami.mn.us/living-here/roads-bridges/road-construction/. Accessed September 10, 2024.

[82] MnDOT. 2024. MnDot 10-Year Capital Highway Investment Plan. Online. [URL]: https://www.dot.state.mn.us/planning/10yearplan/district-chip.html. Accessed September 10, 2024.

[83] EQB. 2024. EQB Projects Interactive Map. Online. [URL]: https://pca-gis02.pca.state.mn.us/EQB/. Accessed September 10, 2024.

6. AGENCY, TRIBAL, AND STAKEHOLDER COORDINATION

This section describes outreach efforts conducted by Otter Tail and discusses pre-Application involvement by federal, state, and local agencies as well as the public information outreach campaign. Throughout the development process, Otter Tail has provided stakeholders and potentially affected landowners the opportunity to participate in the siting process. This engagement provided Otter Tail with valuable insight into landowners' and public agency preferences regarding development of Project facilities.

6.1. Pre-Application Coordination

As part of pre-Application efforts, Otter Tail initiated outreach to public agencies through Project notification letters. Many agencies were contacted to gather feedback on the Project (refer to **Table 24**).

Initial outreach letters and maps were sent to most federal, state and tribal agencies in Summer 2024. Otter Tail requested input specific to the resources under each agency's respective jurisdiction, as well as the identification of permits and/or approvals that may be potentially required for the Project.

All representative letters and agency responses received as of September 20, 2024 are included in **Appendices Q and R**. A summary of responses from federal and state agencies is included below. Otter Tail will continue to coordinate with township and county officials as the Project moves forward and will seek any necessary local permits. **Table 24** identifies agencies that were contacted through an email or a notification letter and the date that the consultation was conducted.

Table 24. Otter Tail Agency Correspondence

Agency	Letter Sent	Meeting/Response Date (Type)
Federal		
U.S. Army Corps of Engineers, St. Paul District	6/24/24	Response received 7/16/24, and 7/26/24
U.S. Fish and Wildlife Service – Twin Cities Ecological Services Field Office	6/24/24	Response received 8/13/24, 8/28/24, and 8/30/24
State		
Minnesota Historical Society and State Historic Preservation Office	6/24/24	Response received 9/27/24, 10/1/24
Minnesota Department of Commerce, Energy Environmental Review and Analysis (Size Determination Form)	9/9/24	Response received 9/13/24 (**Appendix D**)
Minnesota Department of Natural Resources – Ecological Services Field Office	6/24/24	Response received 7/15/24

Agency	Letter Sent	Meeting/Response Date (Type)
Minnesota Department of Agriculture	6/25/24	
Minnesota Department of Transportation	6/25/24	
Minnesota Pollution Control Agency	9/16/24	
Minnesota Office of the State Archeologist	6/24/24	
County		
Beltrami County	9/4/24*	
Local Government Units		
Lammers Township	9/4/24*	Current Chair attended Open House
Shevlin Township	9/4/24*	
City of Solway	9/4/24*	
Native American Tribes		
Fond du Lac Band of Lake Superior Chippewa	7/2/24	
Bois Forte Band of Chippewa	7/2/24	
Grand Portage Band of Lake Superior Chippewa	7/2/24	
Leech Lake Band of Ojibwe	7/2/24	Response received 9/9/24
Lower Sioux Indian Community	7/2/24	Responses received 8/19/24, 8/28/24, 9/11/24, 9/20/24
Mille Lacs Band of Ojibwe	7/2/24	
Minnesota Chippewa Tribe	7/2/24	
Prairie Island Indian Community	7/2/24	
Red Lake Band of Chippewa Indians	7/2/24	
Shakopee Mdewakanton Sioux Community	7/2/24	Response received 8/19/24
Upper Sioux Community	7/2/24	Phone call on 8/20/24 Responses received 8/27/24, 9/9/24
White Earth Nation	7/2/24	
Minnesota Indian Affairs Counsel	6/24/24	

*This was an invitation to attend the Open House on September 10, 2024.

6.1.1. Federal Agencies

6.1.1.1. U.S. Army Corps of Engineers

The Applicant sent an initial project introduction to the USACE in July 2024. They responded by providing information on their regulatory program. The USACE outlined general information regarding navigable waters, discharge of dredged or fill material into

water, Section 404 permit, underground utility lines, and placement of materials. See **Appendix R** for more information on the response received.

6.1.2. State Agencies

6.1.2.1. State Historic Preservation Office

The Applicant sent an initial project introduction letter to the MN SHPO in July 2024. The Applicant also submitted the Cultural Resources Literature Review and Assessment (**Appendix N**) on August 2, 2024 to SHPO for review and comment. SHPO responded September 27, 2024 and recommended a Phase I Archaeological Survey be completed. See **Appendix R** for more information on the response received.

6.1.2.2. Minnesota Department of Natural Resources

The Applicant sent an initial project introduction to the MNDNR in July 2024. A response was received, providing general comments relating to the project siting, rare features, wildlife movement, protective vegetation management, and various MNDNR permits. See **Appendix R** for more information on the response received.

6.1.3. Local Agencies

The Applicant sent an invitation letter for a public open house meeting that will occur on September 10, 2024 to local agencies within five miles of the Project including Beltrami County, Lammers Township, Shevlin Township, and the City of Solway. The Applicant has not yet applied for local permits for the Project, so the Project does not yet have official correspondence between the applicant and local government agencies related to any necessary permits. Further information will be communicated after the Site Permit has been filed.

6.1.4. Native American Tribes

Consistent with Minn. Stat. § 10.65, on July 2, 2024, Otter Tail sent letters to the 11 federally recognized Tribal Nations in Minnesota, the Minnesota Chippewa Tribe, and the Minnesota Indian Affairs Council requesting comments on the Project and inviting tribal members to participate in the cultural resources field investigation.

Phone calls were completed August 9, 2024 to the Tribal Historic Preservation Offices (THPO) of each of the 11 federally recognized Tribal Nations, except the Red Lake Band of Chippewa Indians, to follow-up regarding potential interest in participating in the cultural resources field investigation. The Applicants are not aware of a THPO currently appointed for the Red Lake Band of Chippewa Indians. Voicemails were left for

each of the remaining ten THPOs. A follow-up email was sent to THPOs on August 19, 2024 (**Appendix R**).

To date, the Lower Sioux Indian Community THPO, responded to the email on August 19, 2024 expressing interest in joining the cultural resources field investigation. The Shakopee Mdewakanton Sioux THPO, responded in an August 19, 2024 email that they would not participate in the cultural resources field survey, but they are interested in following the Project as it develops. The Upper Sioux Indian Community THPO responded in an August 20, 2024 phone call that they likely had the capacity to join the cultural survey but needs to review details prior to confirming that intention. The Leech Lake Band of Ojibwe THPO indicated in a letter dated September 9, 2024, that there are no recorded historic properties within the Project Area and requested to reenter the consultation process at any time. At the time of this Application, only the Upper Sioux THPO will be joining the cultural resource field investigation.

The remaining seven federally recognized Tribal Nations have not yet responded.

7. GLOSSARY OF TERMS/ACRONYMS

ACRONYMS	
AC	Alternating Current
AIMP	Agricultural Impact Mitigation Plan
AMAs	Aquatic Management Areas
Applicant, Otter Tail	Otter Tail Power Company
Application	Site Permit Application
AQI	Air Quality Matrix
ARMER	Allied Radio Matric for Emergency Response
BGEPA	Bald and Golden Eagle Protection Act
bgs	Below ground surface
BMPs	Best Management Practices
BWSR	Minnesota Board of Water and Soil Resources
CAA	Clean Air Act
CFR	Code of Federal Regulations
CFS	Carbon Free Standard
CH4	Methane
CN	Certificate of Need
CO	Carbon Monoxide
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
Commission or MPUC	Minnesota Public Utilities Commission
CRP	Conservation Reserve Program
dBA	Decibel – A weighted
DOC	Minnesota Department of Commerce
DC	Direct Current
EERA	Department of Commerce, Energy Environmental Review and Analysis
EJ	Environmental Justice
EJ Screen	Environmental Justice Screening and Mapping Tool
EMF	Electromagnetic Fields
ESA	Endangered Species Act
GHG	Greenhouse gas
GIS	Geographic Information Systems
GMAs	Ruffed Grouse Management Areas
GPS	Global Positioning System
GWP	Global Warming Potential
IBAs	Important Bird Areas

ACRONYMS	
IPaC	Information for Planning and Consultation
KCMIL	thousand circular mil
kV	Kilovolt
kV/m	Kilovolts Per Meter
L_{10}	The maximum allowable noise volumes that may not be exceeded for more than 10 percent of any hour.
L_{50}	The maximum allowable noise volumes that may not be exceeded for more than 50 percent of any hour.
LEPGP	Large Electric Power Generating Plant
Leq	Equivalent average sound level
MBS	Minnesota Biological Survey
MBTA	Migratory Bird Treaty Act
MCE	Minnesota Conservation Explorer
MDH	Minnesota Department of Health
MDR	Minnesota Department of Revenue
MNDNR	Minnesota Department of Natural Resources
mG	Milligauss
Minn. R.	Minnesota Rules
Minn. S.	Minnesota Statues
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MVA	Megavolt-amperes
MWs	Megawatts
MWh	Megawatt hours
N2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classification
NHIS	Natural Heritage Inventory System
NIEHS	National Institute of Environmental Health Sciences
NOx	Nitrogen Oxides
NPCs	Native plant communities
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSAs	Noise sensitive receptor/areas
O&M	Operations and Maintenance
OSA	Minnesota Office of the State Archeologist
PDSI	Palmer Drought Severity Index

ACRONYMS	
Phase I ESA	Phase I Environmental Site Assessment
PM2.5	Fine particulate matter equal to or less than 2.5 microns in diameter.
PM10	Particulate matter equal to or less than 10 microns in diameter.
POI	Point of interconnection
Prime Farmland Guidance	Solar Energy Production and Prime Farmland: Guidance for Evaluating Prudent and Feasible Alternative.
Project	Solway Solar Project, a solar energy conversion facility with an up to 66 megawatt (MW) alternating current (AC) nameplate capacity, in Lammers Township in Beltrami County, Minnesota.
Project Area	All 487 acres of land owned by Otter Tail for the Project.
Project Footprint	The 287 acre portion of the Project Area enclosed within the Project fence and includes the land needed for the Project components and for operation and maintenance of the Project.
RES	Renewable Energy Standard
RIM	Reinvest in Minnesota
ROW	Right-of-Way
SCADA	Supervisory Control and Data Acquisition
SCAQMD	South Coast Air Quality Management District
SHPO	State Historic Preservation Office
SNAs	Scientific and Natural Areas
SO2	Sulfur Dioxide
SOBS	Sites of biodiversity significance
SPCC	Spill Prevention, Control, and Countermeasure
SPL	sound power level
SSURGO	Soil Service Geographic Database
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Office
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VMP	Vegetation Management Plan
VOC	Volatile organic compounds
WMAs	Wildlife Management Area
WPAs	USFWS Waterfowl Production Areas

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